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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, 2019

☐ **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	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, Par Value $0.0001 Per Share	JAGX	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, 2019, the aggregate market value of the registrant's common stock held by non-affiliates was approximately $8,457,091 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 March 23, 2020 was 15,321,913 shares of voting common stock and 40,301,237 shares of non-voting common stock. The company also had 6,504,792 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 2020 Annual Meeting of Stockholders, or Proxy Statement, to be filed within 120 days of the end of the fiscal year ended December 31, 2019 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.

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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” or the negative 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

We are a commercial stage plant medicine prescription pharmaceutical company focused on developing and commercializing 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 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— 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 may occur at an FDA-inspected and approved facilities, including a recently constructed, multimillion-dollar commercial manufacturing facility. Additionally, several of the drug product candidates in Jaguar's Mytesi pipeline are backed by strong Phase 2 and proof of concept evidence from completed human clinical 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 cancer therapy-related diarrhea (CTD); orphan-drug indications for infants and children with congenital diarrheal disorders (CDDs) 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 9 sales representatives and a national sales director covering U.S. geographies with the highest commercial potential. In November 2019, we hired Ian Wendt, a seasoned industry veteran with a broad range of experience that includes commercializing supportive care and HIV treatments, as Vice President of Commercial Strategy. With support provided by concomitant marketing, promotional activities, patient education programs and peer education initiatives described below, we expect continued growth in the number of patients treated with Mytesi. He will lead business development initiatives that pave the way for Mytesi's final development to the Cancer Therapy Related diarrhea ("CTD") market and our commercial role for this next important indication for 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 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, with 27% of respondents reporting that they currently have diarrhea, and 56% reporting that they have had diarrhea in the past. Additionally, the results of a 2017 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 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 1,300 high volume ART prescribing HIV specialists, and gastroenterologists who see the largest number of people living with HIV/AIDs, and we've strategically focused our sales force in the US geographies with the highest potential, including San Francisco, southern California, Arizona, Nevada, Florida, New York City/Long Island, Connecticut, New Jersey/eastern Pennsylvania, Texas, Chicago, Alabama, Mississippi, Louisiana, DC/eastern Virginia, Indianapolis, and Ohio.

Medical education presentations led by health care providers (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 People Living With HIV/AIDS ("PLWH") and offer guidance about talking to HCPs regarding diarrhea-related concerns.

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 the 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%.

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. As announced on 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.

Napo has an agreement with the ADAP Crisis Task Force. The agreement establishes a reduced price provided by Napo to 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.

As announced on June 26, 2019, we signed an agreement with Integrium, LLC, a clinical research organization, in support of a study to evaluate the effect of Mytesi on the gastrointestinal microbiome in people living with HIV. The study, which is currently still enrolling, is being funded by an investment in Jaguar by California-based PoC Capital. We look forward to adding microbiome data to our overall understanding of the gut health of Mytesi patients, especially as Jaguar works towards expanding Mytesi access to new groups of patients who need symptomatic relief from diarrhea and diarrhea-related symptoms, such as bloating and abdominal discomfort. 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 NapoCares, which assists patients with benefit verification, prior authorization, and claims appeals, can be found at https://mytesi.com/mytesi_savings/.

As announced on October 10, 2019, Jaguar has engaged Angel Pond Capital LLC ("Angel Pond") to explore potential licensing agreements and collaborations for Mytesi in China. Angel Pond was founded by Ted Wang, a former Goldman Sachs partner, with a mission to help bring quality U.S. medical care to the growing needs of patients in China. Angel Pond has offices in New York and Hangzhou, China. Jaguar has engaged Angel Pond as an advisor to help facilitate and negotiate the out-license of our Mytesi and crofelemer technology in China, including identifying additional potential strategic partners in China beyond those Jaguar has already engaged in discussions and due diligence. Cancer therapy-related diarrhea is our lead potential follow-on indication for Mytesi, and cancer is a leading cause of death in China—making the country a compelling region for addressing the unmet medical need of the devastating diarrhea associated with cancer treatment.

As announced on October 30, 2019, Napo has entered into a two-year distribution agreement with TannerGAP, Inc. ("Tanner"), a division of Tanner Pharma Group, a global provider of integrated specialty access solutions. The agreement names Tanner as a distributor of Mytesi on a named patient supply basis outside of the United States, Canada and Israel in regions where the product is not yet registered. Jaguar's ongoing commitment is to enhance Mytesi access for people living with HIV—across all populations, all countries, and the Company believes this agreement will help accelerate that access to Mytesi on a named patient access basis in underserved international markets. Tanner possesses extensive knowledge and experience in the distribution of pharmaceutical products on a

global basis, including the servicing of requests for a particular medicine in markets where that medicine is not licensed.

As we announced on February 20, 2020, the nonprofit American Botanical Council has given the 2019 Varro E. Tyler Commercial Investment in Phytomedicinal Research Award to Napo in recognition of Napo's ongoing commitment to the sustainable development and production of natural therapeutic preparations. Specifically, this award acknowledges the successful development and approval of crofelemer, which is derived from the medicinal *Croton lechleri* tree in the Amazon rainforest. Previous recipients of this award include Jaguar's partner, Italy-based Indena S.p.A., one of the world's largest producers of clinically-tested botanical extracts for the food, dietary supplement, cosmetic, and pharmaceutical markets.

As announced on March 23, 2020, Jaguar submitted a request on March 21, 2020 to the FDA for Emergency Use Authorization for crofelemer (Mytesi) for the symptomatic relief of diarrhea and other gastrointestinal symptoms in patients with coronavirus ("COVID-19") and for patients with COVID-19 who have diarrhea associated with certain antiviral treatments. The American College of Gastroenterology, a medical association that represents thousands of gastroenterologists from around the world that has been studying coronavirus cases, found that coronavirus may present with not only respiratory symptoms, but also with diarrhea.

Pipeline within a product—crofelemer

According to the World Health Organization, there are nearly 1.7 billion cases of diarrheal disease globally every year, and the disease caused an estimated 1.5 million deaths in 2012. 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.

As part of the Company's near term plan, Napo had a meeting with the FDA in March 2019 to review the protocol for Napo's planned Phase 3 clinical trial in cancer subjects to evaluate the effects of Mytesi in prevention and/or relief of CTD. Participants in the meeting, which was with the FDA's Division of Gastroenterology and Inborn Errors Products (DGIEP) and the FDA's Division of Oncology Products, included Pravin Chaturvedi, Ph.D., Napo's/Jaguar's Chairman of the Scientific Advisory Board (SAB) and Acting Chief Scientific Officer, regulatory affairs, medical safety monitoring, and biostatistics specialists, and academic key opinion leaders (KOLs)/SAB members from leading oncology treatment institutions, one of whom will serve as the principal investigator for Napo's planned trial. Following the meeting with the FDA, we reached agreement with the DGIEP in the following key areas related to our planned investigational new drug application (IND) submission for a supplemental new drug application (sNDA) for crofelemer (Mytesi) for the symptomatic relief of CTD:

- Acceptance of the nonclinical safety package for crofelemer from NDA 202292 (the NDA for Mytesi's currently approved HIV indication) without the need for any additional nonclinical or preclinical safety studies for our planned sNDA

- Acceptance of the Chemistry, Manufacturing and Controls (CMC) submissions for use of 125-mg delayed release crofelemer tablets (Mytesi) from NDA 202292, with the proviso of requiring additional details on the drug product specification assays and a summary of assay results for Mytesi lots that are planned to be used in the proposed single pivotal clinical trial in CTD

- No additional drug-drug interaction studies are required for crofelemer at this time

Napo's planned next steps are to continue interactions with the FDA and KOLs/SAB members from leading oncology treatment institutions to incorporate the input from our dialog with the FDA into the pivotal Phase 3 protocol. Our goal is to ensure that the protocol addresses the need for a treatment for CTD, the practicalities of patient enrollment and trial design, and that expert statisticians from both Napo and FDA agree on endpoints relevant to crofelemer's mechanism of action. 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.

In support of our focus on the potential CTD indication, an ongoing investigator-initiated trial (IIT) utilizing Mytesi is underway. Enrollment is ongoing for the HALT D study in breast cancer patients receiving regimens containing Herceptin and Perjeta ("HALT D Investigator Initiated Trial"). The final report for the study, which is sponsored by Georgetown University and funded by Genentech, a member of the Roche Group, is expected to be read out in late-2020. The study's primary endpoint has an 81% power to detect a 40% difference in the percent and/or number of patients experiencing any grade of diarrhea for two consecutive days at a p value of 0.1. (The statistical power of a study, sometimes referred to as a study's sensitivity, is a measure of how likely the study is to distinguish an actual effect from one of chance). For the sake of clarity, the estimates of the percent of patients experiencing such diarrhea is postulated to be 60% in the placebo patients and 20% in the study's crofelemer treated arms. An interim analysis was conducted to ensure that the study has a chance to ultimately achieve the primary endpoint. As announced November 14, 2019, Georgetown University's Data Safety Monitoring Committee ("DSMC") reviewed the interim analysis for futility for the study and notified the Principal Investigator that the study is allowed to enroll to completion. At that point in time, enrollment in the study exceeded 85%. The treatment period for each patient is 3 months. Although this study is not required to support the clinical program for Mytesi for FDA approval for CTD, the final results may inform Jaguar and Napo about potential exploratory clinical endpoints for our planned Phase 3 clinical study for CTD and development activities aimed at additional indications for Mytesi.

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 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.

Plans are in place with Sheikh Khalifa Medical City (SKMC) in Abu Dhabi for a Phase 2 sponsored study of crofelemer, the active pharmaceutical ingredient in Mytesi, for congenital diarrheal disorders (CDDs) and short bowel syndrome (SBS) in children. The Company expects this study to be initiated in the second quarter of 2020.

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 marriage (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.

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.

As announced on December 16, 2019, a clinical research study initiated and sponsored by The University of Texas Health Science Center at Houston (UTHealth) is being supported by Napo. The study will evaluate the safety and effectiveness of crofelemer for treatment of chronic idiopathic diarrhea in patients. Chronic idiopathic diarrhea is a common complaint of patients presenting to family practitioners and internists, and is one of the most common reasons for referral to gastroenterologists. It is estimated that the prevalence of chronic idiopathic diarrhea in developed countries (including the U.S.) is approximately 3-5%. It has a significant negative effect on health-related quality of life and causes a high economic burden on patients and society. The American Gastroenterological Association Burden of Illness study (2012) showed that the estimated annual direct and indirect costs associated with chronic idiopathic diarrhea is up to $524 million per year and $136 million per year, respectively. The principal investigator for the Study is Dr. Brooks D. Cash, MD, AGAF, FACG, FACP, FASGE, Chief - Division of Gastroenterology, Hepatology and Nutrition, Sterling Professor of Medicine, McGovern Medical School at UTHealth, Co-Director, Ertan Digestive Disease Center at Memorial Hermann-Texas Medical Center. The Study is titled Yield of Diagnostic Tests and Management of Crofelemer for Chronic Idiopathic Diarrhea in Non-HIV Patients: A Pilot Study, and is a single-center trial at UTHealth.

Crofelemer is also being evaluated in another investigator-initiated trial for the management of functional diarrhea in non-HIV patients. The principal investigator for this clinical study is Dr. Anthony Lembo, Professor, Gastroenterology, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA. This clinical study is a randomized double-blind, placebo-controlled study in adult subjects with functional diarrhea. Eligible patients will have functional diarrhea defined by Rome IV criteria as >25% loose watery stools and <25% hard/lumpy stools. The study plans to randomize 80 patients and the subjects will be randomized 1:1 for 4 weeks to either the placebo or crofelemer 125 mg delayed-release tablets (Mytesi) arm, administered twice daily for 4 weeks. Following the four-week placebo-controlled period, all subjects will receive Mytesi for an additional four weeks in an open label extension phase. The safety and tolerability of crofelemer and the clinical response during the placebo-controlled period will be evaluated in this study. Subjects will be allowed to use limited amounts of an antimotility drug (loperamide) during the placebo-controlled and open-label extension phase to manage uncontrolled diarrhea. However, no more than 11 doses of 2 mg loperamide will be permitted during any given week per subject. This study is planned to be initiated around mid-2020 and is estimated to be completed by mid 2021.

Napo has previously 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.

Napo Pharmaceuticals has submitted an Emergency Use Authorization (EUA) request for the use of Mytesi for the symptomatic relief of diarrhea and other gastrointestinal symptoms in patients infected with COVID-19. A new study published in the American Journal of Gastroenterology looked at data from 204 patients with COVID-19 in

China's Hubei province and found that 48.5% of these patients arrived at the hospital with digestive symptoms such as diarrhea, vomiting, or abdominal pain. Napo has also requested the issuance of EUA of Mytesi for the symptomatic relief of diarrhea from the proposed empirical use of antiviral drugs including HIV protease inhibitors such as lopinavir/ritonavir (Kaletra) in patients infected with COVID-19.

Mytesi is the only antidiarrheal drug that has been approved by the US FDA for the treatment of chronic, noninfectious diarrhea in adult HIV/AIDS patients receiving antiretroviral therapy (ART). This approval was on the basis of the drug's safety and efficacy in reducing the number of weekly and daily watery stools in patients and improvement of stool consistency, from unformed to formed stools, over a 24-week treatment period.

Unlike other available diarrhea treatments, crofelemer does not act by inhibiting intestinal motility. It has minimal oral absorption and does not have any clinically significant food or drug interactions, thereby allowing patients to maintain their appropriate dosing of treatment to suppress their viral load and maintain adequate CD4 levels in people living with HIV/AIDS (PLWHA). Crofelemer is also the only approved antidiarrheal drug that is approved for chronic use. Moreover, it is not an opioid, like other traditionally used treatments; thus avoiding both the acute side effect of constipation and the potential for abuse. Napo Pharmaceuticals plans to ensure an adequate supply of Mytesi tablets to support any requests for administration of Mytesi to address the COVID-19 pandemic.

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.

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 144 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 39 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 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, our drug product candidate for treatment of chemotherapy-induced diarrhea ("CID") in dogs and exercise-induced diarrhea ("EID") in dogs. 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. CID is an interesting model for human medical need and is being pursued as a prescription indication for animal health. We believe there is an important unmet medical need for the treatment of CID in dogs. Certain cancer treatment agents provided to dogs are human drugs or have the same mechanism of action as human cancer drugs, and these agents and mechanisms of action often have meaningful rates of diarrhea in humans as well.

The U.S. Food & Drug Administration's Center for Veterinary Medicine (“CVM”) indicated in March 2020 that Jaguar’s Chemistry, Manufacturing, and Controls (“CMC”) Technical Section is complete in support of our application for conditional approval under MUMS of Canalevia (crofelemer delayed-release tablets) for the treatment of CID in dogs. The CMC Technical Section is one of the four major technical sections required as part of our application for conditional approval of Canalevia for CID. As previously announced, the CVM has already indicated that two of Jaguar's other major technical sections – the Reasonable Expectation of Effectiveness Technical Section and the Environmental Impact Technical Section – are complete for Canalevia for this proposed indication. The Target Animal Safety Technical Section is the last open major technical section.

The Target Animal Safety Technical Section contains data from a 2017 target animal safety study indicating that the no-observed-adverse-effect level (“NOAEL”) of Canalevia in dogs is approximately six times greater than previously demonstrated and that Canalevia is also safe for use in puppies. The safety of residues of veterinary drugs is most commonly addressed through the conduct of target animal safety studies that provide for the determination of the NOAEL.

The 2017 toxicology study is the first study to demonstrate the safety of Canalevia in puppies as young as 12 weeks of age. Prior crofelemer toxicology studies only involved adult dogs.

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.

As previously announced, Jaguar has two separate indications for Canalevia being considered for Conditional Approval by the CVM. The second proposed indication is for exercise-induced diarrhea (EID) in dogs. Jaguar will be leveraging the use of many of the same major technical sections for EID that have been submitted in support of the Company's application for Canalevia for the indication of CID in dogs. With receipt of Conditional Approval of Canalevia for CID, we expect to launch Canalevia CA-1 for this indication in the first quarter of 2021.

Crofelemer is extracted from the *Croton lechleri* tree, which we sustainably harvest and manage through programs that we have been developing over the past 30 years. This process has involved working with local and indigenous 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 30 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, lechlemer, is in development for cholera.

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 & a third-party cancer agent manufacturer • Met with FDA in March 2019 to discuss the anticipated protocol for a planned pivotal trial	Phase 3	• Final study reported expected in late 2020
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 • Previously received orphan drug designation for SBS	Phase 2	• Initiate POC trial in Abu Dhabi, post US approval of trial design (2H, 2020)
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 • Clinical study initiated at The University of Texas Health Science Center at Houston • 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	• Pre clinical toxicology funded by NIAID • 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 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(3). Global CINV market projected to reach a valuation of $2.7 billion by 2022(4)
IBD	0	Estimated 1,171,000 Americans have IBD(5)
IBS-D	3	Most IBS products have an estimated revenue potential of greater than $1.0 billion(6)
CDD/SBS	0	Financial benefits of Orphan-drug Designation
Cholera (hydration maintenance) PRV (SB-300)	0	In recent transactions by other companies, priority review vouchers have sold for $67 million to $350 million(7)

(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

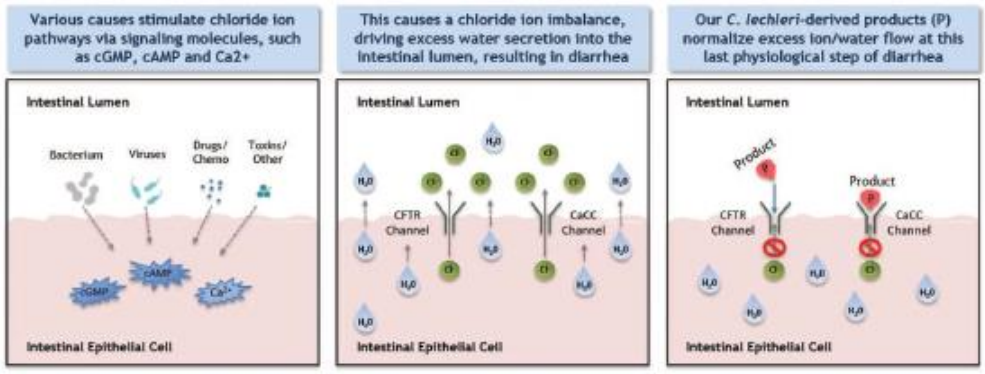
(4) Report published by Allied Market Research, titled, "Chemotherapy-induced Nausea and Vomiting (CINV) Market-Global Opportunity Analysis and Industry Forecast, 2014-2022" (https://www.prnewswire.com/news-releases/chemotherapy-induced-nausea-and-vomiting-cinv-market-expected-to-reach-2659-million-by-2022-611755395.html)

(5) 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

(6) Merrill Lynch forecasts peak US sales of roughly $1.5 bn for Ironwood's Linzess (https://247wallst.com/healthcare-business/2015/04/27/key-analyst-sees-nearly-30-upside-in-ironwood/); Rodman & Renshaw estimate peak annual sales of Synergy Pharmaceuticals' Trulance at $2.3 bn in 2021 (https://www.benzinga.com/analyst-ratings/analyst-color/17/04/9304883/what-synergys-new-patents-mean-for-its-commercial-prospe)

(7) In Aug. 2015, AbbVie Inc. bought a priority review voucher from United Therapeutics Corp for $350 million (https://www.wsj.com/articles/united-therapeutics-sells-priority-review-voucher-to-abbvie-for-350-million-1439981104). 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).

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

Napo’s direct sales organization is comprised of Mytesi field sales representatives strategically positioned to cover U.S. geographies with the highest potential. 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.

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

Approximately 16 key opinion leaders (KOLs) who are recognized specialists in HIV patient care, CTD, IBD, IBS, cholera, SBS, and CDD are currently 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 the 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 or co-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 U.S. 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. 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 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 is to have de-risked the program as much as we believe we possibly can, by the time we start devoting significant funds to a clinical trial, 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.

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 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 (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 the 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 the development of lechlemer for potential cholera-related indication.

As announced, Napo received preclinical services from the National Institute of Allergy and Infectious Diseases (“NIAID”) to support the development of lechlemer for the proposed cholera indication. Under NIAID’s suite of preclinical services, NIAID-funded contractors conducted toxicology testing for 7-day rat and dog studies. NIAID is part of the National Institutes of Health, which is an agency of the U.S. Department of Health and Human Services.

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 human and veterinary indications. Crofelemer is also the API in Canalevia, our lead prescription drug product candidate, intended for the treatment of chemotherapy-induced diarrhea in dogs.

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

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)

CTD 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 Study

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.

As we announced on August 19, 2019, statistically significant top line results have been achieved in a key preclinical pharmacological study to evaluate the effects of crofelemer on diarrhea induced in healthy dogs by a maximally tolerated dose of a specific tyrosine kinase inhibitor (TKI). The results of the study, which was funded by a third-party cancer agent manufacturer of an FDA-approved TKI, are expected to provide additional scientific rationale and support for the use of crofelemer in providing symptomatic relief of noninfectious diarrhea in human patients receiving TKI-and/or-other targeted cancer therapy-containing regimens in future human clinical investigations. The top line results of the study show that combined crofelemer groups demonstrated superior benefit for “responders” (p= 0.01). The results from this key preclinical study show concordance and remarkable similarity to the substantial benefits that were observed in the pivotal human trial of crofelemer (ADVENT trial) that resulted in the approval of the drug for the symptomatic relief of noninfectious diarrhea in adult patients with HIV/AIDS on antiretroviral therapy. We are applying our lessons from the ADVENT trial and this preclinical study in our clinical study design

that we are discussing with the FDA to allow the conduct of a single pivotal study for CTD in all solid tumor human patients.

As we announced October 22, 2019, additional findings from the above preclinical study evaluating the effects of crofelemer on diarrhea induced by a specific TKI show that the animals in the crofelemer groups received approximately 20% higher doses of the TKI than the animals in the placebo group through the four weeks of the treatment period. The TKI dose reductions over the four-week period were statistically higher for the control group compared to the crofelemer QID group and trending toward statistical significance in the BID group. In general, the treatment effect of crofelemer was 1.5 to 2.5 times better than placebo for multiple endpoints in this study. Specifically, the preclinical study showed that crofelemer treatment resulted in lesser incidence and severity of diarrhea with the maintenance and tolerability of a higher dose of the selected TKI. The study points to potential benefits Jaguar hopes to see in future human studies of crofelemer's ability to provide symptomatic relief of noninfectious diarrhea in patients receiving a targeted cancer therapy in an adjuvant or metastatic setting.

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.

Completed Studies—IBS-D

As we announced on January 8, 2020, a study appearing in the December 2019 issue of *Clinical and Translational Gastroenterology*, a peer-reviewed journal published by the American College of Gastroenterology, indicates that crofelemer could be a treatment option for abdominal pain associated with diarrhea-predominant irritable bowel syndrome (IBS-D). This multicenter, phase 2, randomized, double-blind, placebo-controlled trial evaluated the effect of crofelemer on abdominal pain in women with IBS-D. A total of 240 women were enrolled, and participants were randomized to crofelemer (125 mg) or placebo twice daily for 12 weeks. Following an analysis by the FDA-issued revised recommendations for outcome measures in IBS clinical trials in 2010, the proportion of monthly abdominal pain responders was significantly higher in the crofelemer group during months 1 through 2 (58.3% vs 45.0%, p = 0.030) as well as during the entire 3 months (54.2% vs 42.5%, p = 0.037) when compared with placebo. No significant differences were observed in the proportion of stool consistency monthly responders based on the revised FDA guidelines.

These observed trends of improvement in monthly abdominal pain responders suggest that crofelemer may have a use for treatment in abdominal pain in IBS-D patients without having significant changes to bowel habits. Currently, there are very few treatment options to address the visceral pain associated with IBS-D. Crofelemer has a distinct and novel antisecretory mechanism of action of modulation of cystic fibrosis transmembrane conductance regulator (CFTR) and/or calcium-activated chloride channels (CaCC) that may provide a new non-opiate or antibiotic-based option to treat the visceral abdominal pain and discomfort for IBS-D patients.

Irritable bowel syndrome (IBS) is a gastrointestinal condition defined by abdominal pain and altered bowel habits in the absence of another disease that can account for these symptoms. IBS is the most commonly diagnosed gastrointestinal condition and has a population prevalence of up to 12% in North America and is more prevalent in women than in men. Currently, IBS is a clinical diagnosis based on abdominal pain associated with a change in bowel habits. Patients with IBS, but particularly those with IBS-D, report significantly reduced quality of life, higher indirect costs, and greater impairments in daily and work activities.

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 a stool consistency score of ≥ 4 for $< 25\%$ of days in a given week and $\geq$ 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 was 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.

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 the 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-point 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.

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.

We have previously 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 might 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 might 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 currently approved indication and has demonstrated statistically significant results in multiple supportive care settings, though not specifically in IBD patients. The 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.

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.

As announced October 23, 2019, two short-term preclinical toxicology studies in rats and dogs intended to support continued development of lechlemer for the symptomatic relief of diarrhea from cholera and potentially other acute infectious diarrheal conditions have been completed. Completion of these initial studies supports the initiation of longer term toxicity and safety pharmacology studies that the Company expects will support the Investigational New Drug (IND) application Jaguar plans to file for lechlemer. As previously announced, Napo received preclinical services supported by the National Institute of Allergy and Infectious Diseases ("NIAID") to support development of lechlemer. NIAID is part of the National Institutes of Health. Under NIAID's suite of preclinical services, NIAID-funded contractors conducted the initial 7-day rat and dog toxicology studies.

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 a total of 7-item GI index. Clinical success was defined as no diarrhea within 48 hours from the 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. Sixteen 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 the 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 ($p<0.05$).

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 are transferred to patients mainly via the hands of healthcare personnel who have touched a contaminated surface or item. We believe the 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 GW Pharmaceuticals, Lexicon Pharmaceuticals, 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 ongoing 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 2b 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.

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

Effective January 16, 2019, Napo Pharmaceuticals, Inc. engaged Cardinal Health as its exclusive third party logistics distribution agent for commercial sales for the Company's Mytesi product and to perform certain other services which include, without limitation, storage, distribution, returns, customer support, financial support, EDI and system access support (Exclusive Distribution Agreement).

In addition to the terms and conditions of the Agreement, Cardinal Health's purchase of products, and assumption of title therein, is set forth in the Title Model Addendum. The Title Model Addendum states that upon receipt of product at the 3PL Facility (Cardinal Health in La Vergne, Tennessee) from the Company, title and risk of loss for the Mytesi product purchased by Cardinal Health (excluding consigned inventory) shall pass to Cardinal Health, and title and risk of loss for consigned inventory shall remain with Client until purchased by Cardinal Health in accordance with this Addendum. Napo Pharmaceuticals, Inc. considers Cardinal Health the Company's exclusive customer for Mytesi products per the Cardinal Health Exclusive Distribution agreement.

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 an FDA-approved Glenmark facility. Additionally, Napo plans to establish a second 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.

As we announced on August 2, 2019, Indena has successfully developed and implemented an improved crofelemer manufacturing process, effectively increasing yield and realizing reduced cost through increased manufacturing efficiencies while retaining the same phytochemical profile without compromising product quality, safety, purity and efficacy. The modified process allows Napo to support the increased crofelemer manufacturing demand expected if crofelemer receives FDA approval for new indications, including approval for the symptomatic relief of CTD. The improved process supports Jaguar's goal of increasing product yield, lowering the cost of goods, and securing manufacturing capacity to support future growth.

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 increasing scale. We are in the process of evaluating alternative and 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 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.

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 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 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. 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 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 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.

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 the 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.

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 the of 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.

Once 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 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 mean that if anyone 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 “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 the 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 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 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 the 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 covered 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 the 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 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 the 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 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.

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"). The Company 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 April 12, 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 Commission on July 6, 2017 related to the solicitation of votes from shareholders to approve the merger and certain transactions related thereto. The Company accepted service of the complaint and summons on behalf of itself and the United States-based director Defendants on November 1, 2017. The Company has 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 amended complaint on September 20, 2018. Plaintiff was entitled to amend that complaint within 20 days from the date of dismissal. On October 10, 2018, Plaintiff filed a second amended complaint to focus on the Company's 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 second amended 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 denied the Defendants' motion to dismiss on June 28, 2019. The Company answered the second amended complaint on August 2, 2019; the answer denied the material allegations of the second amended complaint. The parties are now engaged in discovery. If the Plaintiff were able to prove his allegations in this matter and to establish the damages he asserts, then an adverse ruling could have a material impact on the Company. The Company believes 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.

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, 2019, we had 29 employees. Five employees hold D.V.M. or Ph.D. degrees. Nine of our employees are engaged in research and development activities and 12 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. Anyone 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 years ended December 31, 2019 and 2018 was $38.5 million and $32.1, respectively. As of December 31, 2019, we had total stockholders' equity of $10.7 million. We expect to 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 increase 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, 2021, 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 expect to incur significant additional costs as we continue commercialization efforts for current prescription drug candidates 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 September 2016. 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 lechlemer. These 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;
- 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, 2021 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 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;
- 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 candidate, Mytesi, and cannot be certain that necessary approvals will be received for planned Mytesi follow-on indications 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. Our current efforts are primarily focused on the ongoing commercialization of Mytesi, and development efforts related to Mytesi. With regard to Mytesi, we are focused on marketing 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.

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

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

- 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 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 market Mytesi, whether alone or in collaboration with others;
- the availability, perceived advantages, relative cost, relative safety and relative efficacy of our prescription drug product candidates 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 commercializing Mytesi, 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, 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 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 Takeda Pharmaceuticals, Allergan, Inc., Ironwood Pharmaceuticals, Inc., Synergy Pharmaceuticals 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.

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;
- 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 maybe 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 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;
- 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 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, and the resignation of our former Chief Financial Officer and Treasurer, Karen Wright, in August 2019, 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. To help attract, retain, and motivate qualified management and other personnel, we use share-based incentive awards such as employee stock options and restricted stock units. Due to the decline in our stock price that has occurred since February 2016, a large percentage of the options held by our employees are underwater. As of December 31, 2019, all outstanding options had an exercise price below the closing price of the stock on that date. As a result, the current situation provides a considerable challenge to maintaining employee motivation, as well as creating a serious threat to retention until a recovery commences. If our share-based compensation ceases to be viewed as a valuable benefit, our ability to attract, retain, and motivate qualified management and other personnel could be weakened, which could harm our results of operations and 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 gastrointestinal health field 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 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. 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 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 and anticipated line extensions.

We are dependent upon third-party contract manufacturers, both for the supply of the active pharmaceutical ingredient in Mytesi, 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. Glenmark 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 into an agreement with Patheon, a provider of drug development and delivery solutions, under which Patheon provides enteric-coated tablets to us for use in humans and 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 2020. However, we will require additional quantities of API to ensure our ongoing sales efforts for 2021 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 of Mytesi, or if our contract manufacturer and formulator are not able to produce sufficient quantities or quality of the Mytesi API or finished product under their agreements, it could delay our plans and harm our business prospects. For example, as a result of the recent outbreak of a novel strain of COVID-19 originated from Wuhan, China, which has since spread to a number of other countries, including the United States, our suppliers and contract manufacturer could be disrupted by worker absenteeism, quarantines, or other travel or health-related restrictions or could incur increased costs associated with ensuring the safety and health of their personnel. If our suppliers or contract manufacturer is so affected, our supply chain could be disrupted, our product shipments could be delayed, our costs could be increased and our business could be adversely affected.

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, they and we 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 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 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 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 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, and, if approved, Canalevia. If we are not successful in commercializing Mytesi, for its currently approved indication or for any potential Mytesi follow-on indication, 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.

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

As of December 31, 2019, we had 29 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.

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 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 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 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, as applicable, the willingness of patients, 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 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 to pay for our products may be less than we anticipate, and may be negatively affected by overall economic conditions.

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, 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 and substantially all of Napo's assets, so if we default on those obligations, CVP could foreclose on our assets.

Our obligations under the secured promissory notes issued to Chicago Venture Partners, L.P. ("CVP") are secured by a security interest in substantially all of our veterinary related assets and substantially all of Napo's assets, including intellectual property, as provided in the Security Agreement, dated May 28, 2019 between Jaguar and CVP, and the Security Agreement dated May 28, 2019 between Napo 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.

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 cyber security attack 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.

The novel coronavirus global pandemic could adversely impact our business, including our supply chain, clinical trials and commercialization of Mytesi.

As a result of the recent outbreak of novel COVID-19, we may experience disruptions that could severely impact our supply chain, ongoing and future clinical trials and commercialization of Mytesi. For example, COVID-19 has resulted in increased travel restrictions and the shutdown or delay of business activities in various regions, including certain activities of our contract manufacturer in India. To the extent our suppliers and contract manufacturer are unable to comply with their obligations under our agreements with them or they are otherwise unable to deliver or are delayed in delivering raw materials, Mytesi API or finished products to us due to COVID-19, our ability to continue meeting commercial demand for Mytesi in the United States or advancing development of our product candidates may become impaired. Travel restrictions and shutdowns in business operations as a result of the

outbreak may also limit our ability to pursue business development activities, including limiting onsite diligence of manufacturing facilities owned or operated by the Company and our contractors.

Such travel restrictions and shutdowns in business operations may also adversely impact our commercialization of Mytesi, including limiting the ability of our marketing and sales force to engage with healthcare providers and patient groups, and could result in patients postponing visits to healthcare provider facilities, healthcare providers temporarily closing their offices or restricting patient visits, pharmacies being closed or suffering supply chain disruptions, healthcare provider and/or pharmacy employees being unavailable and general disruptions in the operations of payors, distributors, logistics providers and other third parties that are necessary for Mytesi to be prescribed and reimbursed.

COVID-19 continues to rapidly evolve. The extent to which COVID-19 may impact our business, including our supply chain, clinical trials, commercialization of Mytesi and distribution channels, will depend on future developments, which are highly uncertain and cannot be predicted with confidence, such as the ultimate geographic spread of the pandemic, the duration of the pandemic, travel restrictions and social distancing in the United States and other countries, business closures or business disruptions and the effectiveness of actions taken in the United States and other countries to contain and treat the pandemic.

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 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 three 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.

The Leahy-Smith America Invents Act, patent reform legislation enacted in 2011, could increase the uncertainties and costs surrounding the prosecution of any patent applications and the enforcement or defense of any patents that issue. The Leahy-Smith Act introduced 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 is entitled to the patent on an invention regardless of whether another inventor had made the invention earlier. The USPTO developed 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 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 the botanical guidance of our drug approval and 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 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. 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. 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 an ANDA with a certification under 21 U.S.C. § 3559(j)(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.

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 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.

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 MYTESI®, JAGUAR HEALTH®, the Jaguar Health Logo®, NAPO®, Napo Logo®, CANALEVIA, EQUILEVIA, NEONORM®, JAGUAR ANIMAL HEALTH®, and the Jaguar Animal Health Logo®. We also own registered and pending applications for the CANALEVIA mark in a number of foreign countries. 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.

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;
- 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.

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.

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 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.

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.

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 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.

If we fail to satisfy the continued listing requirements of The Nasdaq Capital Market, such as the minimum closing bid price requirement, Nasdaq may take steps to delist our common stock.

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 we offer our securities.

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. We did not have adequate policies and procedures in place to ensure the timely, effective review of assumptions used in measuring the fair value of certain financial instruments. We did not have adequate policies and procedures in place to ensure the timely, effective review of compliance with contractual covenants in certain financial instruments. 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.

In connection with our preparation of our annual financial statements for the year ended December 31, 2019, there remains a material weakness in our internal control over financial reporting related to our financial statement close process and policies. The primary factors contributing to the material weaknesses were as follows:

- We did not have adequate policies and procedures in place to ensure the timely, effective review of assumptions used in measuring the fair value of certain financial instruments.

- We did not have adequate policies and procedures in place to ensure the timely, effective review of compliance with contractual covenants in certain financial instruments.

Each of these factors resulted in a material weakness in our financial statement preparation and financial statement close process and policies, and a determination that such process was not adequately designed, documented and executed to support the accurate and timely reporting of our financial results.

We have begun taking steps and plan to take additional measures to remediate the underlying causes of the material weakness, primarily through the development and implementation of formal policies, improved processes and documented procedures. 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 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;
- uncertainties related to COVID-19; and
- general economic conditions in the United States and abroad.

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.

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.

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 Series A Convertible Preferred Stock, exchanges of our promissory notes and exercises of outstanding options and warrants.

As of December 31, 2019, we had (i) outstanding options to purchase an aggregate of 3,902,675 shares of our common stock at a weighted average exercise price of $5.20 per share, (ii) 15,310,000 shares of common stock issuable upon exercise of the Series 1 warrants and Series 2 warrants, with an exercise price of $1.40 and $2.00, respectively, (iii) 2,781,250 shares of common stock issuable upon exercise of the Bridge Warrants issuable pursuant to the Securities Purchase Agreement entered into beginning on March 18, 2019 by and among the Company and selected accredited investors, with an exercise price of $2.00, (iv) 27,432 shares of voting common stock issuable upon exercise of other warrants outstanding as of December 31, 2019, with a weighted-average exercise price of $1.70, (v) 473,565 shares of common stock issuable upon conversion of outstanding Series A convertible preferred stock, with a conversion price of $19.425 per share, (vi) 985,500 shares of common stock issuable upon conversion of outstanding Series B convertible preferred stock, with a conversion price of $1,000 per share, (vii) 630,063 shares of common stock issuable upon conversion of outstanding Series B-1 convertible preferred stock, with a conversion price of $9,901 per share, (viii) 3,821,690 shares of voting common stock issuable upon exercise of outstanding options, with a weighted-average exercise price of $5.72, (ix) 2,993 shares of common stock issuable upon exercise of outstanding inducement options, with a weighted-average exercise price of $5.72, (x) RSUs for 5,613 shares of voting common stock issuable upon vesting of outstanding restricted stock unit awards, and (xi) outstanding promissory

notes in an aggregate principal amount of $7,725,893.

The exercise of such options and warrants, conversion of the Series A convertible preferred stock, Series B convertible preferred stock, and Series B-1 convertible preferred stock, and exchange of the promissory notes for shares of our common stock will result in further dilution of your investment. In addition, you may experience further dilution if we issue common stock in the future. As a result of this dilution, you may receive significantly less 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, 2019, we had 14,273,061 shares of voting common stock and 40,301,237 shares of non-voting common stock (38,382 shares of voting common stock on an as converted basis) 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 one thousand fifty-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 Investments Limited ("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;
- 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 employees 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. or any of its affiliates owns 35% or more of the shares of our Series A Convertible 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 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, 2019, our executive officers, directors, holders of 5% or more of our capital stock and their respective affiliates beneficially owned in the aggregate approximately 57.16% 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 our 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 ourselves of this exemption when we cease to be an “emerging growth company” on December 31, 2020. 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.

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 $1.07 billion in any fiscal year or (iii) if we issue more than $1.0 billion of non-convertible debt over a three-year period.

We effected two reverse stock splits since January 1, 2018, which may not achieve one or more of our objectives.

We have effected two reverse stock splits since January 1, 2018, each of which has impacted the trading liquidity of the shares of our common stock. There can be no assurance that the market price per share of our common stock after a reverse stock split will remain unchanged or increase in proportion to the reduction in the number of shares of our common stock outstanding before the reverse stock split. The market price of our shares may fluctuate and potentially decline after a reverse stock split. Accordingly, the total market capitalization of our common stock after a reverse stock split may be lower than the total market capitalization before the reverse stock split. Moreover, the market price of our common stock following a reverse stock split may not exceed or remain higher than the market price prior to the reverse stock split.

Additionally, there can be no assurance that a reverse stock split will result in a per-share market price that will attract institutional investors or investment funds or that such share price will satisfy investing guidelines of institutional investors or investment funds. As a result, the trading liquidity of our common stock may not necessarily improve. Further, if a reverse stock split is effected and the market price of our common stock declines, the percentage decline may be greater than would occur in the absence of a reverse stock split.

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 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 amended complaint on September 20, 2018. Plaintiff was entitled to amend that complaint within 20 days from the date of dismissal. On October 10, 2018, Plaintiff filed a second amended complaint to focus on the Company's 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 second amended 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 denied the Defendants' motion to dismiss on June 28, 2019. The Company answered the second amended complaint on August 2, 2019; the answer denied the material allegations of the second amended complaint. The parties are now engaged in discovery. If the Plaintiff were able to prove his allegations in this matter and to establish the damages he asserts, then an adverse ruling could have a material impact on the Company. The Company believes 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.

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 30, 2020, there were approximately 35 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 21, 2019, August 14, 2019 and November 14, 2019 and our current reports on Form 8-K filed with the SEC on March 5, 2019, March 19, 2019, March 22, 2019, March 25, 2019, April 4, 2019, June 3, 2019, June 14, 2019, June 28, 2019, July 5, 3019, July 12, 2019, October 3, 2019, October 7, 2019 and December 26, 2019, 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.

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 plant medicine prescription 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.

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. Crofelemer 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 $38.5 million and $32.1 million for the years ended December 31, 2019 and 2018, respectively. As of December 31, 2019, we had total stockholders' equity of $10.7 million, an accumulated deficit of $133.1 million, and unrestricted cash of $3.5 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.

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.

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.

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 to prepare for future Mytesi indications.

We expect sales and marketing expenses to increase significantly as we develop and commercialize new products. 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.

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 sold Mytesi through Mission, who then sold Mytesi to its distributors and wholesalers — McKesson, Cardinal Health, AmerisourceBergen Drug Corporation (“ABC”), HD Smith, Smith Drug and Publix (together “Distributors”). Mission sold Mytesi to their Distributors, on behalf of Napo, under agreements executed by Mission with these Distributors and Napo abided by the terms and conditions of sales agreed to between Mission and their Distributors. Health care providers ordered Mytesi through pharmacies who obtained Mytesi through Mission's Distributors. Napo considered Mission as the sales agent and the Distributors of Mission as its customers. Napo retained control of Mytesi held at Mission.

Mission's Distributors were 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 together met 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 16, 2019, Napo engaged Cardinal Health as its exclusive third party logistics distribution agent for commercial sales for the Company’s Mytesi product and to perform certain other services which include, without limitation, storage, distribution, returns, customer support, financial support, EDI and system access support (Exclusive Distribution Agreement).

In addition to the terms and conditions of the Agreement, Cardinal Health’s purchase of products, and assumption of title therein, is set forth in the Title Model Addendum. The Title Model Addendum states that upon receipt of product at the 3PL Facility (Cardinal Health in La Vergne, Tennessee) from the Company, title and risk of loss for the Mytesi product purchased by Cardinal Health (excluding consigned inventory) shall pass to Cardinal Health, and title and risk of loss for consigned inventory shall remain with Napo until purchased by Cardinal Health in accordance with this Addendum. Napo considers Cardinal Health the Company’s exclusive customer for Mytesi products per the Cardinal Health Exclusive Distribution agreement.

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.

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 the fiscal year 2018. The decline in market capitalization during the 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 an impairment charge of the remaining carrying value of $5.2 million during the year ended December 31, 2018 and recorded no impairment charge during the year ended December 31, 2019. 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 $4.0 million and zero during the years ended December 31, 2019 and 2018, 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 is less than 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 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.

Results of Operations

Comparison of the Years Ended December 31, 2019 and 2018

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, 2019 and 2018 together with the change in such items in dollars and as a percentage.

	Year Ended December 31,			
	2019	2018	Variance	Variance %
Product revenue	$ 5,775,257	$ 4,238,756	$ 1,536,501	36.2 %
Collaboration revenue	—	177,389	(177,389)	(100.0)%
Total revenue	5,775,257	4,416,145	1,359,112	30.8 %
Operating Expenses				
Cost of product revenue	3,815,812	2,765,746	1,050,066	38.0 %
Research and development	5,819,817	5,154,748	665,069	12.9 %
Sales and marketing	6,936,314	9,831,576	(2,895,262)	(29.4)%
General and administrative	13,502,625	12,277,222	1,225,403	10.0 %
Settlement of Tempesta Royalty License Agreement	648,800	—	648,800	100.0 %
Impairment of goodwill	—	5,210,821	(5,210,821)	(100.0)%
Impairment of indefinite-lived intangible assets	4,000,000	—	4,000,000	100.0 %
Total operating expenses	34,723,368	35,240,113	(516,745)	(1.5)%
Loss from operations	(28,948,111)	(30,823,968)	1,875,857	(6.1)%
Interest expense	(5,730,648)	(2,628,685)	(3,101,963)	118.0 %
Other income	80,832	315,691	(234,859)	(74.4)%
Change in fair value of financial instruments	1,009,402	331,016	678,386	204.9 %
Gain on Valeant settlement	—	1,204,333	(1,204,333)	(100.0)%
Loss on extinguishment of debt	(4,940,911)	(544,444)	(4,396,467)	807.5 %
Loss before income tax	(38,529,436)	(32,146,057)	(6,383,379)	19.9 %
Income tax expense	(10,000)	—	(10,000)	100.0 %
Net loss	$ (38,539,436)	$ (32,146,057)	$ (6,393,379)	19.9 %

Revenue

Product revenue

The increase in product revenue of $1.5 million for the year ended December 31, 2019 compared to 2018 was due to increased sales of Mytesi as a result of the more streamlined distribution and increased sales presence which resulted in an increase in prescription volume from a combination of new prescriptions and refills.

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, 2019 and 2018 are as follows:

	Year Ended December 31,			
	2019	2018	Variance	Variance %
Gross product sales				
Mytesi	$ 8,248,993	$ 5,730,283	$ 2,518,710	44.0 %
Neonorm	102,167	116,843	(14,676)	(12.6)%
Total gross product sales	8,351,160	5,847,126	2,504,034	42.8 %
Medicare rebates	(499,748)	(184,339)	(315,409)	171.1 %
Sales discounts	(1,451,286)	(918,722)	(532,564)	58.0 %
Sales returns	(120,317)	(167,908)	47,591	(28.3)%
Wholesaler fee	(504,552)	(337,401)	(167,151)	49.5 %
Net product sales	$ 5,775,257	$ 4,238,756	$ 1,536,501	36.2 %

Cost of Product Revenue

	Year Ended December 31,			
	2019	2018	Variance	Variance %
Cost of Product Revenue				
Material cost	$ 2,144,616	$ 1,329,432	$ 815,184	61.3 %
Direct labor	586,275	579,412	6,863	1.2 %
Distribution fees	404,121	460,551	(56,430)	(12.3)%
Royalties	24,508	138,494	(113,986)	(82.3)%
Other	656,292	257,857	398,435	154.5 %
Total	$ 3,815,812	$ 2,765,746	$ 1,050,066	38.0 %

The increase in cost of product revenue of $1.1 million for the year ended December 31, 2019 compared to 2018 was due to increased sales of Mytesi, including non-recurring charges of material costs for a campaign batch cancellation fee of $78,000 and the write-off of $390,000 non-conforming inventory, and distribution fees of $227,000 from the Company's former distributor, offset by the reversal of $189,000 of accrued royalties related to the termination of a royalty agreement.

Research and Development Expense

The following table presents the components of research and development (R&D) expense for the years ended December 31, 2019 and 2018:

	Year Ended December 31,			
	2019	2018	Variance	Variance %
Research and Development:				
Personnel and related benefits	$ 1,724,699	$ 2,207,199	$ (482,500)	(21.9)%
Materials expense and tree planting	103,064	195,792	(92,728)	(47.4)%
Travel, other expenses	164,052	120,334	43,718	36.3 %
Clinical and contract manufacturing	1,759,913	1,145,594	614,319	53.6 %
Stock-based compensation	868,527	579,641	288,886	49.8 %
Other	1,199,562	906,188	293,374	32.4 %
Total	$ 5,819,817	$ 5,154,748	$ 665,069	12.9 %

The increase in research and development expense of $0.7 million for the year ended December 31, 2019 compared to 2018 was due primarily to:

- Clinical and contract manufacturing expenses increased $614,319 from $1,145,594 for the year ended December 31, 2018 to $1,759,913 in 2019 primarily due to an increase in contract manufacturing costs for enhanced manufacturing process improvements the Company is developing to reduce the cost of revenue.

- Personnel and related benefits decreased $482,500 from $2,207,199 in the year ended December 31, 2018 to $1,724,699 in 2019 due to changes in headcount and related salaries.

- Stock-based compensation increased $288,886 primarily due to an increase in the number of option grants.

- Other expenses, consisting primarily of consulting, formulation and regulatory fees, increased $293,374 from $906,188 in the year ended December 31, 2018 to $1,199,562 in 2019. Consulting expenses increased by $424,971 due to an increase in clinical trial consultants consistent with the temporary termination of clinical trials and an increase in R&D testing consultant work. Regulatory expenses decreased by $176,038 due to the Company receiving a waiver of fee payment from the FDA.

Sales and Marketing Expense

The following table presents the components of sales and marketing (S&M) expense for the years ended December 31, 2019 and 2018 together with the change in such components in dollars and as a percentage:

	Year Ended December 31,			
	2019	2018	Variance	Variance %
Sales and Marketing:				
Personnel and related benefits	$ 4,197,864	$ 4,237,472	$ (39,608)	(0.9)%
Stock-based compensation	160,838	96,730	64,108	66.3 %
Direct Marketing fees and expense	1,396,481	3,891,286	(2,494,805)	(64.1)%
Other	1,181,131	1,606,088	(424,957)	(26.5)%
Total	$ 6,936,314	$ 9,831,576	$ (2,895,262)	(29.4)%

The decrease in sales and marketing expense of $2,895,262 for the year ended December 31, 2019 compared to 2018 was due primarily to:

- Direct marketing and sales expense decreased $2,494,805 from $3,891,286 for the year ended December 31, 2018 to $1,396,481 in 2019 due to a decrease in marketing programs for Mytesi.

- Personnel and related benefits decreased $39,608 from $4,237,472 for the year ended December 31, 2018 to $4,197,864 in 2019 due to a decrease of $325,641 related to a sales force reduction, partially offset severance expenses of $116,000 and increased sales incentive bonuses of $165,000 from increased sales.

- Other expenses decreased $424,957 from $1,606,088 the year ended December 31, 2018 to $1,181,131 in 2019 largely due to reduction in advertising costs of $454,000.

General and Administrative Expense

The following table presents the components of general and administrative (G&A) expense for the years ended December 31, 2019 and 2018:

	Year Ended December 31,			
	2019	2018	Variance	Variance %
General and Administrative:				
Personnel and related benefits	$ 1,812,187	$ 1,744,733	$ 67,454	3.9 %
Audit, tax and accounting services	814,764	590,712	224,052	37.9 %
Third-party consulting services	2,001,643	2,103,880	(102,237)	(4.9)%
Legal services	1,894,533	2,252,203	(357,670)	(15.9)%
Travel, other expenses	244,705	282,268	(37,563)	(13.3)%
Stock-based compensation	1,959,119	1,347,503	611,616	45.4 %
Rent and lease expense	796,151	530,223	265,928	50.2 %
Public company expense	651,217	664,733	(13,516)	(2.0)%
Other	3,328,306	2,760,967	567,339	20.5 %
Total	$ 13,502,625	$ 12,277,222	$ 1,225,403	10.0 %

The increase in general and administrative expenses of $1,234,203 for the year ended December 31, 2019 compared to 2018 was due primarily to:

- Accounting fees increased $224,052 from $590,712 for the year ended December 31, 2018 to $814,764 in 2019, mostly due to change in the timing of services provided.

- Consulting fees decreased $102,237 from $2,103,880 for the year ended December 31, 2018 to $2,001,643 in 2019. This was primarily due to replacing third-party consultants with regular fulltime employees for accounting and financial planning and analysis.

- Legal fees decreased $357,670 from $2,252,203 for the year ended December 31, 2018 to $1,894,533 in 2019 mostly due to a decrease in patent legal fees.

- Stock-based compensation expense increased $611,616 from $1,347,503 for the year ended December 31, 2018 to $1,959,119 in 2019 due to an increase in the volume of option grants to new and existing employees.

- Rent and lease expense increased $265,928 from $530,223 for the year ended December 31, 2018 to $796,151 in 2019 primarily due to contractual increases in rent on the Company’s office facilities and the additional increase in rent expense beginning in March 2019 due to the cost of the LOC warrant.

- Other general and administrative expenses increased $567,339 from $2,760,967 for the year ended December 31, 2018 to $3,328,306 in 2019 largely due to personnel recruiting fees and increased D&O liability insurance.

Settlement of Tempesta Royalty License Agreement

A royalty license agreement settlement expense of $648,800 was incurred for the year ended December 31, 2019. In October 2019, the Company and Tempesta settled a dispute, pursuant to which Tempesta received $50,000 in cash, an unsecured promissory note issued by the Company in the aggregate principal amount of $550,000 and 40,000 shares of the Company's common stock in exchange for the cessation of all royalty payments by Napo to Dr. Tempesta under the License Agreements (see Note 7).

Impairment of indefinite-lived intangible assets

The Company recorded an impairment of indefinite-lived assets of $4,000,000 and zero in the fiscal years ending December 31, 2019 and 2018, respectively.

Interest Expense, net

The increase in interest expense of $3,101,963 million for the year ended December 31, 2019 compared to the same period in 2018 was primarily due to debt extinguishments in the fiscal year 2019.

Other income, net

The decrease in Other income, net of $234,859 for the year ended December 31, 2019 compared to 2018 was due to miscellaneous non-operating activities in the fiscal year 2018, such as the extinguishment of the conversion option liability of $286,274; compared to activities in the fiscal year 2019, such as foreign currency gains of $37,555.

Change in fair value of financial instruments

The net gain of $1,009,402 in the change in fair value of financial instruments was due entirely from the remeasurement of the fair value of the Company's warrant liabilities for the year ending December 31, 2019. The warrant liabilities remeasured during the year ending December 31, 2019 include the Series A warrants, the October 2018 Underwriter warrants, the March 2019 LOC warrants and the 2019 Bridge warrants. In addition, the Company recorded a loss of $136,484 in the change in fair value of financial instruments for the year ending December 31, 2019, representing the initial value of a derivative asset and it's subsequent remeasurement to zero on settlement.

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 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 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 $4,940,911 and $544,444 for the year ended December 31, 2019 and 2018, respectively, 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, 2019 and 2018, we had net losses of $38.5 million and $32.1 million, respectively, and we expect to incur additional losses in the near-term future At December 31, 2019, we had an accumulated deficit of $133.1 million. To date, we have generated only limited revenue, and we may never achieve revenue sufficient to offset our expenses.

We had unrestricted cash of $3.5 million as of December 31, 2019. We do not believe our existing cash will be sufficient to meet our anticipated cash requirements for the next 12 months. Our independent registered public accounting firms have included an explanatory paragraph in their audit reports included in our Form 10-K for the years ended December 31, 2019 and 2018 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.

The Company has funded operations primarily through the issuance of equity and debt financing, in addition to sales of commercial products. Primary funding sources in the fiscal year 2019 are as follows:

- Between January and April 2019, the Company issued 195,319 shares of common stock via equity lines of credit with Oasis Capital for total proceeds of $2.6 million.

- Between January and June 2019, the Company entered into exchange agreements with Chicago Venture Partners L.P., pursuant to which 395,970 shares of common stock were issued to CVP, with a fair value of $8.2 million, in exchange for a reduction of approximately $5.8 million in the principal amount of the CVP Promissory Notes and $2.4 million in accrued interest thereon.

- Between March and June 2019, the Company entered into a securities purchase agreement with selected investors, pursuant to which the Company issued $5.1 million in short-term promissory notes (the Bridge Notes). The Company settled these short-term promissory notes and interest accrued thereon in July 2019.

- In March 2019, the Company entered into a securities purchase agreement with Oasis Capital, whereby 19,019 shares were issued in a registered direct public offering to Oasis Capital for gross proceeds of approximately $0.3 million.

- In March 2019, the Company issued 19,752 shares of our common stock in lieu of a cash payment of $0.4 million in interest expense on the Napo convertible notes payable.

- Between May and July 2019, the Company entered into exchange agreements with Chicago Venture Partners L.P., pursuant to which 1,119,440 shares of common stock were issued to CVP with a fair market value of $6.7 million, in exchange for a reduction of approximately $6.2 million in the principal amount of CVP Exchange Note 1 and $0.1 million in accrued interest thereon.

- In July 2019, the Company entered into an underwriting agreement, relating to a public offering, in which the Company sold 2,886,500 shares of common stock, 10,787 shares of Series B convertible preferred stock, Series 1 warrants to purchase 8,280,000 shares of common stock and Series 2 warrants

to purchase 8,280,000 shares of common stock. The Company received total gross proceeds from the offering of $16.6 million, or $14.0 million net of issuance and other costs of $2.6 million.

- On October 3 and October 9, 2019, in two separate transactions, the Company exercised its purchased put option (see Note 3) to require the Exercising Holder to exercise all of its 1,250,000 Series 1 warrants (see Note 8), upon which the Company issued 1,250,000 common shares to the Exercising Holder in return for aggregate gross proceeds of $1,750,001. In consideration (the strike price) of the exercising the warrants, the Company issued 63 shares of Series B-1 Convertible Preferred Stock to the Exercising Holder.

- In November 2019, the Company entered into a securities purchase agreement with Oasis Capital, in which the Company issued and sold, in a registered public offering, pre-funded warrants to purchase up to an aggregate of 2,222,223 shares of the Company's common stock at an exercise price of $0.01 per share. The net proceeds from the offering were $1.7 million. Subsequently, in November 2019, Oasis exercised 986,000 of the 2,222,223 pre-funded warrants issued in the registered offer and sale, with the Company receiving net proceeds of $9,860.

- In December 2019, the Company entered into a securities purchase agreement with certain investors, in which an aggregate of 2,500,000 unregistered shares of the Company's common stock were sold. The Company received total gross proceeds of $1.5 million.

The Company expects expenditures will continue to increase as it continues its efforts to develop products and continue development of its pipeline in the near term. The Company does not believe the current capital is sufficient to fund its operating plan through March 2021. The Company 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 the Company's business. In addition, the Company may seek additional capital due to favorable market conditions or strategic considerations even if it believes to have sufficient funds for current or future operating plans. The Company may also not be successful in entering into partnerships that include payment of upfront licensing fees for its products and product candidates for markets outside the United States, where appropriate. If the Company does not generate upfront fees from any anticipated arrangements, it would have a negative effect on its operating plan. The Company plans to finance 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 on acceptable terms on a timely basis, if at all, or that the Company will generate sufficient cash from operations to adequately fund operating needs or ultimately achieve profitability. If the Company is unable to obtain an adequate level of financing needed for short term operations and the long-term development and commercialization of its products, it 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. There is 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, 2019 compared to the Year Ended December 31, 2018

The following table shows a summary of cash flows for the years ended December 31, 2019 and 2018:

	Year Ended December 31,	
	2019	2018
Total cash used in operating activities	$ (20,456,806)	$ (22,730,832)
Total cash used in investing activities	—	(6,527)
Total cash provided by financing activities	21,771,993	24,545,683
Net increase in cash	$ 1,315,187	$ 1,808,324

Cash Used in Operating Activities

During the year ended December 31, 2019, cash used in operating activities of $20.5 million resulted from our net loss of $38.5 million, adjusted by non-cash depreciation and amortization expense of $1.7 million, impairment of indefinite-lived intangible assets of $4.0 million, stock-based compensation of $3.1 million, a debt extinguishment loss of $4.9 million, amortization of interest expense from debt discount and issuance costs of $5.2 million, amortization of operating lease right-of-use-assets of $0.2 million, offset by a change in fair value of warrants of $1.0 million, and net of changes in operating assets and liabilities of $0.7 million.

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.

Cash Used In Investing Activities

During the year ended December 31, 2019, no cash was 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 equipment.

Cash Provided by Financing Activities

During the year ended December 31, 2019, net cash provided by financing activities of $21.8 million primarily consisted of $2.6 million in net proceeds received from 195,319 shares of common stock issued to Oasis Capital via an option to increase the equity line of credit, $0.3 million in net proceeds received from 19,019 shares issued in a registered direct public offering to Oasis Capital, $14.0 million in net proceeds received from the July 2019 public offering, $1.5 million received in PIPE financings, $1.7 million in net proceeds received from issuance to Oasis Capital of Pre-Funded Warrants to purchase up to an aggregate of 2,222,223 shares of the Company's common stock, $1.8 million in proceeds received from issuance of Series 1 warrants via put options, less $0.1 million from notes payable interest expense.

During the year ended December 31, 2018, net cash provided by financing activities of $24.6 million primarily consisted of $1.3 million and $0.8 million 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.

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.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Jaguar Health, Inc.
Index to Financial Statements

Report of Independent Registered Public Accounting Firm

To the Board of Directors
and Stockholders Jaguar Health, Inc.:

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheet of Jaguar Health, Inc. ("Company") as of December 31, 2019, and the related consolidated statements of operations, stockholders' equity, and cash flows for the year ended December 31, 2019, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2019, and the results of its operations and its cash flows for the year ended December 31, 2019, in conformity with accounting principles generally accepted in the United States of America.

Going Concern Uncertainty

The accompanying financial statements have been prepared assuming that Jaguar Health, Inc. will continue as a going concern. As discussed in Note 1 to the financial statements, the Company has experienced losses since inception, significant cash used in operations, and is dependent on future financing to meet its obligations and fund its planned operations. These conditions 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 financial statements do not include any adjustments that might result should the Company be unable to continue as a going concern.

Basis for Opinion

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

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

/s/ Mayer Hoffman McCann P.C.

We have served as the Company's auditor since 2019.
San Diego, California
April 2, 2020

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 sheet of Jaguar Health, Inc. (formerly Jaguar Animal Health, Inc.) (the "Company") as of December 31, 2018, the related consolidated statement of operations, stockholders' equity, and cash flows for the year 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 the results of their operations and their cash flows for the year 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 the fiscal year 2018 due to the adoption of Topic 606: Revenue from Contracts with Customers.

Basis for Opinion

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

We conducted our audit in accordance with the standards of the PCAOB. 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 audit 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 audit included performing procedures to assess the risks of material misstatement of the consolidated financial statement, 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 statement. Our audit also included evaluating the accounting principles used and significant estimates made by

management, as well as evaluating the overall presentation of the consolidated financial statement. We believe that our audit provides a reasonable basis for our opinion.

We served as the Company’s auditors from 2013 to 2019

/s/ BDO USA, LLP

San Francisco, California

April 10, 2019

JAGUAR HEALTH, INC.
CONSOLIDATED BALANCE SHEETS

	December 31, 2019	December 31, 2018
Assets		
Current assets:		
Cash	$ 3,495,431	$ 2,568,191
Restricted cash	387,947	—
Accounts receivable	1,691,712	995,683
Other receivable	2,872	6,118
Inventory	2,128,686	3,342,177
Operating lease - right-of-use asset	552,967	—
Prepaid expenses and other current assets	1,262,737	1,237,772
Total current assets	9,522,352	8,149,941
Property and equipment, net	710,207	760,617
Intangible assets, net	26,023,889	31,710,556
Other assets	153,973	420,831
Total assets	$ 36,410,421	$ 41,041,945
Liabilities, convertible preferred stock and stockholders' equity		
Current liabilities:		
Accounts payable	$ 5,351,535	$ 5,414,260
Accrued liabilities	2,922,255	4,939,441
Warrant liability	3,492	220,376
Operating lease liability	336,647	—
Convertible debt, net of discount	—	11,239,170
Notes payable, net of discount	6,778,461	4,845,575
Total current liabilities	15,392,390	26,658,822
Notes payable long term	450,000	—
Total liabilities	15,842,390	26,658,822
Commitments and contingencies (See Note 5)		
Series A redeemable convertible preferred stock: $0.0001 par value, 5,524,926 shares authorized at December 31, 2019 and December 31, 2018; 5,524,926 shares issued and outstanding at December 31, 2019 and December 31, 2018; (redemption amount of $12,738,822 and zero at December 31, 2019 and December 31, 2018, respectively; liquidation preference of $9,199,002 at December 31, 2019 and December 31, 2018)	9,894,492	9,000,002
Stockholders' equity		
Series B convertible preferred stock: $0.0001 par value, 11,000 and zero shares authorized at December 31, 2019 and December 31, 2018, respectively; 1,971 and zero shares issued and outstanding at December 31, 2019 and December 31, 2018, respectively	475,928	—
Series B-1 convertible preferred stock: $0.0001 par value; 63 and zero shares authorized at December 31, 2019 and December 31, 2018, respectively; zero shares issued and outstanding at December 31, 2019 and December 31, 2018	—	—
Series B-2 convertible preferred stock: $0.0001 par value, 10,165 and zero shares authorized at December 31, 2019 and December 31, 2018, respectively; 10,165 and zero Series B-2 shares issued and outstanding at December 31, 2019 and December 31, 2018, respectively	1,236,064	—
Common stock - voting: $0.0001 par value, 150,000,000 shares authorized at December 31, 2019 and December 31, 2018; 14,273,061 and 351,472 shares issued and outstanding at December 31, 2019 and December 31, 2018, respectively	1,428	35
Common stock - non-voting: $0.0001 par value, 50,000,000 shares authorized at December 31, 2019 and December 31, 2018; 40,301,237 shares issued and outstanding at December 31, 2019 and December 31, 2018	4,030	4,030
Additional paid-in capital	142,046,304	99,929,835
Accumulated deficit	(133,090,215)	(94,550,779)
Total stockholders' equity	10,673,539	5,383,121
Total liabilities, convertible preferred stock and stockholders' equity	$ 36,410,421	$ 41,041,945

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

JAGUAR HEALTH, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS

	Year Ended December 31,	
	2019	2018
Product revenue	$ 5,775,257	$ 4,238,756
Collaboration revenue	—	177,389
Total revenue	5,775,257	4,416,145
Operating expenses		
Cost of product revenue	3,815,812	2,765,746
Research and development	5,819,817	5,154,748
Sales and marketing	6,936,314	9,831,576
General and administrative	13,502,625	12,277,222
Settlement of Tempesta Royalty License Agreement	648,800	—
Impairment of goodwill	—	5,210,821
Impairment of indefinite-lived intangible assets	4,000,000	—
Total operating expenses	34,723,368	35,240,113
Loss from operations	(28,948,111)	(30,823,968)
Interest expense	(5,730,648)	(2,628,685)
Other income	80,832	315,691
Change in fair value of financial instruments	1,009,402	331,016
Gain on Valeant settlement	—	1,204,333
Loss on extinguishment of debt	(4,940,911)	(544,444)
Loss before income tax expense	(38,529,436)	(32,146,057)
Income tax expense	(10,000)	—
Net loss	(38,539,436)	(32,146,057)
Deemed dividend attributable to accretion of Series A convertible preferred stock	(894,490)	—
Deemed dividend attributable to Series B convertible preferred stock	(4,239,870)	—
Deemed dividend attributable to Series B-1 convertible preferred stock	(530,303)	—
Deemed dividend attributable to the Series 1 warrant modification	(522,143)	—
Net loss attributable to common shareholders	$ (44,726,242)	$ (32,146,057)
Net loss per share, basic and diluted	$ (9.01)	$ (153.27)
Weighted-average common shares outstanding, basic and diluted	4,965,337	209,729

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

JAGUAR HEALTH, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

	Series A Convertible Preferred Stock		Series B Convertible Preferred Stock		Series B-1 Convertible Preferred Stock		Series B-2 Convertible Preferred Stock		Common Stock - voting		Common Stock - non-voting		Additional paid-in capital	Accumulated deficit	Total Stockholders' Equity
	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount			
January 1, 2018	—	$ —	—	$ —	—	$ —	—	$ —	59,721	$ 6	42,617,893	$ 4,262	$79,661,456	$(62,404,722)	$ 17,261,002
Issuance of preferred stock and common stock in a private placement	5,524,926	9,000,002	—	—	—	—	—	—	28,011	3	—	—	4,999,997	—	5,000,000
Beneficial conversion feature of the Series A convertible preferred stock	—	(995,000)	—	—	—	—	—	—	—	—	—	—	995,000	—	995,000
Deemed dividend on the Series A convertible preferred stock	—	995,000	—	—	—	—	—	—	—	—	—	—	(995,000)	—	(995,000)
Issuance of common stock -exercise of prepaid equity forward contracts, October 2018	—	—	—	—	—	—	—	—	17,075	2	—	—	2,055,872	—	2,055,874
Issuance of common stock in exchange for redemption of convertible debt	—	—	—	—	—	—	—	—	13,665	1	—	—	1,607,420	—	1,607,421
Issuance of common stock in exchange for services	—	—	—	—	—	—	—	—	47	—	—	—	6,425	—	6,425
Issuance of common stock in exchange for payment of interest expense on convertible debt, March 2018	—	—	—	—	—	—	—	—	4,081	—	—	—	704,725	—	704,725
Conversion of non-voting common stock to voting common stock	—	—	—	—	—	—	—	—	2,206	—	(2,316,656)	(232)	232	—	—
Issuance of common stock in exchange for payment of interest expense on convertible debt, August 2018	—	—	—	—	—	—	—	—	4,582	—	—	—	479,808	—	479,808
Issuance of common stock in PIPE financing, July 2018	—	—	—	—	—	—	—	—	6,725	1	—	—	624,896	—	624,897
Issuance of common stock in debt financing September 2018	—	—	—	—	—	—	—	—	1,071	—	—	—	48,000	—	48,000
Issuance of warrants in debt financing September 2018	—	—	—	—	—	—	—	—	—	—	—	—	118,149	—	118,149
Issuance of warrants for office lease September 2018	—	—	—	—	—	—	—	—	—	—	—	—	493,688	—	493,688
Fractional common stock shares repurchased	—	—	—	—	—	—	—	—	—	—	—	—	(30)	—	(30)
Issuance of common stock, net of issuance costs of $1.9 million, October 2018	—	—	—	—	—	—	—	—	165,358	17	—	—	5,026,434	—	5,026,451
Issuance of common stock from prepaid equity forward contracts, October 2018									48,930	5	—	—	2,054,995	—	2,055,000
Issuance of warrants for services	—	—	—	—	—	—	—	—	—	—	—	—	23,895	—	23,895
Stock-based compensation	—	—	—	—	—	—	—	—	—	—	—	—	2,023,873	—	2,023,873
Net loss	—	—	—	—	—	—	—	—	—	—	—	—	—	(32,146,057)	(32,146,057)
December 31, 2018	5,524,926	$9,000,002	—	$ —	—	$ —	—	$ —	351,472	$ 35	40,301,237	$ 4,030	$99,929,835	$(94,550,779)	$ 5,383,121

	Series A Convertible Preferred Stock		Series B Convertible Preferred Stock		Series B-1 Convertible Preferred Stock		Series B-2 Convertible Preferred Stock		Common Stock - voting		Common Stock - non-voting		Additional paid-in capital	Accumulated deficit	Total Stockholders' Equity
	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount			
January 1, 2019	5,524,926	$9,000,002	—	$ —	—	$ —	—	$ —	351,472	$ 35	40,301,237	$ 4,030	$ 99,929,835	$ (94,550,779)	$ 5,383,121
Issuance of common stock to Oasis, put exercise	—	—	—	—	—	—	—	—	195,319	20	—	—	2,602,876	—	2,602,896
Issuance of common stock to Oasis, registered offering	—	—	—	—	—	—	—	—	19,019	1	—	—	266,265	—	266,266
Issuance of common stock in exchange of CVP Notes	—	—	—	—	—	—	—	—	395,970	40	—	—	8,224,883	—	8,224,923
Issuance of common stock for payment of interest expense (Kingdon)	—	—	—	—	—	—	—	—	19,752	2	—	—	446,727	—	446,729
Issuance of common stock in exchange of CVP Exchange Notes	—	—	—	—	—	—	—	—	1,119,440	112	—	—	6,672,838	—	6,672,950
Issuance of Series B convertible preferred stock, net of offering costs of $875,184	—	—	10,787	2,604,686	—	—	—	—	—	—	—	—	—	—	2,604,686
Beneficial conversion feature of the Series B convertible preferred stock	—	—	—	(4,239,870)	—	—	—	—	—	—	—	—	4,239,870	—	—
Deemed dividend on the Series B convertible preferred stock	—	—	—	4,239,870	—	—	—	—	—	—	—	—	(4,239,870)	—	—
Issuance of common stock in Class A Units, net	—	—	—	—	—	—	—	—	2,886,500	289	—	—	1,393,689	—	1,393,978
Issuance of Series 1 warrants in Class A and B Units	—	—	—	—	—	—	—	—	—	—	—	—	5,025,515	—	5,025,515
Issuance of Series 2 warrants in Class A and B Units	—	—	—	—	—	—	—	—	—	—	—	—	5,025,515	—	5,025,515
Modification of Series 1 warrants	—	—	—	—	—	—	—	—	—	—	—	—	522,143	—	522,143
Deemed dividend attributable to Series 1 warrant modification	—	—	—	—	—	—	—	—	—	—	—	—	(522,143)	—	(522,143)
Bridge warrant reclassification from liability to equity	—	—	—	—	—	—	—	—	—	—	—	—	4,259,327	—	4,259,327
LOC warrant reclassification from liability to equity	—	—	—	—	—	—	—	—	—	—	—	—	71,079	—	71,079
Issuance of common stock upon conversion of Series B convertible preferred stock	—	—	(8,816)	(2,128,758)	—	—	—	—	4,408,000	441	—	—	2,128,317	—	—
Fractional common stock shares repurchased	—	—	—	—	—	—	—	—	(14)	—	—	—	—	—	—
Issuance of common stock for Tempesta Settlement, October 2019	—	—	—	—	—	—	—	—	40,000	4	—	—	48,796	—	48,800
Issuance of common stock upon exercise of Series 1 warrants, October 2019	—	—	—	—	—	—	—	—	277,774	28	—	—	388,861	—	388,889
Issuance of preferred stock to Ionic, October 2019	—	—	—	—	14	145,615	—	—	—	—	—	—	(145,615)	—	—
Beneficial conversion feature of the Series B-1 convertible preferred stock, October 2019	—	—	—	—	—	(145,615)	—	—	—	—	—	—	145,615	—	—
Deemed dividend on the Series B-1 convertible preferred stock, October 2019	—	—	—	—	—	145,615	—	—	—	—	—	—	(145,615)	—	—
Issuance of common stock upon exercise of Series 1 warrants, October 2019	—	—	—	—	—	—	—	—	972,226	97	—	—	1,361,015	—	1,361,112
Issuance of preferred stock, October 2019	—	—	—	—	49	384,688	—	—	—	—	—	—	(384,688)	—	—
Beneficial conversion feature of the Series B-1 convertible preferred stock, October 2019	—	—	—	—	—	(384,688)	—	—	—	—	—	—	384,688	—	—
Deemed dividend on the Series B-1 convertible preferred stock, October 2019	—	—	—	—	—	384,688	—	—	—	—	—	—	(384,688)	—	—
Issuance costs from issuance of Series B-1 preferred stock, October 2019	—	—	—	—	—	—	—	—	—	—	—	—	(20,000)	—	(20,000)
Issuance of common stock in exchange for services, October 2019	—	—	—	—	—	—	—	—	166,667	17	—	—	139,983	—	140,000
Issuance of prepaid equity forward contracts, November 2019, net of offering costs of $64,503	—	—	—	—	—	—	—	—	—	—	—	—	1,713,275	—	1,713,275
Issuance of common stock upon settlement of prepaid equity forward contracts, net, November 2019	—	—	—	—	—	—	—	—	986,000	99	—	—	9,761	—	9,860
Conversion of Series B convertible preferred stock into common stock, December 2019	—	—	—	—	(63)	(530,303)	—	—	630,063	63	—	—	530,240	—	—
Issuance of Series B-2 preferred stock in exchange for prepaid equity forward contracts and Jaguar Health common stock, December 2019	—	—	—	—	—	—	10,165	1,236,064	(695,127)	(70)	—	—	(1,235,994)	—	—
Issuance of common stock in PIPE Financing, December 2019	—	—	—	—	—	—	—	—	2,500,000	250	—	—	1,034,750	—	1,035,000
Issuance of warrants in PIPE Financing, December 2019	—	—	—	—	—	—	—	—	—	—	—	—	465,000	—	465,000
Accretion to redemption value of contingently redeemable preferred stock	—	894,490	—	—	—	—	—	—	—	—	—	—	(894,490)	—	(894,490)
Stock-based compensation	—	—	—	—	—	—	—	—	—	—	—	—	2,988,544	—	2,988,544
Net loss	—	—	—	—	—	—	—	—	—	—	—	—	—	(38,539,436)	(38,539,436)
December 31, 2019	5,524,926	$9,894,492	1,971	$ 475,928	—	$ —	10,165	$1,236,064	14,273,061	$ 1,428	40,301,237	$ 4,030	$142,046,304	$(133,090,215)	$ 10,673,539

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

JAGUAR HEALTH, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year Ended December 31,	
	2019	2018
Cash flows from operating activities		
Net loss	$ (38,539,436)	$ (32,146,057)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization expense	1,737,077	1,319,003
Impairment of goodwill	—	5,210,821
Impairment of indefinite-lived intangible assets	4,000,000	—
Interest paid on the conversion of debt to equity	—	21,274
Warrants issued for services	—	23,894
Loss on extinguishment of debt	4,940,911	544,444
Amortization of operating lease right-of-use-assets	191,133	—
Stock-based compensation	2,988,544	2,023,874
Issuance of common stock in exchange for services	140,000	6,425
Issuance of common stock in Tempesta settlement agreement	48,800	—
Tempesta settlement note expense	550,000	—
Amortization of debt issuance costs and debt discount	5,157,338	1,196,914
Change in fair value of warrants, conversion option and derivative liability	(1,009,402)	(6,325)
Changes in assets and liabilities		
Accounts receivable	(696,028)	(528,025)
Other receivable	(7,850)	(4,738)
Inventory	1,213,492	(1,269,360)
Prepaid expenses and other current assets	(246,658)	(111,616)
Other non-current assets	108,687	(262,659)
Deferred collaboration revenue	—	(177,389)
Operating lease liabilities	(132,985)	109,240
Deferred rent	221,692	—
Accounts payable	(62,725)	(1,940,671)
Accrued expenses	(1,059,396)	3,260,119
Total cash used in operating activities	(20,456,806)	(22,730,832)
Cash flows from investing activities		
Purchase of equipment	—	(6,527)
Total cash used in investing activities	—	(6,527)
Cash flows from financing activities		
Proceeds from issuance of notes payable	5,050,000	2,564,938
Proceeds from issuance of convertible debt	—	474,000
Repayment of notes payable	(5,150,000)	(1,689,200)
Repayment of convertible debt	—	(566,249)
Proceeds from issuance of common stock	—	7,055,874
Proceeds from issuance of convertible preferred stock, March 2018	—	9,199,002
Proceeds from issuance of common stock, July 2018	—	624,897
Proceeds from issuance of common stock, 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
Proceeds from issuance of common stock in Class A Units, July 2019	2,249,100	—
Payment of underwriting discounts, commissions and other associated offering costs for Class A Units	(875,122)	—
Proceeds from issuance of common stock to Oasis, put exercise	2,612,756	—
Proceeds from issuance of common stock to Oasis, registered offering	266,266	—
Proceeds from issuance of common stock in a PIPE with existing investors, December 2019	1,500,000	—
Proceeds from issuance of Series B-2 convertible preferred for pre-funded warrants, November 2019	1,777,778	—
Issuance costs, pre-funded warrants, November 2019	(64,503)	—
Proceeds from issuance of Series 1 warrants via put option, October 2019	1,750,001	—
Proceeds from issuance of Series 1 Warrants in Class A and B Units, July 2019	5,025,515	—
Proceeds from issuance of Series 2 Warrants in Class A and B Units, July 2019	5,025,515	—
Proceeds from issuance of Series B convertible preferred stock, net of issuance costs, July 2019	4,239,870	—
Payment of underwriting discounts, commissions and other associated offering costs for Class B Units	(1,635,183)	—
Fractional common stock shares repurchased	—	(30)
Total cash provided by financing activities	21,771,993	24,545,683
Net increase in cash	1,315,187	1,808,324
Cash at beginning of year	2,568,191	759,867
Cash at end of year	$ 3,883,378	$ 2,568,191

JAGUAR HEALTH, INC.
STATEMENTS OF CASH FLOWS (continued)

	Year Ended December 31,	
	2019	**2018**
Supplemental schedule of cash flow information		
Cash paid for interest	$ 142,000	$ —
Supplemental schedule of non-cash financing and investing activities		
Interest paid on long-term debt	$ —	$ 19,344
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
Common stock issued with September 2018 Promissory Notes	$ —	$ 48,000
Warrants issued with the September 2018 Promissory Notes	$ —	$ 118,148
Deemed dividend attributable to Series A convertible preferred stock	$ —	$ 995,000
Warrants issued with October 2018 offering	$ —	$ 611,286
Common stock exchanged for CVP Exchange Note 1 and related interest	$ 6,672,838	$ —
Repayment of Kingdon interest by issuance of common stock	$ 446,729	$ —
Repayment of CVP Note principal by issuance of common stock	$ 8,224,923	$ —
Conversion of Series B convertible preferred to common stock	$ 2,128,317	$ —
Reclassification of Bridge warrant liability to equity	$ 4,259,327	$ —
Reclassification of LOC warrant to Equity	$ 71,079	$ —
Accretion to redemption value of Series A contingently redeemable convertible preferred stock	$ 894,490	$ —
Deemed dividend attributable to modification of Series 1 warrants	$ 522,143	$ —
Deemed dividend attributable to Series B convertible preferred stock	$ 4,239,870	$ —
Cash and Restricted Cash:		
Cash	$ 3,495,431	$ 2,568,191
Restricted cash	387,947	—
Total cash and restricted cash	$ 3,883,378	$ 2,568,191

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

Jaguar Health, Inc.
Notes to Financial Statements

1. Organization and Business

Jaguar Health, Inc. (“Jaguar” 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 complete 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.

Nasdaq Communication and Compliance

On December 30, 2019, the Company received written notice from the Staff of the Listing Qualifications Department (the “Staff”) of The Nasdaq Stock Market LLC (“Nasdaq”) indicating that the bid price for the Company’s common stock for the last 30 consecutive business days had closed below the minimum $1.00 per share required for continued listing under Nasdaq Listing Rule 5550(a)(2).

Under Nasdaq Listing Rule 5810(c)(3)(A), the Company has been granted a 180 calendar day grace period, or until June 29, 2020, to regain compliance with the minimum bid price requirement. The continued listing standard will be met if the Company evidences a 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. In order for Nasdaq to consider granting the Company additional time beyond June 29, 2020, the Company would be required, among other things, to meet the continued listing requirement for market value of publicly held shares as well as all other standards for initial listing on Nasdaq, with the exception of the minimum bid price requirement. If measured today, the Company would qualify for Nasdaq’s consideration of an extension because the Company currently has stockholders’ equity of at least $5 million. In the event the Company does not regain compliance with the $1.00 bid price requirement by June 29, 2020, eligibility for Nasdaq’s consideration of a second 180 day grace period would be determined on the Company’s compliance with the above referenced criteria on June 29, 2020.

The Company is diligently working to evidence compliance with the minimum bid price requirement for continued listing on Nasdaq; however, there can be no assurance that the Company will be able to regain compliance or that Nasdaq will grant the Company a further extension of time to regain compliance, if necessary. If the Company fails to regain compliance with the Nasdaq continued listing standards, its common stock will be subject to delisting from Nasdaq.

Reverse stock-splits

On May 29, 2018, the Company filed the Certificate of Second Amendment to its Third Amended and Restated Certificate of Incorporation with the Secretary of State of the State of Delaware to effect a 1-for-15 reverse stock split of the Company's issued and outstanding shares of voting common stock, effective June 1, 2018. The reverse split has been retrospectively reflected in all voting common stock, warrants, and common stock option shares disclosed in these condensed consolidated financial statements. The non-voting common stock and the convertible preferred stock were excluded from the reverse split.

On June 3, 2019, the Company filed the Certificate of Fifth Amendment to its Third Amended and Restated Certificate of Incorporation with the Secretary of State of the State of Delaware to effect a 1-for-70 reverse stock split of the Company's issued and outstanding shares of voting common stock, effective June 7, 2019. The reverse split has been retrospectively reflected in all voting common stock, warrants, and common stock option shares disclosed in these condensed consolidated 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, since its inception, has incurred recurring operating losses and negative cash flows from operations and has an accumulated deficit of $133.0 million as of December 31, 2019. The Company expects to incur substantial losses and negative cash flows 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 and generating positive cash flows from operations. There is no assurance that the Company will have adequate cash balances to maintain its operations. In addition, as a result of the recent outbreak of novel COVID-19 (see Note 15), the Company may experience disruptions in the fiscal year 2020 and beyond that could severely impact its supply chain, ongoing and future clinical trials and commercialization of Mytesi.

Although the Company plans to finance its operations and cash flow needs through equity and/or debt financing, collaboration arrangements with other entities, license royalty agreements, as well as revenue from future product sales, the Company does not believe its current cash balances are sufficient to fund its operating plan through one year from the issuance of these consolidated financial statements. The Company has an immediate need to raise cash. There can be no assurance that additional funding will be available to the Company on acceptable terms, or on a timely basis, if at all, or that the Company will generate sufficient cash from operations to adequately fund operating needs. If the Company is unable to obtain an adequate level of financing needed for short-term operations and 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; accordingly, there is substantial doubt about the ability of the Company to continue in existence as a going concern. The accompanying consolidated financial statements do not include any adjustments that might result from the outcome of these uncertainties.

Potential Impact of the COVID-19

As a result of the recent outbreak of novel COVID-19, we may experience disruptions that could severely impact our supply chain, ongoing and future clinical trials and commercialization of Mytesi. It is currently not possible to predict how long the pandemic will last or the time that it will take for economic activity to return to prior levels. We do not yet know the full extent of any impact on its business or operations. We will continue to monitor the COVID-19 situation closely, and intend to follow health and safety guidelines as they evolve.

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.

Cash and Restricted Cash

Our cash on deposit may exceed United States federally insured limits at certain times during the year. We maintain cash accounts with certain major financial institutions in the United States. Restricted cash represents cash not available to us for immediate and general use.

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.

For the year ended December 31, 2019, substantially all of the Company’s revenue was derived from the sale of Mytesi. In looking at sales by the Company to distributors whose net revenue percentage of total net revenue was equal to or greater than 10%, for the fiscal year 2019 the Company earned Mytesi revenue primarily from one major pharmaceutical distributor located in the United States, whereas in the fiscal year 2018 it was primarily from three major pharmaceutical distributors in the United States. Revenue earned from each as a percentage of total net revenue follows:

Consolidated (percentage of total net sales)	**Year Ended December 31,**	
	2019	**2018**
Customer 1	91 %	32 %
Customer 2	— %	31 %
Customer 3	— %	26 %
	91 %	89 %

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:

	December 31, 2019	December 31, 2018
Customer 1	99 %	34 %
Customer 2	— %	31 %
Customer 3	— %	21 %

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 accounts receivable, accounts payable, accrued expenses, warrant liabilities, derivative assets and liabilities, equity-linked financial instruments and debt. 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 3 for the fair value measurements.

Inventory

Inventory is stated at the lower of cost or net realizable value. Cost is determined using the first-in, first-out method. The Company calculates inventory valuation adjustments when conditions indicate that net realizable value 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 net realizable value.

Property and Equipment

Land is stated at cost, reflecting fair value of the property at July 31, 2017, the date of the Napo merger. Equipment is stated at cost, net of accumulated depreciation. Equipment begins to be depreciated when it is placed into service. Depreciation is calculated using the straight-line method over estimated useful lives ranging between 3 to 10 years.

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 consolidated statements of operations.

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 zero and $5.2 million in the fiscal years ending December 31, 2019 and 2018, respectively.

Acquired in-process research and development ("IPR&D") are intangible assets acquired in the July 2017 Napo merger. Under ASC 805, IPR&D are 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. An impairment loss is measured based on the excess of the carrying amount over the asset's fair value. Definite-lived intangible assets are amortized on a straight-line basis over the estimated periods benefited and are reviewed when appropriate for possible impairment. The Company recorded an impairment of $4,000,000 and zero in the fiscal years ending December 31, 2019 and 2018, respectively.

Leases

ASC 842, '*Leases*," requires lessees to recognize right-of-use assets and lease liabilities for all leases with a term greater than 12 months regardless of their classification on the balance sheet and to provide expanded disclosures about leasing arrangements. The Company adopted ASC 842 on January 1, 2019, using the optional transition method with no restatements of comparative periods. There was no effect on the Company's accumulated deficit upon adoption.

The Company elected to adopt the package of practical expedients to (i) not reassess whether expired or existing contracts are or contain leases, (ii) not reassess the lease classification for any expired or existing leases and (iii) not reassess the accounting for initial direct costs.

The adoption of the new leases standard resulted in the following adjustments to the consolidated balance sheet as of January 1, 2019:

	December 31, 2018	Adoption Impact	January 1, 2019
Operating lease right-of-use assets	$ —	$ 1,111,214	$ 1,111,214
Operating leases liabilities, current portion	—	336,647	336,647
Operating leases liabilities, long term	—	394,703	394,703
Deferred rent	379,864	(379,864)	—

At the inception of an arrangement, the Company determines whether the arrangement is or contains a lease based on the unique facts and circumstances present. Operating lease liabilities and their corresponding right-of-use assets are recorded based on the present value of lease payments over the expected lease term. Because the interest rate implicit in lease contracts is typically not readily determinable, the Company utilizes its incremental borrowing rate, which is the rate incurred to borrow on a collateralized basis over a similar term, an amount equal to the lease payments in a similar economic environment. Certain adjustments to the right-of-use asset may be required for items such as initial direct costs paid or incentives received.

Operating Lease

The Company has a non-cancelable operating lease with CA-Mission Street Limited Partnership for its offices in San Francisco, California, through September 30, 2020. The lease agreement calls for monthly base rents between $38,392 and $40,730 over the term of the lease.

Prior to the Company's adoption of ASC 842 on January 1, 2019, the Company recorded lease expense for its operating leases in accordance with ASC 840.

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

Effective January 16, 2019, Napo Pharmaceuticals, Inc. engaged Cardinal Health as its exclusive third-party logistics distribution agent for commercial sales for the Company's Mytesi product and to perform certain other services which include, without limitation, storage, distribution, returns, customer support, financial support, Electronic Data Interchange ("EDI") and system access support (the "Exclusive Distribution Agreement").

In addition to the terms and conditions of the Exclusive Distribution Agreement, Cardinal Health's purchase of products, and assumption of title therein, is set forth in the Title Model Addendum. The Title Model Addendum states that upon receipt of product at the 3PL Facility (Cardinal Health in La Vergne, Tennessee) from the Company, title and risk of loss for the Mytesi product purchased by Cardinal Health (excluding consigned inventory) shall pass to Cardinal Health, and title and risk of loss for consigned inventory shall remain with the Company until purchased by Cardinal Health in accordance with the Title Model Addendum. Napo Pharmaceuticals, Inc. considers Cardinal Health the Company's exclusive customer for Mytesi products per the Exclusive Distribution Agreement.

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, Covetrus, 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 animal products sold by Jaguar, the single performance obligation identified above is the Company's promise to transfer the Company's animal products 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. For the Company's human product, Mytesi, which is sold by Napo Pharmaceuticals Inc., the single performance obligation identified above is the Company's promise to transfer Mytesi to Cardinal Health, the Company's exclusive distributor for the product, based on specified payment and shipping terms as outlined in the Exclusive Distribution Agreement. The product warranties are assurance type warranties that do 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 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 wholesaler. Revenues from the sale of Mytesi were $5,673,068 and $4,121,913 for the years ended December 31, 2019 and 2018, respectively.

Animal

The Company recognized Neonorm revenues of $102,189 and $294,232 for the years ended December 31, 2019 and 2018, 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 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. 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. Under the terms of the agreement, the Company received revenue of $177,389 in the year ended December 31, 2018.

On September 24, 2018, the Company entered into a Distribution, License and Supply Agreement (“License Agreement”) with Knight Therapeutics ("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. The Company did not have any license revenues in the years ended December 31, 2019 and 2018.

Modifications to equity-classified instruments

In September 2019, the Company modified its equity-classified Series 1 Warrants (see Note 8). It is the Company’s policy to determine the impact of modifications to equity-classified warrants by analogy to the share-based compensation guidance of ASC 718, *Compensation - Stock Compensation* (“ASC 718”). The model for a modified share-based payment award that is classified as equity and remains classified in equity after the modification is addressed in ASC 718-20-35-3. Pursuant to that guidance, the incremental fair value from the modification is recognized as an expense in the income statement to the extent the modified instrument has a higher fair value. The Company uses a similar model for measuring the effects of a modification to equity-classified warrants; however, in contrast to the ASC 718 model, the measured increase in fair value may be more appropriately recorded as a deemed dividend, depending upon the nature of the warrant modification.

For amendments to preferred stock, it is the Company’s policy to measure the impact by analogy to ASC 470 in determining if such an amendment is an extinguishment or a modification. If the amendment results in an extinguishment, the Company follows the SEC staff guidance in ASC 260-10-S99-2. If the amendment results in a modification, the Company follows the model in either ASC 718 or ASC 470, depending on the nature of the amendment.

Stock-Based Compensation

The Company's 2014 Stock Incentive Plan (see Note 11) provides for the grant of stock options, restricted stock and restricted stock unit awards.

The Company measures stock awards granted to employees, non-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 revalued 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. Begining in 2019, all stock-based compensation payments, to employees and non-employees, are measured with an estimate of the fair market value at the grant date.

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

For all periods presented, the comprehensive loss was equal to the net loss; therefore, a separate statement of comprehensive loss is not included in the accompanying consolidated financial statements.

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, 2019 and 2018.

Recent Accounting Pronouncements

In December 2019, the FASB issued ASU 2019-12, Income Taxes (Topic 740): *Simplifying the Accounting for Income Taxes*, which is intended to simplify various aspects related to accounting for income taxes. The standard also removes certain exceptions to the general principles in Topic 740 and clarifies and amends existing guidance to improve consistent application. The pronouncement is effective for the Company beginning January 1, 2021 with early adoption permitted. The Company is still evaluating the impact of the adoption of this standard.

In June 2018, the Financial Accounting Standards Board (“FASB”) issued ASU 2018-07, *Compensation – Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting*. This update expands the scope of Topic 718 to include share-based payment transactions for acquiring goods and services from nonemployees. The amendments specify that Topic 718 applies to all share-based payment transactions in which a grantor acquires goods or services to be used or consumed in a grantor’s own operations by issuing share-based payment awards. The amendments also clarify that Topic 718 does not apply to share-based payments used to effectively provide (1) financing to the issuer or (2) awards granted in conjunction with selling goods or services to customers as part of a contract accounted for under ASC 606. The amendments in ASU 2018-07 are effective for public business entities for fiscal years beginning after December 15, 2018, including interim periods within that fiscal year. Early adoption is permitted. The Company adopted this standard on January 1, 2019, and this standard did not have a material impact on the Company’s financial position, results of operations or disclosures.

In August 2018, the FASB issued ASU 2018-15, *Intangible - Goodwill and Other - Internal-Use Software (Subtopic 350-40)*, which aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software. ASU 2018-15 is effective for the Company in the first quarter of 2020. Early adoption is permitted. ASU 2018-15 permits either a prospective or retrospective transition approach. The Company is currently evaluating ASU 2018-15 to determine the impact to its consolidated financial statements and related disclosures.

In August 2018, the FASB issued ASU 2018-13, Fair Value Measurement (Topic 820). The new guidance modifies the disclosure requirements on fair value measurements. ASU 2018-13 is effective for the Company beginning in the first quarter of 2020 and must be adopted on a modified retrospective basis, with certain exceptions. Early adoption is permitted. The Company does not expect ASU 2018-13 to have a significant impact to its consolidated financial statements and related disclosures.

3. 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, 2019 and 2018:

	December 31, 2019			
	Level 1	Level 2	Level 3	Total
Warrant liability	$ —	$ —	$ 3,492	$ 3,492
Total fair value	$ —	$ —	$ 3,492	$ 3,492

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

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

	For the year ended December 31, 2019	
	Warrant Liability	Derivative Asset
Beginning fair value of Level 3 liability	$ 220,376	$ —
Additions	5,122,924	136,484
Reclassification to equity	(4,330,406)	—
Change in fair value	(1,009,402)	(136,484)
Ending fair value of Level 3 liability	$ 3,492	$ —

Warrant Liability

The warrants associated with the Level 3 warrant liability activity for the year ended December 31, 2019 were the November 2016 Series A warrants, the October 2018 Underwriter warrants, the March 2019 LOC warrants and the Bridge warrants, which at December 31, 2019 were valued at $10, $3,482, zero and zero, respectively in the Company's consolidated balance sheet. At December 31, 2018, the warrants associated with the Level 3 warrant liability were the November 2016 Series A Warrants and the October 2018 Underwriter Warrants, which were valued at $7,388 and $212,988, respectively in the Company's consolidated balance sheet.

The Series A Warrants

The Series A warrant valuation of $10 at December 31, 2019 was computed using the Black-Scholes-Merton pricing model using a stock price of $0.65, a strike price of $787.50 per share, an expected term of 2.41 years, volatility of 143.41% and a risk-free discount rate of 1.62%. 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 $16.10, a strike price of $787.50 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 $7,378 for the year-ended December 31, 2019 was recorded as a gain in the change in fair value of financial instruments in the consolidated statement of operations

The October 2018 Underwriter Warrants

The October 2018 Underwriter Warrants valuation of $3,482 at December 31, 2019 was computed using the Black-Scholes-Merton pricing model using a stock price of $0.65, a strike price of $52.50 per share, an expected term of 3.76 years, volatility of 143.41% and a risk-free discount rate of 1.69%. 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 $16.10, a strike price of $52.50 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 $209,506 for twelve months ended December 31, 2019 ws recorded as a gain in the change in fair value of financial instruments in the consolidated statement of operations.

March 2019 LOC Warrants

The March 2019 LOC Warrants (see Note 8) were issued on March 29, 2019 with a valuation at issuance and at March 31, 2019 of $116,297, computed using the Black-Scholes-Merton pricing model using a stock price of $19.60, a strike price of $17.50 per share, an expected term of 5.0 years, volatility of 145.72% and a risk-free discount rate of 2.23%. On July 23, 2019, at which date the exercise price of the March 2019 LOC warrants became fixed, the March 2019 LOC warrants were reclassified from liability classification to equity classification. Immediately prior to reclassification to equity, the March 2019 LOC Warrant liability was valued at $71,079 using the Black-Scholes-Merton pricing model, calculated using a stock price of $1.73, a strike price of $2.00, an expected term of 5.00 years, volatility of 147.43% and a risk-free discount rate of 1.83%. The net change in the fair value of the warrants of

$45,218 for the year ended December 31, 2019, was recorded as a gain in the change in fair value of financial instruments in the consolidated statement of operations.

2019 Bridge Warrants

The 2019 Bridge Warrants were issued between March and June 2019, concurrent to the Company entering into short term Promissory Notes of $5,050,000 (see Note 7). The Company issued (i) fourteen Notes with a principal balance of $3,550,000 and warrant coverage at 125% of principal, and (ii) seven Notes with a principal balance of $1,500,000 and warrant coverage at 75% of principal. At issuance, the exercise price of the warrants was either (i) the price the Company issued common shares in its next public offering subject to a registration statement or (ii) if no such offering were consummated by the four month maturity date of the Promissory Notes, then the exercise price would be equal to the closing price of the Company's common stock on the Notes four-month maturity date. The warrants for all twenty-one Bridge Notes had a collective issuance date fair value of $5,005,742, computed using the Black-Scholes-Merton pricing model using a range of stock prices between $4.84 and $32.90, a range of strike prices between $4.84 and $32.90 per share, an expected term of 5.0 years, a range of volatilities between 145.60% and 145.72%, and a range of risk-free discount rates between 1.76% and 2.23%. At issuance, all twenty-one warrants were liability classified. On July 23, 2019, upon the Company's filing of a registration statement, the exercise price for all twenty-one warrants became fixed at $2.00, at which point the Bridge warrants were reclassified from liability classification to equity classification. Immediately prior to reclassification, the liability for all twenty-one Bridge Warrants had a collective fair value of $4,259,327, calculated using the Black-Scholes-Merton pricing model using a stock price of $1.73, a strike price of $2.00 per share, an average expected term of 4.80 years, volatility of 145.84% and a risk-free discount rate of 1.76%. The net change in the fair value of the warrants of $746,415 for the twelve months ended December 31, 2019, was recorded as a gain in the change in fair value of financial instruments in the consolidated statements of operations.

Derivative Asset

The derivative asset classified as a Level 3 asset represents a freestanding purchased put option associated with a Warrant Exercise Agreement entered into between the Company and a Series 1 warrant holder (see Note 8) in October 2019. Under the agreement, the Company had the right (a purchased put option) to require the warrant holder to exercise its Series 1 warrants so as to allow the Company to monetize the warrants. The derivative asset was initially valued at $136,484 using the Black-Scholes-Merton pricing model, calculated using a stock price of $1.04, a strike price of $1.04, an expected term of one month, volatility of 144.27% and a risk-free discount rate of 1.75%. Shortly after entering into the agreement, the Company exercised the put option in October 2019, whereupon the Series 1 warrant holder was required to exercise 1,250,000 Series 1 warrants, with the Company receiving gross proceeds of $1,750,001; and in consideration of the warrant exercise, the Company issued 63 shares of Series B-1 Convertible Preferred Stock (see Note 9) to the Series 1 warrant holder.

4. 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. For the year ended December 31, 2019, total fees incurred were $438,904. As of December 31, 2019, the Company has a balance due of $787,500.

Consent and Waiver Fee

In May 2019, the Company paid Sagard Capital Partners a consent and waiver fee of $250,000 to receive permission grant security interest in substantially all of the Company's assets for the Company's obligations under the restructuring the Napo December 2016 and Napo July 2017 Notes (see Note 7).

Letter of Credit

In August 2018, to satisfy a letter of credit requirement in the Company's office lease agreement (see Note 5), 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. In consideration of the letter of credit, in August 2018, the Company issued to Capital Management, LLC a warrant (see Note 8) to purchase 9,580 shares of the Company's voting common stock. As additional consideration, a payment of $45,000 was made to Pacific Capital Management, LLC in November 2019.

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. 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 484 shares of Common Stock (Investor Warrant). The exercise price for the Investor Warrant is $86.10 per share.

2019 Bridge Notes

Between March 18, 2019 and June 26, 2019, three members of the Board of Directors of the Company entered into short-term Promissory Note Purchase Agreements (see Note 7, the "2019 Bridge Notes") with the Company: (i) Lisa Conte, the Company's CEO & President, purchased a short-term Promissory Note of $100,000 which the Company settled in July 2019. In consideration for the short-term financing, the Company issued Ms. Conte a warrant that became exercisable into 37,500 shares of the Company's common stock; (ii) James Bochnowski, purchased a short-term Promissory Note of $350,000 which the Company settled in July 2019. In consideration for the short-term financing, the Company issued Mr. Bochnowski a warrant that became exercisable into 218,750 shares of the Company's common stock; and (iii) Jonathan Siegel DBA JBS Healthcare Ventures, purchased a short-term Promissory Note of $75,000 which the Company settled in July 2019. In consideration for the short-term financing, the Company issued Mr. Siegel a warrant that became exercisable into 34,375 shares of the Company's common stock.

In addition, Sagard Capital Partners purchased a short-term Promissory Note of $500,000, which the Company settled in July 2019. In consideration for the short-term financing, the Company issued Sagard Capital Partners a warrant that became exercisable into 187,500 shares of the Company's common stock; and Jonathan Glaser, an existing shareholder, purchased short-term Promissory Notes of $500,000 which the Company settled in July 2019. In consideration for the short-term financing, the Company issued Mr. Glaser warrants that became exercisable into 250,000 shares of the Company's common stock.

5. Commitments and Contingencies

Leases

On August 28, 2018, the Company entered into an office lease extension agreement for approximately 6,311 square feet of 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 shareholder a five-year warrant (see Note 8) to purchase 9,580 shares of the Company's voting common stock. The $493,688 fair value of the Warrant was classified in stockholders' equity with an offset to deferred rent. With the Company's adoption of ASC 842 on January 1, 2019, the offset to deferred balance was classified as a right-of-use asset. Each month, $19,748 of this rent will be recognized as non-cash lease expense.

In December 2018, the Company did not meet a covenant per the terms of the $475,000 Letter of Credit, the result of which required the Company to issue a Letter of Credit of $122,000 to the shareholder who issued the original $475,000 letter of credit. In March 2019, the Company canceled the $122,000 letter of credit in lieu of issuing the shareholder a promissory note for that amount in April 2019, as well as issuing the shareholder a warrant (see Note 8).

The Company recognizes rent expense on a straight-line basis over the non-cancelable lease period. Rent expense was $745,150 and $475,305 for the years ended December 31, 2019 and 2018, respectively. Rent expense is included in general and administrative expenses in the consolidated statements of operations. Future minimum lease payments under the non-cancelable operating leases as of December 31, 2019, and through to the end of the lease in September 2020 are $357,079.

Angel Pond Agreement

In October 2019, the Company engaged Angel Pond Capital LLC to explore potential licensing agreements and collaborations for Mytesi in China. In consideration of these services, the Company compensated Angel Pond Capital LLC with $140,000, paid via the issuance of 166,667 shares of the Company's common stock, for the initial four-month term of the agreement. The Company has the option to extend the agreement term for two months for $30,000 payable in shares of the Company's common stock.

If a definitive commercial agreement is executed by the Company with an entity that does all or substantially all of its business in China and one with whom Angel Pond Capital LLC has had substantial contact on the Company's behalf prior to the expiration or termination of this Agreement, Angel Pond Capital LLC will be paid compensation equal to 6% (6.5% for certain engaged entities) of the amounts received by the Company from such engaged entity in the form of upfront licensing fees and regulatory milestone payments pursuant to such Definitive Commercial Agreement.

The Company will pay to Angel Pond Capital LLC sales milestone payments equal to $300,000 after the first $50,000,000 of "Net Sales" (as defined in a Definitive Commercial Agreement) has been achieved in China by an engaged entity, and $300,000 after each and every additional $50,000,000 in cumulative net sales in China by such engaged entity; provided, however, such milestone payments will be capped at 6% of the cumulative sales royalty payments received by the Company from such engaged entity.

If Angel Pond Capital LLC is able to raise equity capital for the Company from an engaged entity prior to the expiration or termination of the Agreement, Angel Pond Capital LLC will receive compensation equal to 6% of the total dollar amount raised.

If Angel Pond Capital LLC is instrumental in arranging for the sale of the Company to an engaged entity prior to the expiration or termination of the Agreement, then Angel Pond Capital LLC will be compensated determinant upon any such sale price.

Asset transfer and transition commitment update

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

controls commercial rights for Mytesi for all indications, territories and patient populations globally, and also holds commercial rights to the existing regulatory approvals for crofelemer in Brazil, Ecuador, Zimbabwe and Botswana. In exchange, Napo agrees 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 $7.0 million. No payments have been made to date.

Revenue sharing commitment update

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 United Arab Emirates (“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 remained obligated to make Revenue Sharing Payments to SEED until the end of 2018. No payments have been made to date.

Legal Proceedings

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 April 12, 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 Commission on July 6, 2017 related to the solicitation of votes from shareholders to approve the merger and certain transactions related thereto. The Company accepted service of the complaint and summons on behalf of itself and the United States-based director Defendants on November 1, 2017. The Company has 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 amended complaint on September 20, 2018. Plaintiff was entitled to amend that complaint within 20 days from the date of dismissal. On October 10, 2018, Plaintiff filed a second amended complaint to focus on the Company’s 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 second amended 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 denied the Defendants’ motion to dismiss on June 28, 2019. The Company answered the second amended complaint on August 2, 2019; the answer denied the material allegations of the second amended complaint. The parties are now engaged in discovery. If the Plaintiff were able to prove his allegations in this matter and to establish the damages he asserts, then an adverse ruling could have a material adverse impact on the Company. The Company believes 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.

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.

6. Balance Sheet Components

Inventory

Inventory at December 31, 2019 and 2018 consisted of the following:

	December 31,	
	2019	2018
Raw Material	$ 457,345	$ 197,359
Work in Process	1,210,616	2,672,264
Finished Goods	460,725	472,554
Inventory	$ 2,128,686	$ 3,342,177

Property and Equipment

Property and equipment at December 31, 2019 and 2018 consisted of the following:

	December 31,	
	2019	2018
Land	$ 396,247	$ 396,247
Lab equipment	410,522	410,522
Clinical equipment	64,870	64,870
Software	62,637	62,637
Total property and equipment at cost	934,276	934,276
Accumulated depreciation	(224,069)	(173,659)
Property and equipment, net	$ 710,207	$ 760,617

Depreciation and amortization expense was $50,410 and $60,886 in the years ended December 31, 2019 and 2018, respectively.

Goodwill

The change in the carrying amount of goodwill for the year ended December 31, 2019 and 2018 was as follows:

	December 31,	
	2019	2018
Beginning balance	$ —	$ 5,210,821
Impairment	—	(5,210,821)
Ending balance	$ —	$ —

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. 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, 2019 and 2018 consist of the following:

	December 31, 2019	December 31, 2018
Developed technology	$ 25,000,000	$ 25,000,000
Accumulated developed technology amortization	(4,027,778)	(2,361,111)
Developed technology, net	20,972,222	22,638,889
In-process research and development	8,800,000	8,800,000
Impairment	(4,000,000)	—
In process research and development, net	4,800,000	8,800,000
Trademarks	300,000	300,000
Accumulated trademark amortization	(48,333)	(28,333)
Trademarks, net	251,667	271,667
Total intangible assets, net	$ 26,023,889	$ 31,710,556

In June 2019, the Company determined that in-process research and development was impaired and recorded an impairment loss of $4,000,000 in the consolidated statements of operations. Amortization expense of finite-lived intangibles was $1,686,667 and $1,686,657 for the years ended December 31, 2019 and 2018, respectively.

The following table summarizes the Company's estimated future amortization expense of intangible assets with finite lives as of December 31, 2019:

	Amounts
2020	$ 1,686,667
2021	1,686,667
2022	1,686,667
2023	1,686,667
2024	1,686,667
Thereafter	12,790,554
	$ 21,223,889

Accrued Liabilities

Accrued liabilities at December 31, 2019 and 2018 consist of the following:

	December 31, 2019	December 31, 2018
Accrued vacation	$ 272,822	$ 287,326
Accrued payroll and commission	111,087	298,960
Accrued payroll tax	52,228	57,306
Accrued interest	356,778	917,482
Accrued consulting	257,492	368,862
Accrued contract manufacturing costs	386,591	106,607
Accrued legal costs	291,508	731,190
Accrued audit and tax services	188,967	96,150
Accrued other	1,004,782	2,075,558
Total	$ 2,922,255	$ 4,939,441

7. Debt

Convertible Debt

Convertible debt at December 31, 2019 and December 31, 2018 consist of the following:

	December 31, 2019	December 31, 2018
June 2017 convertible debt	$ —	$ 740,882
Napo convertible debt	—	10,553,888
	—	11,294,770
Less: unamortized debt discount and debt issuance costs	—	(55,600)
Net convertible debt obligation	$ —	$ 11,239,170
Convertible debt - non-current, net of discount	—	—
Convertible debt - current, net of discount	$ —	$ 11,239,170

February 2015 Convertible Debt

In February 2015, the Company issued a convertible promissory note to an accredited investor in the aggregate principal 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 1,937 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 lender 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 was included as a derivative liability on the Balance Sheet. At September 30, 2018, the derivatives were determined to have a de-minimis fair value and were written-off.

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 June 2017 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 principal 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 June 2017 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.

In May 2019, the Company and CVP amended the June 2017 Note agreement such that the Company made three separate exchanges of principal and related accrued interest for shares of the Company's common stock. The first two exchanges of principal and accrued interest for common stock were not considered a substantial change to the June 2017 Note and therefore resulted in modification accounting and the determination of a new effective interest rate; the third exchange on May 29, 2019 resulted in the extinguishment of the entire June 2017 Note with a corresponding extinguishment loss of $7,566. At December 31, 2019 and December 31, 2018, the net carrying value of the June 2017 Note was zero and $685,282, respectively.

September 2018 L2 Promissory Note

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 of a discount of $55,000. The Notes bore interest at the rate of 8% per annum with a maturity date of March 11, 2019. On October 10, 2018, the Company paid off the entire $455,000 principal 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 1,071 shares of common stock and a 5-year warrant (see Note 8) to purchase 2,649 shares of common stock.

September 2018 Conte Promissory Note

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 bore interest at the rate of 8% per annum with a maturity date of March 11, 2019. On October 10, 2018, the Company paid off the entire $111,250 principal 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 484 shares of common stock (see Note 8).

Napo convertible Notes

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 $39.20 per share to $14.00 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.

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 3,603 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 $14.70 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 statement 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 $64.75 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 was being amortized over the twenty-nine (29) month period from July 31, 2017 to December 31, 2019. 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 4,081 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 4,582 shares of the Company’s common stock. In January 2019, $446,729 of accrued interest was paid through the issuance of 19,751 shares of the Company's common stock.

Extinguishment and Exchange of the Napo Convertible Notes

In May 2019, in a restructuring of the Notes, Chicago Venture Partners (“CVP”) acquired the Napo December 2016 and Napo July 2017 Notes, as well as all rights thereof, and immediately extinguished the two Notes; in their place, the Company issued to CVP a new note (“Exchange Note 1”). The collective carrying amount of the Napo December 2016 and Napo July 2017 Note immediately before the exchange was $10,375,326, or principal of $10,125,339 and unamortized premium of $249,987. The new Exchange Note 1 had an opening principal balance of

$10,535,900, consisting of the $10,125,339 principal balance of the extinguished notes plus $410,562 in accrued but unpaid interest from the Napo December 2016 and Napo July 2017 Notes. At December 31, 2019 and December 31, 2018, the balance of the Napo December 2016 and Napo July 2017 Notes was zero and $10,553,888, respectively.

Concurrent with the restructuring, CVP also entered into security agreements with Jaguar (the "Jaguar Security Agreement") and Napo (the "Napo Security Agreement", and together with the Jaguar Security Agreement, the "Security Agreements"), pursuant to which CVP will receive (i) a security interest in substantially all of the Company's assets as security for the Company's obligations under Exchange Note 2 and (ii) a security interest in substantially all of Napo's assets as security for Napo's obligations under Exchange Note 1 and Exchange Note 2. Notwithstanding the foregoing, (a) the amount owing under Exchange Note 2 will not be considered part of the obligations secured by the Napo Security Agreement until such time as Jaguar receives permission from a third party and (b) the security interest granted under the Jaguar Security Agreement will be automatically terminated and released upon Jaguar's receipt of a waiver from such third party.

Notes Payable

Notes Payable at December 31, 2019 and December 31, 2018 consist of the following:

	December 31, 2019	December 31, 2018
December 2017 note payable	$ —	1,673,237
February 2018 note payable	—	2,359,750
March 2018 note payable	—	1,147,870
2019 Exchange Note 1	4,381,535	—
2019 Exchange Note 2	2,296,926	—
Tempesta Note Payable	550,000	
	7,228,461	5,180,857
Less: unamortized discount and debt issuance costs	—	(335,282)
Note payable, net of discount	$ 7,228,461	$ 4,845,575
Notes payable - non-current, net	$ 450,000	$ —
Notes payable - current, net	$ 6,778,461	$ 4,845,575

December 2017 Note

On December 8, 2017, the Company entered into a securities purchase agreement with CVP pursuant to which the Company issued a promissory note (the "December 2017 Note") in the aggregate principal amount of $1,587,500 for an aggregate purchase price of $1,100,000. The December 2017 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 December 2017 Note bears interest at the rate of 8% per annum and matures on August 26, 2019.

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 CVP 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 December 2017 Note 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 December 2017 Note agreement such that CVP agreed not to make any redemptions of the December 2017 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 principal 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 December 2017 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 December 2017 Note.

In March and April 2019, the Company and CVP amended the December 2017 Note agreement such that the Company, in three separate exchanges, prepaid principal and accrued interest of $1,673,237 and $180,258, respectively, in 105,239 shares of the Company's common stock. These exchanges of principal and accrued interest for common stock resulted in the extinguishment of the entire December 2017 Note with a corresponding extinguishment loss. For the year ended December 31, 2019, the Company recorded a loss on extinguishment of $363,061 for the December 2017 Note. At December 31, 2019 and December 31, 2018, the net carrying value of the December 2017 Note was zero and $1,548,829, respectively.

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 "February 2018 Note"). The February 2018 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 February 2018 Note bears interest at the rate of 8% per annum and matures on August 26, 2019.

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 February 2018 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 principal 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 February 2018 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 February 2018 Note.

In March 2019, the Company and CVP amended the February 2018 Note agreement such that the Company prepaid principal and accrued interest of $2,044,627 and $203,866, respectively, in 114,802 shares of the Company's common stock. The exchange of debt for common stock was considered a substantial change to the February 2018 Note and therefore the exchange resulted in extinguishment accounting and a corresponding extinguishment loss of $487,865. In April 2019, the Company and CVP amended the February 2018 Note agreement such that the Company made a single exchange of principal and related accrued interest of $315,123 and $1,755, respectively, for 20,345 shares of the Company's common stock. The first exchange on April 16, 2019 resulted in the extinguishment of the entire February 2018 Note with a corresponding extinguishment loss of $37,740. At December 31, 2019 and December 31, 2018, the net carrying value of the February 2018 Note was zero and $2,290,865, respectively.

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 "March 2018 Note" and together with the June 2017 Note, the December 2017 Note

and the February 2018 Note, the “CVP Notes”). The March 2018 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 March 2018 Note bears interest at the rate of 8% per annum and matures on September 21, 2019.

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 March 2018 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 principal 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 March 2018 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 March 2018 Note.

Between January 2019 and March 2019, the Company and CVP amended the March 2018 Note agreement such that the Company prepaid principal and accrued interest of $1,050,114 and $85,681, respectively, in 95,407 shares of the Company’s common stock. These exchanges in whole represented four separate prepayments of principal and accrued interest, resulting in three debt extinguishments and one debt modification accounted. For the debt extinguishments, the Company recorded an aggregate extinguishment loss of $1,210,676. For the modification, a new effective rate was determined at the date of modification that equated the revised cash flows to the carrying amount of the March 2018 Note. The March 2018 Note was fully extinguished in March 2019. At December 31, 2019 and December 31, 2018, the net carrying value of the March 2018 Note was zero and $1,005,880, respectively.

2019 Bridge Notes

Between March 18, 2019 and June 26, 2019, the Company entered into Promissory Note Purchase Agreements with certain accredited investors under which the Company issued (i) fourteen promissory notes with a principal balance of $3,550,000 and warrant coverage at 125% of principal, and (ii) seven promissory notes with a principal balance of $1,500,000 and warrant coverage at 75% of principal. Collectively, cash proceeds from the twenty-one promissory notes (collectively, the “Bridge Notes”) was $5,050,000. The Bridge Notes were not convertible and bore interest at 12% with a maturity date of July 18, 2019, at which date all principal and accrued interest were due. The exercise price of the warrants was either (i) the price the Company issued common shares in its next public offering subject to a registration statement or (ii) if no such offering was consummated by the four-month maturity date of the Notes, then the exercise price would be equal to the closing price of the Company’s common stock on the Notes four-month maturity date. The warrants (see Note 3) for all twenty-one Bridge Notes had an issuance date fair value of $5,005,742, which was recorded as a discount to the Bridge Notes and amortized to interest expense.

Between May and early July 2019, the Company and the Bridge Note investors extended the maturity date of the Bridge Notes from July 18, 2019 to July 31, 2019, or an addition of thirteen days; this amendment to the terms of the Promissory Note Purchase Agreements did not represent a troubled debt restructuring per Subtopic 470-60, nor was it considered a substantial change requiring extinguishment accounting per Subtopic 470-50. Rather, it represented a modification under Subtopic 470-50 requiring the determination of a new effective interest rate at the modification date that equated the revised cash flows to the carrying amounts of the Bridge Notes.

On July 23, 2019, the Company paid-off all twenty-one Bridge Notes prior to maturity. The Company paid cash of $5,192,923, or $5,050,000 of principal and $142,923 of accrued interest. The extinguishment of the Bridge Notes resulted in an extinguishment loss of $335,753.

2019 Exchange Notes

In May 2019, the Company and CVP entered into an Exchange Agreement whereby CVP purchased the two outstanding Napo convertible notes and all rights thereof from the current debt holders. Subject to the terms of the Exchange Agreement, CVP and the Company agreed to exchange the two Napo convertible notes for a single CVP Note ("CVP Exchange Note 1"). At the Exchange date, the principal balance of the two Napo convertible notes was $10,125,339, or $10,535,900 inclusive of accrued but unpaid interest of $410,561. The beginning principal balance of CVP Exchange Note 1 was $10,535,900, or equal to the principal balance of the two Napo convertible notes and accrued interest thereon. The maturity date of CVP Exchange Note 1 is December 31, 2020, with an interest rate of 10%. Per the terms of the Exchange Agreement, CVP agreed to extend the maturity date of CVP Exchange Note 1 from December 31, 2019 (the same maturity date carried over from the two Napo convertible notes) to December 31, 2020; in consideration of this extension, the Company issued CVP Exchange Note 2 with a principal balance of $2,296,926. The maturity date of CVP Exchange Note 2 is December 31, 2020, with an interest rate of 10%. The exchange of the two outstanding Napo convertible notes for Exchange Note 1 and Exchange Note 2 resulted in the recording of a $2,046,939 loss on extinguishment of debt.

Between May 2019 and July 2019, the Company and CVP entered into note exchange agreements pursuant to which the Company made prepayments of principal and related accrued interest of $6,154,366 and $89,809, respectively, in lieu of making cash payments to CVP on Exchange Note 1, by issuing 1,119,440 shares of the Company's common stock to CVP. These exchanges of principal and related accrued interest resulted in debt extinguishments accounted for under ASC 470-50, and for the year ended December 31, 2019, the Company recorded a net loss on extinguishment of $428,776 for Exchange Note 1. At December 31, 2019, the net carrying value of Exchange Note 1 and Exchange Note 2 was $4,381,535 and $2,296,926, respectively, or an aggregate principal balance of $6,678,461.

2019 Tempesta Note

In October 2019, the Company entered into a License Termination and Settlement Agreement with Dr. Michael Tempesta, pursuant to which certain royalty payment disputes between Napo and Tempesta were settled. Per the terms of the Agreement, Tempesta received $50,000 in cash, an unsecured promissory note issued by the Company in the aggregate principal amount of $550,000 and 40,000 shares of the Company's common stock in exchange for the cessation of all royalty payments by Napo to Dr. Tempesta under the License Agreements. The $550,000 promissory note bears interest at the rate of 2.5% per annum and matures on March 1, 2025. The promissory note provides for the Company to make semi-annual payments equal to $50,000 plus accrued interest beginning on March 1, 2020 until the Note is paid in full. At December 31, 2019, the net carrying value of the 2019 Tempesta Note was $550,000.

Long-term Debt

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.

8. Warrants

The following table summarizes information about warrants outstanding and exercisable into shares of the Company's common stock for the years ended December 31, 2019 and 2018 is as follows:

	Year ended December 31,	
	2019	2018
Warrants outstanding, beginning balance	34,682	4,590
Issuances	20,637,761	30,951
Exercises	(1,250,000)	—
Expirations and cancellations	(551)	(859)
Warrants outstanding, ending balance	19,421,892	34,682

For the fiscal year ended December 31, 2019, the Company issued 20,637,761 warrants, as follows:

March 2019 Ladenburg Warrants

In March 2019, in consideration of services provided in the Company's March 2019 public offering of 19,019 common shares, the Company issued to Ladenburg Thalmann & Co. warrants to purchase an aggregate of 761 shares of common stock at an exercise price of $17.50 per common share. The warrants were valued at $13,028 using the Black-Scholes option pricing model as follows: exercise price of $17.50 per share, stock price of $18.90 per share, expected life of five years, volatility of 146%, and a risk-free rate of 2.21%. The warrants were classified in stockholders' equity.

March 2019 LOC Warrant

In March 2019, in consideration of a letter of credit cancellation related to the Company's office lease, the Company issued a warrant to purchase warrant shares equal to a fixed principal amount divided by a variable exercise price (see Note 3). The warrants were initially classified as liabilities pursuant to ASC 480-10 due to their debt-like nature. On July 23, 2019, upon the exercise price of the warrants becoming fixed, the warrants became exercisable into 45,750 shares of the Company's common stock and were reclassified to additional paid-in-capital with a fair value of $71,079 (see Note 3).

2019 Bridge Note Warrants

Between March 18, 2019 and June 26, 2019, concurrent to the Company entering into Promissory Notes of $5,050,000, the Company issued twenty-one warrants to purchase warrant shares equal to a fixed principal amount divided by a variable exercise price (see Note 3). The warrants for all twenty-one Bridge Notes were initially liability classified pursuant to ASC 480-10 due to their debt-like nature. On July 23, 2019, upon the exercise price of the warrants becoming fixed, the warrants became exercisable into 2,781,250 shares of the Company's common stock and were reclassified to additional paid-in-capital with a fair value of $4,259,327 (see Note 3).

July 2019 Series 1 Warrants

In July 2019, the Company entered into an underwriting agreement (see Note 10), relating to a public offering, which was comprised of (1) 2,886,500 Class A Units, priced at $2.00 per unit, with each unit consisting of (i) one share of the Company's voting common stock, (ii) one Series 1 warrant to purchase one share of Common Stock,

and (iii) one Series 2 warrant to purchase one share of Common Stock, and (2) 10,787 Class B Units, priced at a price of $1,000 per unit, with each unit consisting of (i) one share of Series B convertible preferred stock, convertible into 500 shares of Common Stock, (ii) 500 Series 1 Warrants and (iii) 500 Series 2 Warrants.

The Series 1 Warrants have an exercise price of $2.00 and expire on the earlier of (a) 5 years from the date of issuance and (b) 30 calendar days following the public announcement of Positive Interim Results related to the diarrhea results from the HALT-D investigator initiated trial, if and only if certain trading benchmarks are achieved during such 30 calendar day period.

In the offering, the Company sold (i) 2,886,500 Class A Units, which included Series 1 warrants to purchase 2,886,500 shares of the Company's common stock and (ii) 10,787 Class B Units, which included Series 1 warrants to purchase 5,393,500 shares of the Company's common stock. In total, 8,280,000 Series 1 warrants were issued, with an initial valuation of $5,025,515 computed using the Black-Scholes-Merton pricing model using a stock price of $1.73, a strike price of $2.00, an expected term of 5.0 years, volatility of 109.25% and a risk-free discount rate of 1.83%. Upon issuance, the Series 1 warrants were classified in additional paid-in-capital.

Modification of the July 2019 Series 1 Warrants

In September 2019, the Company reduced the exercise price all 8,280,000 Series 1 Warrants from $2.00 to $1.40. The Company determined the impact of this modification to be an increase in the fair value of the warrants of $522,143. Because the modification applied to the entire class of Series 1 Warrant holders, the increase in fair value represented a deemed dividend to the entire class of Series 1 Warrant holders. The modification did not result in the reclassification of the equity-classified Series 1 warrants from additional paid-in-capital to liability classification.

During the three months ended December 31, 2019, the Company determined that it had used the incorrect volitlity rate in measuring the value of the modified Series 1 warrants. In the three months ended September 30, 2019, the Series 1 warrants were recorded at $252,106 in additional paid-in-capital – when it should have been $522,143. This error led to the understatement of additional paid-in-capital by $270,037 on the condensed consolidated balance sheet for the three and nine months ended September 30, 2019. In the three months ended December 31, 2019, the Company corrected this error. The Company did not deem this error to be material to its consolidated financial statements for the third quarter of 2019.

July 2019 Series 2 Warrants

The Series 2 Warrants have an exercise price of $2.00 and expire on the first date on the earlier of (a) 5 years from the date of issuance and (b) 30 calendar days following the public announcement by the Company that a pivotal phase 3 clinical trial using crofelemer (Mytesi®, or the same or similar product with a different name) for the treatment of cancer therapy-related diarrhea in humans has met its primary endpoint in accordance with the protocol, if and only if certain trading benchmarks are achieved during such 30 calendar day period. In addition, each Series 2 Warrant has an embedded call option that allows the Company to redeem any unexercised warrants if certain contingencies are met.

In the July 2019 offering, the Company sold (i) 2,886,500 Class A Units, which included Series 2 warrants to purchase 2,886,500 shares of the Company's common stock and (ii) 10,787 Class B Units, which included Series 2 warrants to purchase 5,393,500 shares (10,787 Class B Units multiplied by 500 warrants per Class B Unit equals 5,393,500) of the Company's common stock. In total, 8,280,000 Series 2 warrants were issued, with an initial valuation of $5,025,515 computed using the Black-Scholes-Merton pricing model using a stock price of $1.73, a strike price of $2.00, an expected term of 5.0 years, volatility of 109.25% and a risk-free discount rate of 1.83%. Upon issuance, the Series 2 Warrants were classified in additional paid-in-capital.

December 2019 PIPE Financing Warrants

In December 2019, the Company entered into a securities purchase agreement with certain investors pursuant to which the Company, in a Private Placement, sold (i) an aggregate of 2,500,000 unregistered shares of the Company's common stock, and (ii) Warrants to purchase up to an aggregate of approximately 1,250,000 shares of common stock, for an aggregate purchase price of $1,500,000 (see Note 10). The warrants have an exercise price of $0.78 per share and become exercisable on June 24, 2020 (6 months after their issuance date) and have a five-year term.

The warrants were valued at $685,969 using the Black-Scholes option pricing model as follows: exercise price of $0.78 per share, stock price of $0.62 per share, expected life of five years, volatility of 143%, and a risk-free rate of 2.42%. As the common stock and warrants were issued in a unit structure, the aggregate proceeds of $1,500,000 were allocated to the two securities using the relative fair value method, resulting with the common stock and warrants being allocated $1,035,000 and $465,000, respectively. The warrants were classified in stockholders' equity.

For the fiscal year ended December 31, 2018, the Company issued 30,951 warrants, as follows:

August 2018 Financing Warrants

In August 2018, in consideration of services provided, the Company issued a warrant to purchase 429 shares of common stock which were exercisable only in the event that the Company raised new financing of at least $3,000,000, 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 $74.20 per share, stock price of $74.20 per share, expected life of five years, volatility of 126%, and a risk-free rate of 3.83%. In October 2018, in a public offering, the Company met the $3,000,000 new financing threshold and the warrants became exercisable.The warrants were classified in stockholders' equity.

August 2018 License Transaction Warrants

In August 2018, in consideration of services provided, the Company issued a warrant contingent upon the Company consummating a Licensing Transaction. Upon resolution of the contingency, the Company issued a five-year warrant to purchase 952 shares of the Company's common stock.The warrants had an issuance-date fair value of $6,312 using the Black-Scholes option pricing model as follows: exercise price of $74.20 per share, stock price of $74.20 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.

August 2018 LOC Warrant

In August 2018, in consideration of the Letter of Credit associated with the Company's office lease, the Company issued to an existing shareholder a five-year warrant to purchase 9,580 shares of the Company's common stock. The Warrant is exercisable on or after March 28, 2019 at an exercise price of $49.08. The warrants had an issuance-date fair value of $493,688 using the Black-Scholes-Merton model with the following criteria: stock price of $58.52 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.

September 2018 L2 Warrants

Concurrent to entering into the Note Purchase Agreement with L2 Capital in September 2018, the Company issued to L2 Capital a 5-year warrant to purchase 2,649 shares of the Company's common stock at an exercise price of $63.00 per share. The warrants had an issuance-date fair value of $100,330 using the Black-Scholes-Merton model with the following criteria: stock price of $44.80 per share, expected life of 5 years, volatility of 132%, risk-free rate

of 2.87% and dividend rate of 0%. The $100,330 fair value of the Warrant was recorded in additional paid-in-capital and treated as a discount to the L2 Capital Promissory note balance.

September 2018 Conte Warrants

Concurrent to entering into the Note Purchase Agreement with an accredited investor in September 2018, the Company issued to the accredited investor a 5-year warrant to purchase 484 shares of the Company's common stock at an exercise price of $86.10 per share. The warrants had an issuance-date fair value of $17,819 using the Black-Scholes-Merton model with the following criteria: stock price of $44.80 per share, expected life of 5 years, volatility of 132%, risk-free rate of 2.87% and dividend rate of 0% The warrants were recorded in additional paid-in capital and treated as a discount to the Conte Promissory note balance.

October 2018 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 17,142 shares of common stock at an exercise price of $52.50 per common share. The warrants had an issuance-date fair value of $611,286 using the Black-Scholes option pricing model as follows: exercise price of $52.50 per share, stock price of $41.30 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.

9. Convertible Preferred Stock

At December 31, 2019, convertible preferred stock consisted of the following:

Series	Shares Authorized	Issued and Outstanding	Carrying Value	Liquidation Preference per Share
A	5,524,926	5,524,926	$ 9,894,492	$ 1.665
B	11,000	1,971	475,928	—
B-1	63	—	—	—
B-2	10,165	10,165	1,236,064	—
Non-designated	5,453,846	—	—	—
Total	11,000,000	5,537,062	11,606,484	

At December 31, 2018, convertible preferred stock consisted of the following:

Series	Shares Authorized	Issued and Outstanding	Carrying Value	Liquidation Preference per Share
A	5,524,926	5,524,926	$ 9,000,002	$ 1.665

Series A Redeemable 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 gross proceeds of $9,199,002, or $9,000,002 net of issuance costs. The preferred stock is convertible into approximately 473,565 shares of common stock at the option of the holder at an effective conversion price of $19.425 per share. Subject to certain limited exceptions, the shares of Preferred Stock could not 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 Series A convertible preferred shares are redeemable by Sagard Capital upon a Redemption Event that is not solely within the control of the Company. Were a Redemption Event to occur 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 convertible preferred stock then outstanding may require the Company to redeem all Series A shares for cash at a per share purchase price equal to $2.3057. Any one of the following conditions can result in a Redemption Event: (i) revenue attributable to the Mytesi product for the six-month period ended March 31, 2021 is less than $22.0 million; (ii) the daily volume weighted average price (“VWAP”) of the Company's common stock on Nasdaq for the 30 days prior to a Measurement Date is less than $105.00; (iii) the Company fails to file with the Securities and Exchange Commission (“SEC”) on or before June 30, 2021, its Form 10-Q for the three months ending March 31, 2021.

On the March 23, 2018 issuance date, the effective conversion price per share was less than the fair value of the underlying common stock. As a result, the Company determined that there was a Beneficial Conversion Feature (“BCF”) of approximately $995,000. Because the Company's Series A Convertible Preferred Stock does not have a stated conversion date and was immediately convertible at the issuance date, the Company recorded a deemed dividend charge of $995,000 for the accretion of the discount on the Series A Convertible Preferred Stock. 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 consolidated statements of operations for the year ended December 31, 2018.

During the three months ended December 31, 2019, the Company determined that a Redemption Event was probable as of July 1, 2019, yet did not record any accretion for the three months ended September 30, 2019. This error led to the understatement of the carrying value of the Series A convertible preferred stock by $436,652 on the condensed consolidated balance sheet for the three and nine months ended September 30, 2019. In the three months ended December 31, 2019, the Company corrected this error. The Company is accreting the carrying value to the redemption amount of $12,738,822. The Company did not deem this error to be material to its consolidated financial statements for the third quarter of 2019.

The redemption amount and carrying value of the Series A convertible preferred stock is $12,738,822 and $9,894,492 as of December 31, 2019, respectively. The redemption amount and carrying value of the Series A convertible preferred stock was zero and $9,000,002 as of December 31, 2018, respectively. For the year ended December 31, 2019, using the effective interest method and a probable redemption date of April 30, 2021, the Company accreted $894,490 as recorded in the consolidated statements of stockholders’ equity. The accretion of $894,490 represents a deemed dividend and is reflected below net loss to arrive at net loss available to common stockholders on the Company's consolidated statement of operations for the year ended December 31, 2019.

In March 2019, the Company and Sagard Capital Partners, L.P. amended certain terms of the agreement, such that the effective conversion price was adjusted to $19.425 per share.

The preferred stock has been classified outside of stockholders' equity in accordance with authoritative guidance for the classification and measurement of potentially redeemable securities.

Series B Convertible Preferred Stock

In July 2019, the Company entered into an underwriting agreement relating to the public offering comprised of (1) 2,886,500 Class A Units, priced at a public offering price of $2.00 per unit, with each unit consisting of (i) one share of the Company's voting common stock, (ii) one Series 1 warrant to purchase one share of Common Stock and (2) 10,787 Class B Units, priced at a public offering price of $1,000 per unit, with each Class B unit consisting of (i) one share of Series B convertible preferred stock with a stated value of $1,000 and convertible into 500 shares of Common Stock, (ii) 500 Series 1 Warrants and (iii) 500 Series 2 Warrants, at a public offering price of $1,000 per Class B Unit.

The Company sold 10,787 Class B Units, comprised of 10,787 shares of Series B convertible preferred stock, Series 1 warrants to purchase 5,393,500 shares of common stock and Series 2 warrants to purchase 5,393,500 shares of common stock. The total gross proceeds to the Company from the offering of the Class B Units were $10,787,000, of which $4,239,870 was allocated to the Series B convertible preferred stock, $3,273,565 to the Series 1 Warrants and $3,273,565 to the Series 2 Warrants. Issuance costs of $1,635,184 were allocated to the Class B Units.

Holders of the Series B 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 B then outstanding were converted into shares of common stock. With certain exceptions, the shares of Series B Convertible Preferred Stock have no voting rights. However, as long as any shares of Series B Convertible Preferred Stock remain outstanding, the Company shall not, without the affirmative vote of holders of a majority of the then outstanding shares of Series B Convertible Preferred Stock, (a) alter or change adversely the powers, preferences or rights given to the Series B Convertible Preferred Stock or alter or amend the Series B Certificate of Designation or (b) enter into any agreement with respect to any of the foregoing. Each share of Series B Convertible Preferred Stock is convertible at any time at the holder's option into 500 shares of Common Stock, which conversion ratio will be subject to adjustment for stock splits, stock dividends, distributions, subdivisions and combinations and other similar transactions.

On the July 23, 2019 issuance date, the effective conversion price per share was less than the fair value of the underlying common stock. As a result, the Company determined that there was a Beneficial Conversion Feature of $4,239,870. Because the Company's Series B Convertible Preferred Stock does not have a stated conversion date and was immediately convertible at the issuance date, the Company recorded a deemed dividend charge of $4,239,870 for the accretion of the discount on the Series B Convertible Preferred Stock. 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 consolidated statement of operations for the year ended December 31, 2019.

During July and August 2019, certain investors converted 8,816 Series B convertible preferred shares into 4,408,000 shares of the Company's common shares at the stated conversion ratio. As of December 31, 2019, there remained 1,971 shares of Series B Convertible Preferred Stock outstanding.

The preferred stock has been classified in stockholders' equity in accordance with authoritative guidance.

During the three months ended December 31, 2019, the Company determined that it had made an error in allocating the proceeds of the financing. In the three months ended September 30, 2019, the Series B shares, the Beneficial Conversion Feature and the deemed dividend were recorded at $3,875,779 when they should have been $4,239,870. This error led to the understatement of the Series B Preferred Stock, the Beneficial Conversion Feature and the deemed dividend by $364,092 on the condensed consolidated financial statements for the three and nine months ended September 30, 2019. In the three months ended December 31, 2019, the Company corrected this error. The Company did not deem this error to be material to its consolidated financial statements for the third quarter of 2019.

Series B-1 Convertible Preferred Stock

In October 2019, the Company entered into a Warrant Exercise Agreement with the sole remaining holder of the Series B Convertible Preferred Stock (the Exercising Holder), who owned Series 1 warrants exercisable for 1,250,000 shares of Common Stock. Pursuant to the terms of the Warrant Exercise Agreement, the Company had the right (a purchased put option) to require the Exercising Holder to exercise all or a portion of its Series 1 warrants in accordance with the existing terms of the Series 1 warrants, in exchange for the Company's agreement to issue to the Exercising Holder a number of shares of the Company's Series B-1 Convertible Preferred Stock, with a stated value of $12,201, in an amount equal to one Series B-1 Preferred Share for every 19,841 Series 1 Warrant Shares issued by the Company to the Exercising Holder. The purpose of the Company entering into the agreement was to enable the Company to monetize the remaining Series 1 warrants.To the extent that all Series 1 warrants held by the Exercising Holder were exercised at their $1.40 exercise price, the Company would receive aggregate gross proceeds of approximately $1,750,001 and, in turn, have issued 63 shares of Series B-1 Preferred Stock to the Exercising Holder.

On October 3 and October 9, 2019, in two separate transactions, the Company exercised its purchased put option (see Note 3) to require the Exercising Holder to exercise all of its 1,250,000 Series 1 warrants (see Note 8), upon which the Company issued 1,250,000 common shares to the Exercising Holder in return for aggregate gross proceeds of $1,750,001. In consideration (the strike price) of the exercising the warrants, the Company issued 63 shares of Series B-1 Convertible Preferred Stock to the Exercising Holder.

Holders of the Series B-1 Convertible Preferred Stock are entitled to receive dividends on shares of Series B-1 Preferred Stock equal (on an as-if-converted-to-Common-Stock basis) to and in the same form as dividends actually paid on shares of the Common Stock when, as and if such dividends are paid on shares of the Common Stock. No other dividends shall be paid on shares of the Series B-1 Preferred Stock.

The shares of Series B-1 Convertible Preferred Stock have no voting rights. However, as long as any shares of Series B-1 Preferred Stock remain outstanding, the Company shall not, without the affirmative vote of holders of a majority of the then outstanding shares of Series B-1 Convertible Preferred Stock, (a) alter or change adversely the powers, preferences or rights given to the Series B-1 Convertible Preferred Stock or alter or amend the Series B-1 Certificate of Designation or (b) enter into any agreement with respect to any of the foregoing.

Upon any liquidation, dissolution or winding-up of the Company, whether voluntary or involuntary, the Holders of the Series B-1 Convertible Preferred Stock are entitled to receive out of the assets, whether capital or surplus, of the Company the same amount that a holder of common stock would receive if the Series B-1 Preferred Stock were fully converted to Common Stock which amounts shall be paid *pari passu* with all holders of Common Stock.

Each share of Series B-1 Convertible Preferred Stock is convertible at any time at the holder's option into 10,001 shares of Common Stock, as determined by dividing the $12,201 stated value of each Series B-1 Convertible Preferred Share by the $1.22 conversion price ($12,201 divided by 1.22 = 10,001 conversion ratio), and which conversion ratio is subject to adjustment for stock splits, stock dividends, distributions, subdivisions and combinations and other similar transactions as specified in the Series B-1 Certificate of Designation.

On the October 3, 2019 issuance date, the effective conversion price was less than the fair value of the underlying common stock. As a result, the Company determined that there was a Beneficial Conversion Feature of $145,615. Because the Company's Series B-1 Convertible Preferred Stock does not have a stated conversion date and was immediately convertible at the issuance date, the Company recorded a deemed dividend charge of $145,615 for the accretion of the discount on the Series B-1 Convertible Preferred Stock. 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 consolidated statement of operations for the fiscal year ended December 31, 2019.

On the October 9, 2019 issuance date, the effective conversion price was less than the fair value of the underlying common stock. As a result, the Company determined that there was a Beneficial Conversion Feature of

$384,688. Because the Company's Series B-1 Preferred Stock does not have a stated conversion date and was immediately convertible at the issuance date, the Company recorded a deemed dividend charge of $384,688 for the accretion of the discount on the Series B-1 Preferred Stock. 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 consolidated statements of operations for the fiscal year ended December 31, 2019.

The Series B-1 Preferred Stock was classified in stockholders' equity in accordance with authoritative guidance.

In December 2019, the sole investor in the Series B-1 Preferred Stock converted its entire holding of 63 shares of the Series B-1 Preferred Stock into 630,063 shares of the Company’s common shares at the stated conversion ratio. As of December 31, 2019, there were no shares of the Series B-1 Preferred Stock outstanding.

Series B-2 Convertible Preferred Stock

In December 2019, the Company entered into an exchange agreement with Oasis Capital, pursuant to which Oasis Capital gave up (i) its remaining unexercised Prepaid Forward contracts (see Note 10) exercisable for 1,236,223 shares of the Company’s common stock and (ii) 695,127 common shares held as an investment by Oasis Capital, in exchange for 10,165 shares of the Company’s newly authorized Series B-2 Convertible Preferred Stock.

Holders of the Series B-2 Convertible Preferred Stock are entitled to receive dividends on shares of Series B-2 Convertible Preferred Stock equal (on an as-if-converted-to-Common-Stock basis) to and in the same form as dividends actually paid on shares of the Common Stock when, as and if such dividends are paid on shares of the Common Stock. No other dividends shall be paid on shares of the Series B-2 Convertible Preferred Stock.

The shares of Series B-2 Convertible Preferred Stock have no voting rights. However, as long as any shares of Series B-2 Convertible Preferred Stock remain outstanding, the Company shall not, without the affirmative vote of holders of a majority of the then outstanding shares of Series B-2 Convertible Preferred Stock, (a) alter or change adversely the powers, preferences or rights given to the Series B-2 Convertible Preferred Stock or alter or amend the Series B-2 Certificate of Designation or (b) enter into any agreement with respect to any of the foregoing.

Upon any liquidation, dissolution or winding-up of the Company, whether voluntary or involuntary, the Holders of the Series B-2 Convertible Preferred Stock are entitled to receive out of the assets, whether capital or surplus, of the Company the same amount that a holder of common stock would receive if the Series B-2 Convertible Preferred Stock were fully converted to Common Stock which amounts shall be paid *pari passu* with all holders of Common Stock.

Each share of Series B-2 Convertible Preferred Stock is convertible at any time at the holder’s option into 190 shares of Common Stock, as determined by dividing the $153.90 stated value of each Series B-2 Convertible Preferred Share by the $0.81 conversion price ($153.90 divided by 0.81 = 190 conversion ratio), and which conversion ratio is subject to adjustment for stock splits, stock dividends, distributions, subdivisions and combinations and other similar transactions as specified in the Series B-2 Certificate of Designation.

The Series B-2 Convertible Preferred Stock was classified in stockholders' equity in accordance with authoritative guidance.

10. Stockholders' Equity

As of December 31, 2019 and 2018, the Company had reserved shares of common stock, on an as-if converted basis, for issuance as follows:

	December 31, 2019	December 31, 2018
Options issued and outstanding	3,902,675	42,059
Inducement options issued and outstanding	74	2,984
Options available for grant under stock option plans	479,829	2,327
Restricted stock unit awards issued and outstanding	5,613	5,613
Warrants issued and outstanding	19,421,892	34,681
Convertible notes	—	10,849
Series A convertible preferred stock	473,565	47,357
Series B convertible preferred stock	985,500	—
Series B-2 convertible preferred stock	1,931,350	—
Total	27,200,498	145,870

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.

The Company is authorized to issue a total number of 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 are preferred stock.

Reverse stock-splits

In June 2018, the Company effected 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 retrospectively reflected in all voting common stock, warrants, the conversion feature of the Company's Series A Convertible Preferred Stock, and common stock option shares disclosed in these consolidated financial statements. The non-voting common stock and the convertible preferred stock were excluded from the reverse split.

In June, 2019, the Company effected a 1-for-70 reverse stock split of the Company's issued and outstanding shares of common stock, effective June 7, 2019. The reverse split has been retrospectively reflected in all voting common stock, warrants, the conversion feature of the Company's Series A Convertible Preferred Stock, and common stock option shares disclosed in these consolidated financial statements. The non-voting common stock and the convertible preferred stock were excluded from the reverse split.

Transactions with Oasis Capital

On January 7, 2019, the Company entered into a common stock purchase agreement with Oasis Capital, relating to an offering of an aggregate of up to 76,190 shares of common stock via an equity line of credit. Under the terms of the purchase agreement, the Company has the right to "put," or sell, up to 76,190 shares of common stock to

Oasis Capital for an amount equal to the product of (i) the number of shares set forth on the applicable put notice (minus the deposit and clearing fees associated with such purchase) and (ii) a fixed price of $52.50 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 114,286 shares of common stock by notifying Oasis Capital at any time after the effective date of the purchase agreement. In March 2019, the Company exercised this option. As of March 31, 2019, the Company had sold all of the 76,190 shares of common stock of the equity line and all 114,286 shares of common stock from the option to Oasis Capital, or a total of 190,476 shares.

In March 2019, the Company entered into a securities 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, an aggregate of 19,019 shares of common stock at an offering price of $14.00 for gross proceeds of approximately $266,266.

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 285,714 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 equal 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 $19.60 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 285,714 shares of Common Stock by notifying Oasis Capital at any time after the effective date of the April CSPA.

Effective June 14, 2019, the Company halted all future offers and sales of our voting common stock under the April CSPA and terminated the April CSPA. Between April 1, 2019, the date of the April CSPA, and June 14, 2019, we sold an aggregate of 4,843 shares of Common Stock pursuant to the CSPA for aggregate gross proceeds of approximately $100,000.

In November 2019, the Company entered into a securities purchase agreement with Oasis Capital, pursuant to which the Company, in a registered public offering, sold directly to Oasis Pre-Funded Warrants to purchase 2,222,223 shares of the Company’s common stock. The Pre-Funded Warrants were exercisable immediately and could be exercised at any time until all of the Pre-Funded Warrants were exercised in full. The purchase price paid by Oasis was non-refundable in the event that the Pre-Funded Warrants were never exercised. The purchase price of each Pre-Funded Warrant was $0.81, or the $0.80 price per share in the offering, plus an additional $0.01 exercise price upon subsequent exercise. Gross proceeds to the Company from the offer and sale was $1,777,778, or $1,713,275 net of issuance costs. In November 2019, subsequent to the initial sale, Oasis Capital exercised 986,000 of the 2,222,223 Pre-Funded Warrants, with the Company receiving gross proceeds of $9,860. The pre-funded warrants represented prepaid equity forward contracts that were equity classified, as they were not subject to ASC 480-10 and did not meet the definition of a derivative pursuant to ASC 815-10 due to their requiring a substantial upfront payment.

October 2019 Tempesta Settlement

In October 2019, the Company entered into a License Termination and Settlement Agreement with Dr. Michael Tempesta, pursuant to which certain royalty payment disputes between Napo and Tempesta were settled. Per the terms of the Agreement, Tempesta received $50,000 in cash, an unsecured promissory note (see Note 7) issued by the Company in the aggregate principal amount of $550,000 and 40,000 shares of the Company’s common stock in exchange for the cessation of all royalty payments by Napo to Dr. Tempesta under the License Agreements. Upon issuance, the 40,000 shares had a fair value of $48,800 and were subject to lock-up restrictions under which they are not tradeable by Dr. Tempesta until October 1, 2020.

October 2019 Angel Pond Agreement

In October 2019, the Company engaged Angel Pond Capital LLC (see Note 5) to explore potential licensing agreements and collaborations for Mytesi in China. In consideration of these services, the Company issued 166,667 shares of the Company's common stock to Angel Pond Capital LLC.

December 2019 PIPE Financing

In 2019, the Company entered into a securities purchase agreement with certain investors pursuant to which the Company, in a Private Placement, sold (i) an aggregate of 2,500,000 unregistered shares of the Company's common stock, and (ii) Warrants (see Note 8) to purchase 1,250,000 shares of common stock, for an aggregate purchase price of $1,500,000. As the common stock and warrants were issued in a unit structure, the aggregate proceeds of $1,500,000 were allocated to the two securities using the relative fair value method, resulting in the common stock and warrants being allocated $1,035,000 and $465,000, respectively. The warrants were classified in stockholders' equity.

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 395 option shares outstanding at December 31, 2019.

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, canceled or expired.

Stock Options and Restricted Stock Units ("RSUs")

Activity under the 2013 Plan and the 2014 Plan is set forth below:

	Shares Available for Grant	Stock Options Outstanding	RSUs Outstanding	Weighted Average Stock Option Exercise Price	Weighted Average Remaining Contractual Life (Years)	Aggregate Intrinsic Value*
Outstanding at December 31, 2018	2,327	42,059	5,613	$ 406.36	9.24	$ —
Additional shares authorized	4,338,197	—	—	—	—	
Options granted	(4,481,764)	4,481,764	—	1.68	—	—
Options canceled	621,069	(621,148)	—	5.51	—	—
Outstanding at December 31, 2019	479,829	3,902,675	5,613	$ 5.20	9.56	$ —
Exercisable at December 31, 2019		904,051		$ 13.77	9.47	$ —
Vested and expected to vest at December 31, 2019		3,364,438		$ 5.69	9.55	$ —

* Fair market value of Jaguar stock on December 31, 2019 was $0.80 per share.

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 $1.54 and $111.88 per share during the years ended December 31, 2019 and 2018, respectively.

The number of options that vested in the years ended December 31, 2019 and 2018 was 944,821 and 12,590, respectively. The grant date weighted average fair value of options that vested in the years ended December 31, 2019 and 2018 was $ 3.12 and $172.07, respectively.

No options were exercised in the years ended December 31, 2019 and 2018.

The Company granted 2,993 inducement options in the 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 $93.80 per share. Stock-based compensation expense related to the inducement stock for the years ended December 31, 2019 and 2018 was $92,506 and 52,577, respectively. There were 74 and 2,983 option shares outstanding at December 31, 2019 and 2018, respectively.

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 5,613 RSU's outstanding at December 31, 2019 and 2018.

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, 2019 and 2018, and are included in the consolidated statements of operations as follows:

	Year Ended December 31,	
	2019	2018
Research and development expense	$ 868,603	$ 579,641
Sales and marketing expense	160,837	96,730
General and administrative expense	1,959,104	1,347,503
Total	$ 2,988,544	$ 2,023,874

As of December 31, 2019, the Company had $5,671,503 of unrecognized stock-based compensation expense for options and RSU's, which is expected to be recognized over a weighted-average period of 2.3 years.

The fair value of options granted during the years ended December 31, 2019 and 2018, respectively, were calculated using the weighted average assumptions set forth below:

	Year Ended December 31,	
	2019	2018
Weighted-average volatility	143.1 - 145.9 %	87.4 - 105.9 %
Weighted-average expected term (years)	5.0 - 5.8	5.1 - 5.8
Risk-free interest rate	1.5 - 1.9 %	2.6 - 2.9 %
Expected dividend yield	—	—

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, 2019 and 2018:

	Year Ended December 31,	
	2019	2018
Net loss attributable to common shareholders (basic and diluted)	$ (44,726,242)	$ (32,146,057)
Shares used to compute net loss per common share, basic and diluted	4,965,337	209,729
Net loss per share attributable to common shareholders, basic and diluted	$ (9.01)	$ (153.27)

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, RSUs 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, 2019 and 2018 because their inclusion would be anti-dilutive:

	December 31, 2019	December 31, 2018
Options issued and outstanding	3,902,675	42,059
Restricted stock unit awards issued and outstanding	5,613	5,613
Warrants issued and outstanding	19,421,892	34,682
Series A convertible preferred stock	473,565	47,357
Series B convertible preferred stock	985,500	—
Series B-2 convertible preferred stock	1,931,350	—
Total	26,720,595	129,711

13. Income Taxes

The Company's loss before provision for income taxes during the years ended December 31, 2019 and 2018, was a domestic loss of $38,529,436 and $32,146,057, respectively.

The effective tax rate for 2019 and 2018 was 0%. As a result of the Company's history of net operating losses and a full valuation allowance against its deferred tax assets, there was no current or deferred income tax provision for the year ended December 31, 2019.

The components of the provision for income taxes during the years ended December 31, 2019 and 2018 is as follows:

	December 31, 2019	December 31, 2018
Current:		
Federal	$ 10,000	$ —
State	—	—
Foreign	—	—
Total current	10,000	—
Deferred:		
Federal	—	—
State	—	—
Foreign	—	—
Total deferred	—	—
Total provision for income taxes	$ 10,000	$ —

The Company's effective tax during the years ended December 31, 2019 and 2018, differed from the federal statutory rate as follows:

	December 31, 2019	December 31, 2018
Statutory rate	(21.0)%	(21.0)%
State taxes	(0.1)%	(5.6)%
Tax credits	— %	(0.2)%
Goodwill and indefinite-lived intangible asset impairment	— %	3.4 %
Book loss on debt extinguishment	5.4 %	— %
Other	0.5 %	1.0 %
Effect of U.S. tax law change	— %	— %
Valuation allowance	15.2 %	22.4 %
Effective tax rate	— %	— %

Net deferred tax assets as of December 31, 2019 and 2018 consist of the following:

	December 31, 2019	December 31, 2018
Non-current deferred tax assets:		
Net operating losses	$ 15,966,084	$ 12,156,279
Tax credits	241,425	329,563
Stock compensation	1,363,578	1,479,325
Other	—	573,441
	17,571,087	14,538,608
Valuation allowance	(13,884,133)	(8,512,820)
Net non-current deferred tax assets	3,686,954	6,025,788
Non-current deferred tax liabilities:		
Other	(20,594)	—
Property and equipment	(3,666,360)	(6,025,788)
Net non-current deferred tax liability	(3,686,954)	(6,025,788)
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, 2019 and 2018, 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 $5,371,313 during the year ended December 31, 2019.

As of December 31, 2019, the Company had federal and California net operating loss carryovers of approximately $68,143,400 and $23,705,790, respectively. Of the federal net operating losses, $20,741,993 will begin to expire in 2034 and $47,401,407 will carryforward indefinitely. The California net operating losses will begin to expire in 2033.

As of December 31, 2019, the Company had California research credit carryovers of approximately $382,003. The California research credits carry forward indefinitely. The Company had no Federal research credit carryovers.

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.

Uncertain Tax Positions

The Company has adopted the provisions of ASC 740, “Income Taxes Related to Uncertain Tax Positions.” Under these principals, tax positions are evaluated in a two-step process. The Company first determines whether it is more-likely-than-not that a tax position 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, 2019	December 31, 2018
Gross Unrecognized Tax Benefit--Beginning Balance	$ 100,889	$ 97,010
Increases Related to Tax Positions from Prior Years	(24,486)	(20,607)
Increases Related to Tax Positions Taken During the Current Year	—	24,486
Gross Unrecognized Tax Benefit--Ending Balance	$ 76,403	$ 100,889

14. Segment Data

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 sales and net income consisted of:

	Year Ended December 31,	
	2019	2018
Revenue from external customers		
Human Health	$ 5,673,068	$ 4,121,913
Animal Health	102,189	294,232
Consolidated Totals	$ 5,775,257	$ 4,416,145
Segment net loss		
Human Health	$ (19,263,550)	$ (12,337,529)
Animal Health	(19,275,886)	(19,808,528)
Consolidated Totals	$ (38,539,436)	$ (32,146,057)

The Company's reportable segments assets consisted of the following:

	December 31, 2019	December 31, 2018
Segment assets		
Human Health	$ 32,431,891	$ 37,985,935
Animal Health	68,169,193	54,893,593
Total	$ 100,601,084	$ 92,879,528

The reconciliation of segments assets to the consolidated assets is as follows:

	December 31, 2019	December 31, 2018
Total assets for reportable segments	$ 100,601,084	$ 92,879,528
Less: Investment in subsidiary	(29,240,965)	(29,240,965)
Less: Intercompany loan	(34,949,698)	(22,596,618)
Consolidated Totals	$ 36,410,421	$ 41,041,945

15. Subsequent Events

The Company completed an evaluation of the impact of subsequent events through the date these financial statements were issued.

Royalty Interest Transaction

On March 4, 2020, the Company entered into a royalty interest purchase agreement (the "Purchase Agreement") with Iliad Research and Trading, L.P., a Utah limited partnership affiliated with Chicago Venture Partners, L.P. ("Purchaser"), pursuant to which the Company sold to Purchaser a royalty interest entitling Purchaser to receive $500,000 of future royalties on sales of Mytesi (crofelemer) and certain up-front license fees and milestone payments from licensees and/or distributors (the "Royalty Repayment Amount") for an aggregate purchase price of $350,000. The Company will use the proceeds to support advancement of regulatory activities associated with its pipeline, including the Company's lead product candidate, crofelemer for cancer therapy-related diarrhea, and general corporate purposes. The Company will be obligated to make minimum royalty payments on a monthly basis beginning on September 4, 2020 in an amount equal to the greater of (i) $25,000 (which increases to $43,750 beginning on March 4, 2021) and (ii) 10% of the Company's net sales of Mytesi and 10% of worldwide revenues related to upfront licensing fees and milestone payments from licensees and/or distributors, but specifically excluding licensing fees and/or milestone payments that are reimbursements of clinical trial expenses.

Under the Purchase Agreement, the Company is subject to certain covenants, including the obligations of the Company to: (i) timely file all reports required to be filed under Sections 13 or 15(d) of the Securities Exchange Act of 1934, as amended and not terminate its status as an issuer required to file reports under the Exchange Act; (ii) maintain listing of the Company's common stock on a securities exchange; (iii) avoid trading in the Company's common stock from being suspended, halted, chilled, frozen or otherwise ceased; (iv) not consummate any sale or liquidation of all or substantially all of the Company's business or any material asset outside the ordinary course of business without the prior consent Purchaser unless an acquiring party specifically agrees to assume all rights and obligations associated with the Royalty Interest and, in Purchaser's discretion, is capable of fulfilling such obligations, (v) not grant a security or royalty interest in Mytesi for the primary purposes of raising capital without Purchaser's prior written consent, (vi) provide Mytesi revenue and net sales information to Purchaser on a quarterly basis and (vii) other customary covenants and obligations, for which the Company's failure to comply may be subject to certain liquidated damages, including a right for the Purchaser to increase the Royalty Repayment Amount by 15%.

The foregoing descriptions of the Royalty Interest and Purchase Agreement are not complete and are qualified in their entirety by reference to the full text of the Royalty Interest and Purchase Agreement, respectively.

Warrant Repricing

On March 5, 2020, the Company entered into a warrant exercise agreement (the "Exercise Agreement") with a holder (the "Holder") of its Series 2 warrants (the "Warrants") previously issued in the Company's registered public offering on July 23, 2019, pursuant to which the Holder agreed to exercise in cash its Warrants to purchase an aggregate of 90,940 shares of the Company's common stock at a reduced exercise price of $0.605 per share, which is the Minimum Price (as defined under Nasdaq Listing Rule 5635(d)) as of the date of such Exercise Agreement, for gross proceeds to the Company of approximately $55,000.

The issuance of the Warrants and the offer and sale of shares of common stock underlying the Warrants have been registered on the Company's registration statement on Form S-1 and an additional registration statement of the Securities Act of 1933, as amended of which were previously filed with and declared effective by the Securities and Exchange Commission (the "SEC").

On February 24, 2020, the Company entered into warrant exercise agreements (collectively, the "Exercise Agreements") with a holder (the "Holder") of its Series 1 warrants previously issued in the Company's registered public offering in July 2019 and its warrants previously issued in a PIPE in March through June of 2019 pursuant to which the Holder agreed to exercise in cash its Warrants to purchase an aggregate of 458,022 shares of the Company's common stock at a reduced exercise price of $0.692 per share for gross proceeds to the Company of approximately $317,000.

The PIPE Purchase Agreement includes representations, warranties, and covenants customary for a transaction of this type. In addition, the Company agreed to file a registration statement on Form S-1 with the U.S. Securities and Exchange Commission (the "SEC") no later than 15 business days following the date of the PIPE Purchase Agreement to register the resale of the PIPE Shares. The PIPE Shares were offered and sold in reliance upon exemptions from registration.

The foregoing summary of the PIPE Purchase Agreement is not complete and is subject to, and qualified in its entirety by the PIPE Purchase Agreement.

Private Placement

On March 23, 2020, Jaguar Health, Inc. (the "Company") entered into a securities purchase agreement (the "PIPE Purchase Agreement") with certain investors named therein (collectively, "Investors"), pursuant to which the Company agreed to issue and sell to the Investors in a private placement an aggregate of 1,714,283 unregistered shares (the "PIPE Shares") of the Company's common stock for an aggregate purchase price of approximately $720,000 (the "Private Placement"). The Company intends to use the proceeds from the private placement for working capital and general corporate purposes, including the additional purchase of API and drug product to address potential impact of coronavirus pandemic.

Warrant Exercise and Preferred Convertible Stock Agreement

On March 24, 2020, the Company entered into a warrant exercise agreement (the "Exercise Agreement") with a holder (the "Holder") of its Series 2 warrants, pursuant to which the Holder agreed to exercise in cash its Warrants to purchase an aggregate of 1,250,000 shares of the Company's common stock at a reduced exercise price of $0.5227 per share, for gross proceeds to the Company of approximately $653,400. In consideration for the holder's exercise of the Series 2 warrants, the Company agreed to reduce the conversion price of the Series B Preferred Stock from $2.00 to $0.4456.

Landlord Letter of Credit

On March 24, 2020, the Company entered into a Landlord Letter of Credit Agreement with Charles Conte (the "LC Facilitator"), the brother of Lisa A. Conte, the Company's President, Chief Executive Officer and member of

the Company's board of directors (the "Landlord LC Agreement"), pursuant to which the Company will, subject to Landlord's consent, replace the existing letter of credit in the amount of $475,000 entered into on August 28, 2018 by the Company with Pacific Capital Management, LLC to satisfy the letter of credit requirement in the Lease (the "Original LC") with a new letter of credit in the amount of $475,000 (the "New LC"). Pursuant to the Landlord LC Agreement, the Company will pay the LC Facilitator an amount equal to $10,000 per month as consideration for the New LC and reimburse LC Facilitator up to $7,500 for reasonable out-of-pocket expenses incurred in establishing the New LC. The New LC will expire no earlier than December 31, 2020, provided, however that the Company, at no additional cost, may replace the New LC on an earlier date, at the Company's sole discretion upon 30 days' written notice to LC Facilitator.

Equity Line of Credit

On March 24, 2020, the Company entered into an equity purchase agreement (the "ELOC Purchase Agreement") with Oasis Capital, LLC, a Puerto Rico limited liability company ("Oasis Capital"), which provides that, upon the terms and subject to the conditions and limitations set forth therein, Oasis Capital is committed to purchase up to an aggregate of $2.0 million of shares of Common Stock over the 36-month term of the ELOC Purchase Agreement. Concurrently with entering into the ELOC Purchase Agreement, the Company also entered into a registration rights agreement with Oasis Capital (the "Registration Rights Agreement"), in which the Company agreed to file one or more registration statements, as permissible and necessary to register under the Securities Act, registering the sale of the shares of common stock that may be issued to Oasis Capital under the ELOC Purchase Agreement.

The purpose of the equity line of credit is to provide the Company with proceeds as may be necessary for working capital and general corporate purposes, including the additional purchase of API and drug product to address potential impact of coronavirus pandemic.

Under the ELOC Purchase Agreement, after the SEC has declared effective the registration statement referred to above, on any trading day selected by the Company (such date, the "Put Date), the Company has the right, in its sole discretion, to present Oasis Capital with a purchase notice (each, a "Put Notice"), directing Oasis Capital (as principal) to purchase up to the lesser of (i) 200,000 shares of Common Stock or (ii) 20% of the average trading volume of common stock in the 10 trading days immediately preceding the date of such Put Notice, at a per share price (the "Purchase Price") equal to $0.436 (each, an "Option 1 Put"), provided that the aggregate amount of all Option 1 Puts and Option 2 Puts (as defined below) does not exceed $2.0 million.

In addition, on any date on which Oasis Capital receives shares of Common Stock in connection with a Put Notice (the "Clearing Date"), the Company also has the right, in its sole discretion, to present Oasis Capital with a Put Notice (each, an "Option 2 Put") directing Oasis Capital to purchase an amount of Common Stock equal to the lesser of (i) such amount that equals 10% of the daily trading volume of the Common Stock on the date of such Put Notice and (ii) $200,000, provided that the aggregate amount of the Option 1 Put and Option 2 Put on any Put Date or Clearing Date does not exceed $500,000 and the aggregate amount of all Option 1 Puts and Option 2 Puts does not exceed $2.0 million. The purchase price per share pursuant to such Option 2 Put is equal to the Purchase Price. The Threshold Price and the Purchase Price will be adjusted for any reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction occurring during the period(s) used to compute the Threshold Price or the Purchase Price.

The ELOC Purchase Agreement provides that the Company and Oasis Capital shall not effect any sales under the ELOC Purchase Agreement on any purchase date where the lowest traded price of the Common Stock on both such date and on the immediately preceding trading day is less than $0.5014 (the "Threshold Price"). The Company will control the timing and amount of sales of Common Stock to Oasis Capital. Oasis Capital has no right to require any sales by the Company, but is obligated to make purchases from the Company as directed by the Company in accordance with the ELOC Purchase Agreement. There are no limitations on use of proceeds, financial or business covenants, rights of first refusal, or participation rights in the ELOC Purchase Agreement. In consideration for entering into the ELOC Purchase Agreement, the Company agreed to issue Oasis Capital 68,807 shares of Common Stock, subject to the Company's receipt of approval by the Company's stockholders (the "Commitment Shares"). The

Purchase Agreement may be terminated by the Company at any time, at its discretion, without any cost to the Company. Oasis Capital has agreed that neither it nor any of its agents, representatives and affiliates shall engage in any direct or indirect short-selling or hedging of Common Stock during any time prior to the termination of the ELOC Purchase Agreement.

The foregoing descriptions of the ELOC Purchase Agreement and the Registration Rights Agreement are not complete and are qualified in their entirety by reference to the full text of the ELOC Purchase Agreement and the Registration Rigths Agreement.

The issuance of the Commitment Shares and all other shares of common stock that may be issued from time to time to Oasis Capital under the ELOC Purchase Agreement is exempt from registration under the Securities Act.

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 Principal Financial and Accounting Officer, evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2019. 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 Principal Financial and Accounting Officer, as appropriate, to allow timely decisions regarding required disclosure. Based on this evaluation, our Chief Executive Officer and Principal Financial and Accounting Officer concluded that our disclosure controls and procedures were not effective at the reasonable assurance level as of December 31, 2019. This conclusion was based on the material weakness in our internal control over financial reporting as 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. As previously reported in our annual report on Form 10-K for the year ended December 31, 2018, 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 internal controls related to staff turnover in our accounting department and inadequate internal technical staffing levels.

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.

In connection with our preparation of our annual financial statements for the year ended December 31, 2019, there remains a material weakness in our internal control over financial reporting related to our financial statement close process and policies. The primary factors contributing to the material weaknesses were as follows:

- We did not have adequate policies and procedures in place to ensure the timely, effective review of assumptions used in measuring the fair value of certain financial instruments.

- We did not have adequate policies and procedures in place to ensure the timely, effective review of compliance with contractual covenants in certain financial instruments.

Each of these factors resulted in a material weakness in our financial statement preparation and financial statement close process and policies, and a determination that such process was not adequately designed, documented and executed to support the accurate and timely reporting of our financial results.

Remediation Efforts to Address Material Weakness

With the oversight of Chief Executive Officer and Principal Financial and Accounting Officer, we have begun taking steps and plan to take additional measures to remediate the underlying causes of the material weakness, primarily through the development and implementation of formal policies, improved processes and documented procedures.

Notwithstanding the identified material weakness, management believes the consolidated financial statements included in this Annual Report fairly represent in all material respects our financial condition, results of operations and cash flows as of and for the periods presented in accordance with U.S. GAAP.

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 Principal Financial and Accounting Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2019 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, 2019, 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.

Changes in Internal Control over Financial Reporting

Other than the changes disclosed above regarding the remediation efforts to address the 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 2019.

ITEM 9B. OTHER INFORMATION

None.

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 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2019.

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 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2019.

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 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2019.

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 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2019.

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 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2019.

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	Certificate of Amendment to the 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 15, 2019).
3.7	Certificate of Fifth 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 6, 2019).
3.8	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).
3.9	Certificate of Designation of Preferences, Rights, and Limitations of Series B Convertible Preferred Stock (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K (No. 001-036714) filed with the Securities and Exchange Commission on July 23, 2019).
3.10	Certificate of Designation of Preferences, Rights, and Limitations of Series B-1 Convertible Preferred Stock (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K (No. 001-036714) filed with the Securities and Exchange Commission on October 3, 2019).
3.11	Certificate of Designation of Preferences, Rights, and Limitations of Series B-2 Convertible Preferred Stock (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K (No. 001-036714) filed with the Securities and Exchange Commission on December 26, 2019).
4.1	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).
4.2	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).
4.3	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).
4.4	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).
4.5	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).

Exhibit No.	Description
4.6	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).
4.7	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).
4.8	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).
4.9	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).
4.10	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).
4.11	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).
4.12	Form of 75% Coverage Promissory Note (incorporated by reference to Exhibit 4.1 to the Form 8-K of Jaguar Health, Inc. filed March 22, 2019).
4.13	Form of 125% Coverage Promissory Note (incorporated by reference to Exhibit 4.2 to the Form 8-K of Jaguar Health, Inc. filed March 22, 2019).
4.14	Form of Common Stock Warrant (incorporated by reference to Exhibit 4.3 to the Form 8-K of Jaguar Health, Inc. filed March 22, 2019).
4.15	Form of Placement Agent Warrant (incorporated by reference to Exhibit 4.1 to the Form 8-K/A of Jaguar Health, Inc. filed March 26, 2019).
4.16	Form of LOC Common Stock Warrant (incorporated by reference to Exhibit 4.1 to the Form 8-K of Jaguar Health, Inc. filed April 4, 2019, File No. 001-36714).
4.17	Specimen Common Stock Certificate of Jaguar Health, Inc. (incorporated by reference to Exhibit 4.1 to the Form 8-K of Jaguar Health, Inc. filed June 1, 2018, File No. 001-36714).
4.18	Secured Promissory Note, dated May 28, 2019, by and among Jaguar Health, Inc., Napo Pharmaceuticals, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Exhibit 4.1 to the Form 8-K of Jaguar Health, Inc. filed June 3, 2019, File No. 001-36714).
4.19	Secured Promissory Note, dated May 28, 2019, by and among Jaguar Health, Inc., Napo Pharmaceuticals, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Exhibit 4.2 to the Form 8-K of Jaguar Health, Inc. filed June 3, 2019, File No. 001-36714).
4.20	Form of Series 1 Warrant (incorporated by reference to Exhibit 4.1 to the Form 8-K of Jaguar Health, Inc. filed July 23, 2019, File No. 001-36714).
4.21	Form of Series 2 Warrant (incorporated by reference to Exhibit 4.1 to the Form 8-K of Jaguar Health, Inc. filed July 23, 2019, File No. 001-36714).
4.22	Promissory Note, dated October 1, 2019, between Napo Pharmaceuticals, Inc. and Michael Tempesta (incorporated by reference to Exhibit 4.1 to the Form 8-K of Jaguar Health, Inc. filed October 7, 2019, File No. 001-36714).
4.23	Form of Pre-Funded Common Stock Purchase Warrant (incorporated by reference to Exhibit 4.1 to the Form 8-K of Jaguar Health, Inc. filed November 14, 2019, File No. 001-36714).
4.24	Form of Common Stock Purchase Warrant (incorporated by reference to Exhibit 4.1 to the Form 8-K of Jaguar Health, Inc. filed December 26, 2019, File No. 001-36714).
4.25	Royalty Interest, dated March 4, 2020, by and between the Company and Iliad Research and Trading L.P. (incorporated by reference to Exhibit 4.1 to the Form 8-K of Jaguar Health, Inc. filed March , 2020, File No. 001-36714).
4.26*	Description of the Registrant's Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1945, as amended.

Exhibit No.	Description
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).
10.10	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).
10.11	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).
10.12	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).
10.13	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).
10.14	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).
10.15	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).
10.16	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).

Exhibit No.	Description
10.17	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).
10.18	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).
10.19	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).
10.20	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).
10.21†	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).
10.22	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).
10.23‡	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).
10.24	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).
10.25	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).
10.26	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).
10.27	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).
10.28	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).
10.29	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).
10.30†	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).
10.31†	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).
10.32	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).
10.33	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).

Exhibit No.	Description
10.34	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).
10.35	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).
10.36	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)).
10.37	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).
10.38	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)).
10.39	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)).
10.40	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)).
10.41†	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)).
10.42†	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)).
10.43†	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)).
10.44†	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)).
10.45	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)).
10.46†	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)).
10.47†	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).
10.48	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).
10.49	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).

Exhibit No.	Description
10.50	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).
10.51	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).
10.52	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).
10.53	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).
10.54	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).
10.55	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).
10.56	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).
10.57	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).
10.58	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).
10.59	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).
10.60	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).
10.61	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).
10.62	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).
10.63	Management Services Agreement, dated March 23, 2018, by and between Jaguar Health, Inc. and Sagard Capital Partners Management Corp. (incorporated by reference to Ex. 10.4 to the Current Report on Form 8-K filed on March 27, 2018).
10.64	Securities Purchase Agreement, dated Marchh 21, 2018, by and between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Ex. 10.5 to the Current Report on Form 8-K filed on March 27, 2018).
10.65	Security Agreement, dated March 21, 2018, by and between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Ex. 10.6 to the Current Report on Form 8-K filed on March 27, 2018).
10.66	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).
10.67‡	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).
10.68	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).

Exhibit No.	Description
10.69	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).
10.70	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).
10.71	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).
10.72	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).
10.73	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).
10.74	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).
10.75	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).
10.76	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).
10.77	Common Stock Purchase Agreement, dated January 7, 2019, by and between Jaguar Health, Inc. and Oasis Capital, LLC (incorporated by reference to Exhibit 10.1 to the Form 8-K of Jaguar Health, Inc. filed January 8, 2019).
10.78	Form of Securities Purchase Agreement (incorporated by reference to Exhibit 10.1 to the Form 8-K of Jaguar Health, Inc. filed March 22, 2019).
10.79	Form of Registration Rights Agreement (incorporated by reference to Exhibit 10.2 to the Form 8-K of Jaguar Health, Inc. filed March 22, 2019).
10.80	Securities Purchase Agreement, dated March 24, 2019, by and between Jaguar Health, Inc. and the Investor (incorporated by reference to Exhibit 10.1 to the Form 8-K of Jaguar Health, Inc. filed March 25, 2019).
10.81	Common Stock Purchase Agreement, dated April 1, 2019, by and between Jaguar Health, Inc. and Oasis Capital, LLC (incorporated by reference to Exhibit 10.1 to the Form 8-K of Jaguar Health, Inc. filed April 1, 2019).
10.82	Letter of Credit Cancellation & Warrant Issuance Agreement, dated March 29, 2019, by and between Jaguar Health, Inc. and the letter of credit beneficiary named therein (incorporated by reference to Exhibit 10.1 to the Form 8-K of Jaguar Health, Inc. filed April 4, 2019).
10.83	Guaranty and Suretyship Agreement, dated May 28, 2019, made by Jaguar Health, Inc. (incorporated by reference to Exhibit 10.1 to the Form 8-K of Jaguar Health, Inc. filed June 3, 2019, File No. 001.36714).
10.84	Exchange Agreement, dated May 28, 2019, by and among Jaguar Health, Inc., Napo Pharmaceuticals, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Exhibit 10.2 to the Form 8-K of Jaguar Health, Inc. filed June 3, 2019, File No. 001-36714).
10.85	Security Agreement, dated May 28, 2019, between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Exhibit 10.3 to the Form 8-K of Jaguar Health, Inc. filed June 3, 2019, File No. 001-36714).
10.86	Security Agreement, dated May 28, 2019, between Napo Pharmaceuticals, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Exhibit 10.4 to the Form 8-K of Jaguar Health, Inc. filed June 3, 2019, File No. 001-36714).

Exhibit No.	Description
10.87	Amendment No. 1 to Registration Rights Agreement, dated May 30, 2019, by and between Jaguar Health, Inc. and Sagard Capital Partners, L.P. (incorporated by reference to Exhibit 10.120 to the Registration Statement on Form S-1 (No. 333-233989) filed with the Securities and Exchange Commission on September 27, 2019).
10.88	Form of Amendment Agreement (incorporated by reference to Exhibit 10.1 to the Form 8-K of Jaguar Health, Inc. filed July 5, 2019, File No. 001-36714).
10.89	Form of Exchange Agreement, between Jaguar Health, Inc. and Chicago Venture Partners, L.P. (incorporated by reference to Exhibit 10.6 to the Form 10-Q of Jaguar Health, Inc. filed on August 14, 2019, File No. 001-36714).
10.90	Form of Warrant Agency Agreement between Jaguar Health, Inc. and American Stock Transfer & Trust Company, LLC (incorporated by reference to Exhibit 10.117 to the Form S-1/A of Jaguar Health, Inc. filed on July 15, 2019, File No. 333-231399).
10.91	Form of Leak-out Agreement (incorporated by reference to Exhibit 10.118 to the Form S-1/A of Jaguar Health, Inc. filed on July 18, 2019, File No. 333-231399).
10.92	Promotion Letter, dated September 6, 2019 (incorporated by reference to Exhibit 10.1 to the Form 8-K of Jaguar Health, Inc. filed September 9, 2019, File No. 001-36714).
10.93	First Amendment to Landlord Letter of Credit & Warrant Issuance Agreement, dated September 16, 2019, by and between Jaguar Health, Inc. and Pacific Capital Management, LLC (incorporated by reference to Exhibit 10.1 to the Form 8-K of Jaguar Health, Inc. filed September 20, 2019, File No. 001-36714).
10.94	Warrant Exercise Agreement, dated October 2, 2019, between Jaguar Health, Inc. and the purchaser named therein (incorporated by reference to Exhibit 10.1 to the Form 8-K of Jaguar Health, Inc. filed October 3, 2019, File No. 001-36714).
10.95	License Termination and Settlement Termination Agreement, dated October 1, 2019, by and among Jaguar Health, Inc., Napo Pharmaceuticals, Inc. and Michael Tempesta (incorporated by reference to Exhibit 10.1 to the Form 8-K of Jaguar Health, Inc. filed October 7, 2019, File No. 001-36714).
10.96	China Life Science Advisory Agreement, dated October 8, 2019, by and between Jaguar Health, Inc. and Angel Pond Capital LLC (incorporated by reference to Exhibit 10.129 to the Registration Statement on Form S-1/A (No. 333-233989) filed with the Securities and Exchange Commission on October 22, 2019).
10.97#	Securities Purchase Agreement, dated November 13, 2019, by and between Jaguar Health, Inc. and the purchasers named therein (incorporated by reference to Exhibit 10.1 to the Form 8-K of Jaguar Health, Inc. filed November 14, 2019, File No. 001-36714).
10.98	Securities Purchase Agreement, dated December 20, 2019, by and between Jaguar Health, Inc. and the investors named therein (incorporated by reference to Exhibit 10.1 to the Form 8-K of Jaguar Health, Inc. filed December 26, 2019, File No. 001-36714).
10.99	Exchange Agreement, dated December 23, 2019, by and between Jaguar Health, Inc. and Oasis Capital, LLC (incorporated by reference to Exhibit 10.2 to the Form 8-K of Jaguar Health, Inc. filed December 26, 2019, File No. 001-36714).
10.100	Lock-Up Agreement, dated December 23, 2019, by and between Jaguar Health, Inc. and Oasis Capital, LLC (incorporated by reference to Exhibit 10.3 to the Form 8-K of Jaguar Health, Inc. filed December 26, 2019, File No. 001-36714).
10.101*	Jaguar Health, Inc. 2014 Stock Incentive Plan as Amended and Restated Effective October 1, 2019.
23.1*	Consent of Independent Registered Public Accounting Firm.
23.2*	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).

Exhibit No.	Description
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

* 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.

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 2, 2020

Exhibit 4.26

DESCRIPTION OF THE REGISTRANT'S SECURITIES REGISTERED PURSUANT TO SECTION 12 OF THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED

As of December 31, 2019, Jaguar Health, Inc. ("we," "our," "us" or the "Company") had one class of securities registered under Section 12 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"): our voting common stock $0.0001 par value per share.

Pursuant to our Third Amended and Restated Certificate of Incorporation, as amended, our authorized capital stock consists of (i) 150,000,000 shares of common stock, (ii) 50,000,000 shares of convertible non-voting common stock, and (iii) 10,000,000 shares of preferred stock. The following description summarizes the material terms of our common stock. Defined terms used and not defined herein shall have the meaning ascribed to such terms in the Company's Annual Report on Form 10-K.

Common Stock

Voting Rights

The holders of our voting common stock are entitled to one vote per share on all matters to be voted on by our stockholders. Subject to preferences that may be applicable to any outstanding shares of preferred stock, holders of common stock are entitled to receive ratably such dividends as may be declared by our board of directors out of funds legally available for that purpose. In the event of our liquidation, dissolution or winding up, the holders of common stock are entitled to share ratably in all assets remaining after the payment of liabilities, subject to the prior distribution rights of preferred stock then outstanding. Holders of common stock have no preemptive, conversion or subscription rights. There are no redemption or sinking fund provisions applicable to the common stock.

Dividends

Subject to preferences that may be applicable to any outstanding preferred stock, holders of common stock are entitled to receive dividends, if any, as may be declared from time to time by our board of directors out of legally available funds.

Liquidation

In the event of our liquidation, dissolution or winding up, holders of common stock will be entitled to share ratably in the net assets legally available for distribution to stockholders after the payment of all of our debts and other liabilities and the satisfaction of any liquidation preference granted to the holders of any then outstanding shares of preferred stock.

Rights and Preferences

Holders of common stock have no preemptive, conversion, subscription or other rights, and there are no redemption or sinking fund provisions applicable to the common stock. The rights, preferences, and privileges of the holders of common stock are subject to and may be adversely affected by, the rights of the holders of shares of any series of preferred stock that we may designate in the future.

Anti-Takeover Effects of Delaware Law and Our Certificate of Incorporation and Bylaws

Delaware Law

Certain provisions of Delaware law and our Certificate of Incorporation and amended and restated bylaws contain provisions that could have the effect of delaying, deferring or discouraging another party from acquiring control of us. These provisions, which are summarized below, are expected to discourage certain types of coercive takeover practices and inadequate takeover bids. These provisions are also designed in part to encourage anyone

seeking to acquire control of us to negotiate with our board of directors. We believe that the advantages gained by protecting our ability to negotiate with any unsolicited and potentially unfriendly acquirer outweigh the disadvantages of discouraging such proposals, including those priced above the then-current market value of our common stock, because, among other reasons, the negotiation of such proposals could improve their terms.

Third Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws

Our Certificate of Incorporation and amended and restated bylaws include provisions that:

- require that any action to be taken by our stockholders be effected at a duly called annual or special meeting and not by written consent;
- specify that special meetings of our stockholders can be called only by our board of directors, the chairman of our board of directors, the chief executive officer or the president;
- establish an advance notice procedure for stockholder approvals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to our board of directors;
- provide that directors may be removed only for cause;
- provide that vacancies on our board of directors may be filled only by a majority of directors then in office, even though less than a quorum;
- establish that our board of directors is divided into three classes, Class I, Class II and Class III, with each class serving staggered terms;
- specify that no stockholder is permitted to cumulate votes at any election of our board of directors; and
- require approval of the stockholders of at least 75% of the shares and a majority of the board of directors to amend certain of the above-mentioned provisions.

Delaware Anti-Takeover Statute

We are subject to the provisions of Section 203 of the Delaware General Corporation Law regulating corporate takeovers. In general, Section 203 prohibits a publicly-held Delaware corporation from engaging, under certain circumstances, in a business combination with an interested stockholder for a period of three years following the date the person became an interested stockholder unless:

- prior to the date of the transaction, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- upon the closing of the transaction that resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the voting stock outstanding, but not for determining the outstanding voting stock owned by the interested stockholder, (1) shares owned by persons who are directors and also officers, and (2) shares owned by employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or
- at or subsequent to the date of the transaction, the business combination is approved by the board of directors of the corporation and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least 662/3% of the outstanding voting stock which is not owned by the interested stockholder.

Generally, a business combination includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. An interested stockholder is a person who, together with affiliates and associates, owns or, within three years prior to the determination of interested stockholder status, did own 15% or more of a corporation's outstanding voting stock. We expect the existence of this provision to have an anti-takeover effect with respect to transactions our board of directors does not approve in advance. We also anticipate that Section 203 may discourage business combinations or other attempts that might result in the payment of a premium over the market price for the shares of common stock held by our stockholders.

The provisions of Delaware law and our Certificate of Incorporation and amended and restated bylaws could have the effect of discouraging others from attempting hostile takeovers and, as a consequence, they may also inhibit temporary fluctuations in the market price of our common stock that often result from actual or rumored takeover attempts. These provisions may also have the effect of preventing changes in our management. It is possible that these provisions could make it more difficult to accomplish transactions that stockholders may otherwise deem to be in their best interests.

Exhibit 10.101

JAGUAR HEALTH, INC.

2014 STOCK INCENTIVE PLAN

AS AMENDED AND RESTATED EFFECTIVE OCTOBER 1, 2019

1. ESTABLISHMENT, PURPOSE AND TERM OF PLAN.

1.1 Establishment. The Plan is hereby established effective as of May 12, 2015.

1.2 Purpose. The purpose of the Plan is to advance the interests of the Participating Company Group and its shareholders by providing an incentive to attract, retain and reward persons performing services for the Participating Company Group and by motivating such persons to contribute to the growth and profitability of the Participating Company Group. The Company intends that Awards granted pursuant to the Plan be exempt from or comply with Section 409A of the Code (including any amendments or replacements of such section), and the Plan shall be so construed.

1.3 Term of Plan. The Plan shall continue in effect until its termination by the Board; provided, however, that all Awards shall be granted, if at all, within ten (10) years from the earlier of the date the Plan is adopted by the Board or the date the Plan is duly approved by the shareholders of the Company.

2. DEFINITIONS AND CONSTRUCTION.

2.1 Definitions. Whenever used herein, the following terms shall have their respective meanings set forth below:

(a) "1933 Act" means the Securities Act of 1933, as amended.

(b) "1934 Act" means the Securities Exchange Act of 1934, as amended.

(c) "Applicable Laws" means the requirements relating to the administration of equity-based awards under U.S. federal and state corporate laws, U.S. federal and state securities laws, the Code, any stock exchange or quotation system on which the Company's common stock is listed or quoted and the applicable laws of any foreign country or jurisdiction where Awards are, or will be, granted under the Plan,

(d) "Award" means an Option, Restricted Stock, or Restricted Stock Units granted under the Plan.

(e) "Award Agreement" means a written or electronic agreement between the Company and a Participant setting forth the terms, conditions and restrictions of the Award granted to the Participant.

(f) "Board" means the Board of Directors of the Company. If one or more Committees have been appointed by the Board to administer the Plan, "Board" also means such Committee(s).

(g) "Cause" means, unless such term or an equivalent term is otherwise defined with respect to an Award by the Participant's Award Agreement or written contract of employment or service, any of the following: (i) the Participant's theft, dishonesty, willful misconduct, breach of fiduciary duty for personal profit, or falsification of any Participating Company documents or records; (ii) the Participant's material failure to abide by a Participating Company's code of conduct or other policies (including, without limitation, policies relating to confidentiality and reasonable workplace conduct); (iii) the Participant's unauthorized use, misappropriation, destruction or diversion of any tangible or intangible asset or corporate opportunity of a Participating Company (including, without limitation, the Participant's improper use or disclosure of a Participating Company's confidential or proprietary information); (iv) any intentional act by the Participant which has a material detrimental effect on a Participating Company's reputation or business; (v) the Participant's repeated failure or inability to perform any reasonable assigned duties after written notice from a Participating Company of, and a reasonable opportunity to cure, such failure or inability; (vi) any material breach by the Participant of any employment or service agreement between the Participant and a Participating Company, which breach is not cured pursuant to the terms of such agreement; or (vii) the Participant's conviction (including any plea of guilty or nolo contendere) of any criminal act involving fraud, dishonesty, misappropriation or moral turpitude, or which impairs the Participant's ability to perform his or her duties with a Participating Company.

(h) "Change of Control" means the occurrence of any of the following events:

(i) A change in the ownership of the Company that occurs on the date that any one person, or more than one person acting as a group ("Person"), acquires ownership of the stock of the Company that, together with the stock held by such Person, constitutes more than fifty percent (50%) of the total voting power of the stock of the Company. For purposes of this subsection (a), the acquisition of additional stock by any one Person, who is considered to own more than fifty percent (50%) of the total voting power of the stock of the Company will not be considered an additional Change of Control; or

(ii) A change in the effective control of the Company that occurs on the date that a majority of members of the Board is replaced during any twelve (12) month period by directors whose appointment or election is not endorsed by a majority of the members of the Board prior to the date of the appointment or election; or for purposes of this subsection (b), once any Person is considered to be in effective control of the Company, the acquisition of additional control of the Company by the same Person will not be considered an additional Change of Control; or

(iii) A change in the ownership of a "substantial portion of the Company's assets", as defined herein. For this purpose, a "substantial portion of the Company's assets" shall mean assets of the Company having a total gross fair market value equal to or more than fifty percent (50%) of the total gross fair market value of all of the assets of the Company

immediately prior to such change in ownership. For purposes of this subsection (c), a change in ownership of a substantial portion of the Company's assets occurs on the date that any Person acquires (or has acquired during the twelve (12) month period ending on the date of the most recent acquisition by such person or persons) assets from the Company that constitute a "substantial portion of the Company's assets." For purposes of this subsection (c), the following will not constitute a change in the ownership of a substantial portion of the Company's assets: (A) a transfer to an entity that is controlled by the Company's stockholders immediately after the transfer, or (B) a transfer of assets by the Company to: (1) a stockholder of the Company (immediately before the asset transfer) in exchange for or with respect to the Company's stock, (2) an entity, fifty percent (50%) or more of the total value or voting power of which is owned, directly or indirectly, by the Company, (3) a Person, that owns, directly or indirectly, fifty percent (50%) or more of the total value or voting power of all the outstanding stock of the Company, or (4) an entity, at least fifty percent (50%) of the total value or voting power of which is owned, directly or indirectly, by a Person described in this subsection (c). For purposes of this subsection (c), gross fair market value means the value of the assets of the Company, or the value of the assets being disposed of, determined without regard to any liabilities associated with such assets.

For purposes of this Section, persons will be considered to be acting as a group if they are owners of a corporation that enters into a merger, consolidation, purchase or acquisition of stock, or similar business transaction with the Company.

Notwithstanding the foregoing, a transaction will not be deemed a Change of Control unless the transaction qualifies as a change of control event within the meaning of Section 409A.

Further and for the avoidance of doubt, a transaction will not constitute a Change of Control if its primary purpose is to: (1) change the state of the Company's incorporation, or (2) create a holding company that will be owned in substantially the same proportions by the persons who held the Company's securities immediately before such transaction

(i) "Code" means the Internal Revenue Code of 1986, as amended.

(j) "Committee" means the committee appointed by the Board (pursuant to Section 3 to administer the Plan.

(k) "Company" means Jaguar Health, Inc., a Delaware corporation, or any successor corporation thereto.

(l) "Consultant" means a person engaged to provide consulting or advisory services (other than as an Employee or a Director) to a Participating Company, provided that the identity of such person, the nature of such services or the entity to which such services are provided would not preclude the Company from offering or selling securities to such person pursuant to the Plan in reliance on a Form S-8 Registration Statement under the Securities Act.

(m) "Director" means a member of the Board.

(n) "Disability" means a permanent and total disability within the meaning of Section 22(e)(3) of the Code. In the case of Awards other than Incentive Stock Options, the Committee, in its discretion, may determine that a different definition of Disability shall apply in accordance with standards adopted by the Committee from time to time.

(o) "Employee" means any person treated as an employee (including an Officer or a Director who is also treated as an employee) in the records of a Participating Company and, with respect to any Incentive Stock Option granted to such person, who is an employee for purposes of Section 422 of the Code; provided, however, that neither service as a Director nor payment of a director's fee shall be sufficient to constitute employment for purposes of the Plan. The Company shall determine in its discretion whether an individual has become or has ceased to be an Employee and the effective date of such individual's employment or termination of employment, as the case may be. For purposes of an individual's rights, if any, under the terms of the Plan as of the time of the Company's determination of whether or not the individual is an Employee, all such determinations by the Company shall be final, binding and conclusive as to such rights, if any, notwithstanding that the Company or any court of law or governmental agency subsequently makes a contrary determination as to such individual's status as an Employee.

(p) "Exercise Price" means the price at which a Share may be purchased by a Participant pursuant to the exercise of an Option

(q) "Fair Market Value" means, as of any date, the value of a share of Stock or other property as determined by the Board, in its discretion, or by the Company, in its discretion, if such determination is expressly allocated to the Company herein, subject to the following:

(i) If, on such date, the Stock is listed on a national or regional securities exchange or market system, the Fair Market Value of a share of Stock shall be the closing price of a share of Stock as quoted on the national or regional securities exchange or market system constituting the primary market for the Stock, as reported in The Wall Street Journal or such other source as the Company deems reliable. If the relevant date does not fall on a day on which the Stock has traded on such securities exchange or market system, the date on which the Fair Market Value shall be established shall be the last day on which the Stock was so traded prior to the relevant date, or such other appropriate day as shall be determined by the Board, in its discretion.

(ii) If, on such date, the Stock is not listed on a national or regional securities exchange or market system, the Fair Market Value of a share of Stock shall be as determined by the Board in good faith without regard to any restriction other than a restriction which, by its terms, will never lapse, and in a manner consistent with the requirements of Section 409A of the Code.

(r) "Grant Date" means, with respect to an Award, the date on which the Committee makes the determination granting such Award, or such later date as is determined by the Committee at the time it approves the grant. The Grant Date of an Award shall not be earlier than the date the Award is approved by the Committee.

(s) "Incentive Stock Option" means an Option intended to be (as set forth in the Award Agreement) and which qualifies as an incentive stock option within the meaning of Section 422(b) of the Code.

(t) "Insider" means an Officer, a Director or other person whose transactions in Stock are subject to Section 16 of the Exchange Act.

(u) "Insider Trading Policy" means the written policy of the Company pertaining to the purchase, sale, transfer or other disposition of the Company's equity securities by Directors, Officers, Employees or other service providers who may possess material, nonpublic information regarding the Company or its securities.

(v) "Nonemployee Director" means a Director who is not an employee of the Company or any Affiliate.

(w) "Nonstatutory Stock Option" means an Option not intended to be (as set forth in the Award Agreement) or which does not qualify as an Incentive Stock Option.

(x) "Officer" means any person designated by the Board as an officer of the Company.

(y) "Option" means an Incentive Stock Option or a Nonstatutory Stock Option granted pursuant to the Plan.

(z) "Parent Corporation" means any present or future "parent corporation" of the Company, as defined in Section 424(e) of the Code.

(aa) "Participant" means any eligible person who has been granted one or more Awards.

(bb) "Participating Company" means the Company or any Parent Corporation or Subsidiary Corporation.

(cc) "Participating Company Group" means, at any point in time, all entities collectively which are then Participating Companies,

(dd) "Performance Goals" means the goal(s) (or combined goal(s)) determined by the Committee in its discretion to be applicable to a Participant with respect to an Award. As determined by the Committee, the Performance Goals applicable to an Award shall provide for a targeted level or levels of achievement using one or more of the following measures: (a) cash flow, (b) earnings per share, (c) gross revenue, (d) market share, (e) return on capital, (f) total shareholder return, or (g) operating profits.

(ee) "Performance Period" means the time period during which the Performance Goals or continued status as an Employee, Director, or Consultant must be met as determined by the Committee at is sole discretion

(ff) "Plan" means the Jaguar Animal Health, Inc. 2014 Stock Incentive Plan, as amended.

(gg) "Restricted Stock Award" means an Award of a Restricted Stock granted pursuant to Section 7.

(hh) "Restricted Stock Unit Award" means an Award of a right to receive Stock on a future date granted pursuant to Section 8.

(ii) "Rule 16b-3" means Rule 16b-3 promulgated under the 1934 Act, and any future regulation amending, supplementing or superseding such regulation.

(jj) "Section 16 Person" means an individual, who, with respect to the shares of Stock, is subject to Section 16 of the 1934 Act and the rules and regulations promulgated thereunder.

(kk) "Service" means a Participant's employment or service with the Participating Company Group, whether in the capacity of an Employee, a Director or a Consultant. Unless otherwise provided by the Board, a Participant's Service shall not be deemed to have terminated merely because of a change in the capacity in which the Participant renders such Service or a change in the Participating Company for which the Participant renders such Service, provided that there is no interruption or termination of the Participant's Service. Furthermore, a Participant's Service shall not be deemed to have terminated if the Participant takes any military leave, sick leave, or other bona fide leave of absence approved by the Company. However, unless otherwise provided by the Board, if any such leave taken by a Participant exceeds ninety (90) days, then on the ninety-first (91st) day following the commencement of such leave the Participant's Service shall be deemed to have terminated, unless the Participant's right to return to Service is guaranteed by statute or contract. Notwithstanding the foregoing, unless otherwise designated by the Company or required by law, an unpaid leave of absence shall not be treated as Service for purposes of determining vesting under the Participant's Award Agreement. Except as otherwise provided by the Board, in its discretion, the Participant's Service shall be deemed to have terminated either upon an actual termination of Service or upon the business entity for which the Participant performs Service ceasing to be a Participating Company. Subject to the foregoing, the Company, in its discretion, shall determine whether the Participant's Service has terminated and the effective date of and reason for such termination.

(ll) "Stock" means a share of common stock of the Company, as adjusted from time to time in accordance with Section 4.3.

(mm) "Subsidiary Corporation" means any present or future "subsidiary corporation" of the Company, as defined in Section 424(f) of the Code.

(nn) "Ten Percent Stockholder" means a person who, at the time an Award is granted to such person, owns stock possessing more than ten percent (10%) of the total combined voting power of all classes of stock of a Participating Company within the meaning of Section 422(b)(6) of the Code.

(oo) "Vesting Conditions" mean those conditions established in accordance with the Plan prior to the satisfaction of which shares subject to an Award remain subject to forfeiture or a repurchase option in favor of the Company exercisable for the Participant's monetary purchase price, if any, for such shares upon the Participant's termination of Service.

2.2 Construction. Captions and titles contained herein are for convenience only and shall not affect the meaning or interpretation of any provision of the Plan. Except when otherwise indicated by the context, the singular shall include the plural and the plural shall include the singular. Use of the term "or" is not intended to be exclusive, unless the context clearly requires otherwise.

3. ADMINISTRATION.

3.1 The Committee. The Plan shall be administered by the Committee. The Committee shall consist of not less than two (2) Directors who shall be appointed from time to time by, and shall serve at the pleasure of, the Board of Directors. The Committee shall be comprised solely of Directors are (a) "outside directors" under Section 162(m) of the Code and (b) "non-employee directors" under Rule 16b-3.

3.2 Authority of the Committee. It shall be the duty of the Committee to administer the Plan in accordance with the Plan's provisions. The Committee shall have all powers and discretion necessary or appropriate to administer the Plan and to control its operation, including, but not limited to, the power to (a) determine which Employees Consultants and Directors shall be granted Awards, (b) prescribe the terms and conditions of the Awards, (c) interpret the Plan and the Awards, (d) adopt such procedures and subplans as are necessary or for the purpose of satisfying Applicable Laws, (e) adopt rules for the administration, interpretation and application of the Plan as are consistent therewith, and (f) interpret, amend or revoke any such rules. Notwithstanding the preceding, the Committee shall not implement an Exchange Program without the approval of the holders of a majority of the shares that are present in person or by proxy and entitled to vote at any Annual or Special Meeting of Stockholders of the Company.

3.3 Delegation by the Committee. The Committee, in its sole discretion and on such terms and conditions as it may provide, may delegate all or any part of its authority and powers under the Plan to one or more Directors or officers of the Company, except that the Committee may not delegate all or any part of its authority under the Plan with respect to Awards granted to any individual who is subject to Section 16 Persons. To the extent of any delegation by the Committee, references to the Committee in this Plan and any Award Agreement shall be deemed also to include reference to the applicable delegate(s).

3.4 Decisions Binding. All interpretations, determinations and decisions made by the Committee, the Board, and any delegate of the Committee pursuant to the provisions of the Plan shall be final, conclusive, and binding on all persons, and shall be given the maximum deference permitted by law.

4. SHARES SUBJECT TO PLAN.

4.1 Number of Shares. Subject to adjustment as provided in Section 4.3, and the provisions in this Section 4.1 regarding the annual increase, the aggregate number of shares of Stock that may be issued pursuant to Awards shall not exceed 4,341,958 shares (the "Share Reserve"). In addition, the Share Reserve will automatically increase on January 1st of each year, for a period up to and including January 1, 2024, beginning on January 1st of the year following the year in which the Plan became effective in an amount equal to 2% of the total number of shares of Stock outstanding on December 31st of the preceding calendar year. Notwithstanding the foregoing, the Board may act prior to January 1st of a given year to provide that there will be no January 1st increase in the Share Reserve for such year or that the increase in the Share Reserve for such year will be a lesser number of shares of Stock than would otherwise occur pursuant to this Section 4.1.

4.2 Lapsed Awards. If an Award expires without having been exercised in full, or, with respect to Restricted Stock and Restricted Stock Units is forfeited to the Company, the shares which were subject thereto will become available for future grant or sale under the Plan (unless the Plan has terminated). Shares that have been issued under the Plan under any Award will not be returned to the Plan and will not become available for future distribution under the Plan; provided, however, that if unvested shares of Restricted Stock or Restricted Stock Units are repurchased by the Company or are forfeited to the Company, such shares will become available for future grant under the Plan. Shares used to pay the exercise or purchase price of an Award and/or to satisfy the tax withholding obligations related to an Award will not become available for future grant or sale under the Plan. To the extent an Award under the Plan is paid out in cash rather than shares, such cash payment will not reduce the number of shares available for issuance under the Plan.

4.3 Adjustments in Awards and Authorized Shares. In the event that any dividend (other than regular, ongoing dividends) or other distribution (whether in the form of cash, shares, other securities, or other property), recapitalization, stock split, reverse stock split, reorganization, merger, consolidation, split-up, spin-off, combination, repurchase, or exchange of shares or other securities of the Company, or other change in the corporate structure of the Company affecting the shares such that an adjustment is determined by the Committee (in its sole discretion) to be appropriate in order to prevent dilution or enlargement of the benefits or potential benefits intended to be made available under the Plan, then the Committee shall, in such manner as it may deem equitable, adjust the number and class of stock. Notwithstanding the preceding, the number of shares subject to any Award always shall be a whole number.

5. ELIGIBILITY.

5.1 Persons Eligible for Awards. Awards may be granted only to Employees, Consultants and Directors.

5.2 Participation in the Plan. Awards are granted solely at the discretion of the Board. Eligible persons may be granted more than one Award. However, eligibility in accordance with this Section shall not entitle any person to be granted an Award, or, having been granted an Award, to be granted an additional Award.

6. STOCK OPTIONS.

Options shall be evidenced by Award Agreements specifying the number of shares of Stock covered thereby, in such form as the Board shall from time to time establish. Award Agreements may incorporate all or any of the terms of the Plan by reference and shall comply with and be subject to the following terms and conditions:

6.1 [Reserved]

6.2 Exercise Price. The exercise price for each Option shall be established in the discretion of the Board; provided, however, that (a) the exercise price per share for an Option shall be not less than the Fair Market Value of a share of Stock on the effective date of grant of the Option and (b) no Incentive Stock Option granted to a Ten Percent Stockholder shall have an exercise price per share less than one hundred ten percent (110%) of the Fair Market Value of a share of Stock on the effective date of grant of the Option. Notwithstanding the foregoing, an Option (whether an Incentive Stock Option or a Nonstatutory Stock Option) may be granted with an exercise price lower than the minimum exercise price set forth above if such Option is granted pursuant to an assumption or substitution for another option in a manner qualifying under the provisions of Section 424(a) of the Code.

6.3 Exercisability and Term of Options. Options shall be exercisable at such time or times, or upon such event or events, and subject to such terms, conditions, performance criteria and restrictions as shall be determined by the Board and set forth in the Award Agreement evidencing such Option; provided, however, that (a) no Option shall be exercisable after the expiration of ten (10) years after the effective date of grant of such Option and (b) no Incentive Stock Option granted to a Ten Percent Stockholder shall be exercisable after the expiration of five (5) years after the effective date of grant of such Option. Subject to the foregoing, unless otherwise specified by the Board in the grant of an Option, any Option granted hereunder shall terminate ten (10) years after the effective date of grant of the Option, unless earlier terminated in accordance with its provisions.

6.4 Payment of Exercise Price.

(a) Forms of Consideration Authorized. Except as otherwise provided below, payment of the exercise price for the number of shares of Stock being purchased pursuant to any Option shall be made (i) in cash, by check or in cash equivalent, (ii) by tender to the Company,

or attestation to the ownership, of shares of Stock owned by the Participant having a Fair Market Value not less than the exercise price, (iii) by delivery of a properly executed notice of exercise together with irrevocable instructions to a broker providing for the assignment to the Company of the proceeds of a sale or loan with respect to some or all of the shares being acquired upon the exercise of the Option (including, without limitation, through an exercise complying with the provisions of Regulation T as promulgated from time to time by the Board of Governors of the Federal Reserve System) (a "Cashless Exercise"), (iv) by delivery of a properly executed notice electing a Net-Exercise, (v) by such other consideration as may be approved by the Board from time to time to the extent permitted by applicable law, or (vi) by any combination thereof. The Board may at any time or from time to time grant Options which do not permit all of the foregoing forms of consideration to be used in payment of the exercise price or which otherwise restrict one or more forms of consideration.

(b) Limitations on Forms of Consideration - Tender of Stock. Notwithstanding the foregoing, an Option may not be exercised by tender to the Company, or attestation to the ownership, of shares of Stock to the extent such tender or attestation would constitute a violation of the provisions of any law, regulation or agreement restricting the redemption of the Company's Stock. Unless otherwise provided by the Board, an Option may not be exercised by tender to the Company, or attestation to the ownership, of shares of Stock unless such shares either have been owned by the Participant for more than six (6) months or such other period, if any, required by the Company (and were not used for another Option exercise by attestation during such period) or were not acquired, directly or indirectly, from the Company.

6.5 Certain Additional Provisions for Incentive Stock Options.

(a) Maximum Number of Shares Issuable Pursuant to Incentive Stock Options. Subject to Section 4 and adjustment as provided in Subsection 4.3, the maximum aggregate number of shares of Stock that may be issued under the Plan pursuant to the exercise of Incentive Stock Options shall not exceed 4,341,958 shares (the "ISO Share Limit"). The maximum aggregate number of shares of Stock that may be issued under the Plan pursuant to all Awards other than Incentive Stock Options shall be the number of shares determined in accordance with Section 4, subject to adjustment as provided in Subsection 4.3.

(b) Exercisability. The aggregate Fair Market Value (determined on the Grant Date(s)) of the shares with respect to which Incentive Stock Options are exercisable for the first time by any Employee during any calendar year (under all plans of the Company and its Subsidiaries) shall not exceed $100,000.

(c) Termination of Service. No Incentive Stock Option may be exercised more than three (3) months after the Participant's Termination of Service for any reason other than Disability or death, unless (a) the Participant dies during such three-month period, and/or (b) the Award Agreement or the Committee permits later exercise (in which case the Option instead may be deemed to be a Nonqualified Stock Option). No Incentive Stock Option may be exercised more than one (1) year after the Participant's Termination of Service on account of Disability, unless (a) the Participant dies during such one-year period, and/or (b) the Award

Agreement or the Committee permit later exercise (in which case the option instead may be deemed to be a Nonqualified Stock Option).

(d) Expiration. No Incentive Stock Option may be exercised after the expiration of ten (10) years from the Grant Date; provided, however, that if the Option is granted to an Employee who, together with persons whose stock ownership is attributed to the Employee pursuant to Section 424(d) of the Code, owns stock possessing more than 10% of the total combined voting power of all classes of the stock of the Company or any of its Subsidiaries, the Option may not be exercised after the expiration of five (5) years from the Grant Date.

6.6 Effect of Termination of Service.

(a) Option Exercisability. Subject to earlier termination of the Option as otherwise provided by this Plan and unless a longer exercise period is provided by the Board, an Option shall terminate immediately upon the Participant's termination of Service to the extent that it is then unvested and shall be exercisable after the Participant's termination of Service to the extent it is then vested only during the applicable time period determined in accordance with this Section and thereafter shall terminate:

(i) Disability. If the Participant's Service terminates because of the Disability of the Participant, the Option, to the extent unexercised and exercisable for vested shares on the date on which the Participant's Service terminated, may be exercised by the Participant (or the Participant's guardian or legal representative) at any time prior to the expiration of twelve (12) months after the date on which the Participant's Service terminated, but in any event no later than the date of expiration of the Option's term as set forth in the Award Agreement evidencing such Option (the "Subsection").

(ii) Death. If the Participant's Service terminates because of the death of the Participant, the Option, to the extent unexercised and exercisable for vested shares on the date on which the Participant's Service terminated, may be exercised by the Participant's legal representative or other person who acquired the right to exercise the Option by reason of the Participant's death at any time prior to the expiration of twelve (12) months after the date on which the Participant's Service terminated, but in any event no later than the Option Expiration Date. The Participant's Service shall be deemed to have terminated on account of death if the Participant dies within three (3) months after the Participant's termination of Service.

(iii) Termination for Cause. Notwithstanding any other provision of the Plan to the contrary, if the Participant's Service is terminated for Cause, the Option shall terminate in its entirety and cease to be exercisable immediately upon such termination of Service.

(iv) Other Termination of Service. If the Participant's Service terminates for any reason, except Disability, death or Cause, the Option, to the extent unexercised and exercisable for vested shares on the date on which the Participant's Service terminated, may be exercised by the Participant at any time prior to the expiration of three (3) months after the date on which the Participant's Service terminated, but in any event no later than the Option Expiration Date.

(b) Extension if Exercise Prevented by Law. Notwithstanding the foregoing other than termination of Service for Cause, if the exercise of an Option within the applicable time periods set forth in Subsection 6.6(a) is prevented by the provisions of Section 12 below, the Option shall remain exercisable until the later of (i) thirty (30) days after the date such exercise first would no longer be prevented by such provisions or (ii) the end of the applicable time period under Subsection 6.6(a), but in any event no later than the Option Expiration Date.

6.7 Transferability of Options. During the lifetime of the Participant, an Option shall be exercisable only by the Participant or the Participant's guardian or legal representative. An Option shall not be subject in any manner to anticipation, alienation, sale, exchange, transfer, assignment, pledge, encumbrance, or garnishment by creditors of the Participant or the Participant's beneficiary, except transfer by will or by the laws of descent and distribution. Notwithstanding the foregoing, to the extent permitted by the Board, in its discretion, and set forth in the Award Agreement evidencing such Option, a Nonstatutory Stock Option shall be assignable or transferable subject to the applicable limitations, if any, described in the General Instructions to Form S-8 Registration Statement under the 1933 Act.

7. RESTRICTED STOCK AWARDS.

Restricted Stock Awards shall be evidenced by Award Agreements in such form as the Board shall from time to time establish. Award Agreements evidencing Restricted Stock Awards may incorporate all or any of the terms of the Plan by reference and shall comply with and be subject to the following terms and conditions:

7.1 [Reserved]

7.2 Types of Restricted Stock Awards Authorized. Restricted Stock Awards may be granted upon such conditions as the Board shall determine, including, without limitation, upon the attainment of one or more performance goals.

7.3 Purchase Price. The purchase price for shares of Stock issuable under each Restricted Stock Award shall be established by the Board in its discretion. Except as may be required by applicable law or established by the Board, no monetary payment (other than applicable tax withholding) shall be required as a condition of receiving shares of Stock pursuant to a Restricted Stock Award.

7.4 Payment of Purchase Price. Except as otherwise provided below, payment of the purchase price (if any) for the number of shares of Stock being purchased pursuant to any Restricted Stock Award shall be made (a) in cash, by check or in cash equivalent, (b) by such other consideration as may be approved by the Board from time to time to the extent permitted by applicable law, or (c) by any combination thereof.

7.5 Vesting and Restrictions on Transfer. Shares issued pursuant to any Restricted Stock Award may (but need not) be made subject to Vesting Conditions based upon the satisfaction of such Service requirements, conditions, restrictions or performance criteria, as shall

be established by the Board and set forth in the Award Agreement evidencing such Award. During any period in which shares acquired pursuant to a Restricted Stock Award remain subject to Vesting Conditions, such shares may not be sold, exchanged, transferred, pledged, assigned or otherwise disposed of other than pursuant to an Ownership Change Event or as provided in Subsection 7.7. The Board, in its discretion, may provide in any Award Agreement evidencing a Restricted Stock Award that, if the satisfaction of Vesting Conditions with respect to any shares subject to such Restricted Stock Award would otherwise occur on a day on which the sale of such shares would violate the provisions of the Insider Trading Policy, then satisfaction of the Vesting Conditions automatically shall be determined on the next trading day on which the sale of such shares would not violate the Insider Trading Policy. Upon request by the Company, each Participant shall execute any agreement evidencing such transfer restrictions prior to the receipt of shares of Stock hereunder and shall promptly present to the Company any and all certificates representing shares of Stock acquired hereunder for the placement on such certificates of appropriate legends evidencing any such transfer restrictions.

7.6 Voting Rights; Dividends and Distributions. Except as provided in this Section 7.5, Subsection 7.4 and any Award Agreement, during any period in which shares acquired pursuant to a Restricted Stock Award remain subject to Vesting Conditions, the Participant shall have all of the rights of a stockholder of the Company holding shares of Stock, including the right to vote such shares and to receive all dividends and other distributions paid with respect to such shares. However, in the event of a dividend or distribution paid in shares of Stock or other property or any other adjustment made upon a change in the capital structure of the Company as described in Subsection 4.3, any and all new, substituted or additional securities or other property (other than normal cash dividends) to which the Participant is entitled by reason of the Participant's Restricted Stock Award shall be immediately subject to the same Vesting Conditions as the shares subject to the Restricted Stock Award with respect to which such dividends or distributions were paid or adjustments were made.

7.7 Effect of Termination of Service. Unless otherwise provided by the Board in the Award Agreement evidencing a Restricted Stock Award, if a Participant's Service terminates for any reason, whether voluntary or involuntary (including the Participant's death or disability), then (a) the Company shall have the option to repurchase for the purchase price paid by the Participant any shares acquired by the Participant pursuant to a Restricted Stock Award which remain subject to Vesting Conditions as of the date of the Participant's termination of Service and (b) if the Participant did not pay any consideration for any shares acquired by the Participant pursuant to a Restricted Stock Award which remain subject to Vesting Conditions as of the date of the Participant's termination of Service. The Company shall have the right to assign at any time any repurchase right it may have, whether or not such right is then exercisable, to one or more persons as may be selected by the Company.

7.8 Nontransferability of Restricted Stock Award Rights. Rights to acquire shares of Stock pursuant to a Restricted Stock Award shall not be subject in any manner to anticipation, alienation, sale, exchange, transfer, assignment, pledge, encumbrance or garnishment by creditors of the Participant or the Participant's beneficiary, except transfer by will or the laws of descent and distribution. All rights with respect to a Restricted Stock Award granted to a

Participant hereunder shall be exercisable during his or her lifetime only by such Participant or the Participant's guardian or legal representative.

8. RESTRICTED STOCK UNIT AWARDS.

Restricted Stock Unit Awards shall be evidenced by Award Agreements in such form as the Board shall from time to time establish. Award Agreements evidencing Restricted Stock Unit Awards may incorporate all or any of the terms of the Plan by reference and shall comply with and be subject to the following terms and conditions:

8.1 [Reserved]

8.2 Types of Restricted Stock Unit Awards Authorized. Restricted Stock Unit Awards may be granted upon such conditions as the Board shall determine, including, without limitation, upon the attainment of one or more performance goals.

8.3 Number of Securities. Each Award Agreement will specify the number of Awarded Securities and will provide for the adjustment of such number in accordance with Subsection 4.3 of the Plan.

8.4 Purchase Price. The purchase price for shares of Stock issuable under each Restricted Stock Unit Award shall be established by the Board in its discretion. Except as may be required by applicable law or established by the Board, no monetary payment (other than applicable tax withholding) shall be required as a condition of receiving a Restricted Stock Unit Award.

8.5 Payment of Purchase Price. Except as otherwise provided below, payment of the purchase price (if any) for the number of shares of Stock being purchased pursuant to any Restricted Stock Unit Award shall be made (a) in cash, by check or in cash equivalent, (b) by such other consideration as may be approved by the Board from time to time to the extent permitted by applicable law, or (c) by any combination thereof.

8.6 Vesting and Restrictions on Transfer. Shares issued pursuant to any Restricted Stock Award may (but need not) be made subject to Vesting Conditions based upon the satisfaction of such Service requirements, conditions, restrictions or performance criteria, as shall be established by the Board and set forth in the Award Agreement evidencing such Award. The Board, in its discretion, may provide in any Award Agreement evidencing a Restricted Stock Unit Award that, if the satisfaction of Vesting Conditions with respect to any shares subject to such Restricted Stock Unit Award would otherwise occur on a day on which the sale of such shares would violate the provisions of the Insider Trading Policy, then satisfaction of the Vesting Conditions automatically shall be determined on the next trading day on which the sale of such shares would not violate the Insider Trading Policy.

8.7 Settlement of Restricted Units.

(a) Procedure; Rights as a Shareholder. Any Restricted Stock Unit Award granted hereunder will be settled according to the terms of the Plan and at such times and under such

conditions as determined by the Board and set forth in the Award Agreement. Until the Restricted Stock Unit Awards are settled and the shares of Stock are delivered (as evidenced by the appropriate entry on the books of the Company or of a duly authorized transfer agent of the Company), no right to vote, if applicable, or receive dividends or any other rights as a shareholder will exist with respect to the Award. No adjustment will be made for a dividend or other right for which the record date is prior to the date the Securities are delivered, except as provided in Subsection 4.2 of the Plan or the applicable Award Agreement.

(b) Nontransferability of Restricted Stock Unit Award Rights. Rights to acquire shares of Stock pursuant to a Restricted Stock Unit Award shall not be subject in any manner to anticipation, alienation, sale, exchange, transfer, assignment, pledge, encumbrance or garnishment by creditors of the Participant or the Participant's beneficiary, except transfer by will or the laws of descent and distribution. All rights with respect to a Restricted Stock Unit Award granted to a Participant hereunder shall be exercisable during his or her lifetime only by such Participant or the Participant's guardian or legal representative.

8.8 Cessation of Services. Each Award Agreement will specify the consequences of a Participant's ceasing to be a Service Provider prior to the settlement of a Restricted Stock Unit Award.

9. PERFORMANCE-BASED AWARDS

9.1 General. If the Committee, in its discretion, decides to grant an Award intended to qualify as "performance-based compensation", the provisions of this Section 9 will control over any contrary provision in the Plan.

9.2 Performance Goals. The granting and/or vesting of Awards and other incentives under the Plan may, in the discretion of the Committee, be made subject to the achievement of one or more Performance Goals.

9.3. Procedures. The Committee will, in writing, (i) designate one or more Participants to whom an Award will be made, (ii) determine the Performance Period, (iii) establish the Performance Goals and amounts that may be earned for the Performance Period, and (iv) determine any other terms and conditions applicable to the Award(s).

9.4 [Reserved]

9.5 Determination of Amounts Earned. Following the completion of each Performance Period, the Committee will certify whether the applicable Performance Goals have been achieved for such Performance Period. A Participant will be eligible to receive payment pursuant to an Award intended to qualify as "performance-based compensation" for a Performance Period only if the Performance Goals for such period are achieved. The Committee will have the right to (a) reduce or eliminate (but not to increase) the amount payable at a given level of performance to take into account additional factors that the Committee may deem relevant to the assessment of individual or corporate performance for the Performance Period, (b) determine what actual Award, if any, will be paid in the event of a termination of employment as the result of a

Participant's death or disability or upon a Change of Control or in the event of a termination of employment following a Change of Control prior to the end of the Performance Period, and (c) determine what actual Award, if any, will be paid in the event of a termination of employment other than as the result of a Participant's death or Disability prior to a Change of Control and prior to the end of the Performance Period to the extent an actual Award would have otherwise been achieved had the Participant remained employed through the end of the Performance Period.

10. CHANGE IN CONTROL.

10.1 Effect of Change in Control on Awards. Subject to the requirements and limitations of Section 409A of the Code, if applicable, the Board may provide for any one or more of the following:

(a) Accelerated Vesting. The Board may, in its discretion, provide in any Award Agreement or, in the event of a Change in Control, may take such actions as it deems appropriate to provide for the acceleration of the exercisability and/or vesting in connection with such Change in Control of each or any outstanding Award or portion thereof and shares acquired pursuant thereto upon such conditions, including termination of the Participant's Service prior to, upon, or following such Change in Control, to such extent as the Board shall determine.

(b) Assumption, Continuation or Substitution of Awards. In the event of a Change in Control, the surviving, continuing, successor, or purchasing corporation or other business entity or parent thereof, as the case may be (the "Acquiror"), may, without the consent of any Participant, assume or continue the Company's rights and obligations under each or any Award or portion thereof outstanding immediately prior to the Change in Control or substitute for each or any such outstanding Award or portion thereof a substantially equivalent award with respect to the Acquiror's stock. For purposes of this Section, if so determined by the Board, in its discretion, an Award or any portion thereof shall be deemed assumed if, following the Change in Control, the Award confers the right to receive, subject to the terms and conditions of the Plan and the applicable Award Agreement, for each share of Stock subject to such portion of the Award immediately prior to the Change in Control, the consideration (whether stock, cash, other securities or property or a combination thereof) to which a holder of a share of Stock on the effective date of the Change in Control was entitled; provided, however, that if such consideration is not solely common stock of the Acquiror, the Board may, with the consent of the Acquiror, provide for the consideration to be received upon the exercise of the Award for each share of Stock to consist solely of common stock of the Acquiror equal in Fair Market Value to the per share consideration received by holders of Stock pursuant to the Change in Control. If any portion of such consideration may be received by holders of Stock pursuant to the Change in Control on a contingent or delayed basis, the Board may, in its discretion, determine such Fair Market Value per share as of the time of the Change in Control on the basis of the Board's good faith estimate of the present value of the probable future payment of such consideration. Any Award or portion thereof which is neither assumed or continued by the Acquiror in connection with the Change in Control nor exercised as of the time of consummation of the Change in Control shall terminate and cease to be outstanding effective as of the time of consummation of the Change in Control. Notwithstanding the foregoing, shares acquired upon exercise of an

Award prior to the Change in Control and any consideration received pursuant to the Change in Control with respect to such shares shall continue to be subject to all applicable provisions of the Award Agreement evidencing such Award except as otherwise provided in such Award Agreement.

(c) Cash-Out of Outstanding Awards. The Board may, in its discretion and without the consent of any Participant, determine that, upon the occurrence of a Change in Control, each or any Award or portion thereof outstanding immediately prior to the Change in Control shall be canceled in exchange for a payment with respect to each vested share (and each unvested share, if so determined by the Board) of Stock subject to such canceled Award in (i) cash, (ii) stock of the Company or of a corporation or other business entity a party to the Change in Control, or (iii) other property which, in any such case, shall be in an amount having a Fair Market Value equal to the Fair Market Value of the consideration to be paid per share of Stock in the Change in Control, reduced by the exercise or purchase price per share, if any, under such Award. If any portion of such consideration may be received by holders of Stock pursuant to the Change in Control on a contingent or delayed basis, the Board may, in its sole discretion, determine such Fair Market Value per share as of the time of the Change in Control on the basis of the Board's good faith estimate of the present value of the probable future payment of such consideration. In the event such determination is made by the Board, the amount of such payment (reduced by applicable withholding taxes, if any) shall be paid to Participants in respect of the vested portions of their canceled Awards as soon as practicable following the date of the Change in Control and in respect of the unvested portions of their canceled Awards in accordance with the vesting schedules applicable to such Awards.

11. TAX WITHHOLDING.

11.1 Withholding Requirements. Prior to the delivery of any shares or cash pursuant to an Award (or exercise thereof), or at such earlier time as the Tax Obligations are due, the Company shall have the power and the right to deduct or withhold, or require a Participant to remit to the Company, an amount sufficient to satisfy all Tax Obligations.

11.2 Withholding Arrangements. The Committee, in its sole discretion and pursuant to such procedures as it may specify from time to time, may designate the method or methods by which a Participant may satisfy such Tax Obligations. As determined by the Committee in its discretion from time to time, these methods may include one or more of the following: (a) paying cash, (b) electing to have the Company withhold otherwise cash or shares having a Fair Market Value equal to the amount required to be withheld, (c) delivering to the Company already-owned shares having a Fair Market Value equal to the minimum amount required to be withheld or remitted, provided the delivery of such shares will not result in any adverse accounting consequences as the Committee determines in its sole discretion, (d) selling a sufficient number of shares otherwise deliverable to the Participant through such means as the Committee may determine in its sole discretion (whether through a broker or otherwise) equal to the Tax Obligations required to be withheld, (e) retaining from salary or other amounts payable to the Participant cash having a sufficient value to satisfy the Tax Obligations, or (f) any other means which the Committee, in its sole discretion, determines to both comply with Applicable Laws, and to be consistent with the purposes of the Plan. The amount of Tax Obligations will be deemed to include any amount that the Committee agrees may be withheld at the time the

election is made, not to exceed the amount determined by using the maximum federal, state or local marginal income tax rates applicable to the Participant or the Company, as applicable, with respect to the Award on the date that the amount of tax or social insurance liability to be withheld or remitted is to be determined. The Fair Market Value of the shares to be withheld or delivered shall be determined as of the date that the Tax Obligations are required to be withheld.

12. COMPLIANCE WITH SECURITIES LAW.

12.1 Section 16 Persons. With respect to Section 16 Persons, transactions under this Plan are intended to qualify for the exemption provided by Rule 16b-3. To the extent any provision of the Plan, Award Agreement or action by the Committee fails to so comply, it shall be deemed null and void, to the extent permitted by law and deemed advisable or appropriate by the Committee.

12.2 Investment Representations. As a condition to the exercise of an Award, the Company may require the person exercising such Award to represent and warrant at the time of any such exercise that the shares are being purchased only for investment and without any present intention to sell or distribute such shares if, in the opinion of counsel for the Company, such a representation is required.

12.3 Inability to Obtain Authority. The Company will not be required to issue any Shares, cash or other property under the Plan unless all the following conditions are satisfied: (a) the admission of the shares or other property to listing on all stock exchanges on which such class of stock or property then is listed; (b) the completion of any registration or other qualification or rule compliance of the shares under any U.S. state or federal law or under the rulings or regulations of the Securities and Exchange Commission, the stock exchange on which shares of the same class are then listed, or any other governmental regulatory body, as counsel to the Company, in its absolute discretion, deems necessary or advisable; (c) the obtaining of any approval or other clearance from any U.S. federal, state or other governmental agency, which counsel to the Company, in its absolute discretion, determines to be necessary or advisable; and (d) the lapse of such reasonable period of time following the Grant Date, vesting and/or exercise as the Company may establish from time to time for reasons of administrative convenience. If the Committee determines, in its absolute discretion, that one or more of the preceding conditions will not be satisfied, the Company automatically will be relieved of any liability with respect to the failure to issue the shares, cash or other property as to which such requisite authority will not have been obtained.

13. AMENDMENT OR TERMINATION OF PLAN.

The Board may amend, suspend or terminate the Plan at any time. However, without the approval of the Company's shareholders, there shall be (a) no increase in the maximum aggregate number of shares of Stock that may be issued under the Plan (except by operation of the provisions of Subsection 4.3), (b) no change in the class of persons eligible to receive Incentive Stock Options, and (c) no other amendment of the Plan that would require approval of the Company's shareholders under any applicable law, regulation or rule, including the rules of any stock exchange or market system upon which the Stock may then be listed. No amendment,

suspension or termination of the Plan shall affect any then outstanding Award unless expressly provided by the Board. Except as provided by the next sentence, no amendment, suspension or termination of the Plan may adversely affect any then outstanding Award without the consent of the Participant. Notwithstanding any other provision of the Plan or any Award Agreement to the contrary, the Board may, in its sole and absolute discretion and without the consent of any Participant, amend the Plan or any Award Agreement, to take effect retroactively or otherwise, as it deems necessary or advisable for the purpose of conforming the Plan or such Award Agreement to any present or future law, regulation or rule applicable to the Plan, including, but not limited to, Section 409A of the Code.

14. MISCELLANEOUS PROVISIONS.

14.1 Indemnification. Each person who is or shall have been a member of the Committee, or of the Board, shall be indemnified and held harmless by the Company against and from (a) any loss, cost, liability, or expense that may be imposed upon or reasonably incurred by him or her in connection with or resulting from any claim, action, suit, or proceeding to which he or she may be a party or in which he or she may be involved by reason of any action taken or failure to act under the Plan or any Award Agreement, and (b) from any and all amounts paid by him or her in settlement thereof, with the Company's approval, or paid by him or her in satisfaction of any judgment in any such claim, action, suit, or proceeding against him or her, provided he or she shall give the Company an opportunity, at its own expense, to handle and defend the same before he or she undertakes to handle and defend it on his or her own behalf. The foregoing right of indemnification shall not be exclusive of any other rights of indemnification to which such persons may be entitled under the Company's Certificate of Incorporation or Bylaws, by contract, as a matter of law, or otherwise, or under any power that the Company may have to indemnify them or hold them harmless.

14.2 Successors. All obligations of the Company under the Plan, with respect to Awards granted hereunder, shall be binding on any successor to the Company, whether the existence of such successor is the result of a direct or indirect purchase, merger, consolidation, or otherwise, of all or substantially all of the business or assets of the Company.

14.3 Rights as Employee, Consultant or Director. No person, even though eligible pursuant to Section 5, shall have a right to be selected as a Participant, or, having been so selected, to be selected again as a Participant. Nothing in the Plan or any Award granted under the Plan shall confer on any Participant a right to remain an Employee, Consultant or Director or interfere with or limit in any way any right of a Participating Company to terminate the Participant's Service at any time. To the extent that an Employee of a Participating Company other than the Company receives an Award under the Plan, that Award shall in no event be understood or interpreted to mean that the Company is the Employee's employer or that the Employee has an employment relationship with the Company.

14.4 Rights as a Stockholder. A Participant shall have no rights as a stockholder with respect to any shares covered by an Award until the date of the issuance of such shares (as evidenced by the appropriate entry on the books of the Company or of a duly authorized transfer

agent of the Company). No adjustment shall be made for dividends, distributions or other rights for which the record date is prior to the date such shares are issued.

14.5 Delivery of Title to Shares. Subject to any governing rules or regulations, the Company shall issue or cause to be issued the shares of Stock acquired pursuant to an Award and shall deliver such shares to or for the benefit of the Participant by means of one or more of the following: (a) by delivering to the Participant evidence of book entry shares of Stock credited to the account of the Participant, (b) by depositing such shares of Stock for the benefit of the Participant with any broker with which the Participant has an account relationship, or (c) by delivering such shares of Stock to the Participant in certificate form.

14.6 Fractional Shares. The Company shall not be required to issue fractional shares upon the exercise or settlement of any Award.

14.7 Retirement and Welfare Plans. Neither Awards made under this Plan nor shares of Stock or cash paid pursuant to such Awards shall be included as "compensation" for purposes of computing the benefits payable to any Participant under any Participating Company's retirement plans (both qualified and non-qualified) or welfare benefit plans unless such other plan expressly provides that such compensation shall be taken into account in computing such benefits.

14.8 Section 409A of the Code. Notwithstanding other provisions of the Plan or any Award Agreements hereunder, no Award shall be granted, deferred, accelerated, extended, paid out or modified under this Plan in a manner that would result in the imposition of an additional tax under Section 409A of the Code upon a Participant. In the event that it is reasonably determined by the Board or, if delegated by the Board to the Committee, by the Committee that, as a result of Section 409A of the Code, payments in respect of any Award under the Plan may not be made at the time contemplated by the terms of the Plan or the relevant Award Agreement, as the case may be, without causing the Participant holding such Award to be subject to taxation under Section 409A of the Code, including as a result of the fact that the Participant is a "specified employee" under Section 409A of the Code, the Company will make such payment on the first day that would not result in the Participant incurring any tax liability under Section 409A of the Code. The Company shall use commercially reasonable efforts to implement the provisions of this Subsection 14.8 in good faith; provided that neither the Company, the Board nor any of the Company's employees, directors or representatives shall have any liability to Participants with respect to this Subsection 14.8.

14.9 Severability. If any one or more of the provisions (or any part thereof) of this Plan shall be held invalid, illegal or unenforceable in any respect, such provision shall be modified so as to make it valid, legal and enforceable, and the validity, legality and enforceability of the remaining provisions (or any part thereof) of the Plan shall not in any way be affected or impaired thereby.

14.10 No Constraint on Corporate Action. Nothing in this Plan shall be construed to: (a) limit, impair, or otherwise affect the Company's or another Participating Company's right or power to make adjustments, reclassifications, reorganizations, or changes of its capital or

business structure, or to merge or consolidate, or dissolve, liquidate, sell, or transfer all or any part of its business or assets; or (b) limit the right or power of the Company or another Participating Company to take any action which such entity deems to be necessary or appropriate.

14.11 Choice of Law. Except to the extent governed by applicable federal law, the validity, interpretation, construction and performance of the Plan and each Award Agreement shall be governed by the laws of the State of California, without regard to its conflict of law rules.

14.12 Stockholder Approval. The Plan or any increase in the maximum aggregate number of shares of Stock issuable thereunder as provided in Subsection 4 (the "Authorized Shares") shall be approved by a majority of the outstanding securities of the Company entitled to vote by the later of (a) a period beginning twelve (12) months before and ending twelve (12) months after the date of adoption thereof by the Board. Awards granted prior to security holder approval of the Plan or in excess of the Authorized Shares previously approved by the security holders shall become exercisable no earlier than the date of security holder approval of the Plan or such increase in the Authorized Shares, as the case may be, and such Awards shall be rescinded if such security holder approval is not received in the manner described in the preceding sentence.

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

Jaguar Health, Inc.
San Francisco, California

We hereby consent to the incorporation by reference in the Registration Statements on Form S-1 (Nos. 333-214956 and 333-227292), Form S-3 (Nos. 333-220236 333-221041 and 333-224387) and Form S-8 (Nos. 333-204280, 333-215303, 333-219939 and 333-225057) of Jaguar Health, Inc. of our report dated April 10, 2019, relating to the consolidated financial statements which appear in this Form 10-K. Our report contains an explanatory paragraph regarding the Company's ability to continue as a going concern.

/s/ BDO USA, LLP

San Francisco, California

April 2, 2020

Exhibit 23.2

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the following Registration Statements:

(1) Registration Statement (Form S-1 Nos. 333-232082, 333-231399, 333-232078, 333-232715 and 333-233989) of **Jaguar Health, Inc.**; and

(2) Registration Statement (Form S-3 No. 333-220236) of **Jaguar Health, Inc.**; and

(3) Registration Statements (Form S-8 Nos. 333-204280, 333-215303, 333-219939 and 333-225057) of **Jaguar Health, Inc.**;

of our report dated April 2, 2020, with respect to the consolidated financial statements of **Jaguar Health, Inc.** included in this Annual Report (Form 10-K) of Jaguar Health, Inc. for the year ended December 31, 2019.

/s/ Mayer Hoffman McCann P.C.

San Diego, California
April 2, 2020

Exhibit 31.1

PRINCIPAL EXECUTIVE OFFICER'S CERTIFICATION PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Lisa A. Conte, certify that:

1. I have reviewed this annual report on Form 10-K of Jaguar Health, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: April 2, 2020

/s/ LISA A. CONTE

Lisa A. Conte
Chief Executive Officer and President
(Principal Executive Officer)

Exhibit 31.2

PRINCIPAL FINANCIAL OFFICER'S CERTIFICATION PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Carol Lizak, certify that:

1. I have reviewed this annual report on Form 10-K of Jaguar Health, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: April 2, 2020

/s/ CAROL LIZAK
Carol Lizak
Principal Financial and Accounting Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the annual report of Jaguar Health, Inc. (the "Company") on Form 10-K for the year ended December 31, 2019, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned officer of the Company certifies, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to such officer's knowledge:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: April 2, 2020

/s/ LISA A. CONTE
Lisa A. Conte
Chief Executive Officer and President
(Principal Executive Officer)

Exhibit 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the annual report of Jaguar Health, Inc. (the "Company") on Form 10-K for the year ended December 31, 2019, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned officer of the Company certifies, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to such officer's knowledge:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: April 2, 2020

/s/ CAROL LIZAK
Carol. Lizak
Principal Financial and Accounting Officer