

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
Form 10-K

(Mark One)

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2017

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the Transition Period from _____ to _____

Commission File Number: 001-35558

TROVAGENE, INC.

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of incorporation or organization)

11055 Flintkote Avenue, Suite B, San Diego, California

(Address of principal executive offices)

27-2004382

(I.R.S. Employer Identification No.)

92121

(Zip Code)

(858) 952-7570

(Registrant's telephone number, including area code)

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

Title of each class	Name of each exchange on which registered
Common Stock, \$0.0001 par value	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 o No x

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

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 x No o

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes x No o

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) 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. x

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

Large accelerated filer o Accelerated filer o Non-accelerated filer o Smaller reporting company x Emerging growth company o
(Do not check if a smaller reporting 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. o

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

The aggregate market value of the voting and non-voting common equity held by non-affiliates based on a closing sale price of \$1.26 per share, which was the last sale price of the common stock as of June 30, 2017, the last business day of the registrant's most recently completed second fiscal quarter, was \$38,261,592.

As of February 12, 2018, 55,290,162 shares of the registrant's common stock, \$0.0001 par value per share, were issued and outstanding.

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Forward-Looking Statements

This Annual Report on Form 10-K contains forward-looking statements that involve risks and uncertainties. You should not place undue reliance on these forward-looking statements. Our actual results could differ materially from those anticipated in the forward-looking statements for many reasons, including the reasons described in our “Business,” Risk Factors,” and “Management Discussion and Analysis of Financial Condition and Result of Operations,” sections. In some cases, you can identify these forward-looking statements by terms such as “anticipate,” “believe,” “continue,” “could,” “depends,” “estimate,” “expects,” “intend,” “may,” “ongoing,” “plan,” “potential,” “predict,” “project,” “should,” “will,” “would” or the negative of those terms or other similar expressions, although not all forward-looking statements contain those words.

Our operations and business prospects are always subject to risks and uncertainties including, among others:

- the timing of regulatory submissions;
- our ability to obtain and maintain regulatory approval of our existing product candidates and any other product candidates we may develop, and the labeling under any approval we may obtain;
- approvals for clinical trials may be delayed or withheld by regulatory agencies;
- pre-clinical and clinical studies will not be successful or confirm earlier results or meet expectations or meet regulatory requirements or meet performance thresholds for commercial success;
- risks relating to the timing and costs of clinical trials, the timing and costs of other expenses;
- risks associated with obtaining funding from third parties;
- management and employee operations and execution risks;
- loss of key personnel;
- competition;
- risks related to market acceptance of products;
- intellectual property risks;
- assumptions regarding the size of the available market, benefits of our products, product pricing, timing of product launches;
- risks associated with the uncertainty of future financial results;
- our ability to attract collaborators and partners; and
- risks associated with our reliance on third party organizations.

The forward-looking statements in this Annual Report on Form 10-K represent our views as of the date of filing of this Annual Report on Form 10-K. We anticipate that subsequent events and developments will cause our views to change. However, while we may elect to update these forward-looking statements at some point in the future, we have no current intention of doing so except to the extent required by applicable law. You should, therefore, not rely on these forward-looking statements as representing our views as of any date subsequent to the date of this Annual Report on Form 10-K.

PART I

ITEM 1. BUSINESS

We are a clinical-stage, precision medicine oncology therapeutics company. Our primary focus is to develop oncology therapeutics for improved cancer care and to optimize drug development by leveraging its proprietary Precision Cancer Monitoring[®] (“PCM”) technology in tumor genomics.

Our lead drug candidate, PCM-075, is a Polo-like Kinase 1 (“PLK1”) selective adenosine triphosphate (“ATP”) competitive inhibitor. PCM-075 has shown preclinical antitumor activity as a single agent and synergy in combination with more than ten different chemotherapeutics and targeted therapies, such as Zytiga[®] (abiraterone acetate), Beleodaq[®] (belinostat), Quizartinib (AC220), a development stage FLT3 inhibitor, and Velcade[®] (bortezomib) in Acute Myeloid Leukemia (“AML”), metastatic Castration-Resistant Prostate Cancer (“mCRPC”) and other hematologic and solid tumor cancers.

On March 15, 2017, we announced the licensing of PCM-075, a PLK1 inhibitor, from Nerviano Medical Sciences S.r.l. (“Nerviano”). PCM-075 was developed to have high selectivity to PLK1, to be administered orally, and to have a relatively short drug half-life of approximately 24 hours compared to other pan Polo-like inhibitors. PCM-075 has successfully completed a safety study in patients with advanced metastatic solid tumors. PCM-075 has two active Investigational New Drugs (“IND”) and two clinical studies. The first study is TROV-052 (ClinicalTrials.gov Identifier NCT03303339), a Phase 1b/2 open-label clinical trial in patients with Acute Myeloid Leukemia (“AML”) in combination with standard-of-care. The second study is TROV-053 UNITE (ClinicalTrials.gov Identifier: NCT03414034), a Phase 2 open-label clinical trial in patients with mCRPC in combination with abiraterone acetate (Zytiga[®]) and prednisone.

Our broad intellectual property and proprietary technology enables us to measure circulating tumor DNA (“ctDNA”) in urine and blood to identify and quantify clinically actionable markers for predicting response to cancer therapies. We offer our PCM technology at our Clinical Laboratory Improvement Amendments (“CLIA”) - certified/College of American Pathologists (“CAP”) - accredited laboratory and plan to continue to vertically integrate our PCM technology with the development of precision cancer therapeutics. We believe we have an opportunity to utilize precision diagnostics to improve treatment outcomes for cancer patients using our proprietary technology to detect clinically actionable mutations and monitor patient response to therapy.

PCM-075 is the first PLK1 selective adenosine triphosphate (“ATP”) competitive inhibitor administered orally to enter clinical trials with apparent antitumor activity in different preclinical models. Polo-like kinase family consists of 5 members (PLK1-PLK5) and they are involved in multiple functions in cell division, including the regulation of centrosome maturation, checkpoint recovery, spindle assembly, cytokinesis, apoptosis and many others. PLK1 plays a crucial role in the regulation of mitotic checkpoints. The overexpression of PLK1 can lead to immature cell division with aneuploidy, a hallmark of cancer. PLK1 is over-expressed in a wide variety of hematologic and solid tumor malignancies including acute myeloid leukemia, prostate, lung, breast, and adrenocortical carcinoma. In addition, several studies have shown that this over-expression correlates with poor prognosis.

PCM-075 was developed to have high selectivity to PLK1 (at low nanomolar IC50 levels), oral bioavailability, and a relatively short drug half-life of approximately 24 hours compared to the pan PLK inhibitor, Volasertib (also known as BI 6727). Volasertib is a PLKi inhibitor with nanomolar IC50 level activity for PLK1, PLK2 and PLK3 and was developed by Boehringer Ingelheim. Volasertib has a half-life of 135 hours with phase 2 clinical overall response rate (“ORR”: complete remission or complete remission with incomplete blood count recovery) data in AML patients receiving Volasertib and low dose cytarabine (“LDAC”) twice the ORR vs LDAC alone. However, Volasertib was discontinued after it failed in a phase 3 trial in AML patients where it showed an unfavorable overall survival trend, possibly because of its dosing protocol. We believe the more selective nature of PCM-075 to PLK1 as well as its 24-hour half-life and oral bioavailability may make it feasible to improve on the dosing protocol issues associated with Volasertib. We also believe that PCM-075’s reversibility to on-target hematological toxicities may prove useful in addressing clinical therapeutic needs across a variety of cancers.

PCM-075 has been tested in vivo in different xenograft and transgenic models at times suggesting tumor growth inhibition or tumor regression when used in combination with other therapies. PCM-075 has been tested for antiproliferative activity on a panel of 148 tumor cell lines and appeared highly active with an IC50 (a measure concentration for 50% target inhibition) below 100 nM in 75 cell lines and IC50 values below 1 uM in 133 out of 148 cell lines. PCM-075 also appears active in cells expressing multi-drug resistant (“MDR”) transporter proteins and we believe PCM-075’s apparent ability to overcome the MDR transporter resistance mechanism in cancer cells could prove useful in broader drug combination applications.

In preclinical studies, PCM-075 has demonstrated synergy when used in combination with more than ten different chemotherapeutics, including cisplatin, cytarabine, doxorubicin, gemcitabine and paclitaxel, as well as targeted therapies, such as abiraterone acetate, HDAC inhibitors, FLT3 inhibitors, and bortezomib. These therapeutics are used clinically for the treatment of many hematologic and solid tumor cancers, including Acute Myeloid Leukemia (“AML”), Non-Hodgkin Lymphoma (“NHL”), metastatic Castration-Resistant Prostate Cancer (“mCRPC”), Adrenocortical Carcinoma (“ACC”), and Triple Negative Breast Cancer (“TNBC”).

On August 16, 2017, we announced results of preclinical research indicating potential synergy (interaction of discrete drugs such that the total effect is greater than the sum of the individual effects) of PCM-075 with an investigational FLT3 Inhibitor, Quizartinib by Daiichi Sankyo, in FLT3 mutant xenograft mouse models. This synergy assessment study was conducted for us by a third-party contract research group. Approximately one third of AML patients harbor FLT3-mutated blood cancer cells. The U.S. Food and Drug Administration (“FDA”) recently approved Rydapt® (midostaurin) by Novartis for the treatment of newly diagnosed adult patients with AML that are FLT3 mutation-positive in combination with cytarabine and daunorubicin induction and cytarabine consolidation chemotherapy. There are two additional FLT3 inhibitors in ongoing phase 3 trials, including Quizartinib. We believe that a combination of PCM-075 with a FLT3 inhibitor for AML patients with a FLT3 mutation could extend treatment response and possibly slow or reduce resistance to FLT3 activity.

On August 21, 2017, we announced results of preclinical research indicating potential synergy of PCM-075 with a histone deacetylase (“HDAC”) inhibitor in NHL cell lines. This synergy assessment study was conducted by Dr. Steven Grant, Associate Director for Translational Research and co-Leader, Developmental Therapeutics Program, Massey Cancer Center. Patients with relapsed or refractory NHL, such as cutaneous T cell lymphoma and peripheral T cell lymphoma, may be prescribed approved HDAC inhibitors and we believe this continues to be an area of unmet medical need. Dr. Grant’s data appeared to indicate that the combination of PCM-075 with Beleodaq® (belinostat), an HDAC inhibitor indicated for the treatment of patients with relapsed or refractory peripheral T-cell lymphoma, reduced cancer cells by up to 80% in two different forms of NHL (aggressive double-hit B-cell lymphoma and mantle cell lymphoma) cell lines.

On October 18, 2017, we announced results of preclinical research indicating potential synergy of PCM-075 with abiraterone acetate in C4-2 prostate cancer cells. This synergy assessment study was conducted by Dr. Michael Yaffe M.D., Ph.D. FACS, David H. Koch Professor of Biology and Biological Engineering at MIT. The results appeared to indicate that the combination of PCM-075 with Zytiga® (abiraterone) decreased cell viability in mCRPC tumor cells and the apparent synergy observed was greater than the expected effect of combining the two drugs. Zytiga is indicated for use in combination with prednisone for the treatment of patients with mCRPC who have received prior chemotherapy containing docetaxel. We believe there is an unmet medical need to improve on the resistance to hormone therapy and extend the benefit of response to abiraterone for mCRPC patients.

PCM-075 Phase 1 Safety Study in Solid Tumors

A Phase 1 safety study of PCM-075 was completed in patients with advanced metastatic solid tumor cancers with data published in July, 2017, in the peer-reviewed journal *Investigational New Drugs*. Dr. Glen Weiss, Medical Oncologist at Goodyear, AZ and affiliated with Cancer Treatment Centers of America at Western Regional Medical Center, was the principal investigator and first author of the publication, entitled “Phase 1 Dose-Escalation Study of NMS-1286937, an Orally Available Polo-like Kinase 1 Inhibitor, in Patients with Advanced or Metastatic Solid Tumors.” This study evaluated first-cycle dose limiting toxicities and related maximum tolerated dose with data indicating a manageable safety profile for PCM-075 (formerly known as NMS-1286937) for the treatment of advanced or metastatic solid tumors, with transient adverse events that were likely related to the drug’s mechanism of action. The authors believe that data from preclinical work, coupled with the results of the Phase 1 trial, suggest that PCM-075 could become a new therapeutic option for the treatment of solid tumor and hematologic cancers.

In this trial, PCM-075 was administered orally, once daily for five consecutive days, every three weeks, to evaluate first cycle dose-limiting toxicities and related maximum tolerated dose in adult subjects with advanced/metastatic solid tumors. The study was also intended to evaluate PCM-075’s pharmacokinetic profile in plasma, its anti-tumor activity, and its ability to modulate intracellular targets in biopsied tissue. The study identified thrombocytopenia and neutropenia as the primary toxicities, which is consistent with the expected mechanism of action of PCM-075 and results from preclinical studies. These hematologic toxicities were reversible, with recovery usually occurring within 3 weeks. No GI disorders, mucositis, or alopecia was observed, confirming that bone marrow cells are the most sensitive to PCM-075 inhibition with the applied dosing schedule.

We are utilizing the existing IND application to develop PCM-075 in solid tumors as part of our clinical development expansion plans, with our initial focus in mCRPC.

PCM-075 Phase 2 Study in metastatic Castration-Resistant Prostate Cancer

On December 14, 2017, we announced the submission of our Phase 2 protocol of PCM-075 in combination with abiraterone acetate (Zytiga® - Johnson & Johnson) for the treatment of mCRPC, to the FDA and our active solid tumor IND. In this multi-center, open-label, Phase 2 trial, PCM-075 in combination with the standard dose of abiraterone and prednisone, all administered orally, will be evaluated for safety and efficacy. The primary efficacy endpoint is the proportion of patients achieving disease control after 12 weeks of study treatment, as defined by lack of Prostate Specific Antigen (“PSA”) progression in patients who are showing signs of early progressive disease (rise in PSA but minimally symptomatic or asymptomatic) while currently receiving androgen deprivation therapy (“ADT”), abiraterone and prednisone.

On January 24, 2018, we announced plans for our Phase 2 clinical trial evaluating the combination of PCM-075 and abiraterone acetate (Zytiga®) in patients with mCRPC. We plan to have up to 3 clinical sites for the Phase 2 study, with Beth Israel Deaconess Medical Center in Boston Massachusetts as the principal site. Dr. David Einstein at the Genitourinary Oncology Program at Beth Israel Deaconess Medical Center and Harvard Medical School is the principal investigator for the Phase 2 mCRPC trial.

PCM-075 Phase 1b/2 Study in Acute Myeloid Leukemia

In June, 2017, we announced the submission of our IND application and our Phase 1b/2 protocol of PCM-075 in combination with standard-of-care chemotherapy for the treatment of AML to the FDA. In July, 2017, we received notification from the FDA that our Phase 1b/2 clinical trial of PCM-075 in patients with AML “may proceed”. On October 9, 2017, we announced that the FDA granted Orphan Drug Designation to PCM-075 for the treatment of AML. We initiated our Phase 1b/2 AML trial in November, 2017.

The Phase 1b/2 is an open-label trial to evaluate the safety and anti-leukemic activity of PCM-075 in combination with standard-of-care chemotherapy in patients with AML. Phase 1b is a dose escalation trial to evaluate the safety, tolerability, dose and scheduling of PCM-075, and to determine a recommended clinical treatment dose for the Phase 2 continuation trial.

Pharmacokinetics of PCM-075 and correlative biomarker activity will be assessed prior to the initiation of Phase 2. The Phase 2 continuation trial is open-label with administration of the recommended PCM-075 clinical dose in combination with standard-of-care chemotherapy to further evaluate safety and assess preliminary efficacy. Doses of PCM-075 will be administered orally each day for five consecutive days in a 28-day cycle in both Phase 1b and Phase 2.

We announced in February 2018 that the first patient has completed the first cycle of dosing with PCM-075 in combination with low-dose cytarabine in our Phase 1b/2 multicenter trial of patients with AML. Further we announced that two clinical trial sites are currently screening and enrolling patients and five additional sites are planned to be activated by the end of the first quarter of 2018. We plan to have up to 10 clinical sites activated for the Phase 1b/2 trial. This trial is being led by Hematologist Jorge Cortes, M.D., Deputy Department Chair, Department of Leukemia, Division of Cancer Medicine, The University of Texas MD Anderson Cancer Center.

Optimizing Drug Development with Correlative Biomarker Analysis using Circulating Tumor DNA

We have significant experience and expertise with biomarkers and technology in cancer, including AML. We are one of the patent holders of NPM1 for diagnosis and monitoring of patients. NPM1-mutated AML is a genetic marker in leukemia and accounts for approximately one-third of all AML patients. We plan to use our PCM technology to profile other dominant AML markers, such as FLT3, DNMT3A, NRAS, and KIT, as well as to measure PLK1 enzymatic activity to potentially identify patients most likely to respond to PCM-075 and to measure patient therapy response.

Technological advancements in the molecular characterization of cancers have enabled researchers to identify an increasing number of key molecular drivers of cancer progression. These discoveries have led to multiple novel anticancer therapeutics, and clinical benefit in selected patient populations. As a precision medicine biotechnology company developing targeted therapies to treat hematologic and solid tumor cancers, our objective is to optimize drug development by using our proprietary precision medicine technology as part of our approach to genomic profiling of tumors.

Our CLIA-certified/CAP-accredited laboratory in San Diego, California, enables us to use our technology platform to optimize drug development and patient care. In the clinical development of our lead drug candidate, PCM-075, correlative biomarker analysis will be used to help inform decisions in the evaluation of dose-response and optimal regimen for desired pharmacologic effect and safety. Additionally, some biomarkers can be used as a surrogate endpoint for efficacy and/or

toxicity, as well as predicting patients' response by identifying certain patient populations that are more likely to respond to the drug therapy.

Targeting cell-free nucleic acid markers allows for the development of genetic tests that use noninvasive and easy-to-obtain urine samples, as well as blood samples, rather than other more traditional and more invasive, expensive and/or often unreliable methods, such as radiographic imaging and tissue biopsy. Using our proprietary technology, we developed NextCollect, a first of its kind high-volume urine specimen collection and DNA preservation kit. Formulated DNA preservative solution is integrated into the NextCollect reservoir cap, and dispensed when secured the NextCollect cup. When added to the urine specimen, NextCollect preserves DNA for up to 2 weeks at room temperature. NextCollect™ is designed to collect a higher volume of urine specimen, containing more DNA available for testing methods. NextCollect™ urine extracted DNA can be used for a range of applications across oncology, urology, virology and infectious disease. NextCollect™ is manufactured for Research Use Only and we began making it available in December 2017, for purchase by academic institutions, cancer centers and research laboratories for their clinical research purposes.

Operating Segment and Geographic Information

We operate in one business segment, using one measurement of profitability to manage our business. We do not assess the performance of our geographic regions on measures of revenue or comprehensive income or expense. In addition, all of our principal operations, assets and decision-making functions are located in the U.S. We do not produce reports for, or measure the performance of, our geographic regions on any asset-based metrics. Therefore, geographic information is not presented for revenues or long-lived assets.

The Market

PCM-075

We are a clinical-stage biotechnology company with our primary focus on the development of our lead drug candidate, PCM-075, a PLK1 inhibitor that may treat multiple hematologic and solid tumor cancers.

There have been several drug candidates in this class of targeted oncology therapeutics to enter clinical trials; however, PCM-075 is the lead candidate and is differentiated from other ATP competitive inhibitors in that:

- its inhibition of PLK1 is highly-selective and the half maximal inhibitory concentration (IC₅₀) for PLK2 and PLK3 is over 5,000-fold of that for PLK1;
- it has a relatively short half-life of approximately 24 hours;
- it is available in an oral gelcap formulation.

The unacceptable toxicity of prior PLK inhibitors, such as volasertib from Boehringer Ingelheim, may be due to non-selective inhibition of PLK2 and PLK3 and a much longer half-life (approximately 135 hours) that could result in drug accumulation, which ultimately may have led to unsatisfactory clinical outcomes.

We believe the efficacy of PLK1 inhibition in AML has already been shown in the proof-of-concept trial of volasertib. Therefore, PCM-075's highly-selective activity, oral dosing and short half-life could enable favorable efficacy and safety with potential survival benefits in AML patients with relapsed/refractory disease or newly-diagnosed disease and ineligible for intensive induction therapy.

We recently initiated a Phase 1b/2 clinical trial of PCM-075 in combination with standard-of-care chemotherapy in AML patients to evaluate the safety/tolerability, determine the maximum tolerated dose ("MTD"), and assess preliminary efficacy. This study is on file at ClinicalTrials.gov with the Identifier NCT03303339. We also announced a Phase 2 open-label clinical trial in adult patients with mCRPC in combination with abiraterone acetate (Zytiga®) and prednisone. The mCRPC Phase 2 trial is on file at ClinicalTrials.gov with the Identifier NCT03414034. As such, we have two active IND applications in place with the FDA, one with the hematologic division and one with the solid tumor division. This enables us to quickly activate to conduct clinical trials of our lead drug candidate, PCM-075, in both hematologic and solid tumor cancers.

Drug Development and Monitoring of Therapeutic Outcomes

Cell-free DNA diagnostic technology has significant potential as a simple, quick, noninvasive way of monitoring clinical responses to drugs in clinical development and evaluating patient-specific responses to already approved and marketed therapies. Specific target applications include, but are not limited to, optimizing drug development to identify patients most likely to respond to targeted therapeutics.

One of the largest costs associated with development of a new therapy is the phases and size of human clinical studies required to identify the cohort of responders, and the resulting statistical power required. By measuring specific genetic markers, it may be possible to pre-identify, and subsequently screen, for the most likely responders to the therapy, and to limit patient recruitment to this subset. This strategy could significantly reduce the cost to develop a drug and improve development time lines. We believe that there is significant research potential for our molecular diagnostic technology to be incorporated into these clinical trial protocols, and ultimately into post-approval patient identification protocol.

Infectious Diseases — HPV

The rationale for screening for HPV is that high-risk subtypes cause virtually all cases of cervical cancer. We have developed a urine-based HPV test capable of screening for known high-risk HPV types that are associated with the development of cervical cancer. Cervical cancer is the third most commonly diagnosed cancer, and the fourth leading cause of cancer deaths in females, worldwide. Deaths due to cervical cancer are a significant global problem, especially in developing countries where screening practices are inadequate.

Other areas beyond HPV detection and monitoring include those infectious diseases caused by viruses, bacteria, fungi, and parasites. Cell-free nucleic acid assays that detect molecular targets in organisms can provide a quick, accurate, simple, and cost effective method for screening and monitoring disease. Specific areas of interest include testing for molecular targets from organisms that cause Lyme disease, John Cunningham Virus, valley fever, and various fungal infections. These organisms all tend to be difficult to identify with current technology, making differential diagnosis especially challenging, thus delaying the start of potentially curative anti-infective treatment.

Our investment in the research and development of new nucleic acid preservatives or methods, which improve the stability of urine as a cell-free nucleic acid specimen led to the development of a new urine collection and DNA preservation cup (“NextCollect™”). It is our expectation that we will continue to provide the NextCollect™ as a stand-alone kit for research use to academic researchers and institutions that they can purchase and utilize in their own laboratories.

Our Business Strategy

We are a precision medicine biotechnology company developing oncology therapeutics for improved cancer care, optimizing drug development by leveraging our proprietary PCM technology in tumor genomics. Our broad intellectual property and proprietary technology enables us to measure ctDNA in urine and blood to identify and quantify clinically actionable markers for predicting response to cancer therapies. We offer our PCM technology at our CLIA-certified/CAP-accredited laboratory and plan to continue to vertically integrate our PCM technology with the development of precision cancer therapeutics.

We believe we have an opportunity to utilize precision diagnostics to improve treatment outcomes for cancer patients using our proprietary technology to detect clinically actionable mutations and monitor patient response to therapy. The licensing of global development and commercialization rights to PCM-075 allows us to execute our strategy to vertically integrate our PCM technology with precision cancer therapeutics, by developing drugs where our deep understanding of tumor genomics may allow for effective targeting of appropriate cancer patients.

Research and Development

We have historically made substantial investments in research and development. Our research and development efforts prioritize discovering, developing and testing our clinical and preclinical candidates and platform technologies. Our research and development team is composed of researchers and scientists (PhD’s), laboratory associate scientists, and experts in drug development and tumor genomics.

Research and development expenses for the years ended December 31, 2017 and 2016 were approximately \$7.9 million and \$15.0 million, respectively.

Intellectual Property

We consider the protection of our proprietary technologies and products, as well as our ability to maintain patent protection intended to cover the composition of matter of our product candidates, their methods of use, and other related technology and inventions, to be a critical element in the success of our business. As of December 31, 2017, our wholly-owned and licensed intellectual property included over 120 issued patents and over 50 pending patent applications in the U.S. and abroad. The pending applications include multiple international applications filed under the Patent Cooperation Treaty (“PCT applications”) that may be used as the basis for multiple additional patent applications.

We plan to protect our intellectual property position by, among other things, licensing or filing our own U.S. and foreign patent applications related to our proprietary technology, and any inventions or improvements that are important to the development and implementation of our business. We also may seek patent protection, if available, with respect to biomarkers and diagnostic methods that may be used to determine optimal patient populations for use of our product candidates.

Our license agreement related to PCM-075 grants us exclusive, worldwide licenses under a portfolio of patents covering three broad areas: (1) Directed to PCM-075, related compounds and processes for making compounds; pharmaceutical compositions and methods of treating diseases characterized by dysregulated protein kinase activity; (2) Directed to salts and pharmaceutical compositions of PCM-075; methods of treating mammals in need of PLK inhibition; and (3) Directed to synergistic combinations of PCM-075 and one or more of a broad range of antineoplastic agents, and pharmaceutical compositions of those combinations. Members of this patent group expire between 2026 and 2029.

On October 11, 2017, we entered into a Patent Option Agreement with Massachusetts Institute of Technology (“MIT”) for the exclusive rights to negotiate a royalty-bearing, limited-term exclusivity license to practice world-wide patent rights to US Patent 9,566,280, subject to the rights of MIT (research, testing, and educational purposes), Ortho McNeil Pharmaceuticals-Janssen Pharmaceuticals and its Affiliates (internal research and pre-clinical drug development purposes including some laboratory research) and the federal government (government-funded inventions claimed in any patent rights and to exercise march in rights). This patent is generally directed to combination therapies including an antiandrogen or androgen antagonist and polo-like kinase inhibitor for the treatment of cancer. The Patent Option Agreement expires one-year from the effective date and includes other requirements to maintain the option period.

Another group of patents and patent applications are directed to various methods relating to detecting nucleic acid sequences in urine and nucleic acid modifications and alterations in urine; detecting and monitoring cancer through urine-based testing, nucleic acid screening, and monitoring in cases of transplantation and infectious diseases, detecting specific gene mutations and indicators of disease (including NPM1 mutations). Applications are also pending to protect proprietary methods of collecting, extracting, detecting and enriching small concentrations of short nucleic acid sequences, and detecting and monitoring mutations in diseases, such as cancer, over time. Members of this patent group expire between 2018 and 2034.

Wherever possible, we seek to protect our inventions by filing U.S. patents as well as foreign counterpart applications in select other countries. Because patent applications in the U.S. are maintained in secrecy for at least eighteen months after the applications are filed, and since publication of discoveries in the scientific or patent literature often lags behind actual discoveries, we cannot be certain that we were the first to make the inventions covered by each of our issued or pending patent applications, or that we were the first to file for protection of inventions set forth in such patent applications. Our planned or potential products may be covered by third-party patents or other intellectual property rights, in which case continued development and marketing of our products would require a license. Required licenses may not be available to us on commercially acceptable terms, if at all. If we do not obtain these licenses, we could encounter delays in product introductions while we attempt to design around the patents, or we could find that the development, manufacture or sale of products requiring such licenses are not possible.

In addition to patent protection, we also rely on know-how, trade secrets and the careful monitoring of proprietary information, all of which can be difficult to protect. We seek to protect some of our proprietary technology and processes by entering into confidentiality agreements with our employees, consultants, and contractors. These agreements may be breached, we may not have adequate remedies for any breach and our trade secrets may otherwise become known or be independently discovered by competitors. To the extent that our employees or our consultants or contractors use intellectual property owned by others in their work for us, disputes may also arise as to the rights in related or resulting know-how and inventions.

Manufacturing and Distribution

We have a supplier agreement with NerPharMa, S.r.l., a pharmaceutical manufacturing company and a subsidiary of Nerviano, to manufacture drug product for PCM-075. The agreement covers the clinical and commercial supply of PCM-075, and includes both Active Pharmaceutical Ingredients (“API”) and Good Manufacturing Process (“GMP”) production of capsules.

In 2018, we will continue offering laboratory testing services of LDTs from our CLIA-certified/CAP-accredited laboratory. Our primary customers for these LDT’s are pharmaceutical companies and third party laboratories. In addition, we plan to offer our NextCollect™ urine collection and DNA preservation cup for research use by academic institutions, cancer centers and research laboratories.

Government Regulation

We operate in a highly regulated industry that is subject to significant federal, state, local and foreign regulation. Our present and future business has been, and will continue to be, subject to a variety of laws including, the Federal Food, Drug, and Cosmetic Act, or FDC Act, and the Public Health Service Act, among others.

The FDC Act and other federal and state statutes and regulations govern the testing, manufacture, safety, effectiveness, labeling, storage, record keeping, approval, advertising and promotion of our products. As a result of these laws and regulations, product development and product approval processes are very expensive and time-consuming.

FDA Approval Process

In the United States, pharmaceutical products, including biologics, are subject to extensive regulation by the FDA. The FDC Act and other federal and state statutes and regulations, govern, among other things, the research, development, testing, manufacture, storage, recordkeeping, approval, labeling, promotion and marketing, distribution, post-approval monitoring and reporting, sampling, and import and export of pharmaceutical products. Failure to comply with applicable U.S. requirements may subject a company to a variety of administrative or judicial sanctions, such as FDA refusal to approve pending new drug applications, or NDAs, or biologic license applications, or BLAs, warning letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, civil penalties, and criminal prosecution.

Pharmaceutical product development in the United States typically involves preclinical laboratory and animal tests, the submission to the FDA of an IND, which must become effective before clinical testing may commence, and adequate and well-controlled clinical trials to establish the safety and effectiveness of the drug or biologic for each indication for which FDA approval is sought. Satisfaction of FDA pre-market approval requirements typically takes many years and the actual time required may vary substantially based upon the type, complexity and novelty of the product or disease.

Preclinical tests include laboratory evaluation as well as animal trials to assess the characteristics and potential pharmacology and toxicity of the product. The conduct of the preclinical tests must comply with federal regulations and requirements including good laboratory practices. The results of preclinical testing are submitted to the FDA as part of an IND along with other information, including information about product chemistry, manufacturing and controls, and a proposed clinical trial protocol. Long term preclinical tests, such as animal tests of reproductive toxicity and carcinogenicity, may continue after the IND is submitted.

A 30-day waiting period after the submission of each IND is required prior to the commencement of clinical testing in humans. If the FDA has not objected to the IND within this 30-day period, the clinical trial proposed in the IND may begin.

Clinical trials involve the administration of the investigational drug to healthy volunteers or patients under the supervision of a qualified investigator. Clinical trials must be conducted in compliance with federal regulations and good clinical practices, or GCP, as well as under protocols detailing the objectives of the trial, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated. Each protocol involving testing on U.S. patients and subsequent protocol amendments must be submitted to the FDA as part of the IND.

The FDA may order the temporary or permanent discontinuation of a clinical trial at any time or impose other sanctions if it believes that the clinical trial is not being conducted in accordance with FDA requirements or presents an unacceptable risk to the clinical trial patients. The clinical trial protocol and informed consent information for patients in clinical trials must also be submitted to an institutional review board, or IRB, for approval. An IRB may also require the

clinical trial at the site to be halted, either temporarily or permanently, for failure to comply with the IRB's requirements, or may impose other conditions.

Clinical trials to support NDAs or BLAs, which are applications for marketing approval, are typically conducted in three sequential Phases, but the Phases may overlap. In Phase 1, the initial introduction of the investigational drug candidate into healthy human subjects or patients, the investigational drug is tested to assess metabolism, pharmacokinetics, pharmacological actions, side effects associated with increasing doses and, if possible, early evidence on effectiveness. Phase 2 usually involves trials in a limited patient population, to determine the effectiveness of the investigational drug for a particular indication or indications, dosage tolerance and optimum dosage, and identify common adverse effects and safety risks. In the case of product candidates for severe or life-threatening diseases such as pneumonia, the initial human testing is often conducted in patients rather than in healthy volunteers.

If an investigational drug demonstrates evidence of effectiveness and an acceptable safety profile in Phase 2 evaluations, Phase 3 clinical trials are undertaken to obtain additional information about clinical efficacy and safety in a larger number of patients, typically at geographically dispersed clinical trial sites, to permit the FDA to evaluate the overall benefit-risk relationship of the investigational drug and to provide adequate information for its labeling.

After completion of the required clinical testing, an NDA or, in the case of a biologic, a BLA, is prepared and submitted to the FDA. FDA approval of the marketing application is required before marketing of the product may begin in the United States. The marketing application must include the results of all preclinical, clinical and other testing and a compilation of data relating to the product's pharmacology, chemistry, manufacture, and controls.

The FDA has 60 days from its receipt of an NDA or BLA to determine whether the application will be accepted for filing based on the agency's threshold determination that it is sufficiently complete to permit substantive review. Once the submission is accepted for filing, the FDA begins an in-depth review. The FDA has agreed to certain performance goals in the review of marketing applications. Most such applications for non-priority drug products are reviewed within ten months. The review process may be extended by the FDA for three additional months to consider new information submitted during the review or clarification regarding information already provided in the submission. The FDA may also refer applications for novel drug products or drug products that present difficult questions of safety or efficacy to an advisory committee, typically a panel that includes clinicians and other experts, for review, evaluation and a recommendation as to whether the application should be approved. The FDA is not bound by the recommendation of an advisory committee, but it generally follows such recommendations. Before approving a marketing application, the FDA will typically inspect one or more clinical sites to assure compliance with GCP.

Additionally, the FDA will inspect the facility or the facilities at which the drug product is manufactured. The FDA will not approve the NDA or, in the case of a biologic, the BLA unless compliance with cGMPs is satisfactory and the marketing application contains data that provide substantial evidence that the product is safe and effective in the indication studied. Manufacturers of biologics also must comply with FDA's general biological product standards.

After the FDA evaluates the NDA or BLA and the manufacturing facilities, it issues an approval letter or a complete response letter. A complete response letter outlines the deficiencies in the submission and may require substantial additional testing or information in order for the FDA to reconsider the application. If and when those deficiencies have been addressed in a resubmission of the marketing application, the FDA will re-initiate review. If the FDA is satisfied that the deficiencies have been addressed, the agency will issue an approval letter. The FDA has committed to reviewing such resubmissions in two or six months depending on the type of information included. It is not unusual for the FDA to issue a complete response letter because it believes that the drug product is not safe enough or effective enough or because it does not believe that the data submitted are reliable or conclusive.

An approval letter authorizes commercial marketing of the drug product with specific prescribing information for specific indications. As a condition of approval of the marketing application, the FDA may require substantial post-approval testing and surveillance to monitor the drug product's safety or efficacy and may impose other conditions, including labeling restrictions, which can materially affect the product's potential market and profitability. Once granted, product approvals may be withdrawn if compliance with regulatory standards is not maintained or problems are identified following initial marketing.

Other Regulatory Requirements

Once a NDA or BLA is approved, a product will be subject to certain post-approval requirements. For instance, the FDA closely regulates the post-approval marketing and promotion of therapeutic products, including standards and regulations

for direct-to-consumer advertising, off-label promotion, industry-sponsored scientific and educational activities and promotional activities involving the internet.

Biologics may be marketed only for the approved indications and in accordance with the provisions of the approved labeling. Changes to some of the conditions established in an approved application, including changes in indications, labeling, or manufacturing processes or facilities, require submission and FDA approval of a new BLA or BLA supplement, before the change can be implemented. A BLA supplement for a new indication typically requires clinical data similar to that in the original application, and the FDA uses the same procedures and actions in reviewing BLA supplements as it does in reviewing BLAs. We cannot be certain that the FDA or any other regulatory agency will grant approval for our product candidates for any other indications or any other product candidate for any indication on a timely basis, if at all.

Adverse event reporting and submission of periodic reports is required following FDA approval of a BLA. The FDA also may require post-marketing testing, known as Phase 4 testing, risk evaluation and mitigation strategies, and surveillance to monitor the effects of an approved product or place conditions on an approval that could restrict the distribution or use of the product. In addition, quality control as well as product manufacturing, packaging, and labeling procedures must continue to conform to cGMPs after approval. Manufacturers and certain of their subcontractors are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA during which the agency inspects manufacturing facilities to assess compliance with cGMPs. Accordingly, manufacturers must continue to expend time, money and effort in the areas of production and quality control to maintain compliance with cGMPs. Regulatory authorities may withdraw product approvals or request product recalls if a company fails to comply with regulatory standards, if it encounters problems following initial marketing, or if previously unrecognized problems are subsequently discovered. U.S. Foreign Corrupt Practices Act

The U.S. Foreign Corrupt Practices Act, to which we are subject, prohibits corporations and individuals from engaging in certain activities to obtain or retain business or to influence a person working in an official capacity. It is illegal to pay, offer to pay or authorize the payment of anything of value to any foreign government official, government staff member, political party or political candidate in an attempt to obtain or retain business or to otherwise influence a person working in an official capacity.

Federal and State Fraud and Abuse Laws

Healthcare providers, physicians and third-party payors play a primary role in the recommendation and prescription of drug and biologic product candidates which obtain marketing approval. In addition to FDA restrictions on marketing of pharmaceutical products, pharmaceutical manufacturers are exposed, directly, or indirectly, through customers, to broadly applicable fraud and abuse and other healthcare laws and regulations that may affect the business or financial arrangements and relationships through which a pharmaceutical manufacturer can market, sell and distribute drug and biologic products. These laws include, but are not limited to:

The federal Anti-Kickback Statute which prohibits, any person or entity from, among other things, knowingly and willfully offering, paying, soliciting, or receiving any remuneration, directly or indirectly, overtly or covertly, in cash or in-kind, to induce or reward either the referring of an individual for, or the purchasing, leasing, ordering, or arranging for the purchase, lease, or order of any healthcare item or service reimbursable, in whole or in part, under Medicare, Medicaid, or any other federally financed healthcare program. The term "remuneration" has been broadly interpreted to include anything of value. This statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on one hand and prescribers, purchasers, and formulary managers on the other hand. Although there are a number of statutory exemptions and regulatory safe harbors protecting certain common activities from prosecution, the exemptions and safe harbors are drawn narrowly, and practices that involve remuneration intended to induce prescribing, purchases, or recommendations may be subject to scrutiny if they do not qualify for an exemption or safe harbor..

The federal false claims and civil monetary penalty laws, including the Federal False Claims Act, which imposes significant penalties and can be enforced by private citizens through civil qui tam actions, prohibits any person or entity from, among other things, knowingly presenting, or causing to be presented, a false, fictitious or fraudulent claim for payment to the federal government, or knowingly making, using or causing to be made, a false statement or record material to a false or fraudulent claim to avoid, decrease or conceal an obligation to pay money to the federal government. In addition, a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the False Claims Act. As a result of a modification made by the Fraud Enforcement and Recovery Act of 2009, a claim includes "any request or demand" for money or property presented to the U.S. government. In addition, manufacturers can be held liable under the False Claims Act even when they do not submit claims directly to government payors if they are deemed to "cause" the submission of false or fraudulent claims. Criminal prosecution is also possible for

making or presenting a false, fictitious or fraudulent claim to the federal government. Recently, several pharmaceutical and other healthcare companies have been prosecuted under these laws for 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 company's marketing of the product for unapproved, and thus non-reimbursable, uses.

The federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which, among other things, imposes criminal liability for 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 creates federal criminal laws that prohibit knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false, fictitious or fraudulent statements or representations, or making or using any false writing or document knowing the same to contain any materially false, fictitious or fraudulent statement or entry in connection with the delivery of, or payment for, benefits, items or services.

HIPAA, as amended by the Health Information Technology and Clinical Health Act of 2009, or HITECH, and its implementing regulations, which impose certain requirements relating to the privacy, security, transmission and breach reporting of individually identifiable health information upon entities subject to the law, such as health plans, healthcare clearinghouses and healthcare providers and their respective business associates that perform services for them that involve individually identifiable health information. HITECH also created new tiers of civil monetary penalties, amended HIPAA to make civil and criminal penalties directly applicable to business associates, and gave state attorneys general new authority to file civil actions for damages or injunctions in U.S. federal courts to enforce the federal HIPAA laws and seek attorneys' fees and costs associated with pursuing federal civil actions.

The federal physician payment transparency requirements, sometimes referred to as the "Physician Payments Sunshine Act," and its implementing regulations, which require certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program (with certain exceptions) to report annually to the United States Department of Health and Human Services, or HHS, information related to payments or other transfers of value made to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals, as well as ownership and investment interests held by physicians and their immediate family members.

State and foreign law equivalents of each of the above federal laws, such as anti-kickback and false claims laws, that may impose similar or more prohibitive restrictions, and may apply to items or services reimbursed by non-governmental third-party payors, including private insurers.

State and foreign laws that require pharmaceutical companies to implement compliance programs, comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government, or to track and report gifts, compensation and other remuneration provided to physicians and other healthcare providers, and other federal, state and foreign laws that govern the privacy and security of health information or personally identifiable information in certain circumstances, including state health information privacy and data breach notification laws which govern the collection, use, disclosure, and protection of health-related and other personal information, many of which differ from each other in significant ways and often are not pre-empted by HIPAA, thus requiring additional compliance efforts.

Because of the breadth of these laws and the narrowness of the safe harbors, it is possible that some business activities can be subject to challenge under one or more of such laws. The scope and enforcement of each of these laws is uncertain and subject to rapid change in the current environment of healthcare reform, especially in light of the lack of applicable precedent and regulations. Federal and state enforcement bodies have recently increased their scrutiny of interactions between healthcare companies and healthcare providers, which has led to a number of investigations, prosecutions, convictions and settlements in the healthcare industry.

Ensuring that business arrangements with third parties comply with applicable healthcare laws and regulations is costly and time consuming. If business operations are found to be in violation of any of the laws described above or any other applicable governmental regulations a pharmaceutical manufacturer may be subject to penalties, including civil, criminal and administrative penalties, damages, fines, disgorgement, individual imprisonment, exclusion from governmental funded healthcare programs, such as Medicare and Medicaid, contractual damages, reputational harm, diminished profits and future earnings, additional reporting obligations and oversight if subject to a corporate integrity agreement or other agreement to resolve allegations of non-compliance with these laws, and curtailment or restructuring of operations, any of which could adversely affect a pharmaceutical manufacturer's ability to operate its business and the results of its operations.

Healthcare Reform in the United States

In the United States, there have been, and continue to be, a number of legislative and regulatory changes and proposed changes to the healthcare system that could affect the future results of pharmaceutical manufacturers' operations. In particular, there have been and continue to be a number of initiatives at the federal and state levels that seek to reduce healthcare costs. Most recently, the Patient Protection and Affordable Care Act, or PPACA, was enacted in March 2010, which includes measures to significantly change the way healthcare is financed by both governmental and private insurers. Among the provisions of the PPACA of greatest importance to the pharmaceutical and biotechnology industry are the following:

- an annual, nondeductible fee on any entity that manufactures or imports certain branded prescription drugs and biologic agents, apportioned among these entities according to their market share in certain government healthcare programs;
- implementation of the federal physician payment transparency requirements, sometimes referred to as the "Physician Payments Sunshine Act";
- a licensure framework for follow-on biologic products;
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research;
- establishment of a Center for Medicare Innovation at the Centers for Medicare & Medicaid Services to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending;
- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program, to 23.1% and 13% of the average manufacturer price for most branded and generic drugs, respectively and capped the total rebate amount for innovator drugs at 100% of the Average Manufacturer Price, or AMP;
- a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for certain drugs and biologics, including our product candidates, that are inhaled, infused, instilled, implanted or injected;
- extension of manufacturers' Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations;
- expansion of eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to additional individuals and by adding new mandatory eligibility categories for individuals with income at or below 133% of the federal poverty level, thereby potentially increasing manufacturers' Medicaid rebate liability;
- a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D; and
- expansion of the entities eligible for discounts under the Public Health program.

Some of the provisions of the PPACA have yet to be implemented, and there have been legal and political challenges to certain aspects of the PPACA. Since January 2017, President Trump has signed two executive orders and other directives designed to delay, circumvent, or loosen certain requirements mandated by the PPACA. Concurrently, Congress has considered legislation that would repeal or repeal and replace all or part of the PPACA. While Congress has not passed repeal legislation, the Tax Cuts and Jobs Act of 2017 includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the PPACA on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate". Congress may consider other legislation to repeal or replace elements of the PPACA.

Many of the details regarding the implementation of the PPACA are yet to be determined, and at this time, the full effect that the PPACA would have on a pharmaceutical manufacturer remains unclear. In particular, there is uncertainty surrounding the applicability of the biosimilars provisions under the PPACA. The FDA has issued several guidance documents,

but no implementing regulations, on biosimilars. A number of biosimilar applications have been approved over the past few years. The regulations that are ultimately promulgated and their implementation are likely to have considerable impact on the way pharmaceutical manufacturers conduct their business and may require changes to current strategies. A biosimilar is a biological product that is highly similar to an approved drug notwithstanding minor differences in clinically inactive components, and for which there are no clinically meaningful differences between the biological product and the approved drug in terms of the safety, purity, and potency of the product.

Individual states have become increasingly aggressive in passing legislation and implementing regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access, and marketing cost disclosure and transparency measures, and to encourage importation from other countries and bulk purchasing. Legally mandated price controls on payment amounts by third-party payors or other restrictions could harm a pharmaceutical manufacturer's business, results of operations, financial condition and prospects. In addition, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine what pharmaceutical products and which suppliers will be included in their prescription drug and other healthcare programs. This could reduce ultimate demand for certain products or put pressure product pricing, which could negatively affect a pharmaceutical manufacturer's business, results of operations, financial condition and prospects.

In addition, given recent federal and state government initiatives directed at lowering the total cost of healthcare, Congress and state legislatures will likely continue to focus on healthcare reform, the cost of prescription drugs and biologics and the reform of the Medicare and Medicaid programs. While no one cannot predict the full outcome of any such legislation, it may result in decreased reimbursement for drugs and biologics, which may further exacerbate industry-wide pressure to reduce prescription drug prices. This could harm a pharmaceutical manufacturer's ability to generate revenue. Increases in importation or re-importation of pharmaceutical products from foreign countries into the United States could put competitive pressure on a pharmaceutical manufacturer's ability to profitably price products, which, in turn, could adversely affect business, results of operations, financial condition and prospects. A pharmaceutical manufacturer might elect not to seek approval for or market products in foreign jurisdictions in order to minimize the risk of re-importation, which could also reduce the revenue generated from product sales. It is also possible that other legislative proposals having similar effects will be adopted.

Furthermore, regulatory authorities' assessment of the data and results required to demonstrate safety and efficacy can change over time and can be affected by many factors, such as the emergence of new information, including on other products, changing policies and agency funding, staffing and leadership. No one can be sure whether future changes to the regulatory environment will be favorable or unfavorable to business prospects. For example, average review times at the FDA for marketing approval applications can be affected by a variety of factors, including budget and funding levels and statutory, regulatory and policy changes.

Regulation in the European Union

Biologics are also subject to extensive regulation outside of the United States. In the European Union, for example, there is a centralized approval procedure that authorizes marketing of a product in all countries of the European Union, which includes most major countries in Europe. If this procedure is not used, approval in one country of the European Union can be used to obtain approval in another country of the European Union under two simplified application processes, the mutual recognition procedure or the decentralized procedure, both of which rely on the principle of mutual recognition. After receiving regulatory approval through any of the European registration procedures, pricing and reimbursement approvals are also required in most countries.

Other Regulations

We are also subject to numerous federal, state and local laws relating to such matters as safe working conditions, manufacturing practices, environmental protection, fire hazard control, and disposal of hazardous or potentially hazardous substances and biological materials. We may incur significant costs to comply with such laws and regulations now or in the future.

Some drugs benefit from additional government incentives. Orphan drugs receive special consideration from the FDA in order to encourage pharmaceutical companies to develop treatments for rare diseases. Incentives for the development of orphan drugs include quicker approval time and potential financial assistance, including waiver of Prescription Drug User Fee Act ("PDUFA"). Companies are often permitted to charge substantial prices for orphan drugs, making them more profitable than they would be without government intervention. As a result, the development of orphan drugs continues to grow at a faster rate than the development of traditional pharmaceuticals. The FDA granted Orphan Drug Designation ("ODD") to PCM-075 in the treatment of AML in October, 2017.

Competition

PCM-075 is not the first PLK inhibitor that has entered clinical development; however, it currently is the only oral PLK inhibitor in active clinical development and delivers highly-selective PLK1 inhibition, which suggests that it could demonstrate survival benefits in elderly AML patients without the adverse events that have prohibited the advancement of other PLK1 inhibitors. PCM-075 has completed a Phase 1 trial in advanced metastatic solid tumor cancers and a Phase 1b/2 trial in AML was initiated in November 2017. Additionally, a Phase 2 trial in mCRPC is filed with FDA and we are working towards the activation up to three sites including Beth Israel Deaconess Medical Center.

The most prominent PLK inhibitor tested in late-stage clinical development, thus far, is volasertib, developed by Boehringer Ingelheim. In a randomized Phase 2 trial of volasertib plus low-dose cytarabine (“LDAC”) in 87 AML patients not eligible for induction therapy, patients received LDAC 20mg twice-daily subcutaneously on days 1-10 or LDAC plus volasertib 350 mg IV on days 1 + 15 every four weeks. The response rate (complete remission and complete remission with incomplete blood count recovery) was higher for LDAC + volasertib vs LDAC (31.0% vs 13.3%; p=0.052). Median event-free survival was significantly prolonged by LDAC + volasertib compared with LDAC (5.6 vs 2.3 months). The encouraging results led to the Phase 3 POLO-AML-2 study in early 2013, which enrolled 666 elderly patients (65 years or older) with newly diagnosed AML, who were not eligible for intensive induction therapy. However; in June, 2016, Boehringer Ingelheim reported that LDAC + volasertib did not meet the primary endpoint of objective response; although better than LDAC, alone, the difference was not statistically significant. The data also showed an unfavorable overall survival trend for the experimental arm, with the safety profile of the LDAC + volasertib dosing regimen considered as the main reason for the trend. The fact that volasertib demonstrated survival benefits in the Phase 2 trial provided proof-of-concept for PLK inhibition as a mechanism of action for an AML therapy; however, its unacceptable safety profile may have resulted from the fact that volasertib’s inhibition of PLK1 is not highly selective and it also inhibits PLK2 and PLK3. By contrast, PCM-075 is able to deliver much more selective inhibition of PLK1 than volasertib. PCM-075 also has a half-life of 24 hours vs volasertib’s 135 hours.

GSK461364, developed by GSK, appears to have less sensitivity to PLK2 and PLK3 than volasertib, although it is not as specific to PLK1 as PCM-075. GSK461364 was investigated in a Phase 1 study in patients with advanced solid tumor cancers. The best response was prolonged stable disease of more than 16 weeks that occurred in 15% of patients. However, GSK461364 had off target adverse events including grade 4 pulmonary emboli. Venous thrombotic emboli (VTE) and myelosuppression were the most common grade 3-4 drug-related events; and VTE occurred in 20% of patients, which demanded co-administration of anticoagulants. There are no further clinical updates for GSK461364 after the Phase 1 study.

Other PLK inhibitors that have been evaluated include rogosertib - Oncova, a non-targeted broad-spectrum multi-kinase inhibitor (RAF, PI3K, PLK), evaluated for pancreatic cancer and Myelodysplastic Syndrome (“MDS”), which failed a Phase 3 trial in MDS. Currently, Oncova is testing an IV formulation of rogosertib in high-risk MDS patients. CY140 - Cyclacel, a PLK1, 2, 3 inhibitor, is currently in preclinical studies for the treatment of esophageal cancer.

Employees

As of February 12, 2018, we had a total of 17 employees, all of whom were full-time. None of our employees are covered by a collective bargaining agreement, and we consider our relations with our employees to be good.

Corporation Information

We were originally incorporated under the laws of the State of Florida in April 2001. In January 2010, we re-incorporated under the laws of the State of Delaware and changed our name to Trovagene, Inc. In June 2012, our common stock was listed on The NASDAQ Capital Market under the ticker symbol TROV. Our corporate website address is www.trovagene.com. Our annual reports on Form 10-K, quarterly reports on Form 10-Q, proxy statements, current reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, are available free of charge at www.trovagene.com as soon as reasonably practicable after electronically filing such reports with the Securities and Exchange Commission. Any information contained on, or that can be accessed through, our website is not incorporated by reference into, nor is it in any way a part of, this Annual Report on Form 10-K.

ITEM 1A. RISK FACTORS

An investment in our securities involves a high degree of risk. An investor should carefully consider the risks described below as well as other information contained in this Annual Report on Form 10-K and our other reports filed with the SEC. The risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently believe are immaterial may also impair our business operations. If any of the following risks

actually occur, our business, financial condition or results of operations could be materially adversely affected, the value of our securities could decline, and investors in our company may lose all or part of their investment.

Risks Related to Our Business

We are a development stage company and may never earn a profit.

We are a development stage company and have incurred losses since our formation. As of December 31, 2017, we have an accumulated total deficit of approximately \$173.0 million. For the fiscal years ended December 31, 2017 and 2016, we had a net loss attributable to common stockholders of approximately \$24.9 million and \$39.2 million, respectively. To date, we have experienced negative cash flow from development of our product candidate PCM-075 and our cell-free molecular diagnostic technology. We have generated limited revenue from operations, and we expect to incur substantial net losses for the foreseeable future as we seek to further develop and commercialize PCM-075 and our cell-free molecular diagnostic technology. We cannot predict the extent of these future net losses, or when we may attain profitability, if at all. If we are unable to generate significant revenue from PCM-075 and our cell-free molecular diagnostic technology or attain profitability, we will not be able to sustain operations.

Because of the numerous risks and uncertainties associated with developing and commercializing PCM-075 and our cell-free molecular diagnostic technology and tests, we are unable to predict the extent of any future losses or when we will attain profitability, if ever. We may never become profitable and you may never receive a return on an investment in our common stock. An investor in our common stock must carefully consider the substantial challenges, risks and uncertainties inherent in the attempted development and commercialization of PCM-075 and tests in the medical diagnostic industry. We may never successfully commercialize PCM-075 and our cell-free molecular diagnostic technology or any future tests we may develop, and our business may not be successful.

We will need to raise substantial additional capital to develop and commercialize PCM-075 and our failure to obtain funding when needed may force us to delay, reduce or eliminate our product development programs or collaboration efforts.

As of December 31, 2017, our cash and cash equivalents balance was approximately \$8.2 million and our working capital was approximately \$5.5 million. Due to our recurring losses from operations and the expectation that we will continue to incur losses in the future, we will be required to raise additional capital to complete the development and commercialization of our current product candidates. We have historically relied upon private and public sales of our equity, as well as debt financings to fund our operations. At December 31, 2017, we had \$1.3 million outstanding under debt agreements. In order to raise additional capital, we may seek to sell additional equity and/or debt securities or obtain a credit facility or other loan, which we may not be able to do on favorable terms, or at all. Our ability to obtain additional financing will be subject to a number of factors, including market conditions, our operating performance and investor sentiment. If we are unable to raise additional capital when required or on acceptable terms, we may have to significantly delay, scale back or discontinue the development and/or commercialization of one or more of our product candidates, restrict our operations or obtain funds by entering into agreements on unfavorable terms.

Our financial statements include an explanatory paragraph that expresses substantial doubt about our ability to continue as a going concern, indicating the possibility that we may not be able to operate in the future.

Primarily as a result of our losses incurred to date, our expected continued future losses, and limited cash balances, we have included an explanatory paragraph in our financial statements expressing substantial doubt about our ability to continue as a going concern. Our ability to continue as a going concern is contingent upon, among other factors, the sale of the shares of our common stock or obtaining alternate financing.

Recent events of default have forced us to repay outstanding indebtedness sooner than expected.

On June 1, 2017, we received a Notice of Event of Default (the "Notice") from Oxford Finance LLC ("Oxford") with respect to the Loan Agreement dated as of June 30, 2014 (as amended, restated, supplemented or otherwise modified from time to time, the "Loan Agreement"), by and among Oxford, as Collateral Agent, Oxford, as a Lender, Silicon Valley Bank, as a Lender ("SVB") and together with Oxford, the "Lenders") and us. The Notice stated that Events of Default had occurred and are continuing under Sections 8.2(a) and 8.2(b) (Covenant Defaults) (as a result of violations of Section 5.2, 7.1 and 7.2), Section 8.3 (Material Adverse Change), Section 8.6 (Other Agreements) and Section 8.8 (Misrepresentations) of the Loan and Security Agreement. The Notice further stated that all of the obligation under the Loan and Security Agreement are immediately due and payable. On June 6, 2017, the Lenders withdrew approximately \$16.7 million out of our bank accounts which satisfies all of our outstanding obligations under the Loan Agreement. On March 31, 2017, we had approximately

\$28.8 million of cash and short-term investments. As of December 31, 2017, we had approximately \$8.2 million of cash and cash equivalents. We need to raise substantial additional capital to operate our business and our failure to obtain financing will force us to delay, reduce or eliminate our product development programs or collaboration efforts and would have a material adverse effect on our business.

On June 20, 2017, we received a Notice of Event of Default (the “Equipment Notice”) from SVB with respect to that certain Loan and Security Agreement in the aggregate principal amount of \$1.5 million dated as of November 17, 2015 (as amended, restated, supplemented or otherwise modified from time to time, the “Equipment Loan Agreement”), between SVB and us. The Equipment Notice stated that Events of Default had occurred and are continuing under Sections 8.2(a) (Covenant Defaults) (as a result of violations of Section 7.1 and 7.2), Section 8.3 (Material Adverse Change), Section 8.6 (Other Agreements) and Section 8.8 (Misrepresentations) of the Equipment Loan Agreement. The Equipment Loan Agreement is substantially similar to the Loan and Security Agreement which also was the subject of a Notice of Event of Default on June 1, 2017. Both Notices of Event of Default are substantially similar, except that the Equipment Notice further stated that “SVB intends to monitor the default situation very carefully and will decide in their sole discretion on a “day-by-day” basis whether or not to exercise rights and remedies.” As of December 31, 2017, approximately \$1.3 million of principal and accrued interest was outstanding under the equipment loan. We are currently discussing with SVB a waiver of the defaults. In the event that we cannot agree with SVB on a waiver of the defaults, SVB may accelerate the amounts outstanding under the Equipment Loan Agreement which will cause us to repay such amounts sooner than expected and could have a material adverse effect on our business.

Our product candidate PCM-075 is in the early stages of development and its commercial viability remains subject to the successful outcome of PCM-075, current and future preclinical studies, clinical trials, regulatory approvals and the risks generally inherent in the development of a pharmaceutical product candidate. If we are unable to successfully advance or develop our product candidate, our business will be materially harmed.

In the near-term, failure to successfully advance the development of our product candidate may have a material adverse effect on us. To date, we have not successfully developed or commercially marketed, distributed or sold any product candidate. The success of our business depends primarily upon our ability to successfully advance the development of our product candidate through preclinical studies and clinical trials, have the product candidate approved for sale by the FDA or regulatory authorities in other countries, and ultimately have the product candidate successfully commercialized by us or a strategic partner. We cannot assure you that the results of our ongoing preclinical studies or clinical trials will support or justify the continued development of our product candidate, or that we will receive approval from the FDA, or similar regulatory authorities in other countries, to advance the development of our product candidate.

Our product candidate must satisfy rigorous regulatory standards of safety and efficacy before we can advance or complete its clinical development or it can be approved for sale. To satisfy these standards, we must engage in expensive and lengthy preclinical studies and clinical trials, develop acceptable manufacturing processes, and obtain regulatory approval of our product candidate. Despite these efforts, our product candidate may not:

- offer therapeutic or other medical benefits over existing drugs or other product candidates in development to treat the same patient population;
- be proven to be safe and effective in current and future preclinical studies or clinical trials;
- have the desired effects;
- be free from undesirable or unexpected effects;
- meet applicable regulatory standards;
- be capable of being formulated and manufactured in commercially suitable quantities and at an acceptable cost; or
- be successfully commercialized by us or by collaborators.

Even if we demonstrate favorable results in preclinical studies and early-stage clinical trials, we cannot assure you that the results of late-stage clinical trials will be favorable enough to support the continued development of our product candidate. A number of companies in the pharmaceutical and biopharmaceutical industries have experienced significant delays, setbacks and failures in all stages of development, including late-stage clinical trials, even after achieving promising results in preclinical testing or early-stage clinical trials. Accordingly, results from completed preclinical studies and early-stage clinical

trials of our product candidate may not be predictive of the results we may obtain in later-stage trials. Furthermore, even if the data collected from preclinical studies and clinical trials involving our product candidate demonstrate a favorable safety and efficacy profile, such results may not be sufficient to support the submission of a New Drug Application, or NDA or a biologics license application, or BLA to obtain regulatory approval from the FDA in the U.S., or other similar regulatory agencies in other jurisdictions, which is required to market and sell the product.

Our product candidate will require significant additional research and development efforts, the commitment of substantial financial resources, and regulatory approvals prior to advancing into further clinical development or being commercialized by us or collaborators. We cannot assure you that our product candidate will successfully progress through the drug development process or will result in commercially viable products. We do not expect our product candidate to be commercialized by us or collaborators for at least several years.

Our product candidate may exhibit undesirable side effects when used alone or in combination with other approved pharmaceutical products or investigational new drugs, which may delay or preclude further development or regulatory approval, or limit their use if approved.

Throughout the drug development process, we must continually demonstrate the safety and tolerability of our product candidate to obtain regulatory approval to further advance clinical development or to market it. Even if our product candidate demonstrates biologic activity and clinical efficacy, any unacceptable adverse side effects or toxicities, when administered alone or in the presence of other pharmaceutical products, which can arise at any stage of development, may outweigh potential benefits. In preclinical studies and clinical trials we have conducted to date, our product candidate's safety profile is based on studies and trials that have involved a small number of subjects or patients over a limited period of time. We may observe adverse or significant adverse events or drug-drug interactions in future preclinical studies or clinical trial candidates, which could result in the delay or termination of development, prevent regulatory approval, or limit market acceptance if ultimately approved.

If the results of preclinical studies or clinical trials for our product candidate, including those that are subject to existing or future license or collaboration agreements, are unfavorable or delayed, we could be delayed or precluded from the further development or commercialization of our product candidate, which could materially harm our business.

In order to further advance the development of, and ultimately receive regulatory approval to sell, our product candidate, we must conduct extensive preclinical studies and clinical trials to demonstrate its safety and efficacy to the satisfaction of the FDA or similar regulatory authorities in other countries, as the case may be. Preclinical studies and clinical trials are expensive, complex, can take many years to complete, and have highly uncertain outcomes. Delays, setbacks, or failures can occur at any time, or in any phase of preclinical or clinical testing, and can result from concerns about safety or toxicity, a lack of demonstrated efficacy or superior efficacy over other similar products that have been approved for sale or are in more advanced stages of development, poor study or trial design, and issues related to the formulation or manufacturing process of the materials used to conduct the trials. The results of prior preclinical studies or clinical trials are not necessarily predictive of the results we may observe in later stage clinical trials. In many cases, product candidates in clinical development may fail to show desired safety and efficacy characteristics despite having favorably demonstrated such characteristics in preclinical studies or earlier stage clinical trials.

In addition, we may experience numerous unforeseen events during, or as a result of, preclinical studies and the clinical trial process, which could delay or impede our ability to advance the development of, receive regulatory approval for, or commercialize our product candidate, including, but not limited to:

- communications with the FDA, or similar regulatory authorities in different countries, regarding the scope or design of a trial or trials;
- regulatory authorities (including an Institutional Review Board or Ethical Committee) or IRB or EC, not authorizing us to commence or conduct a clinical trial at a prospective trial site;
- enrollment in our clinical trials being delayed, or proceeding at a slower pace than we expected, because we have difficulty recruiting patients or participants dropping out of our clinical trials at a higher rate than we anticipated;
- our third party contractors, upon whom we rely for conducting preclinical studies, clinical trials and manufacturing of our trial materials, may fail to comply with regulatory requirements or meet their contractual obligations to us in a timely manner;

- having to suspend or ultimately terminate our clinical trials if participants are being exposed to unacceptable health or safety risks;
- IRBs, ECs or regulators requiring that we hold, suspend or terminate our preclinical studies and clinical trials for various reasons, including non-compliance with regulatory requirements; and
- the supply or quality of drug material necessary to conduct our preclinical studies or clinical trials being insufficient, inadequate or unavailable.

Even if the data collected from preclinical studies or clinical trials involving our product candidates demonstrate a favorable safety and efficacy profile, such results may not be sufficient to support the submission of a NDA or BLA to obtain regulatory approval from the FDA in the U.S., or other similar foreign regulatory authorities in foreign jurisdictions, which is required to market and sell the product.

If third party vendors upon whom we intend to rely on to conduct our preclinical studies or clinical trials do not perform or fail to comply with strict regulations, these studies or trials of our product candidate may be delayed, terminated, or fail, or we could incur significant additional expenses, which could materially harm our business.

We have limited resources dedicated to designing, conducting and managing preclinical studies and clinical trials. We intend to rely on third parties, including clinical research organizations, consultants and principal investigators, to assist us in designing, managing, monitoring and conducting our preclinical studies and clinical trials. We intend to rely on these vendors and individuals to perform many facets of the drug development process, including certain preclinical studies, the recruitment of sites and patients for participation in our clinical trials, maintenance of good relations with the clinical sites, and ensuring that these sites are conducting our trials in compliance with the trial protocol, including safety monitoring and applicable regulations. If these third parties fail to perform satisfactorily, or do not adequately fulfill their obligations under the terms of our agreements with them, we may not be able to enter into alternative arrangements without undue delay or additional expenditures, and therefore the preclinical studies and clinical trials of our product candidate may be delayed or prove unsuccessful. Further, the FDA, or other similar foreign regulatory authorities, may inspect some of the clinical sites participating in our clinical trials in the U.S., or our third-party vendors' sites, to determine if our clinical trials are being conducted according to Good Clinical Practices or GCPs. If we or the FDA determine that our third-party vendors are not in compliance with, or have not conducted our clinical trials according to, applicable regulations we may be forced to delay, repeat or terminate such clinical trials.

We have limited capacity for recruiting and managing clinical trials, which could impair our timing to initiate or complete clinical trials of our product candidates and materially harm our business.

We have limited capacity to recruit and manage the clinical trials necessary to obtain FDA approval or approval by other regulatory authorities. By contrast, larger pharmaceutical and bio-pharmaceutical companies often have substantial staff with extensive experience in conducting clinical trials with multiple product candidates across multiple indications. In addition, they may have greater financial resources to compete for the same clinical investigators and patients that we are attempting to recruit for our clinical trials. If potential competitors are successful in completing drug development for their product candidates and obtain approval from the FDA, they could limit the demand for PCM-075.

As a result, we may be at a competitive disadvantage that could delay the initiation, recruitment, timing, completion of our clinical trials and obtaining regulatory approvals, if at all, for our product candidate.

We, and our collaborators, must comply with extensive government regulations in order to advance our product candidate through the development process and ultimately obtain and maintain marketing approval for our products in the U.S. and abroad.

The product candidate that we, or our collaborators, are developing require regulatory approval to advance through clinical development and to ultimately be marketed and sold, and are subject to extensive and rigorous domestic and foreign government regulation. In the U.S., the FDA regulates, among other things, the development, testing, manufacture, safety, efficacy, record-keeping, labeling, storage, approval, advertising, promotion, sale and distribution of pharmaceutical and biopharmaceutical products. Our product candidate is also subject to similar regulation by foreign governments to the extent we seek to develop or market it in those countries. We, or our collaborators, must provide the FDA and foreign regulatory authorities, if applicable, with preclinical and clinical data, as well as data supporting an acceptable manufacturing process, that appropriately demonstrate our product candidate's safety and efficacy before it can be approved for the targeted indications. Our product candidate has not been approved for sale in the U.S. or any foreign market, and we cannot predict whether we or

our collaborators will obtain regulatory approval for any product candidates we are developing or plan to develop. The regulatory review and approval process can take many years, is dependent upon the type, complexity, novelty of, and medical need for the product candidate, requires the expenditure of substantial resources, and involves post-marketing surveillance and vigilance and ongoing requirements for post-marketing studies or Phase 4 clinical trials. In addition, we or our collaborators may encounter delays in, or fail to gain, regulatory approval for our product candidate based upon additional governmental regulation resulting from future legislative, administrative action or changes in FDA's or other similar foreign regulatory authorities' policy or interpretation during the period of product development. Delays or failures in obtaining regulatory approval to advance our product candidate through clinical development, and ultimately commercialize them, may:

- adversely impact our ability to raise sufficient capital to fund the development of our product candidate;
- adversely affect our ability to further develop or commercialize our product candidate;
- diminish any competitive advantages that we or our collaborators may have or attain; and
- adversely affect the receipt of potential milestone payments and royalties from the sale of our products or product revenues.

Furthermore, any regulatory approvals, if granted, may later be withdrawn. If we or our collaborators fail to comply with applicable regulatory requirements at any time, or if post-approval safety concerns arise, we or our collaborators may be subject to restrictions or a number of actions, including:

- delays, suspension or termination of clinical trials related to our products;
- refusal by regulatory authorities to review pending applications or supplements to approved applications;
- product recalls or seizures;
- suspension of manufacturing;
- withdrawals of previously approved marketing applications; and
- fines, civil penalties and criminal prosecutions.

Additionally, at any time we or our collaborators may voluntarily suspend or terminate the preclinical or clinical development of a product candidate, or withdraw any approved product from the market if we believe that it may pose an unacceptable safety risk to patients, or if the product candidate or approved product no longer meets our business objectives. The ability to develop or market a pharmaceutical product outside of the U.S. is contingent upon receiving appropriate authorization from the respective foreign regulatory authorities. Foreign regulatory approval processes typically include many, if not all, of the risks and requirements associated with the FDA regulatory process for drug development and may include additional risks.

We have limited experience in the development of therapeutic product candidates and therefore may encounter difficulties developing our product candidate or managing our operations in the future.

We have limited experience in the discovery, development and manufacturing of therapeutic compounds. In order to successfully develop our product candidate, we must continuously supplement our research, clinical development, regulatory, medicinal chemistry, virology and manufacturing capabilities through the addition of key employees, consultants or third-party contractors to provide certain capabilities and skill sets that we do not possess.

Furthermore, we have adopted an operating model that largely relies on the outsourcing of a number of responsibilities and key activities to third-party consultants, and contract research and manufacturing organizations in order to advance the development of our product candidate. Therefore, our success depends in part on our ability to retain highly qualified key management, personnel, and directors to develop, implement and execute our business strategy, operate the company and oversee the activities of our consultants and contractors, as well as academic and corporate advisors or consultants to assist us in this regard. We are currently highly dependent upon the efforts of our management team. In order to develop our product candidate, we need to retain or attract certain personnel, consultants or advisors with experience in drug development activities that include a number of disciplines, including research and development, clinical trials, medical matters, government regulation of pharmaceuticals, manufacturing, formulation and chemistry, business development, accounting, finance,

regulatory affairs, human resources and information systems. We are highly dependent upon our senior management and scientific staff, particularly William Welch, our Chief Executive Officer. The loss of services of Mr. Welch or one or more of our other members of senior management could delay or prevent the successful completion of our planned clinical trials or the commercialization of our product candidate.

Our success depends in part on our continued ability to attract, retain and motivate highly qualified management, clinical and scientific personnel and on our ability to develop and maintain important relationships with leading academic institutions, clinicians and scientists. The competition for qualified personnel in the biotechnology and pharmaceuticals field is intense. We will need to hire additional personnel as we expand our clinical development and commercial activities. While we have not had difficulties recruiting qualified individuals, to date, we may not be able to attract and retain quality personnel on acceptable terms given the competition for such personnel among biotechnology, pharmaceutical and other companies. Although we have not experienced material difficulties in retaining key personnel in the past, we may not be able to continue to do so in the future on acceptable terms, if at all. If we lose any key managers or employees, or are unable to attract and retain qualified key personnel, directors, advisors or consultants, the development of our product candidate could be delayed or terminated and our business may be harmed.

Clinical trials involve a lengthy and expensive process with an uncertain outcome, and results of earlier studies and trials may not be predictive of future trial results.

Our product candidate may not prove to be safe and efficacious in clinical trials and may not meet all the applicable regulatory requirements needed to receive regulatory approval. In order to receive regulatory approval for the commercialization of our product candidate, we must conduct, at our own expense, extensive preclinical testing and clinical trials to demonstrate safety and efficacy of our product candidate for the intended indication of use. Clinical testing is expensive, can take many years to complete, if at all, and its outcome is uncertain. Failure can occur at any time during the clinical trial process.

The results of preclinical studies and early clinical trials of new drugs do not necessarily predict the results of later-stage clinical trials. The design of our clinical trials is based on many assumptions about the expected effects of our product candidate, and if those assumptions are incorrect it may not produce statistically significant results. Preliminary results may not be confirmed on full analysis of the detailed results of an early clinical trial. Product candidates in later stages of clinical trials may fail to show safety and efficacy sufficient to support intended use claims despite having progressed through initial clinical testing. The data collected from clinical trials of our product candidates may not be sufficient to support the filing of an NDA or to obtain regulatory approval in the United States or elsewhere. Because of the uncertainties associated with drug development and regulatory approval, we cannot determine if or when we will have an approved product for commercialization or achieve sales or profits.

Delays in clinical testing could result in increased costs to us and delay our ability to generate revenue.

We may experience delays in clinical testing of our product candidate. We do not know whether planned clinical trials will begin on time, will need to be redesigned or will be completed on schedule, if at all. Clinical trials can be delayed for a variety of reasons, including delays in obtaining regulatory approval to commence a clinical trial, in securing clinical trial agreements with prospective sites with acceptable terms, in obtaining institutional review board approval to conduct a clinical trial at a prospective site, in recruiting patients to participate in a clinical trial or in obtaining sufficient supplies of clinical trial materials. Many factors affect patient enrollment, including the size of the patient population, the proximity of patients to clinical sites, the eligibility criteria for the clinical trial, competing clinical trials and new drugs approved for the conditions we are investigating. Clinical investigators will need to decide whether to offer their patients enrollment in clinical trials of our product candidate versus treating these patients with commercially available drugs that have established safety and efficacy profiles. Any delays in completing our clinical trials will increase our costs, slow down our product development, timeliness and approval process and delay our ability to generate revenue.

The regulatory approval processes of the FDA and comparable foreign authorities are lengthy, time consuming and inherently unpredictable, and if we are ultimately unable to obtain regulatory approval for our product candidate, our business will be substantially harmed.

The time required to obtain approval by the FDA and comparable foreign authorities is unpredictable but typically takes many years following the commencement of clinical trials and depends upon numerous factors, including the substantial discretion of the regulatory authorities. In addition, approval policies, regulations, or the type and amount of clinical data necessary to gain approval may change during the course of a product candidate's clinical development and may vary among jurisdictions. We have not obtained regulatory approval for any product candidate and it is possible that our existing product candidates or any product candidate we may seek to develop in the future will ever obtain regulatory approval.

Our product candidate could fail to receive regulatory approval for many reasons, including the following:

- the FDA or comparable foreign regulatory authorities may disagree with the design or implementation of our clinical trials;
- we may be unable to demonstrate to the satisfaction of the FDA or comparable foreign regulatory authorities that a product candidate is safe and effective for its proposed indication;
- the results of clinical trials may not meet the level of statistical significance required by the FDA or comparable foreign regulatory authorities for approval;
- the FDA or comparable foreign regulatory authorities may disagree with our interpretation of data from preclinical studies or clinical trials;
- the data collected from clinical trials of our product candidates may not be sufficient to support the submission of an NDA or other submission or to obtain regulatory approval in the United States or elsewhere;
- the FDA or comparable foreign regulatory authorities may fail to approve the manufacturing processes or facilities of third-party manufacturers with which we contract for clinical and commercial supplies;
- the FDA or comparable foreign regulatory authorities may fail to approve the companion diagnostics we contemplate developing with partners; and
- the approval policies or regulations of the FDA or comparable foreign regulatory authorities may significantly change in a manner rendering our clinical data insufficient for approval.

This lengthy approval process as well as the unpredictability of future clinical trial results may result in our failing to obtain regulatory approval to market our product candidate, which would significantly harm our business, results of operations and prospects.

In addition, even if we were to obtain approval, regulatory authorities may approve our product candidate for fewer or more limited indications than we request, may grant approval contingent on the performance of costly post-marketing clinical trials, or may approve a product candidate with a label that does not include the labeling claims necessary or desirable for the successful commercialization of that product candidate. Any of the foregoing scenarios could materially harm the commercial prospects for our product candidate.

We have not previously submitted a biologics license application, or BLA, or a New Drug Application, or NDA, to the FDA, or similar drug approval filings to comparable foreign authorities, for our product candidate, and we cannot be certain that our product candidate will be successful in clinical trials or receive regulatory approval. Further, our product candidate may not receive regulatory approval even if it is successful in clinical trials. If we do not receive regulatory approvals for our product candidate, we may not be able to continue our operations. Even if we successfully obtain regulatory approvals to market one or more of our product candidates, our revenues will be dependent, in part, upon our collaborators' ability to obtain regulatory approval of the companion diagnostics to be used with our product candidates, as well as the size of the markets in the territories for which we gain regulatory approval and have commercial rights. If the markets for patients that we are targeting for our product candidate are not as significant as we estimate, we may not generate significant revenues from sales of such products, if approved.

We plan to seek regulatory approval and to commercialize our product candidate, directly or with a collaborator, worldwide including the United States, the European Union and other additional foreign countries which we have not yet identified. While the scope of regulatory approval is similar in other countries, to obtain separate regulatory approval in many other countries we must comply with numerous and varying regulatory requirements of such countries regarding safety and efficacy and governing, among other things, clinical trials and commercial sales, pricing and distribution of our product candidates, and we cannot predict success in these jurisdictions.

We may be required to suspend or discontinue clinical trials due to unexpected side effects or other safety risks that could preclude approval of our product candidate.

Our clinical trials may be suspended at any time for a number of reasons. For example, we may voluntarily suspend or terminate our clinical trials if at any time we believe that they present an unacceptable risk to the clinical trial patients. In addition, the FDA or other regulatory agencies may order the temporary or permanent discontinuation of our clinical trials at any time if they believe that the clinical trials are not being conducted in accordance with applicable regulatory requirements or that they present an unacceptable safety risk to the clinical trial patients.

Administering our product candidate to humans may produce undesirable side effects. These side effects could interrupt, delay or halt clinical trials of our product candidates and could result in the FDA or other regulatory authorities denying further development or approval of our product candidate for any or all targeted indications. Ultimately, our product candidate may prove to be unsafe for human use. Moreover, we could be subject to significant liability if any volunteer or patient suffers, or appears to suffer, adverse health effects as a result of participating in our clinical trials.

If we fail to comply with healthcare regulations, we could face substantial enforcement actions, including civil and criminal penalties and our business, operations and financial condition could be adversely affected.

As a developer of pharmaceuticals, even though we do not intend to make referrals of healthcare services or bill directly to Medicare, Medicaid or other third-party payers, certain federal and state healthcare laws and regulations pertaining to fraud and abuse, false claims and patients' privacy rights are and will be applicable to our business. We could be subject to healthcare fraud and abuse laws and patient privacy laws of both the federal government and the states in which we conduct our business. The laws include:

- the federal healthcare program anti-kickback law, which prohibits, among other things, persons from soliciting, receiving or providing remuneration, directly or indirectly, to induce either the referral of an individual, for an item or service or the purchasing or ordering of a good or service, for which payment may be made under federal healthcare programs such as the Medicare and Medicaid programs;
- federal false claims laws which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment from Medicare, Medicaid, or other third-party payers that are false or fraudulent, and which may apply to entities like us which provide coding and billing information to customers;
- the federal Health Insurance Portability and Accountability Act of 1996, which prohibits executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters and which also imposes certain requirements relating to the privacy, security and transmission of individually identifiable health information;
- the Federal Food, Drug, and Cosmetic Act, which among other things, strictly regulates drug manufacturing and product marketing, prohibits manufacturers from marketing drug products for off-label use and regulates the distribution of drug samples; and
- state law equivalents of each of the above federal laws, such as anti-kickback and false claims laws which may apply to items or services reimbursed by any third-party payer, including commercial insurers, and state laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by federal laws, thus complicating compliance efforts.

If our operations are found to be in violation of any of the laws described above or any governmental regulations that apply to us, we may be subject to penalties, including civil and criminal penalties, damages, fines and the curtailment or restructuring of our operations. Any penalties, damages, fines, curtailment or restructuring of our operations could adversely affect our ability to operate our business and our financial results. Although compliance programs can mitigate the risk of investigation and prosecution for violations of these laws, the risks cannot be entirely eliminated. Any action against us for

violation of these laws, even if we successfully defend against it, could cause us to incur significant legal expenses and divert management's attention from the operation of our business. Moreover, achieving and sustaining compliance with applicable federal and state privacy, security and fraud laws may prove costly.

If we are unable to satisfy regulatory requirements, we may not be able to commercialize our product candidate.

We need FDA approval prior to marketing our product candidate in the United States. If we fail to obtain FDA approval to market our product candidate, we will be unable to sell our product candidate in the United States and we will not generate any revenue.

The FDA's review and approval process, including among other things, evaluation of preclinical studies and clinical trials of a product candidate as well as the manufacturing process and facility, is lengthy, expensive and uncertain. To receive approval, we must, among other things, demonstrate with substantial evidence from well-designed and well-controlled pre-clinical testing and clinical trials that the product candidate is both safe and effective for each indication for which approval is sought. Satisfaction of these requirements typically takes several years and the time needed to satisfy them may vary substantially, based on the type, complexity and novelty of the pharmaceutical product. We cannot predict if or when we will submit an NDA for approval for our product candidate currently under development. Any approvals we may obtain may not cover all of the clinical indications for which we are seeking approval or may contain significant limitations on the conditions of use.

The FDA has substantial discretion in the NDA review process and may either refuse to file our NDA for substantive review or may decide that our data is insufficient to support approval of our product candidate for the claimed intended uses. Following any regulatory approval of our product candidate, we will be subject to continuing regulatory obligations such as safety reporting, required and additional post marketing obligations, and regulatory oversight of promotion and marketing. Even if we receive regulatory approvals, the FDA may subsequently seek to withdraw approval of our NDA if we determine that new data or a reevaluation of existing data show the product is unsafe for use under the conditions of use upon the basis of which the NDA was approved, or based on new evidence of adverse effects or adverse clinical experience, or upon other new information. If the FDA does not file or approve our NDA or withdraws approval of our NDA, the FDA may require that we conduct additional clinical trials, preclinical or manufacturing studies and submit that data before it will reconsider our application. Depending on the extent of these or any other requested studies, approval of any applications that we submit may be delayed by several years, may require us to expend more resources than we have available, or may never be obtained at all.

We will also be subject to a wide variety of foreign regulations governing the development, manufacture and marketing of our products to the extent we seek regulatory approval to develop and market our product candidate in a foreign jurisdiction. As of the date hereof we have not identified any foreign jurisdictions which we intend to seek approval from. Whether or not FDA approval has been obtained, approval of a product by the comparable regulatory authorities of foreign countries must still be obtained prior to marketing the product in those countries. The approval process varies and the time needed to secure approval in any region such as the European Union or in a country with an independent review procedure may be longer or shorter than that required for FDA approval. We cannot assure you that clinical trials conducted in one country will be accepted by other countries or that an approval in one country or region will result in approval elsewhere.

If our product candidate is unable to compete effectively with marketed drugs targeting similar indications as our product candidate, our commercial opportunity will be reduced or eliminated.

We face competition generally from established pharmaceutical and biotechnology companies, as well as from academic institutions, government agencies and private and public research institutions. Many of our competitors have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved products than we do. Small or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large, established companies. Our commercial opportunity will be reduced or eliminated if our competitors develop and commercialize any drugs that are safer, more effective, have fewer side effects or are less expensive than our product candidate. These potential competitors compete with us in recruiting and retaining qualified scientific and management personnel, establishing clinical trial sites and patient enrollment for clinical trials, as well as in acquiring technologies and technology licenses complementary to our programs or advantageous to our business.

If approved and commercialized, PCM-075 would compete with several currently approved prescription therapies for the treatment of AML. To our knowledge, other potential competitors are in earlier stages of development. If potential competitors are successful in completing drug development for their product candidates and obtain approval from the FDA, they could limit the demand for PCM-075.

We expect that our ability to compete effectively will depend upon our ability to:

- successfully identify and develop key points of product differentiations from currently available therapies;
- successfully and rapidly complete clinical trials and submit for and obtain all requisite regulatory approvals in a cost-effective manner;
- maintain a proprietary position for our products and manufacturing processes and other related product technology;
- attract and retain key personnel;
- develop relationships with physicians prescribing these products; and
- build an adequate sales and marketing infrastructure for our product candidates.

Because we will be competing against significantly larger companies with established track records, we will have to demonstrate that, based on experience, clinical data, side-effect profiles and other factors, our products, if approved, are competitive with other products. If we are unable to compete effectively and differentiate our products from other marketed drugs, we may never generate meaningful revenue. If a competitor markets the same drug for the treatment of AML, before us, we may not receive orphan drug marketing exclusivity.

If the manufacturers upon whom we rely fail to produce our product candidate, in the volumes that we require on a timely basis, or fail to comply with stringent regulations applicable to pharmaceutical drug manufacturers, we may face delays in the development and commercialization of our product candidate.

We do not currently possess internal manufacturing capacity. We plan to utilize the services of contract manufacturers to manufacture our clinical supplies. Any curtailment in the availability of PCM-075, however, could result in production or other delays with consequent adverse effects on us. In addition, because regulatory authorities must generally approve raw material sources for pharmaceutical products, changes in raw material suppliers may result in production delays or higher raw material costs.

We continue to pursue active pharmaceutical ingredients, or API, and drug product supply agreements with other manufacturers. We may be required to agree to minimum volume requirements, exclusivity arrangements or other restrictions with the contract manufacturers. We may not be able to enter into long-term agreements on commercially reasonable terms, or at all. If we change or add manufacturers, the FDA and comparable foreign regulators may require approval of the changes. Approval of these changes could require new testing by the manufacturer and compliance inspections to ensure the manufacturer is conforming to all applicable laws and regulations and good manufacturing practices or GMP. In addition, the new manufacturers would have to be educated in or independently develop the processes necessary for the production of our product candidate.

The manufacture of pharmaceutical products requires significant expertise and capital investment, including the development of advanced manufacturing techniques and process controls. Manufacturers of pharmaceutical products may encounter difficulties in production, particularly in scaling up production. These problems include difficulties with production costs and yields, quality control, including stability of the product and quality assurance testing, shortages of qualified personnel, as well as compliance with federal, state and foreign regulations. In addition, any delay or interruption in the supply of clinical trial supplies could delay the completion of our clinical trials, increase the costs associated with conducting our clinical trials and, depending upon the period of delay, require us to commence new clinical trials at significant additional expense or to terminate a clinical trial.

We will be responsible for ensuring that each of our future contract manufacturers comply with the GMP requirements of the FDA and other regulatory authorities from which we seek to obtain product approval. These requirements include, among other things, quality control, quality assurance and the maintenance of records and documentation. The approval process for NDAs includes a review of the manufacturer's compliance with GMP requirements. We will be responsible for regularly assessing a contract manufacturer's compliance with GMP requirements through record reviews and periodic audits and for ensuring that the contract manufacturer takes responsibility and corrective action for any identified deviations. Manufacturers our product candidates may be unable to comply with these GMP requirements and with other FDA and foreign regulatory requirements, if any.

While we will oversee compliance by our contract manufacturers, ultimately we will not have control over our manufacturers' compliance with these regulations and standards. A failure to comply with these requirements may result in fines and civil penalties, suspension of production, suspension or delay in product approval, product seizure or recall, or withdrawal of product approval. If the safety of our product candidate is compromised due to a manufacturers' failure to adhere to applicable laws or for other reasons, we may not be able to obtain regulatory approval for or successfully commercialize our product candidates, and we may be held liable for any injuries sustained as a result. Any of these factors could cause a delay of clinical trials, regulatory submissions, approvals or commercialization of PCM-075 or other product candidates, entail higher costs or result in us being unable to effectively commercialize our product candidates. Furthermore, if our manufacturers fail to deliver the required commercial quantities on a timely basis and at commercially reasonable prices, we may be unable to meet demand for any approved products and would lose potential revenues.

We may not be able to manufacture our product candidate in commercial quantities, which would prevent us from commercializing our product candidate.

To date, our product candidate has been manufactured in small quantities for preclinical studies and clinical trials. If our product candidate is approved by the FDA or comparable regulatory authorities in other countries for commercial sale, we will need to manufacture such product candidate in larger quantities. We may not be able to increase successfully the manufacturing capacity for our product candidate in a timely or economic manner, or at all. Significant scale-up of manufacturing may require additional validation studies, which the FDA must review and approve. If we are unable to increase successfully the manufacturing capacity for a product candidate, the clinical trials as well as the regulatory approval or commercial launch of that product candidate may be delayed or there may be a shortage in supply. Our product candidate requires precise, high quality manufacturing. Our failure to achieve and maintain these high quality manufacturing standards in collaboration with our third-party manufacturers, including the incidence of manufacturing errors, could result in patient injury or death, product recalls or withdrawals, delays or failures in product testing or delivery, cost overruns or other problems that could harm our business, financial condition and results of operations.

Materials necessary to manufacture our product candidate may not be available on commercially reasonable terms, or at all, which may delay the development and commercialization of our product candidate.

We rely on Nerviano to purchase from third-party suppliers the materials necessary to produce bulk APIs, and product candidates for our clinical trials, and we will rely on such manufacturers to purchase such materials to produce the APIs and finished products for any commercial distribution of our products if we obtain marketing approval. Suppliers may not sell these materials to our manufacturers at the time they need them in order to meet our required delivery schedule or on commercially reasonable terms, if at all. We do not have any control over the process or timing of the acquisition of these materials by our manufacturers. Moreover, we currently do not have any agreements for the production of these materials. If our manufacturers are unable to obtain these materials for our clinical trials, testing of the affected product candidate would be delayed, which may significantly impact our ability to develop the product candidate. If we or our manufacturers are unable to purchase these materials after regulatory approval has been obtained for one of our products, the commercial launch of such product would be delayed or there would be a shortage in supply of such product, which would harm our ability to generate revenues from such product and achieve or sustain profitability.

Our product candidate, if approved for sale, may not gain acceptance among physicians, patients and the medical community, thereby limiting our potential to generate revenues.

If our product candidate is approved for commercial sale by the FDA or other regulatory authorities, the degree of market acceptance of any approved product by physicians, healthcare professionals and third-party payers and our profitability and growth will depend on a number of factors, including:

- demonstration of safety and efficacy;
- changes in the practice guidelines and the standard of care for the targeted indication;
- relative convenience and ease of administration;
- the prevalence and severity of any adverse side effects;
- budget impact of adoption of our product on relevant drug formularies and the availability, cost and potential advantages of alternative treatments, including less expensive generic drugs;

- pricing, reimbursement and cost effectiveness, which may be subject to regulatory control;
- effectiveness of our or any of our partners' sales and marketing strategies;
- the product labeling or product insert required by the FDA or regulatory authority in other countries; and
- the availability of adequate third-party insurance coverage or reimbursement.

If any product candidate that we develop does not provide a treatment regimen that is as beneficial as, or is perceived as being as beneficial as, the current standard of care or otherwise does not provide patient benefit, that product candidate, if approved for commercial sale by the FDA or other regulatory authorities, likely will not achieve market acceptance. Our ability to effectively promote and sell any approved products will also depend on pricing and cost-effectiveness, including our ability to produce a product at a competitive price and our ability to obtain sufficient third-party coverage or reimbursement. If any product candidate is approved but does not achieve an adequate level of acceptance by physicians, patients and third-party payers, our ability to generate revenues from that product would be substantially reduced. In addition, our efforts to educate the medical community and third-party payers on the benefits of our product candidates may require significant resources, may be constrained by FDA rules and policies on product promotion, and may never be successful.

Guidelines and recommendations published by various organizations can impact the use of our product.

Government agencies promulgate regulations and guidelines directly applicable to us and to our product. In addition, professional societies, practice management groups, private health and science foundations and organizations involved in various diseases from time to time may also publish guidelines or recommendations to the health care and patient communities. Recommendations of government agencies or these other groups or organizations may relate to such matters as usage, dosage, route of administration and use of concomitant therapies. Recommendations or guidelines suggesting the reduced use of our products or the use of competitive or alternative products that are followed by patients and health care providers could result in decreased use of our proposed product.

If third-party contract manufacturers upon whom we rely to formulate and manufacture our product candidate do not perform, fail to manufacture according to our specifications or fail to comply with strict regulations, our preclinical studies or clinical trials could be adversely affected and the development of our product candidate could be delayed or terminated or we could incur significant additional expenses.

We do not own or operate any manufacturing facilities. We intend to rely on third-party contractors, at least for the foreseeable future, to formulate and manufacture these preclinical and clinical materials. Our reliance on third-party contract manufacturers exposes us to a number of risks, any of which could delay or prevent the completion of our preclinical studies or clinical trials, or the regulatory approval or commercialization of our product candidate, result in higher costs, or deprive us of potential product revenues. Some of these risks include:

- our third-party contractors failing to develop an acceptable formulation to support later-stage clinical trials for, or the commercialization of, our product candidates;
- our contract manufacturers failing to manufacture our product candidate according to their own standards, our specifications, cGMPs, or otherwise manufacturing material that we or the FDA may deem to be unsuitable in our clinical trials;
- our contract manufacturers being unable to increase the scale of, increase the capacity for, or reformulate the form of our product candidate. We may experience a shortage in supply, or the cost to manufacture our products may increase to the point where it adversely affects the cost of our product candidate. We cannot assure you that our contract manufacturers will be able to manufacture our products at a suitable scale, or we will be able to find alternative manufacturers acceptable to us that can do so;
- our contract manufacturers placing a priority on the manufacture of their own products, or other customers' products;
- our contract manufacturers failing to perform as agreed or not remain in the contract manufacturing business; and
- our contract manufacturers' plants being closed as a result of regulatory sanctions or a natural disaster.

Manufacturers of pharmaceutical products are subject to ongoing periodic inspections by the FDA, the U.S. Drug Enforcement Administration (“DEA”) and corresponding state and foreign agencies to ensure strict compliance with FDA-mandated current good marketing practices or cGMPs, other government regulations and corresponding foreign standards. While we are obligated to audit their performance, we do not have control over our third-party contract manufacturers’ compliance with these regulations and standards. Failure by our third-party manufacturers, or us, to comply with applicable regulations could result in sanctions being imposed on us or the drug manufacturer from the production of other third-party products. These sanctions may include fines, injunctions, civil penalties, failure of the government to grant pre-market approval of drugs, delays, suspension or withdrawal of approvals, seizures or recalls of product, operating restrictions and criminal prosecutions, any of which could significantly and adversely affect our business.

In the event that we need to change our third-party contract manufacturers, our preclinical studies, clinical trials or the commercialization of our product candidate could be delayed, adversely affected or terminated, or such a change may result in significantly higher costs.

Due to regulatory restrictions inherent in an IND, NDA or BLA, various steps in the manufacture of our product candidate may need to be sole-sourced. In accordance with cGMPs, changing manufacturers may require the re-validation of manufacturing processes and procedures, and may require further preclinical studies or clinical trials to show comparability between the materials produced by different manufacturers. Changing our current or future contract manufacturers may be difficult for us and could be costly, which could result in our inability to manufacture our product candidate for an extended period of time and therefore a delay in the development of our product candidate. Further, in order to maintain our development time lines in the event of a change in our third-party contract manufacturer, we may incur significantly higher costs to manufacture our product candidate.

We do not currently have any internal drug discovery capabilities, and therefore we are dependent on in-licensing or acquiring development programs from third parties in order to obtain additional product candidates.

If in the future we decide to further expand our pipeline, we will be dependent on in-licensing or acquiring product candidates as we do not have significant internal discovery capabilities at this time. Accordingly, in order to generate and expand our development pipeline, we have relied, and will continue to rely, on obtaining discoveries, new technologies, intellectual property and product candidates from third-parties through sponsored research, in-licensing arrangements or acquisitions. We may face substantial competition from other biotechnology and pharmaceutical companies, many of which may have greater resources than we have, in obtaining these in-licensing, sponsored research or acquisition opportunities. Additional in-licensing or acquisition opportunities may not be available to us on terms we find acceptable, if at all. In-licensed compounds that appear promising in research or in preclinical studies may fail to progress into further preclinical studies or clinical trials.

If a product liability claim is successfully brought against us for uninsured liabilities, or such claim exceeds our insurance coverage, we could be forced to pay substantial damage awards that could materially harm our business.

The use of any of our existing or future product candidates in clinical trials and the sale of any approved pharmaceutical products may expose us to significant product liability claims. We currently do not have product liability insurance coverage for our proposed clinical trials but we intend to obtain such insurance. Such insurance coverage may not protect us against any or all of the product liability claims that may be brought against us in the future. We may not be able to acquire or maintain adequate product liability insurance coverage at a commercially reasonable cost or in sufficient amounts or scope to protect us against potential losses. In the event a product liability claim is brought against us, we may be required to pay legal and other expenses to defend the claim, as well as uncovered damage awards resulting from a claim brought successfully against us. In the event our product candidate is approved for sale by the FDA and commercialized, we may need to substantially increase the amount of our product liability coverage. Defending any product liability claim or claims could require us to expend significant financial and managerial resources, which could have an adverse effect on our business.

If we materially breach or default under the Nerviano Agreements, Nerviano will have the right to terminate the agreement and we could lose critical license rights, which would materially harm our business.

Our business is substantially dependent upon certain intellectual property rights that we license from Nerviano. Therefore, our commercial success will depend to a large extent on our ability to maintain and comply with our obligations under the Agreement. The Agreement provides the right to terminate if the Agreement for an uncured breach by us, or if we are insolvent or the subject of a bankruptcy proceeding, or potentially other reasons. We expect that other technology in-licenses that we may enter into in the future will contain similar provisions and impose similar obligations on us. If we fail to

comply with any such obligations such licensor will likely terminate their out-licenses to us, in which case we would not be able to market products covered by these licenses, including our PCM-075 asset. The loss of our license with Nerviano with respect to the PCM-075, and potentially other licenses that we enter into in the future, would have a material adverse effect on our business. In addition, our failure to comply with obligations under our material in-licenses may cause us to become subject to litigation or other potential disputes under any such license agreements.

In addition, the Nerviano Agreement requires us to make certain payments, including license fees, milestone payments royalties, and other such terms typically required under licensing agreements and these types of technology in-licenses generally could make it difficult for us to find corporate partners and less profitable for us to develop product candidates utilizing these existing product candidates and technologies.

We may delay or terminate the development of a product candidate at any time if we believe the perceived market or commercial opportunity does not justify further investment, which could materially harm our business.

Even though the results of preclinical studies and clinical trials that have been conducted or may conduct in the future may support further development of our product candidate, we may delay, suspend or terminate the future development of a product candidate at any time for strategic, business, financial or other reasons, including the determination or belief that the emerging profile of the product candidate is such that it may not receive FDA approval, gain meaningful market acceptance, generate a significant return to shareholders, or otherwise provide any competitive advantages in its intended indication or market.

We depend upon our officers and other key employees, and if we are not able to retain them or recruit additional qualified personnel, the commercialization of our product candidates and any future tests that we develop could be delayed or negatively impacted.

Our success is largely dependent upon the continued contributions of our officers, especially William J. Welch, our Chief Executive Officer, and other key employees. Our success also depends in part on our ability to attract and retain highly qualified scientific, commercial and administrative personnel. The specialized nature of our industry results in an inherent scarcity of experienced personnel in the field and, in order to pursue our test development and commercialization strategies, we will need to attract, hire and retain, or engage as consultants, additional personnel with specialized experience in a number of disciplines, including assay development, bioinformatics and statistics, laboratory and clinical operations, clinical affairs and studies, government regulation, sales and marketing, billing and reimbursement and information systems. Additionally, there is intense competition for personnel in the fields in which we operate. If we are unable to attract new employees and retain existing employees, the development and commercialization of our product candidates and any tests we may develop in the future could be delayed or negatively impacted.

We will need to increase the size of our organization, and we may experience difficulties in managing growth.

We are a small company with 17 full-time employees as of December 31, 2017. Future growth of our company will impose significant additional responsibilities on members of management, including the need to identify, attract, retain, motivate and integrate highly skilled personnel. We may increase the number of employees in the future depending on the progress of our development of our product candidates and our cell-free molecular diagnostic technology. Our future financial performance and our ability to commercialize our product candidates and cell-free molecular diagnostic tests and to compete effectively will depend, in part, on our ability to manage any future growth effectively. To that end, we must be able to:

- manage our clinical studies effectively;
- integrate additional management, administrative, manufacturing and regulatory personnel;
- maintain sufficient administrative, accounting and management information systems and controls; and
- hire and train additional qualified personnel.

There is no guarantee that we will be able to accomplish these tasks, and our failure to accomplish any of them could materially adversely affect our business, prospects and financial condition.

All of our diagnostic technology and services are performed at a single laboratory, and in the event this facility is affected by a termination of the lease or a man-made or natural disaster, our operations could be severely impaired.

We are performing all of our diagnostic services in our laboratory located in San Diego, California. Despite precautions taken by us, any future natural or man-made disaster at this laboratory, such as a fire, flood, earthquake or terrorist act, could cause substantial delays in our operations, damage or destroy our equipment and urine samples or cause us to incur additional expenses.

In addition, we are leasing the facilities where our laboratory operates. We are currently in compliance with all of our lease obligations, but should the lease terminate for any reason, or if the laboratory is moved due to conditions outside of our control, it could cause substantial delay in our diagnostics operations, damage or destroy our equipment and biological samples or cause us to incur additional expenses. In the event of an extended shutdown of our laboratory, we may be unable to perform our services in a timely manner or at all and therefore would be unable to operate in a commercially competitive manner. This could materially adversely affect our operating results and financial condition.

Further, if we have to use a substitute laboratory while our facility is closed, we could only use another facility with established state licensure and accreditation under CLIA. We may not be able to find another CLIA-certified facility and comply with applicable procedures, or find any such laboratory that would be willing to perform the tests for us on commercially reasonable terms. Additionally, any new laboratory opened by us would be subject to certification under CLIA and licensure by various states, which would take a significant amount of time and expense and result in delays in our ability to continue our personalized medicine services operations.

Security threats to our information technology infrastructure and/or our physical buildings could expose us to liability and damage our reputation and business.

It is essential to our business strategy that our technology and network infrastructure and our physical buildings remain secure and are perceived by our customers and corporate partners to be secure. Despite security measures, however, any network infrastructure may be vulnerable to cyber-attacks by hackers and other security threats. We may face cyber-attacks that attempt to penetrate our network security, sabotage or otherwise disable our research, products and services, misappropriate our or our customers' and partners' proprietary information, which may include personally identifiable information, or cause interruptions of our internal systems and services. Despite security measures, we also cannot guarantee security of our physical buildings. Physical building penetration or any cyber-attacks could negatively affect our reputation, damage our network infrastructure and our ability to deploy our products and services, harm our relationship with customers and partners that are affected, and expose us to financial liability.

Additionally, there are a number of state, federal and international laws protecting the privacy and security of health information and personal data. For example, the Health Insurance Portability and Accountability Act, or HIPAA, imposes limitations on the use and disclosure of an individual's healthcare information by healthcare providers, healthcare clearinghouses, and health insurance plans, or, collectively, covered entities, and also grants individuals rights with respect to their health information. HIPAA also imposes compliance obligations and corresponding penalties for non-compliance on individuals and entities that provide services to healthcare providers and other covered entities. As part of the American Recovery and Reinvestment Act of 2009, or ARRA, the privacy and security provisions of HIPAA were amended. ARRA also made significant increases in the penalties for improper use or disclosure of an individual's health information under HIPAA and extended enforcement authority to state attorneys general. As amended by ARRA and subsequently by the final omnibus rule adopted in 2013, HIPAA also imposes notification requirements on covered entities in the event that certain health information has been inappropriately accessed or disclosed: notification requirements to individuals, federal regulators, and in some cases, notification to local and national media. Notification is not required under HIPAA if the health information that is improperly used or disclosed is deemed secured in accordance with encryption or other standards developed by the U.S. Department of Health and Human Services. Most states have laws requiring notification of affected individuals and/or state regulators in the event of a breach of personal information, which is a broader class of information than the health information protected by HIPAA. Many state laws impose significant data security requirements, such as encryption or mandatory contractual terms, to ensure ongoing protection of personal information. Activities outside of the U.S. implicate local and national data protection standards, impose additional compliance requirements and generate additional risks of enforcement for non-compliance. We may be required to expend significant capital and other resources to ensure ongoing compliance with applicable privacy and data security laws, to protect against security breaches and hackers or to alleviate problems caused by such breaches.

General economic or business conditions may have a negative impact on our business.

Continuing concerns over U.S. health care reform legislation and energy costs, geopolitical issues, the availability and cost of credit and government stimulus programs in the U.S. and other countries have contributed to increased volatility and diminished expectations for the global economy. If the economic climate does not improve, or if it deteriorates, our business,

including our access to patient samples and the addressable market for tests that we may successfully develop, as well as the financial condition of our suppliers and our third-party payors, could be negatively impacted, which could materially adversely affect our business, prospects and financial condition.

We incur significant costs as a result of operating as a public company and our management expects to continue to devote substantial time to public company compliance programs.

As a public company, we incur significant legal, accounting and other expenses due to our compliance with regulations and disclosure obligations applicable to us, including compliance with the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act, as well as rules implemented by the Securities and Exchange Commission, or the SEC, and the Nasdaq Stock Market LLC. The SEC and other regulators have continued to adopt new rules and regulations and make additional changes to existing regulations that require our compliance. For example, in July 2010, the Dodd-Frank Wall Street Reform and Consumer Protection Act, or the Dodd-Frank Act, was enacted. There is significant corporate governance and executive compensation related provisions in the Dodd-Frank Act that have required the SEC to adopt additional rules and regulations in these areas. Stockholder activism, the current political environment and the current high level of government intervention and regulatory reform may lead to substantial new regulations and disclosure obligations, which may lead to additional compliance costs and impact (in ways we cannot currently anticipate) the manner in which we operate our business. Our management and other personnel devote a substantial amount of time to these compliance programs and monitoring of public company reporting obligations and, as a result of the new corporate governance and executive compensation related rules, regulations and guidelines prompted by the Dodd-Frank Act and further regulations and disclosure obligations expected in the future, we will likely need to devote additional time and costs to comply with such compliance programs and rules. These rules and regulations will continue to cause us to incur significant legal and financial compliance costs and will make some activities more time-consuming and costly.

We may become subject to federal and state tax assessments, penalties and interest with respect to past compensation paid to certain of our executives.

During our internal review process, contingencies were identified regarding various federal and state tax exposures with respect to past compensation paid to certain of our executives. We have not recorded any accrued liabilities related to the potential federal and state tax exposure. If we become subject to any material tax assessment, penalties and interest by federal and state tax authorities in the future, our results of operations, financial performance and cash flows could be materially adversely affected.

Complying with numerous regulations pertaining to our business is an expensive and time-consuming process, and any failure to comply could result in substantial penalties.

The establishment and operation of our laboratory is subject to regulation by numerous federal, state and local governmental authorities in the U.S. Our laboratory holds a CLIA certificate of compliance and is licensed by every state (other than the State of New York) and the District of Columbia, as required, which enables us to provide testing services to residents of almost every state. Failure to comply with state regulations or changes in state regulatory requirements could result in a substantial curtailment or even prohibition of the operations of our laboratory and could materially adversely affect our business. CLIA is a federal law that regulates clinical laboratories that perform testing on human specimens for the purpose of providing information for the diagnosis, prevention or treatment of disease. To renew CLIA certification, laboratories are subject to survey and inspection every two years. Moreover, CLIA inspectors may make unannounced inspections of these laboratories. If we were to lose our CLIA certification or our state licenses, whether as a result of a revocation, suspension or limitation of our license, we would no longer be able to continue our testing operations, which would materially adversely affect our business, prospects and financial condition. Potential sanctions for violations of these statutes and regulations also include significant fines, the suspension or loss of various licenses, certificates and authorizations, or product suspension or recalls.

We are subject to other regulation in the United States by both the federal government and the states in which we conduct our business, as well as in other jurisdictions outside of the United States, including:

- Medicare billing and payment regulations applicable to clinical laboratories;
- the Federal Anti-kickback Law and state anti-kickback prohibitions;
- the Federal physician self-referral prohibition, commonly known as the Stark Law, and the state equivalents;

- the Federal Health Insurance Portability and Accountability Act of 1996;
- the Medicare civil money penalty and exclusion requirements;
- the Federal False Claims Act civil and criminal penalties and state equivalents; and
- the Foreign Corrupt Practices Act, the United Kingdom Anti-bribery Act and the European Data Protection Directive, all of which apply to our international activities.

We have adopted policies and procedures designed to comply with these laws. In the ordinary course of our business, we conduct internal reviews of our compliance with these laws. Our compliance is also subject to governmental review. The growth of our business and our expansion outside of the United States may increase the potential of violating these laws or our internal policies and procedures. The risk of our being found in violation of these or other laws and regulations is further increased by the fact that many of them have not been fully interpreted by the regulatory authorities or the courts, and their provisions are open to a variety of interpretations. Any action brought against us for violation of these or other laws or regulations, even if we successfully defend against it, could cause us to incur significant legal expenses and divert our management's attention from the operation of our business. If our operations are found to be in violation of any of these laws and regulations, we may be subject to any applicable penalty associated with the violation, including civil and criminal penalties, damages and fines, we could be required to refund payments received by us, and we could be required to curtail or cease our operations. Any of the foregoing consequences could seriously harm our business and our financial results.

If we use biological and hazardous materials in a manner that causes injury, we could be liable for damages.

Our activities currently require the controlled use of potentially harmful biological materials and chemicals. We cannot eliminate the risk of accidental contamination or injury to employees or third parties from the use, storage, handling or disposal of these materials. In the event of contamination or injury, we could be held liable for any resulting damages, and any liability could exceed our resources or any applicable insurance coverage we may have. Additionally, we are subject to, on an ongoing basis, federal, state and local laws and regulations governing the use, storage, handling and disposal of these materials and specified waste products. The cost of compliance with these laws and regulations may become significant and could materially adversely affect our business, prospects and financial condition. Moreover, in the event of an accident or if we otherwise fail to comply with applicable regulations, we could lose our permits or approvals or be held liable for damages or penalized with fines.

Health care reform measures could adversely affect our business.

In the United States and foreign jurisdictions, there have been, and continue to be, a number of legislative and regulatory changes and proposed changes to the healthcare system that could affect our future results of operations. In particular, there have been and continue to be a number of initiatives at the U.S. federal and state levels that seek to reduce healthcare costs. In 2010, the PPACA was enacted, which includes measures to significantly change the way health care is financed by both governmental and private insurers. Among the provisions of the PPACA of greatest importance to the pharmaceutical and biotechnology industry are the following:

- an annual, nondeductible fee on any entity that manufactures or imports certain branded prescription drugs and biologic agents, apportioned among these entities according to their market share in certain government healthcare programs;
- implementation of the federal physician payment transparency requirements, sometimes referred to as the "Physician Payments Sunshine Act";
- a licensure framework for follow-on biologic products;
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research;
- establishment of a Center for Medicare Innovation at the Centers for Medicare & Medicaid Services to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending;

- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program, to 23.1% and 13% of the average manufacturer price for most branded and generic drugs, respectively and capped the total rebate amount for innovator drugs at 100% of the Average Manufacturer Price, or AMP;
- a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for certain drugs and biologics, including our product candidates, that are inhaled, infused, instilled, implanted or injected;
- extension of manufacturers' Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations;
- expansion of eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to additional individuals and by adding new mandatory eligibility categories for individuals with income at or below 133% of the federal poverty level, thereby potentially increasing manufacturers' Medicaid rebate liability;
- a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D; and
- expansion of the entities eligible for discounts under the Public Health program.

Some of the provisions of the PPACA have yet to be implemented, and there have been legal and political challenges to certain aspects of the PPACA. Since January 2017, President Trump has signed two executive orders and other directives designed to delay, circumvent, or loosen certain requirements mandated by the PPACA. Concurrently, Congress has considered legislation that would repeal or repeal and replace all or part of the PPACA. While Congress has not passed repeal legislation, the Tax Cuts and Jobs Act of 2017 includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the PPACA on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate". Congress may consider other legislation to repeal or replace elements of the PPACA.

Many of the details regarding the implementation of the PPACA are yet to be determined, and at this time, the full effect that the PPACA would have on our business remains unclear. In particular, there is uncertainty surrounding the applicability of the biosimilars provisions under the PPACA to our product candidates. The FDA has issued several guidance documents, but no implementing regulations, on biosimilars. A number of biosimilar applications have been approved over the past few years. It is not certain that we will receive 12 years of biologics marketing exclusivity for any of our products. The regulations that are ultimately promulgated and their implementation are likely to have considerable impact on the way we conduct our business and may require us to change current strategies. A biosimilar is a biological product that is highly similar to an approved drug notwithstanding minor differences in clinically inactive components, and for which there are no clinically meaningful differences between the biological product and the approved drug in terms of the safety, purity, and potency of the product.

Individual states have become increasingly aggressive in passing legislation and implementing regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access, and marketing cost disclosure and transparency measures, and to encourage importation from other countries and bulk purchasing. Legally mandated price controls on payment amounts by third-party payors or other restrictions could harm our business, results of operations, financial condition and prospects. In addition, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine what pharmaceutical products and which suppliers will be included in their prescription drug and other healthcare programs. This could reduce ultimate demand for our products or put pressure on our product pricing, which could negatively affect our business, results of operations, financial condition and prospects.

In addition, given recent federal and state government initiatives directed at lowering the total cost of healthcare, Congress and state legislatures will likely continue to focus on healthcare reform, the cost of prescription drugs and biologics and the reform of the Medicare and Medicaid programs. While we cannot predict the full outcome of any such legislation, it may result in decreased reimbursement for drugs and biologics, which may further exacerbate industry-wide pressure to reduce prescription drug prices. This could harm our ability to generate revenues. Increases in importation or re-importation of pharmaceutical products from foreign countries into the United States could put competitive pressure on our ability to profitably price our products, which, in turn, could adversely affect our business, results of operations, financial condition and

prospects. We might elect not to seek approval for or market our products in foreign jurisdictions in order to minimize the risk of re-importation, which could also reduce the revenue we generate from our product sales. It is also possible that other legislative proposals having similar effects will be adopted.

Furthermore, regulatory authorities' assessment of the data and results required to demonstrate safety and efficacy can change over time and can be affected by many factors, such as the emergence of new information, including on other products, changing policies and agency funding, staffing and leadership. We cannot be sure whether future changes to the regulatory environment will be favorable or unfavorable to our business prospects. For example, average review times at the FDA for marketing approval applications can be affected by a variety of factors, including budget and funding levels and statutory, regulatory and policy changes.

Risks Related to Our Intellectual Property

If we are unable to protect our intellectual property effectively, we may be unable to prevent third parties from using our technologies, which would impair our competitive advantage.

We rely on patent protection as well as a combination of trademark, copyright and trade secret protection, and other contractual restrictions, to protect our proprietary technologies, all of which provide limited protection and may not adequately protect our rights or permit us to gain or keep any competitive advantage. We may not be successful in defending challenges made in connection with our patents and patent applications. If we fail to protect our intellectual property, we will be unable to prevent third parties from using our technologies and they will be able to compete more effectively against us.

In addition to our patents, we rely on contractual restrictions to protect our proprietary technology. We require our employees and third parties to sign confidentiality agreements and our employees are also required to sign agreements assigning to us all intellectual property arising from their work for us. Nevertheless, we cannot guarantee that these measures will be effective in protecting our intellectual property rights. Any failure to protect our intellectual property rights could materially adversely affect our business, prospects and financial condition.

Our currently pending or future patent applications may not result in issued patents and any patents issued to us may be challenged, invalidated or held unenforceable. Furthermore, we cannot be certain that we were the first to make the invention claimed in our issued patents or pending patent applications in the U.S., or that we were the first to file for protection of the inventions claimed in our foreign issued patents or pending patent applications. In addition, there are numerous recent changes to the patent laws and proposed changes to the rules of the U.S. Patent and Trademark Office, or the PTO, which may have a significant impact on our ability to protect our technology and enforce our intellectual property rights. For example, in September 2011, the U.S. enacted sweeping changes to the U.S. patent system under the Leahy-Smith America Invents Act, including changes that would transition the U.S. from a "first-to-invent" system to a "first-to-file" system and alter the processes for challenging issued patents. These changes could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents. In addition, we may become subject to interference proceedings conducted in the patent and trademark offices of various countries to determine our entitlement to patents, and these proceedings may conclude that other patents or patent applications have priority over our patents or patent applications. It is also possible that a competitor may successfully challenge our patents through various proceedings and those challenges may result in the elimination or narrowing of our patents, and therefore reduce our patent protection. Accordingly, rights under any of our issued patents, patent applications or future patents may not provide us with commercially meaningful protection for our products or afford us a commercial advantage against our competitors or their competitive products or processes.

The patents issued to us may not be broad enough to provide any meaningful protection, one or more of our competitors may develop more effective technologies, designs or methods without infringing our intellectual property rights and one or more of our competitors may design around our proprietary technologies.

If we are not able to protect our proprietary technology, trade secrets and know-how, our competitors may use our inventions to develop competing products. We own certain patents relating to our cell-free molecular diagnostic technology. However, these patents may not protect us against our competitors, and patent litigation is very expensive. We may not have sufficient cash available to pursue any patent litigation to its conclusion because we currently do not generate revenues other than licensing, milestone and royalty income.

We cannot rely solely on our current patents to be successful. The standards that the PTO and foreign patent offices use to grant patents, and the standards that U.S. and foreign courts use to interpret patents, are not the same, are not always applied predictably or uniformly and can change, particularly as new technologies develop. As such, the degree of patent

protection obtained in the U.S. may differ substantially from that obtained in various foreign countries. In some instances, patents have been issued in the U.S. while substantially less or no protection has been obtained in Europe or other countries.

We cannot be certain of the level of protection, if any, that will be provided by our patents if they are challenged in court, where our competitors may raise defenses such as invalidity, unenforceability or possession of a valid license. In addition, the type and extent of any patent claims that may be issued to us in the future are uncertain. Any patents that are issued may not contain claims that will permit us to stop competitors from using similar technology.

We may incur substantial costs as a result of litigation or other proceedings relating to patent and other intellectual property rights and we may be unable to protect our rights to, or use, our cell-free molecular diagnostic technology.

Third parties may challenge the validity of our patents and other intellectual property rights, resulting in costly litigation or other time-consuming and expensive proceedings, which could deprive us of valuable rights. If we become involved in any intellectual property litigation, interference or other judicial or administrative proceedings, we will incur substantial expenses and the attention of our technical and management personnel will be diverted. An adverse determination may subject us to significant liabilities or require us to seek licenses that may not be available from third parties on commercially favorable terms, if at all. Further, if such claims are proven valid, through litigation or otherwise, we may be required to pay substantial monetary damages, which can be tripled if the infringement is deemed willful, or be required to discontinue or significantly delay development, marketing, selling and licensing of the affected products and intellectual property rights. In our European patent that covers using microRNAs to detect in vivo cell death, an anonymous third party has recently filed an opposition against the claims in the patent. Oppositions against the patentability of claims in a European patent are considered by a panel of examiners at the European Patent Office, and we are considering the full range of options available for defending against the opposition.

Our competitors may have filed, and may in the future file, patent applications covering technology similar to ours. Any such patent application may have priority over our patent applications and could further require us to obtain rights to issued patents covering such technologies. There may be third-party patents, patent applications and other intellectual property relevant to our potential products that may block or compete with our potential products or processes. If another party has filed a U.S. patent application on inventions similar to ours, we may have to participate in an interference proceeding declared by the PTO to determine priority of invention in the U.S. The costs of these proceedings could be substantial, and it is possible that such efforts would be unsuccessful, resulting in a loss of our U.S. patent position with respect to such inventions. In addition, we cannot assure you that we would prevail in any of these suits or that the damages or other remedies that we are ordered to pay, if any, would not be substantial. Claims of intellectual property infringement may require us to enter into royalty or license agreements with third parties that may not be available on acceptable terms, if at all. We may also be subject to injunctions against the further development and use of our technology, which could materially adversely affect our business, prospects and financial condition.

Some of our competitors may be able to sustain the costs of complex patent litigation more effectively than we can because they have substantially greater resources. In addition, any uncertainties resulting from the initiation and continuation of any litigation could materially adversely affect our ability to raise the funds necessary to continue our operations.

Certain rights that we in-license from third-parties are not within our control, and we may be negatively impacted if we lose those rights.

We license some of the technology that is necessary for our products and services from third. In connection with such in-licenses, we may agree to pay the licensor royalties based on sales of our products, which become a cost of product revenues and impact the margins on our products and services. We may need to in-license other technologies in the future to commercialize on our products and services. We may also need to negotiate licenses after launching our products and services. Our business may suffer if any such licenses terminate, if the licensors fail to abide by the terms of the license, if the licensed patents or other rights are found to be invalid, or if we are unable to enter into necessary licenses on acceptable terms

Risks Related to Ownership of Our Common Stock

If we discover material weaknesses and other deficiencies in our internal control and accounting procedures, our stock price could decline significantly and raising capital could be more difficult.

If we fail to comply with the rules under the Sarbanes-Oxley Act, related to disclosure controls and procedures, or if we discover additional material weaknesses and other deficiencies in our internal control and accounting procedures, our stock price could decline significantly and raising capital could be more difficult. Moreover, effective internal controls are necessary

for us to produce reliable financial reports and are important in helping prevent financial fraud. If we cannot provide reliable financial reports or prevent fraud, our business and operating results could be harmed, investors could lose confidence in our reported financial information, and the trading price of our common stock could drop significantly. We previously identified a material weakness in our internal control over financial reporting as of December 31, 2012, which was remedied in the year ended December 31, 2013. We cannot be certain that additional material weaknesses or significant deficiencies in our internal controls will not be discovered in the future.

Our ability to use our net operating loss carry-forwards and certain other tax attributes is limited by Sections 382 and 383 of the Internal Revenue Code.

Net operating loss carryforwards allow companies to use past year net operating losses to offset against future years' profits, if any, to reduce future tax liabilities. Sections 382 and 383 of the Internal Revenue Code of 1986 limit a corporation's ability to utilize its net operating loss carryforwards and certain other tax attributes (including research credits) to offset any future taxable income or tax if the corporation experiences a cumulative ownership change of more than 50% over any rolling three year period. State net operating loss carryforwards (and certain other tax attributes) may be similarly limited. An ownership change can therefore result in significantly greater tax liabilities than a corporation would incur in the absence of such a change and any increased liabilities could adversely affect the corporation's business, results of operations, financial condition and cash flow.

U.S. federal income tax reform could adversely affect us.

On December 22, 2017, President Trump signed into law the "Tax Cuts and Jobs Act" ("TCJA") that significantly reforms the Internal Revenue Code of 1986, as amended. The TCJA, among other things, includes changes to U.S. federal tax rates, imposes significant additional limitations on the deductibility of interest, allows for the expensing of capital expenditures, and puts into effect the migration from a "worldwide" system of taxation to a territorial system. We do not expect tax reform to have a material impact to our projection of minimal cash taxes or to our net operating losses. Our net deferred tax assets and liabilities will be revalued at the newly enacted U.S. corporate rate, and the impact will be recognized in our tax expense in the year of enactment with a corresponding adjustment to its valuation allowance for the period ended December 31, 2017. Further, any eligibility we may have or may someday have for tax credits associated with the qualified clinical testing expenses arising out of the development of orphan drugs will be reduced to 25% as a result of the TCJA; thus, our net future taxable income may be affected. We continue to examine the impact this tax reform legislation may have on our business. The impact of this tax reform on holders of our common stock is uncertain and could be adverse.

The rights of the holders of our common stock may be impaired by the potential issuance of preferred stock.

Our certificate of incorporation gives our board of directors the right to create one or more new series of preferred stock. As a result, the board of directors may, without stockholder approval, issue preferred stock with voting, dividend, conversion, liquidation or other rights that could adversely affect the voting power and equity interests of the holders of our common stock. Preferred stock, which could be issued with the right to more than one vote per share, could be used to discourage, delay or prevent a change of control of our company, which could materially adversely affect the price of our common stock. Without the consent of the holders of the outstanding shares of our Series A Convertible Preferred Stock, we may not adversely alter or change the rights of the holders of the Series A Convertible Preferred Stock or increase the number of authorized shares of Series A Convertible Preferred Stock, create a class of stock that is senior to or on parity with the Series A Convertible Preferred Stock, amend our certificate of incorporation in breach of these provisions or agree to any of the foregoing.

Our common stock price may be volatile and could fluctuate widely in price, which could result in substantial losses for investors.

The market price of our common stock historically has been, and we expect will continue to be, subject to significant fluctuations over short periods of time. For example, during the year ended December 31, 2017, the closing price of our common stock ranged from a low of \$0.25 to a high of \$2.40. These fluctuations may be due to various factors, many of which are beyond our control, including:

- technological innovations or new products and services introduced by us or our competitors;
- clinical trial results relating to our tests or those of our competitors;
- announcements or press releases relating to the industry or to our own business or prospects;

- coverage and reimbursement decisions by third party payors, such as Medicare and other managed care organizations;
- regulation and oversight of our product candidates and services, including by the FDA, Centers for Medicare & Medicaid Services and comparable foreign agencies;
- the establishment of partnerships with clinical reference laboratories;
- healthcare legislation;
- intellectual property disputes;
- additions or departures of key personnel;
- sales of our common stock;
- our ability to integrate operations, technology, products and services;
- our ability to execute our business plan;
- operating results below expectations;
- loss of any strategic relationship;
- industry developments;
- economic and other external factors; and
- period-to-period fluctuations in our financial results.

In addition, market fluctuations, as well as general political and economic conditions, could materially adversely affect the market price of our securities. Because we are a development stage company with no revenue from operations to date, other than licensing, milestone and royalty income, you should consider any one of these factors to be material. Our stock price may fluctuate widely as a result of any of the foregoing.

Because certain of our stockholders control a significant number of shares of our common stock, they may have effective control over actions requiring stockholder approval.

As of December 31, 2017, our directors, executive officers and principal stockholders, and their respective affiliates, beneficially owned approximately 9.0% of our outstanding shares of common stock. As a result, these stockholders, acting together, would have the ability to control the outcome of matters submitted to our stockholders for approval, including the election of directors and any merger, consolidation or sale of all or substantially all of our assets. In addition, these stockholders, acting together, would have the ability to control the management and affairs of our company. Accordingly, this concentration of ownership may harm the market price of our common stock by:

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

We have not paid dividends on our common stock in the past and do not expect to pay dividends on our common stock for the foreseeable future. Any return on investment may be limited to the value of our common stock.

We have never paid any cash dividends on our common stock. We expect that any income received from operations will be devoted to our future operations and growth. We do not expect to pay cash dividends on our common stock in the near future. Payment of dividends would depend upon our profitability at the time, cash available for those dividends, and other factors that our board of directors may consider relevant. If we do not pay dividends, our common stock may be less valuable because a return on an investor's investment will only occur if our stock price appreciates. In addition, under the terms of our Loan and Security Agreement and the Equipment Line of Credit, we are precluded from paying cash dividends without the prior written consent of the Lenders, and the terms of the Series A Convertible Preferred Stock prohibit us from paying dividends to the holders of our common stock so long as any dividends due on the Series A Convertible Preferred Stock remain unpaid. Investors in our common stock should not rely on an investment in our company if they require dividend income.

If securities or industry analysts do not publish research or reports about our business, or if they adversely change their recommendations regarding our stock, our stock price and trading volume could decline.

The trading market for our common stock will be influenced by the research and reports that industry or securities analysts publish about us or our business. If one or more of the analysts who cover us downgrade our stock or publish inaccurate or unfavorable research about our business, our stock price would likely decline. In addition, if our operating results fail to meet the forecast of analysts, our stock price would likely decline. If one or more of these analysts cease coverage of our company or fail to publish reports on us regularly, we could lose visibility in the financial markets, which in turn could cause our stock price or trading volume to decline.

Delaware law and our corporate charter and bylaws contain anti-takeover provisions that could delay or discourage takeover attempts that stockholders may consider favorable.

Provisions in our certificate of incorporation and bylaws may have the effect of delaying or preventing a change of control of our company or changes in our management. For example, our board of directors has the authority to issue up to 20,000,000 shares of preferred stock in one or more series and to fix the powers, preferences and rights of each series without stockholder approval. The ability to issue preferred stock could discourage unsolicited acquisition proposals or make it more difficult for a third party to gain control of our company, or otherwise could materially adversely affect the market price of our common stock.

Furthermore, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the General Corporation Law of the State of Delaware. This provision may prohibit or restrict large stockholders, in particular those owning 15% or more of our outstanding voting stock, from merging or combining with us, which could discourage potential takeover attempts, reduce the price that investors may be willing to pay for shares of our common stock in the future and result in our market price being lower than it would without these provisions.

A sale of a substantial number of shares of our common stock may cause the price of our common stock to decline and may impair our ability to raise capital in the future.

Our common stock is traded on The NASDAQ Capital Market and could be considered "thinly-traded," meaning that the number of investors interested in purchasing our common stock at or near bid prices at any given time may be relatively small or non-existent. Finance transactions resulting in a large amount of newly issued shares that become readily tradable, or other events that cause current stockholders to sell shares, could place downward pressure on the trading price of our common stock. In addition, the lack of a robust resale market may require a stockholder who desires to sell a large number of shares of common stock to sell the shares in increments over time to mitigate any adverse impact of the sales on the market price of our stock.

If our stockholders sell, or the market perceives that our stockholders may sell for various reasons, including the ending of restriction on resale, substantial amounts of our common stock in the public market, including shares issued upon the exercise of outstanding options or warrants, the market price of our common stock could fall. Sales of a substantial number of shares of our common stock may make it more difficult for us to sell equity or equity-related securities in the future at a time and price that we deem reasonable or appropriate.

We may be subject to stockholder litigation, thereby diverting our resources, which could materially adversely affect our profitability and results of operations.

The market for our common stock is characterized by significant price volatility, and we expect that our share price will continue to be at least as volatile for the indefinite future. In the past, plaintiffs have often initiated securities class action litigation against a company following periods of volatility in the market price for its securities. In addition, stockholders may bring actions against companies relating to past transactions or other matters. Any such actions could give rise to substantial damages and thereby materially adversely affect our consolidated financial position, liquidity or results of operations. Even if an action is not resolved against us, the uncertainty and expense associated with stockholder actions could materially adversely affect our business, prospects and financial condition. Litigation can be costly, time-consuming and disruptive to business operations. The defense of lawsuits could also result in diversion of our management's time and attention away from business operations, which could harm our business.

If we fail to comply with the continued minimum closing bid requirements of the Nasdaq Capital Market LLC ("Nasdaq") or other requirements for continued listing, our common stock may be delisted and the price of our common stock and our ability to access the capital markets could be negatively impacted.

On September 5, 2017, we received a written notice (the "Notice") from the Nasdaq Stock Market LLC ("Nasdaq") that we were not in compliance with Nasdaq Listing Rule 5550(a)(2), as the minimum bid price of our common stock has been below \$1.00 per share for 30 consecutive business days. The Notice had no immediate effect on the listing of our common stock, and our common stock continues to trade on the Nasdaq Capital Market under the symbol "TROV". In accordance with Nasdaq Listing Rule 5810(c)(3)(A), we have a period of 180 calendar days, or until March 5, 2018, to regain compliance with the minimum bid price requirement. To regain compliance, the closing bid price of our common stock must meet or exceed \$1.00 per share for at least 10 consecutive business days during this 180 calendar day period. In the event we do not regain compliance by March 5, 2018, we may be eligible for an additional 180 calendar day grace period if we meet the initial listing standards, with the exception of bid price, for the Nasdaq Capital Market, and we provide written notice to Nasdaq of our intention to cure the deficiency during the second compliance period, by effecting a reverse stock split, if necessary. If we do not regain compliance within the allotted compliance period(s), including any extensions that may be granted by Nasdaq or fail to comply with or other requirements for continued listing, our common stock may be delisted and the price of our common stock and our ability to access the capital markets could be negatively impacted. A delisting of our common stock from The Nasdaq Capital Market could materially reduce the liquidity of our common stock and result in a corresponding material reduction in the price of our common stock. In addition, delisting could harm our ability to raise capital through alternative financing sources on terms acceptable to us, or at all, and may result in the potential loss of confidence by investors, employees and fewer business development opportunities.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

We currently lease approximately 26,100 square feet of laboratory and office space for our headquarters in San Diego, California under a lease agreement, as amended from time to time, that expires in December 2021. We believe that our facilities are adequate for our needs for the immediate future and that, should it be needed, suitable additional space will be available to accommodate expansion of our operations on commercially reasonable terms.

ITEM 3. LEGAL PROCEEDINGS

From time to time, we may become involved in various lawsuits and legal proceedings that arise in the ordinary course of business. Litigation is subject to inherent uncertainties, and an adverse result in matters may arise from time to time that may harm our business. As of the date of this report, management believes that there are no claims against us, which it believes will result in a material adverse effect on our business or financial condition.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

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

Our common stock has traded on The NASDAQ Capital Market (“NASDAQ”) under the symbol “TROV” since May 30, 2012.

Our common stock was traded over the counter on the pink sheets under the symbol TROV.PK from June 15, 2007 until May 29, 2012. From July 27, 2004 until June 14, 2007, our common stock was quoted on the OTC Bulletin Board under the symbol “XNOM.OB”. Prior to July 27, 2004, our common stock was quoted on the OTC Bulletin Board under the symbol “UKAR.OB”, but never traded. The following table sets forth the range of high and low per share sales prices of our common stock during the periods indicated, as reported on NASDAQ.

	2017		2016	
	High	Low	High	Low
First Quarter	\$ 2.40	\$ 0.95	\$ 6.93	\$ 2.85
Second Quarter	\$ 1.45	\$ 0.61	\$ 6.67	\$ 3.31
Third Quarter	\$ 1.63	\$ 0.65	\$ 5.98	\$ 4.25
Fourth Quarter	\$ 1.08	\$ 0.24	\$ 4.75	\$ 1.78

The closing price of our common stock on NASDAQ on February 12, 2018 was \$0.36 per share.

Number of Stockholders

As of February 12, 2018, we had approximately 60 stockholders of record of our common stock.

Dividend Policy

Historically, we have not paid any dividends to the holders of shares of our common stock and we do not expect to pay any such dividends in the foreseeable future as we expect to retain our future earnings for use in the operation and expansion of our business. Pursuant to the terms of our outstanding shares of Series A Convertible Preferred Stock, dividends cannot be paid to the holders of shares of our common stock so long as any dividends due on the Series A Convertible Preferred Stock remain unpaid.

Securities Authorized for Issuance under Equity Compensation Plans

The following table summarizes information about our equity compensation plans as of December 31, 2017.

	Number of Shares of Common Stock to be Issued upon Exercise of Outstanding Options, Warrants and Rights	Weighted-Average Exercise Price of Outstanding Options, Warrants and Rights	Number of Options Remaining Available for Future Issuance Under Equity Compensation Plans (excluding securities reflected in column (a))
	(a)	(b)	(c)
Equity Compensation Plans Approved by Stockholders	5,710,611	\$ 3.15	3,436,788
Equity Compensation Plans Not Approved by Stockholders ⁽¹⁾	54,166	\$ 3.35	—
Total	5,764,777		3,436,788

(1) Represents the following options to purchase common stock granted on November 17, 2010: (i) an option to purchase 8,333 shares with an exercise price of \$3.00 per share, (ii) an option to purchase 33,333 shares with an exercise price of \$3.00 per share, and (iii) an option to purchase 12,500 shares with an exercise price of \$4.50 per share. All the options were vested in full on the date of grant and will expire on November 17, 2020.

ITEM 6. SELECTED FINANCIAL DATA

Not applicable.

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

Overview

We are a clinical-stage, precision medicine oncology therapeutics company. Our primary focus is to develop oncology therapeutics for improved cancer care and to optimize drug development by leveraging its proprietary PCM technology in tumor genomics.

Our lead drug candidate, PCM-075, is a PLK1 selective ATP competitive inhibitor. PCM-075 has shown preclinical antitumor activity as a single agent and synergy in combination with more than ten different chemotherapeutics and targeted therapies, such as Zytiga[®] (abiraterone acetate), Beleodaq[®] (belinostat), Quizartinib (AC220), a development stage FLT3 inhibitor, and Velcade[®] (bortezomib) in AML, mCRPC and other hematologic and solid tumor cancers.

On March 15, 2017, we announced the licensing of PCM-075, a PLK1 inhibitor, from Nerviano. PCM-075 was developed to have high selectivity to PLK1, to be administered orally, and to have a relatively short drug half-life of approximately 24 hours compared to other PLK inhibitors. PCM-075 has completed a safety study in patients with advanced metastatic solid tumors, has a phase 1b/2 clinical trial in patients with AML underway, and a Phase 2 clinical trial in mCRPC filed with FDA.

Our broad intellectual property and proprietary technology enables us to measure ctDNA in urine and blood to identify and quantify clinically actionable markers for predicting response to cancer therapies. We offer our PCM technology at our CLIA-certified/CAP-accredited laboratory and plan to continue to vertically integrate our PCM technology with the development of precision cancer therapeutics. We believe we have an opportunity to utilize precision diagnostics to improve treatment outcomes for cancer patients using our proprietary technology to detect clinically actionable mutations and monitor patient response to therapy.

We have significant experience and expertise with biomarkers and technology in cancer, including AML. We are one of the patent holders of NPM1 for diagnosis and monitoring of patients. NPM1-mutated AML is a genetic marker in leukemia and accounts for approximately one-third of all AML patients. We plan to use our PCM technology to profile other dominant AML markers, such as FLT3, DNMT3A, NRAS, and KIT, as well as to measure PLK1 enzymatic activity to potentially identify patients most likely to respond to PCM-075 and to measure patient therapy response.

Through December 31, 2017, our cumulative total deficit was \$173,046,186. To date, we have generated minimal revenues and expect to incur additional losses to perform further research and development activities and commercial expansion. During 2017, we advanced our business with the following activities:

- Activated the first two clinical trial sites for the Phase1b/2 multicenter trial of PCM-075 in patients with AML.
- Completed a public offering of 14,683,333 shares of common stock and common warrants to purchase up to 15,000,000 shares of common stock. The net proceeds from the public offering were approximately \$4.1 million in December 2017.
- Submitted protocol to FDA for Phase 2 Clinical Trial of PCM-075 in combination with Zytiga[®] (abiraterone acetate) for mCRPC.
- Announced the launch of NextCollect[™] urine collection and DNA preservation kit to research laboratories and pharmaceutical customers.
- Presented data showing sensitivity of TNBC cell lines to PCM-075 and Synergy with Zytiga[®] at San Antonio Breast Cancer Symposium.
- Announced preclinical research demonstrating synergy of PCM-075 with Zytiga[®] in Castration-Resistant Prostate Cancer tumor cells.

- Announced that the FDA granted Orphan Drug Designation to PCM-075 for the treatment of patients with AML.
- Announced the expansion and strengthening of our Board of Directors with the appointment of Athena Countouriotis, M.D. Dr. Countouriotis brings significant experience in oncology clinical development and orphan indications.
- Announced PCM-075 synergy with a HDAC Inhibitor in Non-Hodgkin Lymphoma Cell Lines. Additionally, PCM-075 demonstrates synergy in combination with more than ten chemotherapeutic and targeted therapies across a broad range of solid tumor and hematologic cancers.
- Announced preclinical AML data showing that PCM-075 significantly enhances the efficacy of a FLT3 inhibitor in combination therapy.
- Announced FDA approval of IND for Phase 1b/2 trial of PCM-075 in patients with AML.
- Announced peer-reviewed publication of first-in-human Phase 1 trial results with PCM-075 in the journal *Investigational New Drugs*. The data from the trial demonstrated PCM-075's potential as safe and effective treatment for solid tumor and hematological malignancies.
- Completed a registered direct offering of 6,191,500 shares of common stock and a concurrent private placement issuing warrants to purchase up to 4,643,626 shares of common stock. The net proceeds from the registered direct offering and concurrent private placement were approximately \$6.5 million in July 2017.
- Entered into an agreement with Novogene Co. Ltd. ("Novogene"), a leading global provider of genomic services and solutions and the largest sequencing capacity in the world, whereby Novogene will purchase NextCollect™, our proprietary urine collection and nucleic acid preservation device for validation in the Chinese market.
- Engaged PRA Health Sciences, a leading, global contract research organization, to conduct our Phase 1b/2 clinical trial of PCM-075.
- Executed a supplier agreement with NerPharMa, S.r.l., a pharmaceutical manufacturing company and a subsidiary of Nerviano Medical Sciences S.r.l., to manufacture drug product for PCM-075.
- Submitted an IND application to FDA to conduct a Phase 1b/2 clinical trial of PCM-075 in AML.
- Announced expansion of key claims for our NPM1 patent portfolio for AML.
- Entered into an agreement with a global biopharmaceutical company to utilize Trovera® ctDNA tests and services in cancer clinical trials.
- Entered into an agreement with AstraZeneca to utilize Trovera® ctDNA test and services in prospective biomarker study.
- Announced phase 1 safety study conducted by Nerviano Medical Sciences supports planned development of PCM-075 in AML.
- Entered into a license agreement with Nerviano that grants us exclusive global development and commercialization rights to NMS-1286937, which we refer to as PCM-075. PCM-075 is an oral, investigative drug and a highly-selective PLK 1 inhibitor for the treatment of AML.

Our drug development efforts are in their early stages, and we cannot make estimates of the costs or the time that our development efforts will take to complete, or the timing and amount of revenues related to the sale of our drugs. The risk of completion of any program is high because of the many uncertainties involved in developing new drug candidates to market, including the long duration of clinical testing, the specific performance of proposed products under stringent clinical trial protocols, extended regulatory approval and review cycles, our ability to raise additional capital, the nature and timing of research and development expenses, and competing technologies being developed by organizations with significantly greater resources.

Critical Accounting Policies

Financial Reporting Release No. 60 requires all companies to include a discussion of critical accounting policies or methods used in the preparation of financial statements. Our accounting policies are described in Item 8. Financial Statements—Note 2 *Basis of Presentation and Summary of Significant Accounting Policies* in this Annual Report on Form 10-K. The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of expenses during the reporting period. Actual results could differ from those estimates. We believe that the following discussion represents our critical accounting policies.

Revenue Recognition

Historically, our revenues have been generated from royalty, license and milestones related to agreements we have with other healthcare companies, medical laboratories and biotechnology partners. We also have revenues from our diagnostic services and clinical research services.

We recognize revenues when persuasive evidence that an arrangement exists, delivery has occurred, the price is fixed or determinable, and collection is reasonably assured.

Royalty and License Revenues

We license and sublicense our patent rights to healthcare companies, medical laboratories and biotechnology partners. These agreements may involve multiple elements such as license fees, royalties and milestone payments. Revenue is recognized when the criteria described above have been met as well as the following:

- Up-front nonrefundable license fees pursuant to agreements under which we have no continuing performance obligations are recognized as revenues on the effective date of the agreement and when collection is reasonably assured.
- Minimum royalties are recognized as earned, and royalties are earned based on the licensee's use. The Company is unable to predict licensee's sales and thus revenue is recognized upon receipt of notification from licensee and payment when collection is assured. Notification is generally one quarter in arrears.

Diagnostic Service Revenue

Diagnostic service revenue, which consists of fees for clinical laboratory tests may come from several sources, including commercial third-party payors, such as insurance companies and health maintenance organizations, government payors, such as Medicare and Medicaid in the U.S., patient self-pay and, in some cases, from hospitals or referring laboratories who, in turn, bill third-party payors for testing.

Diagnostic service revenue will be recognized when the criteria described above has been met as well as upon cash collection until we can reliably estimate the amount that will be ultimately collected for our LDTs, at which time we will recognize revenues on an accrual basis.

Clinical Research Services Revenue

Revenue from clinical research services consists primarily of revenue from the sale of urine and blood collection supplies under agreements with our clinical research and business development partners. Revenue is recognized when supplies are delivered.

Cost of Revenue

Cost of revenue represents the cost of materials, personnel costs and costs associated with processing specimens including pathological review, quality control analyses, and delivery charges necessary to render an individualized test result. Costs associated with performing tests are recorded as the tests are processed. However, the revenue on diagnostic services is recognized on a cash collection basis resulting in costs incurred before the collection of related revenue.

Derivative Financial Instruments—Warrants

Our derivative financial instruments—warrants liabilities are related to warrants issued in connection with financing transactions and are therefore not designated as hedging instruments. All derivatives are recorded on our consolidated balance sheet at fair value in accordance with current accounting guidelines for such complex financial instruments.

We have issued common stock warrants in connection with the execution of certain equity financings. Such warrants are classified as derivative liabilities under the provisions of the Financial Accounting Standards Board (“FASB”) Accounting Standards Codification (“ASC”) Topic 815, *Derivatives and Hedging* (“ASC 815”) or ASC 480 *Distinguishing Liabilities from Equity* (“ASC 480”) and are recorded at their fair market value as of each reporting period. Such warrants do not meet the exemption that a contract should not be considered a derivative instrument if it is (1) indexed to its own stock and (2) classified in stockholders’ equity. The warrants within the scope of ASC 480 contain a feature that could require the transfer of cash in the event a change of control occurs without an authorization of our Board of Directors, and therefore classified as a liability. Changes in fair value of derivative liabilities are recorded in the consolidated statement of operations under the caption “Gain (loss) from change in fair value of derivative financial instruments—warrants.”

The fair value of warrants is determined using the Black-Scholes option-pricing model using assumptions regarding volatility of our common stock price, remaining life of the warrant, and risk-free interest rates at each period end. Therefore we use model-derived valuations where inputs are observable in active markets to determine the fair value and accordingly classify such warrants in Level 3 per ASC Topic 820, *Fair Value Measurements and Disclosures* (“ASC 820”). At December 31, 2017 and 2016, the fair value of such warrants was \$649,387 and \$834,940, respectively, and was recorded as a liability under the caption “Derivative financial instruments—warrants” on the consolidated balance sheet.

Research and Development

Research and development expense, which includes expenditures in connection with an in-house research and development laboratory, salaries and staff costs, application and filing for regulatory approval of proposed products, regulatory and scientific consulting fees and clinical samples, as well as clinical collaborators and insurance, are accounted for in accordance with FASB ASC Topic 730-10-55-2, *Research and Development*. Also, as prescribed by this guidance, patent filing and maintenance expenses are considered legal in nature and therefore classified as general and administrative expense. We are providing the following summary of our research and development expense to supplement the more detailed discussions under “Results of Operations” below. Costs are not allocated to projects as the majority of the costs relate to employees and facilities costs and we do not track employees’ hours by project or allocate facilities costs on a project basis.

	For the years ended December 31,	
	2017	2016
Salaries and staff costs	\$ 2,568,263	\$ 7,698,632
Outside services, consultants and lab supplies	2,125,374	5,573,362
Facilities	1,064,561	1,434,101
Other	2,124,452	300,547
Total research and development	\$ 7,882,650	\$ 15,006,642

While certain of our research and development costs may have future benefits, our policy of expensing all research and development expenditures is predicated on the fact that we have no history of successful commercialization of molecular diagnostic products to base any estimate of the number of future periods that would be benefited.

FASB ASC Topic 730, *Research and Development* requires that non-refundable advance payments for goods or services that will be used or rendered for future research and development activities be deferred and capitalized. As the related goods are delivered or the services are performed, or when the goods or services are no longer expected to be provided, the deferred amounts are recognized as an expense.

License Fees

We expense amounts paid to acquire licenses associated with products under development when the ultimate recoverability of the amounts paid is uncertain and the technology has no alternative future use when acquired. Acquisitions of technology licenses are charged to expense or capitalized based upon management's assessment regarding the ultimate recoverability of the amounts paid and the potential for alternative future use. We have determined that technological feasibility for its product candidates is reached when the requisite regulatory approvals are obtained to make the product available for sale.

Restructuring

Restructuring costs are included in loss from operations in the consolidated statements of operations. We have accounted for these costs in accordance with ASC Topic 420, *Exit or Disposal Cost Obligations*. One-time termination benefits are recorded at the time they are communicated to the affected employees.

Stock-based Compensation

We rely heavily on incentive compensation in the form of stock options, restricted stock units ("RSU") and restricted stock awards ("RSA") to recruit, retain and motivate directors, executive officers, employees and consultants. Incentive compensation in the form of stock options, RSU, RSA and warrants is designed to provide long-term incentives, develop and maintain an ownership stake and conserve cash. Stock-based compensation expense related to stock options for employees and directors is recognized in the consolidated statement of operations based on estimated amounts, including the grant date fair value and the expected service period. We estimate the grant date fair value using a Black-Scholes model. Stock-based compensation recorded in our consolidated statement of operations is based on awards expected to ultimately vest and has been reduced for estimated forfeitures. We recognize the value of the awards on a straight-line basis over the awards' requisite service periods. The requisite service period is generally the time over which our stock-based awards vest. Compensation expense for RSU and RSA is measured at the grant date and recognized ratably over the vesting period in the consolidated statement of operations. The fair value of RSU and RSA is determined based on the closing market price of our common stock on the grant date.

We account for equity instruments granted to non-employees in accordance with FASB ASC Topic 505-50 "*Equity-Based Payment to Non-Employees*", where the value of the stock-based compensation is based upon the measurement date as determined at either: (1) the date at which a performance commitment is reached, or (2) the date at which the necessary performance to earn the equity instruments is complete. Accordingly, the fair value of these options is being "marked to market" quarterly until the measurement date is determined.

Fair Value of Financial Instruments

Financial instruments consist of cash and cash equivalents, short-term investments, accounts receivable, accounts payable, debt and derivative liabilities. We have adopted ASC 820 for financial assets and liabilities that are required to be measured at fair value and non-financial assets and liabilities that are not required to be measured at fair value on a recurring basis. These financial instruments are stated at their respective historical carrying amounts, which approximate fair value due to their short term nature as they reflect current market interest rates. Debt is stated at its respective historical carrying amounts, which approximate fair value as balances reflect current market interest rates.

ASC 820 provides that the measurement of fair value requires the use of techniques based on observable and unobservable inputs. Observable inputs reflect market data obtained from independent sources, while unobservable inputs reflect our market assumptions. The inputs create the following fair value hierarchy:

- Level 1 — Quoted prices for identical instruments in active markets.
- Level 2 — Quoted prices for similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; and model-derived valuations where inputs are observable or where significant value drivers are observable.
- Level 3 — Instruments where significant value drivers are unobservable to third parties.

Off-Balance Sheet Arrangements

As of December 31, 2017, we did not have any off-balance sheet arrangements as described by Item 303(a)(4) of Regulation S-K.

Recent Accounting Pronouncements

See Item 8. Financial Statements—Note 2 *Basis of Presentation and Summary of Significant Accounting Policies* in this Annual Report on Form 10-K for a discussion of recent accounting pronouncements.

Results of Operations**Years Ended December 31, 2017 and 2016****Revenues**

Our total revenues were \$505,404 and \$381,072 for the years ended December 31, 2017 and 2016, respectively. Total revenues consisted of the following:

	For the years ended December 31,		
	2017	2016	(Decrease)/Increase
Royalty income	\$ 285,444	\$ 258,062	\$ 27,382
Diagnostic service revenue	196,111	86,137	109,974
Clinical research services	23,849	36,873	(13,024)
Total revenues	\$ 505,404	\$ 381,072	\$ 124,332

The \$27,382 increase in royalty income in the year ended December 31, 2017 is primarily a result of higher royalty payments earned in excess of minimum royalty payments in the current year compared to the year ended December 31, 2016. According to our revenue recognition policy, we do not record royalty revenues in excess of minimum royalty amounts until we have received payment of such royalties.

Diagnostic service revenue is recognized when payment is received for the test results as long as all the other revenue criteria are completed. The number of tests payments received were higher in the year ended December 31, 2017 as compared to the prior year.

Revenue from clinical research services consists primarily of revenue from the sale of urine and blood collection supplies and sample processing under agreements with our clinical research and business development partners. Revenue is recognized when supplies are delivered. We sold and delivered fewer supplies during the year ended December 31, 2017 as compared to the year ended December 31, 2016.

We expect our royalty income to fluctuate as the royalties are based on the minimum royalty payments as well as the timing of when payments are received for royalties in excess of minimum royalties. Our diagnostic service revenue will be impacted by our focus on precision cancer therapeutics. In addition, we expect revenue from clinical research services to fluctuate based on timing of delivery of supplies under agreements.

Cost of Revenue

Our total cost of revenue was \$1,811,424 in the year ended December 31, 2017, as compared to \$1,730,512 in the year ended December 31, 2016. Cost of revenue mainly relates to the costs of our diagnostic service revenues and these costs are recognized at the completion of testing. Due to revenue being recognized when cash is received, costs incurred in one period may relate to revenue recognized in a later period. Gross margins are negative related to the timing of cash received as compared to the services performed as well as inefficiencies in realizing capacity-related issues. The increase in cost of revenues in the year ended December 31, 2017 compared to the prior period is mainly due to the higher percentage allocation of cost to cost of revenue versus to research and development expense related to clinical studies and to sales and marketing expense related to our clinical experience program.

Research and Development Expenses

Research and development expenses consisted of the following:

	For the years ended December 31,		
	2017	2016	Increase/(Decrease)
Salaries and staff costs	\$ 1,541,766	\$ 5,277,936	\$ (3,736,170)
Stock-based compensation	1,026,497	2,420,696	(1,394,199)
Outside services, consultants and lab supplies	2,125,374	5,573,362	(3,447,988)
Facilities	1,064,561	1,434,101	(369,540)
Travel and scientific conferences	80,714	213,419	(132,705)
Fees, license and other	2,043,738	87,128	1,956,610
Total research and development expenses	\$ 7,882,650	\$ 15,006,642	\$ (7,123,992)

Research and development expenses decreased by \$7,123,992 to \$7,882,650 for the year ended December 31, 2017 from \$15,006,642 for the year ended December 31, 2016. Our costs have decreased primarily due to the average number of our internal research and development personnel decreasing from thirty-one to ten as a result of our strategic restructuring activities. In addition, research and development expenses incurred related to clinical studies, samples processed and validated in connection with the clinical collaborations, as well as lab supplies, decreased for the year ended December 31, 2017 as compared to the prior year as a result of the shifting of our business focus. The total decrease of research and development expenses was offset by the increase in fees, license and other. The increase in fees, license and other was primarily due to the \$2.0 million license fee payment in March 2017 to Nerviano for development and commercialization rights to PCM-075. We expect a reduction of research and development costs that relate to CLIA services as a result of our focus on precision cancer therapeutics; however, other costs may increase as we continue the development of PCM-075.

Selling and Marketing Expenses

Selling and marketing expenses consisted of the following:

	For the years ended December 31,		
	2017	2016	Increase/(Decrease)
Salaries and staff costs	\$ 1,004,887	\$ 5,336,941	\$ (4,332,054)
Stock-based compensation	676,635	2,111,366	(1,434,731)
Outside services and consultants	250,550	1,260,354	(1,009,804)
Facilities and insurance	273,099	496,881	(223,782)
Trade shows, conferences and marketing	398,425	1,312,749	(914,324)
Travel	74,662	889,265	(814,603)
Other	57,152	115,588	(58,436)
Total selling and marketing expenses	\$ 2,735,410	\$ 11,523,144	\$ (8,787,734)

Selling and marketing expenses decreased by \$8,787,734 to \$2,735,410 for the year ended December 31, 2017, from \$11,523,144 for the year ended December 31, 2016. The overall decrease in selling and marketing expenses was primarily due to our strategic restructuring activities. As part of our restructuring, we reduced the number of our field sales, customer support and marketing personnel, thereby bringing down our average headcount to four from nineteen in the prior year. We expect decreases in personnel and related costs due to the reduction in force.

General and Administrative Expenses

General and administrative expenses consisted of the following:

	For the years ended December 31,		
	2017	2016	Increase/(Decrease)
Personnel and outside services costs	\$ 3,445,296	\$ 4,058,213	\$ (612,917)
Stock-based compensation	2,350,962	2,910,156	(559,194)
Board of Directors' fees	474,676	456,498	18,178
Legal and accounting fees	3,885,613	2,916,508	969,105
Facilities and insurance	963,285	641,715	321,570
Travel	96,134	184,217	(88,083)
Fees, licenses, taxes and other	281,500	308,640	(27,140)
Total general and administrative expenses	<u>\$ 11,497,466</u>	<u>\$ 11,475,947</u>	<u>\$ 21,519</u>

General and administrative expenses increased by \$21,519 to \$11,497,466 for the year ended December 31, 2017 from \$11,475,947 for the year ended December 31, 2016. This increase was primarily due to an increase in legal and accounting fees, offset by a decrease in personnel and outside services costs and stock-based compensation. During the year ended December 31, 2017, we have decreased our average internal headcount to eight from ten in the prior year. We also decreased the utilization of outside services to support our information technology, human resources, and investor relations activities, resulting in the decrease in personnel and outside services costs. Stock-based compensation, a non-cash expense, will fluctuate based on the timing and amount of options granted, forfeitures and the fair value of the options at the time of grant or remeasurement. The increase in legal and accounting fees primarily resulted from the \$2.1 million litigation settlement with the former CEO and CFO offset by decreases in general legal matters and patent related legal fees. Our general and administrative costs may increase in future periods in order to support fundraising activities and general business activities as we continue to develop and introduce new product offerings.

Restructuring

On March 15, 2017, we announced a strategic restructuring plan in connection with the focus on precision medicine therapeutics to our business. The restructuring plan includes a reduction in force and was completed in the last quarter of 2017. Restructuring charges of approximately \$2.2 million were incurred and have been included as a component of operating loss for the year ended December 31, 2017. Of the total restructuring charges, approximately \$1.1 million was related to termination of employees and an approximately \$0.5 million charge related to impaired license fees.

Interest Income and Interest Expense

Interest expense was \$1,033,939 and \$1,674,341 for the years ended December 31, 2017 and 2016, respectively. The decrease in the year ended December 31, 2017 is due to a decrease in interest expense resulting from pay-off of our \$15.0 million term loan. Interest income was \$147,883 and \$298,829 for the years ended December 31, 2017 and 2016, respectively. The decrease in interest income of approximately \$151,000 is a result of liquidation of our short-term investments. We expect interest expense to fluctuate due to the potential changes in the variable interest rate of our equipment line of credit.

Change in Fair Value of Derivative Financial Instruments—Warrants

We have issued warrants to purchase shares of our common stock that are accounted for as derivative liabilities. As of December 31, 2017, the derivative financial instruments—warrants liabilities related to securities issued were revalued to \$649,387, resulting in a decrease in fair value of \$3,401,072 from December 31, 2016 based primarily upon the change in our stock price from \$2.10 at December 31, 2016 to \$0.31 at December 31, 2017, and the changes in the expected term, volatility and risk-free interest rates for the expected term, offset by an issuance of derivative financial instruments of \$3,215,519. The decrease in value was recorded as non-operating gain for the year ended December 31, 2017.

Net Loss

Net loss and per share amounts were as follows:

	For the years ended December 31,		
	2017	2016	Increase/(Decrease)
Net loss attributable to common stockholders	\$ (24,930,984)	\$ (39,227,959)	\$ (14,296,975)
Net loss per common share — basic	\$ (0.72)	\$ (1.30)	\$ (0.58)
Net loss per common share — diluted	\$ (0.72)	\$ (1.37)	\$ (0.65)
Weighted-average shares outstanding — basic	34,680,362	30,174,838	4,505,524
Weighted-average shares outstanding — diluted	34,680,362	30,281,263	4,399,099

The decrease in net loss attributable to common stockholders of \$14,296,975 to \$24,930,984 for the year ended December 31, 2017 from \$39,227,959 for the year ended December 31, 2016 resulted primarily from a decrease in operating expenses as compared to the prior year. Basic and diluted net loss per share for the year ended December 31, 2017 were impacted by the increase in both basic and diluted weighted-average shares outstanding resulting from the sale and issuance of approximately 21.0 million shares of common stock through a public offering, direct registered offering and controlled equity offering through our agreement with Cantor Fitzgerald & Co., and issuance of approximately 1.1 million shares of common stock in connection with the vesting of restricted stock units as well as restricted stock awards.

Liquidity and Capital Resources

As of December 31, 2017, we had \$8,225,764 in cash and cash equivalents. Net cash used in operating activities for the year ended December 31, 2017 was \$23,281,067, compared to \$31,039,855 for the year ended December 31, 2016. Our use of cash was primarily a result of the net loss of \$24,906,744 for the year ended December 31, 2017, adjusted for items mainly related to stock-based compensation of \$4,012,585, depreciation and amortization of \$1,247,576, loss on extinguishment of debt of \$1,655,825, and gain from the change in fair value of derivatives of \$3,401,072. The changes in our operating assets and liabilities consisted primarily of lower accounts payable and accrued expenses, a decrease in accounts receivable and increased prepaid expenses. At our current and anticipated levels of operating losses, we expect to continue to incur an operating cash outflow for the next several years. As of December 31, 2017 and 2016, we had working capital of \$5,522,917 and \$31,152,936, respectively. The decrease in working capital is primarily due to the decrease in cash and cash equivalents and short-term investments. In June 2017, the lenders took the total of \$16,668,583 out of our bank accounts to satisfy all of our outstanding obligations under the Loan and Security Agreement dated as of June 30, 2014, which caused a significant decrease of our cash position as compared to 2016.

Net cash provided by investing activities was \$23,962,225 during the year ended December 31, 2017, compared to \$24,833,649 used in investing activities for the year ended December 31, 2016. Investing activities during the year ended December 31, 2017 consisted primarily of net sales and maturities of short-term investments offset by purchases for capital equipment.

Net cash used in financing activities was \$6,378,057 during the year ended December 31, 2017, compared to \$2,301,376 provided by financing activities during the year ended December 31, 2016. Financing activities during the year ended December 31, 2017 related to the pay-off of long-term debt resulting in debt extinguishment of \$16,613,067 and \$626,104 repayment of equipment line of credit, offset by \$10,861,114 from the sales of common stock and warrants, net of expenses. Financing activities during the year ended December 31, 2016 consisted of net proceeds from the sale of our common stock of \$2,285,415, \$366,966 from proceeds related to the exercise of options, and \$740,076 from net borrowings on equipment lines of credit, offset by \$1,091,018 of net repayment on long-term debt. On June 1, 2017, we received a Notice of Event of Default from the lenders which stated that Events of Default had occurred and all of the obligation under the Loan and Security Agreement dated as of June 30, 2014 were immediately due and payable. On June 6, 2017, the lenders took a total pay-off amount of \$16,668,583 out of our bank accounts which satisfied all of our outstanding obligations under the Agreement.

Based on our current business plan and assumptions, we expect to continue to incur significant losses and require significant additional capital to further advance our clinical trial programs and support our other operations. Considering our current cash resources, including the net proceeds received from the offerings of our equity securities in July and December 2017, we believe our existing resources will be sufficient to fund our planned operations through the second quarter of 2018. In

addition, we have based our cash sufficiency estimates on our current business plan and assumptions that may prove to be wrong. We could utilize our available capital resources sooner than we currently expect, and we could need additional funding to sustain our operations even sooner than currently anticipated. These circumstances raise substantial doubt about our ability to continue as a going concern.

Our working capital requirements will depend upon numerous factors including but not limited to the nature, cost and timing of our research and development programs. To date, our sources of cash have been primarily limited to the sale of equity securities. We cannot be certain that additional funding will be available on acceptable terms, or at all. To the extent that we raise additional funds by issuing equity securities, our stockholders may experience significant dilution. Any debt financing, if available, may involve restrictive covenants that impact our ability to conduct business. If we are unable to raise additional capital when required or on acceptable terms, we may have to significantly delay, scale back or discontinue the development and/or commercialization of one or more product candidates, all of which would have a material adverse impact on our operations. We may also be required to (i) seek collaborators for product candidates at an earlier stage than otherwise would be desirable and on terms that are less favorable than might otherwise be available; or (ii) relinquish or otherwise dispose of rights to technologies, product candidates or products that we would otherwise seek to develop or commercialize ourselves on unfavorable terms. We are evaluating the following options to raise additional capital, increase revenue, as well as reduce costs, in an effort to strengthen our liquidity position: (1) Raising capital through public and private equity offerings; (2) Adding capital through short-term and long-term borrowings; (3) Introducing operation and business development initiatives to bring in new revenue streams by leveraging capabilities within our CLIA lab, as well as monetizing our proprietary NextCollect™ DNA collection and preservation cup; (4) Reducing operating costs by identifying internal synergies; (5) Engaging in strategic partnerships; and (6) Taking actions to reduce or delay capital expenditures. We continually assess our spending plans to effectively and efficiently address our liquidity needs.

Controlled Equity Offering and Public Offerings

On May 27, 2016 we filed a Form S-3 Registration Statement to offer and sell in one or more offerings, any combination of common stock, preferred stock, debt securities, warrants, or units having an aggregate initial offering price not exceeding \$250,000,000. The preferred stock, debt securities, warrants, and units may be convertible or exercisable or exchangeable for common stock or preferred stock or other securities. This Registration Statement was declared effective on June 13, 2016. Gross proceeds of \$2.4 million from the sale of 421,810 shares of our common stock at a weighted-average price of \$5.61 under a Controlled Equity Offering Sales Agreement with Cantor Fitzgerald & Co. as sales agent (the “Agent”) have been raised since the date of effectiveness of the Form S-3 on June 13, 2016.

On March 15, 2017, we filed a supplement to our Form S-3 registration statement to offer and sell additional shares of our common stock having an aggregate offering price up to \$20,698,357 through the Agent. Gross proceeds of approximately \$110,000 were raised in 2017 through the Controlled Equity Offering Agreement with the Agent.

On July 19, 2017, we closed a registered direct offering of 6,191,500 shares of our common stock. In a concurrent private placement, we also issued warrants to purchase up to 4,643,626 shares of its common stock. The warrants will be exercisable six months following the date of issuance, will expire on the fifth anniversary of the initial exercise date and have an exercise price of \$1.41 per share. The combined purchase price for one registered share of common stock and one unregistered warrant to purchase 0.75 of an unregistered share of common stock was \$1.15. The net proceeds to us were approximately \$6.5 million.

On December 19, 2017 we closed a public offering of 14,683,333 shares of our common stock and common warrants to purchase up to an aggregate of 15,000,000 shares of common stock. Each share of common stock was sold together with a common warrant to purchase one share of common stock at a combined effective price to the public of \$0.30 per share and accompanying common warrant. The common warrants are exercisable immediately at an exercise price of \$0.30 per share and will expire five years from the date of issuance. The net proceeds to us was approximately \$4.1 million.

NASDAQ Notice

On September 5, 2017, we received a written notice from the NASDAQ Stock Market LLC (“NASDAQ”) that we were not in compliance with NASDAQ Listing Rule 5550(a)(2) for continued listing on the NASDAQ Capital Market, as the minimum bid price of our common stock had been below \$1.00 per share for 30 consecutive business days. The Notice had no immediate effect on the listing of our common stock, and our common stock continue to trade on the NASDAQ Capital Market under the symbol “TROV”.

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In accordance with NASDAQ Listing Rule 5810(c)(3)(A), we have a period of 180 calendar days, or until March 5, 2018, to regain compliance with the minimum bid price requirement. To regain compliance, the closing bid price of our common stock must meet or exceed \$1.00 per share for at least ten consecutive business days during this 180 calendar day period.

Contractual Obligations and Commitments

The following table is a summary of contractual obligations that existed as of December 31, 2017, and is based on information appearing in the notes to Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K.

	Payments Due by period				
	Total	Less than 1 Year	1-3 Years	3-5 Years	More than 5 Years
Operating leases	\$ 3,679,552	\$ 881,815	\$ 1,838,336	\$ 959,401	\$ —
Debt obligation (1)	1,461,327	1,461,327	—	—	—
Service agreement (2)	1,414,117	222,717	1,191,400	—	—
Total obligations	<u>\$ 6,554,996</u>	<u>\$ 2,565,859</u>	<u>\$ 3,029,736</u>	<u>\$ 959,401</u>	<u>\$ —</u>

(1) Debt is in default. Represents principal, interest under default rate and final fee payment.

(2) Represents amounts that will become due upon future delivery of supplies and services from various parties under service contracts as of December 31, 2017.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Interest Rate Risk

Our primary exposure to market risk is interest income and expense sensitivity, which is affected by changes in the general level of interest rates, particularly because our equipment line of credit has a floating interest rate as of December 31, 2017. Changes in interest rates could affect the amounts of interest that we pay in the future.

Our cash and cash equivalent primary consists of deposits, and money market deposits managed by commercial banks as of December 31, 2017. The goals of our investment policy are preservation of capital, fulfillment of liquidity needs and fiduciary control of cash and investments.

Our investments are in short-term money marketable funds. Due to the short-term duration of our investment portfolio and the relatively low risk profile of our investments, a sudden change in interest rates would not have a material effect on the fair market value of our portfolio, nor our operating results or cash flows.

We do not believe our cash and cash equivalents have significant risk of default issues; however, we maintain significant amounts of cash and cash equivalents at one or more financial institutions that are in excess of federally insured limits. Given the current stability of financial institutions, we believe that we will not experience losses on these deposits.

Foreign Currency Risk

We face the foreign currency risk as a result of entering into transactions denominated in currencies other than U.S. dollars. Changes in foreign currency exchange rates can create foreign exchange gains or losses to us.

Effects of Inflation

We do not believe that inflation and changing prices during the years ended December 31, 2017 and 2016 had a significant impact on our results of operations.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

All financial information required by this Item is attached hereto at the end of this report beginning on page F-1 and is hereby incorporated by reference.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Disclosure Controls and Procedures

Our chief executive officer and principal financial officer evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2017. The term “disclosure controls and procedures,” as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended, or the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the Securities and Exchange Commission’s rules and forms. Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company’s management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure. Based on that evaluation, our principal executive officer and principal financial officer concluded that our disclosure controls and procedures were effective as of the end of the period covered by this Annual Report on Form 10-K.

Management’s Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as such term is defined in Exchange Act Rule 13a-15(f). Internal control over financial reporting is a process designed under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America. All internal control systems, no matter how well designed, have inherent limitations. Therefore, even those systems determined to be effective can provide only reasonable assurance with respect to financial statement preparation and presentation.

As of December 31, 2017, under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on the Committee of Sponsoring Organizations of the Treadway Commission in Internal Control-Integrated Framework - 2013. Based on this assessment, our management concluded that, as of December 31, 2017, our internal control over financial reporting was effective based on those criteria.

Changes in Internal Control Over Financial Reporting

There has been no change in our internal control over financial reporting during the quarter ended December 31, 2017 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

None.

PART III**ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE****Executive Officers, Directors and Key Employees**

The following table sets forth the names and ages of the members of our Board of Directors and our executive officers and the positions held by each as of February 12, 2018.

Name	Age	Position
Thomas H. Adams, Ph.D.	75	Chairman of the Board
William (Bill) Welch	56	Chief Executive Officer and Director
Mark Erlander, Ph.D.	58	Chief Scientific Officer
John Brancaccio	69	Director
Gary S. Jacob, Ph.D.	70	Director
Dr. Paul Billings	65	Director
Dr. Stanley Tennant	66	Director
Dr. Rodney S. Markin	61	Director
Dr. Athena Countouriotis	46	Director

All directors hold office until the next annual meeting of stockholders and the election and qualification of their successors. Officers are elected annually by the board of directors and serve at the discretion of the board.

Executive Biographies

The principal occupations for the past five years (and, in some instances, for prior years) of each of our directors and executive officers are as follows:

Thomas H. Adams. Thomas H. Adams, Ph.D., has been our Chairman of the Board since April 2009. Dr. Adams served as our interim Chief Executive Officer from March 28, 2016 until April 25, 2016. Dr. Adams has served as the Chairman of Clearbridge BioPhotonics, Inc., an imaging solutions company, since April 2013. From June 2005 through 2011, Dr. Adams served as a director of IRIS International, Inc., a diagnostics company, and has served as Chief Technology Officer of IRIS since April 2006. Dr. Adams was the Head of Iris Molecular Diagnostics from 2006 until November 2012 and has served as the President of Iris Personalized Medicine since 2011. In November 2012, IRIS was acquired by Danaher Corporation. Dr. Adams served as Chairman and Chief Executive Officer of Leucadia Technologies, a privately held medical-device company, from 1998 to April 2006, when Leucadia was acquired by IRIS. In 1989, Dr. Adams founded Genta, Inc., a publicly held biotechnology company in the field of antisense technology, and served as its Chief Executive Officer until 1997. Dr. Adams founded Gen-Probe, Inc. in 1984 and served as its Chief Executive Officer and Chairman until its acquisition by Chugai Biopharmaceuticals, Inc. in 1989. Dr. Adams has served as a director of Synergy Pharmaceuticals Inc., a biotechnology company, since July 2009 and has served as a director of Gensignia Life Sciences, Inc., a molecular diagnostics company, since October 2014. Dr. Adams has served as a director of ContraVir Pharmaceuticals, Inc., an antiviral biotechnology company, since September 2016. Dr. Adams holds a Ph.D. in Biochemistry from the University of California, at Riverside. The Board believes that Dr. Adams' executive leadership, particularly in the diagnostic field, and the extensive healthcare expertise he has developed qualifies Dr. Adams to serve as a director of our company.

William (Bill) Welch. William Welch has served as our Chief Executive Officer since April 2016 and as a director of our company since May 2016. Mr. Welch was President and Chief Executive Officer of Sequenom, Inc. from June 2014 to September 2015 where he introduced the first non-invasive prenatal test (NIPT) utilizing maternal blood sample to identify fetal chromosomal abnormalities. Mr. Welch began his career at Sequenom as Senior Vice President, Diagnostics in January 2011 and became President and Chief Operating Officer in June 2014. Prior to joining Sequenom, Mr. Welch was a consultant to molecular diagnostic companies in the personalized medicine sector. From August 2005 to September 2009, Mr. Welch was senior vice president and chief commercial officer at Monogram Biosciences, a leader in HIV and oncology diagnostic testing services. Prior to his time at Monogram, Mr. Welch was vice president of sales and marketing at La Jolla Pharmaceuticals, an immunology based biotechnology company and vice president of global marketing with Dade Behring MicroScan. Mr. Welch entered the healthcare field with Abbott Laboratories where he held progressive management positions, including General

Manager. Mr. Welch earned a B.S. with honors in chemical engineering from the University of California at Berkeley and received his M.B.A. from Harvard University.

Mark Erlander, Ph.D. Mark Erlander, Ph.D., has been our Chief Scientific Officer since March 2013. Dr. Erlander has more than 18 years of experience directing and leading research and development for gene discovery, with a strong focus on molecular diagnostics. Prior to joining Trovogene, Dr. Erlander was Chief Scientific Officer at bioTheragnostics (a bioMerieux company) a molecular diagnostic testing company that is focused on clinical applications in oncology, from September 2008 to February 2013. From March 2013 to March 2014, Dr. Erlander served as Chief Scientific Officer of Gensignia Life Sciences, Inc., a molecular diagnostics company. Previously, Dr. Erlander was a group leader and subsequently a research fellow at the R.W. Johnson Pharmaceutical Research Institute (Johnson & Johnson). He was also an assistant member and postdoctoral fellow at The Scripps Research Institute in the Department of Molecular Biology. Dr. Erlander holds a BS degree in Biochemistry from the University of California, Davis; an MS degree in Biochemistry from Iowa State University; and a Ph.D. in Neuroscience from the University of California, Los Angeles. Dr. Erlander is an accomplished researcher with 32 issued U.S. patents and 38 U.S. patent applications, and is a lead or contributing author on more than 70 scientific papers and review articles.

John Brancaccio. John Brancaccio, a retired CPA, has served as a director of our company since December 2005. From April 2004 until his retirement in May 2017, Mr. Brancaccio was the Chief Financial Officer of Accelerated Technologies, Inc., an incubator for medical device companies. Mr. Brancaccio served as a director of Callisto Pharmaceuticals, Inc. from April 2004 until its merger with Synergy Pharmaceuticals, Inc. in January 2013 and has been a director of Tamir Biotechnology, Inc. (formerly Alfacell Corporation) since April 2004, as well as a director of Synergy Pharmaceuticals Inc. since July 2008 and ContraVir Pharmaceuticals, Inc. since December 2013 and Rasna Therapeutics, Inc. since August 2016. The Board believes that Mr. Brancaccio's experience as a chief financial officer provides him with valuable financial and accounting expertise that qualifies him to serve as a director of our company.

Gary S. Jacob. Gary S. Jacob, Ph.D., has served as a director of our company since February 2009. Since July 2008, Dr. Jacob has been President, Chief Executive Officer and a Director of Synergy Pharmaceuticals Inc., and he has served as its Chairman since September 2013. Dr. Jacob has been Chairman of ContraVir Pharmaceuticals, Inc. since May 2013. Dr. Jacob also served as a director of Callisto Pharmaceuticals, Inc. from October 2004 until its merger with Synergy Pharmaceuticals, Inc. in January 2013. Prior to 1999, Dr. Jacob served as a Monsanto Science Fellow, specializing in the field of glycobiology, and from 1997 to 1998, he was Director of Functional Genomics, Corporate Science & Technology, at Monsanto Company. Dr. Jacob earned a B.S. in Chemistry from the University of Missouri, and holds a Ph.D. in Biochemistry from the University of Wisconsin-Madison. The Board believes that Dr. Jacob's broad management expertise in the pharmaceutical and biotechnology industries provides relevant experience in a number of strategic and operational areas and qualifies him to serve as a director of our company.

Dr. Paul Billings. Paul Billings, M.D., Ph.D., was appointed to the Board in October 2013 and has been a member of our Scientific Advisory Board since November 2012. Dr. Billings is a board certified internist and clinical geneticist, and has served as Executive-in-Residence at the California Innovation Center of Johnson and Johnson, Inc. from 2014 to 2015. He has also served as the Medical Director of the IMPACT program at Thermo Fisher Scientific, Inc. (TFS) from 2013 to 2015. He recently finished serving as the first and only Chief Medical Officer at Life Technologies Corporation (from 2011 to 2014) and the Genetic Sciences Division of TFS. Dr. Billings has extensive healthcare experience in many aspects of genomics and molecular medicine. He has also served on the Scientific Advisory Board of the U.S. Food and Drug Administration from 2011 to 2014, the Genomic Medicine Advisory Committee at the Department of Veterans Affairs from 2010 to 2014, and the National Academy of Sciences Institute of Medicine's Roundtable on Genomics from 2011 to 2015. In addition to Trovogene, Dr. Billings has served as a director of Rennova Health, Inc. (formerly CollabRx, Inc.) from November 2015 to June 2017 and served as a director of Ancestry.com Inc. from February 2012 to May 2013. He serves as an advisor or director for many companies, including Omicia, Inc., BioScale Inc., Applied Immunology, Inc., Aueon, Inc. and PAX Neuroscience Inc. Dr. Billings holds an M.D. from Harvard Medical School and a Ph.D. in immunology, also from Harvard University. The Board believes that Dr. Billings' medical and managerial experience in the diagnostic field qualifies him to serve as a director of our company.

Dr. Stanley Tennant. Stanley Tennant, M.D., has served as a director of our company since December 2010. From July 1983 to June 2012, Dr. Tennant was a cardiologist in Greensboro, North Carolina. Since January 1992, Dr. Tennant has served as the president of Five Star Management, a real estate company. Dr. Tennant has served as a director of Oak Ridge Financial Services, Inc. since July 2011. He graduated from Wake Forest University School of Medicine in 1978 and completed postgraduate training in Internal Medicine and Cardiology at Vanderbilt University in 1983. The Board believes that Dr. Tennant's practical experience in the healthcare field qualifies him to serve as a director of our company.

Dr. Rodney S. Markin. Rodney S. Markin, M.D., Ph.D., has been a director of our company since February 2014. Dr. Markin has served as Chief Operating Officer of University of Nebraska since August 2017. Dr. Markin has served as Chief Technology Officer and Associate Vice Chancellor for Business Development at the University of Nebraska Medical Center from 2011 to July 2017; as a Professor of Pathology and Microbiology since 1985; as David T. Purtilo Distinguished Professor Pathology and Microbiology since 2005; as Courtesy Professor of Surgery since 1990 and as Courtesy Professor of Psychiatry since 2013. Dr. Markin is also a director on the Board of Children’s Hospital and Medical Center Foundation, on the Board of Trustees for Keck Graduate Institute, on the Board of the Make-A-Wish Foundation and on the Board of PerceptiMed since July 2015. Dr. Markin served on the Board of Directors of Transgenomic, Inc. from March 2007 to December 2014. The Board believes that Dr. Markin’s valuable executive experience in the healthcare business qualifies him to serve as a director of our company.

Dr. Athena Countouriotis. Dr. Athena Countouriotis has been a director of our company since September 2017. Dr. Countouriotis brings significant experience leading clinical development programs, from preclinical through clinical stages, and approval. Over the course of her career, she has been involved in multiple clinical programs, with a focus within oncology, both hematologic and solid tumor indications, that have supported regulatory approvals in the U.S. and Europe. Dr. Countouriotis currently serves as Senior Vice President, Chief Medical Officer at Adverum Biotechnologies. Prior to joining Adverum, she served as Senior Vice President and Chief Medical Officer at Halozyme Therapeutics. Dr. Countouriotis was Chief Medical Officer at Ambit Biosciences through the initial development of quizartinib, a small molecule FLT3 inhibitor for the treatment of Acute Myeloid Leukemia, and ultimate acquisition of the company by Daiichi Sankyo. Dr. Countouriotis also worked at both Pfizer and Bristol-Meyers Squibb in various roles leading clinical development of oncology focused therapeutics. She holds a M.D. from Tufts University School of Medicine, completed her pediatric residency at the University of California, Los Angeles, and did additional training at Fred Hutchinson Cancer Research Center in the pediatric hematology-oncology program. The Board believes that Dr. Countouriotis’s medical and clinical research expertise in oncology provides relevant experience to the Board and management and qualifies her to serve as a director of our company.

Family Relationships and Other Arrangements

There are no family relationships among our directors and executive officers. There are no arrangements or understandings between or among our executive officers and directors pursuant to which any director or executive officer was or is to be selected as a director or executive officer.

Involvement in Certain Legal Proceedings

To our knowledge, during the last ten years, none of our directors, executive officers (including those of our subsidiaries), promoters or control persons have:

- had a bankruptcy petition filed by or against any business of which such person was a general partner or executive officer either at the time of the bankruptcy or within two years prior to that time;
- been convicted in a criminal proceeding or been subject to a pending criminal proceeding, excluding traffic violations and other minor offenses;
- been subject to any order, judgment or decree, not subsequently reversed, suspended or vacated, of any court of competent jurisdiction, permanently or temporarily enjoining, barring, suspending or otherwise limiting his involvement in any type of business, securities or banking activities;
- been found by a court of competent jurisdiction (in a civil action), the Securities and Exchange Commission, or SEC, or the Commodities Futures Trading Commission to have violated a federal or state securities or commodities law, and the judgment has not been reversed, suspended or vacated; and
- been the subject of, or a party to, any sanction or order, not subsequently reversed, suspended or vacated, of any self-regulatory organization, any registered entity, or any equivalent exchange, association, entity or organization that has disciplinary authority over its members or persons associated with a member.

Board Leadership Structure and Role in Risk Oversight

Since April 2009, we have separated the roles of Chairman of the Board (“Chairman”) and Chief Executive Officer (“CEO”). Although the separation of roles has been appropriate for us during this time period, in the view of the Board, the advisability of the separation of these roles depends upon the specific circumstances and dynamics of our leadership.

As Chairman, Dr. Adams serves as the primary liaison between the CEO and the independent directors and provides strategic input and counseling to the CEO. With input from other members of the Board, committee chairs and management, he presides over meetings of the Board. Dr. Adams has developed an extensive knowledge of our company, its challenges and opportunities and has a productive working relationship with our senior management team.

The Board, as a unified body and through committee participation, organizes the execution of its monitoring and oversight roles and does not expect the Chairman to organize those functions. Our primary rationale for separating the positions of Chairman and CEO is the recognition of the time commitments and activities required to function effectively as the Chairman and as the CEO of a company with a relatively flat management structure. The separation of roles has also permitted the Board to recruit senior executives into the CEO position with skills and experience that meet the Board's planning for the position, some of which such individuals may not have extensive public company board experience.

The Board has three standing committees—Audit, Compensation and Corporate Governance/Nominating. The membership of each of the committees of the Board is comprised of independent directors, with each of the committees having a separate chairman, each of whom is an independent director. Our non-management members of the Board meet in executive session at each regular Board meeting.

Risk is inherent with every business, and how well a business manages risk can ultimately determine its success. Management is responsible for the day-to-day management of the risks we face, while the Board, as a whole and through its committees, has responsibility for the oversight of risk management. In its risk oversight role, the Board is responsible for satisfying itself that the risk management processes designed and implemented by management are adequate and functioning as designed.

The Board believes that establishing the right “tone at the top” and that full and open communication between executive management and the Board are essential for effective risk management and oversight. Our CEO communicates frequently with members of the Board to discuss strategy and challenges facing our company. Senior management usually attends our regular quarterly Board meetings and is available to address any questions or concerns raised by the Board on risk management-related and any other matters. Each quarter, the Board receives presentations from senior management on matters involving our key areas of operations.

Audit Committee

We have a separately-designated standing Audit Committee established in accordance with Section 3(a)(58)(A) of the Securities Exchange Act of 1934, as amended, or the Exchange Act. The Audit Committee's responsibilities include, among other things: (i) selecting and retaining an independent registered public accounting firm to act as our independent auditors, setting the compensation for our independent auditors, overseeing the work done by our independent auditors and terminating our independent auditors, if necessary, (ii) periodically evaluating the qualifications, performance and independence of our independent auditors, (iii) pre-approving all auditing and permitted non-audit services to be provided by our independent auditors, (iv) reviewing with management and our independent auditors our annual audited financial statements and our quarterly reports prior to filing such reports with the Securities and Exchange Commission, or the SEC, including the results of our independent auditors' review of our quarterly financial statements, and (v) reviewing with management and our independent auditors significant financial reporting issues and judgments made in connection with the preparation of our financial statements. The Audit Committee also prepares the Audit Committee report that is required to be included in our annual proxy statement pursuant to the rules of the SEC.

As of December 31, 2017, the Audit Committee consisted of John P. Brancaccio, chairman of the Audit Committee, Dr. Rodney Markin and Dr. Stanley Tennant. Under the applicable rules and regulations of NASDAQ, each member of a company's audit committee must be considered independent in accordance with NASDAQ Listing Rule 5605(c)(2)(A)(i) and (ii) and Rule 10A-3(b)(1) under the Exchange Act. The Board has determined that each of Mr. Brancaccio, Dr. Markin and Dr. Tennant is “independent” as that term is defined under applicable NASDAQ and SEC rules. Mr. Brancaccio is our audit committee financial expert. The Board has adopted a written charter setting forth the authority and responsibilities of the Audit Committee, which is available on our website at <http://trovagene.investorroom.com/> under “Corporate Governance”.

Compensation Committee

The purpose of the Compensation Committee is to discharge the Board's responsibilities relating to compensation of our directors and executive officers. The Compensation Committee has responsibility for, among other things, (i) recommending to the Board for approval the overall compensation philosophy for our company and periodically reviewing the overall compensation philosophy for all employees to ensure it is appropriate and does not incentivize unnecessary and excessive risk taking, (ii) reviewing annually and making recommendations to the Board for approval, as necessary or appropriate, with respect to our compensation plans, (iii) based on an annual review, determining and approving, or at the discretion of the Compensation Committee, recommending to the Board for determination and approval, the compensation and other terms of employment of each of our officers, (iv) reviewing and making recommendations to the Board with respect to the compensation of directors, (v) overseeing our regulatory compliance with respect to compensation matters, (vi) reviewing and discussing with management, prior to the filing of our annual proxy statement or annual report on Form 10-K, our disclosure relating to executive compensation, including our Compensation Discussion and Analysis and executive and director compensation tables as required by SEC rules, and (vii) preparing an annual report regarding executive compensation for inclusion in our annual proxy statement or our annual report on Form 10-K. The Compensation Committee has the power to form one or more subcommittees, each of which may take such actions as may be delegated by the Compensation Committee.

The charter of the Compensation Committee grants the Compensation Committee authority to select, retain, compensate, oversee and terminate any compensation consultant to be used to assist in the evaluation of director, chief executive officer, officer and our other compensation and benefit plans and to approve the compensation consultant's fees and other retention terms. The Compensation Committee is directly responsible for the appointment, compensation and oversight of the work of any internal or external legal, accounting or other advisors and consultants retained by the Compensation Committee. The Compensation Committee may also select or retain advice and assistance from an internal or external legal, accounting or other advisor as the Compensation Committee determines to be necessary or advisable in connection with the discharge of its duties and responsibilities and will have the direct responsibility to appoint, compensate and oversee any such advisor. During the past year, the Compensation Committee engaged Barney & Barney, LLC ("Barney & Barney") as a compensation consultant.

As of December 31, 2017, the Compensation Committee consisted of Dr. Paul Billings, chairman of the Compensation Committee, Dr. Rodney Markin and Dr. Stanley Tennant. The Board has determined that all of the members are "independent" under NASDAQ Listing Rule 5602(a)(2). The Board has adopted a written charter setting forth the authority and responsibilities of the Compensation Committee, which is available on our website at <http://trovagen.investorroom.com/> under "Corporate Governance".

Corporate Governance/Nominating Committee

The Corporate Governance/Nominating Committee has responsibility for assisting the Board in, among other things, (i) effecting Board organization, membership and function, including identifying qualified board nominees, (ii) effecting the organization, membership and function of the committees of the Board, including the composition of the committees of the Board and recommending qualified candidates for the committees of the Board, (iii) evaluating and providing successor planning for the chief executive officer and our other executive officers, (iv) identifying and evaluating candidates for director in accordance with certain general and specific criteria, (v) developing and recommending to the Board Corporate Governance Guidelines and any changes thereto, setting forth the corporate governance principles applicable to us, and overseeing compliance with the our Corporate Governance Guidelines, and (vi) reviewing potential conflicts of interest involving directors and determining whether such directors may vote on issues as to which there may be a conflict. The Corporate Governance/Nominating Committee is responsible for identifying and evaluating candidates for director. Potential nominees are identified by the Board based on the criteria, skills and qualifications that are deemed appropriate by the Corporate Governance/Nominating Committee. The Corporate Governance/Nominating Committee believes that candidates for director should have certain minimum qualifications, including high character and integrity, an inquiring mind and vision, willingness to ask hard questions, ability to work well with others, freedom from conflicts of interest, willingness to devote sufficient time to the Company's affairs, diligence in fulfilling his or her responsibilities and the capacity and desire to represent the best interests of the Company and our stockholders as a whole and not primarily a special interest group or constituency. While our nominating criteria does not prescribe specific diversity standards, the Corporate Governance/Nominating Committee and its independent members seek to identify nominees that have a variety of perspectives, professional experience, education, difference in viewpoints and skills, and personal qualities that will result in a well-rounded Board.

As of December 31, 2017, the Corporate Governance/Nominating Committee consisted of Dr. Rodney Markin, chairman of the Corporate Governance/Nominating Committee, Mr. John Brancaccio, Dr. Gary S. Jacob and Dr. Paul Billings. The Board has determined that all of the members are "independent" under NASDAQ Listing Rule 5605(a)(2). The

Board has adopted a written charter setting forth the authority and responsibilities of the Corporate Governance/Nominating Committee, which is available on our website at <http://trovagene.investorroom.com/> under “Corporate Governance”.

Code of Business Conduct and Ethics

We have adopted a formal Code of Business Conduct and Ethics applicable to all Board members, officers and employees. Our Code of Business Conduct and Ethics can be found on our website (www.trovagene.com). A copy of our Code of Business Conduct and Ethics may be obtained without charge upon written request to Secretary, Trovagene, Inc., 11055 Flintkote Avenue, San Diego, California 92121. If we make any substantive amendments to our Code of Business Conduct and Ethics or grant any waiver from a provision of the Code of Business Conduct and Ethics to any executive officer or director, we will promptly disclose the nature of the amendment or waiver on our website (www.trovagene.com) and/or in our public filings with the SEC.

Corporate Governance Guidelines

The Board has adopted Corporate Governance Guidelines, which are designed to help us achieve our goals, govern us with high standards of integrity and increase stockholder value. These Corporate Governance Guidelines provide a framework for the conduct of the Board’s business.

The Corporate Governance Guidelines also set forth the practices our Board will follow with respect to Board composition and selection, Board meetings and Board committees and Chief Executive Officer performance evaluation and compensation. Our Corporate Governance Guidelines can be found on our website (www.trovagene.com).

Hedging and Pledging Policies

As part of our Insider Trading Policy, all of our officers, all of our directors, certain of our employees and consultants and family members or others sharing a household with any of the foregoing are prohibited from engaging in short sales of our securities, any hedging or monetization transactions involving our securities and in transactions involving puts, calls or other derivative securities based on our securities. Our Insider Trading Policy further prohibits such persons from purchasing our securities on margin, borrowing against any account in which our securities are held or pledging our securities as collateral for a loan unless pre-cleared by our Insider Trading Compliance Officer. As of February 12, 2018, none of our directors or executive officers had pledged any shares of our common stock.

ITEM 11. EXECUTIVE COMPENSATION

Summary Compensation Table

The following table provides certain summary information concerning compensation awarded to, earned by or paid to our Principal Executive Officer and Principal Financial Officer and our other highest paid executive officer whose total annual salary and bonus exceeded \$100,000 (collectively, the “named executive officers”) for fiscal year 2017.

Name and Principal Position	Year	Salary (\$)	Non-Equity Incentive Plan Compensation (\$) ⁽¹⁾	Option Awards (\$) ⁽²⁾	Stock Awards (\$) ⁽³⁾	Total (\$)
William Welch, CEO	2017	475,000	811,388 ⁽⁴⁾⁽⁵⁾	—	1,123,314	2,409,702
	2016	319,712	115,781	3,204,294	—	3,639,787
Dr. Mark Erlander, CSO	2017	374,400	125,229 ⁽²⁾⁽⁶⁾	225,866	296,252	1,021,747
	2016	374,400	234,000	458,166	199,500	1,266,066

(1) The amounts in this column relate to amounts earned by the Named Executive Officers in 2017 and 2016, as applicable, pursuant to our variable pay program described above under “Elements of our Compensation Program-Variable Pay”.

(2) Amounts shown in this column do not reflect dollar amounts actually received by our named executive officers. Instead, these amounts represent the aggregate grant date fair value of stock option awards determined in accordance with Financial Accounting Standards Board (“FASB”) Accounting Standards Codification (“ASC”) Topic 718. The valuation assumptions used in determining 2017 and 2016 amounts are described in Note 5 to our financial statements included in our Annual Reports on Form 10-K for the fiscal years ended December 31, 2017 and 2016. Our named executive officers will only

realize compensation to the extent the trading price of our common stock is greater than the exercise price of such stock options on the date the options are exercised.

- (3) This reflects the grant date fair value of awards granted during fiscal 2017.
- (4) Amounts shown in this column do not reflect dollar amounts actually received by our named executive officer. Instead, these amounts represent (1) a total of \$652,511 income taxes we paid for our named executive officer related to the restricted stock awards granted and vested during the fiscal year ended December 31, 2017; and (2) the aggregate grant date fair value of stock option awards determined in accordance with Financial Accounting Standards Board (“FASB”) Accounting Standards Codification (“ASC”) Topic 718. The valuation assumptions used in determining 2017 and 2016 amounts are described in Note 5 to our financial statements included in our Annual Reports on Form 10-K for the fiscal years ended December 31, 2017 and 2016. Our named executive officer will only realize compensation to the extent the trading price of our common stock is greater than the exercise price of such stock options on the date the options are exercised.
- (5) Received stock options to purchase 662,500 shares of common stock in lieu of cash bonus.
- (6) Received stock options to purchase 522,189 shares of common stock in lieu of cash bonus.

Outstanding Equity Awards at Fiscal Year-End

The following table sets forth information for the named executive officers regarding the number of shares subject to both exercisable and unexercisable stock options, as well as the exercise prices and expiration dates thereof, as of December 31, 2017. Except for the options set forth in the table below, no other equity awards were held by any our named executive officers as of December 31, 2017.

Name	Option Awards ⁽¹⁾				Stock Awards	
	Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Option Exercise Price (\$)	Option Expiration Date	Number of shares or units of stock that have not vested (#)	Market value of shares or units of stock that have not vested (\$)
William Welch	312,500	437,500	4.73	4/25/2026	200,000	61,500
	—	—	—	—	130,000	39,975
Mark Erlander	5,000	—	2.84	9/13/2022	75,000	23,063
	10,000	—	4.87	12/10/2022	90,000	27,675
	200,000	—	7.04	1/28/2023		
	100,000	—	5.53	12/11/2023		
	150,000	50,000	3.29	7/16/2024		
	45,000	15,000	4.39	12/11/2024		
	71,875	78,125	5.18	1/4/2026		
	96,250	288,750	0.85	8/22/2027		

(1) For each executive officer, the shares listed in this table are subject to a single stock option award carrying the varying exercise prices as set forth herein. The option awards remain exercisable until they expire ten years from the date of grant, subject to earlier expiration following termination of employment.

Director Compensation

Under our non-employee director compensation policy, a new non-employee director receives an initial grant of options to purchase a number of shares of common stock equal to 0.1% of our shares of common stock issued and outstanding as of the date of grant (subject to adjustment for recapitalizations, stock split, stock dividends and the like). In addition, each non-employee director receives the following annual compensation for his or her service: (i) an annual retainer fee of \$50,000, payable quarterly, and an equity grant of options to purchase a number of shares of common stock equal to 0.1% of shares of our common stock issued and outstanding as of the date of grant (subject to adjustment for recapitalizations, stock split, stock dividends and the like), all of which vest on the one year anniversary of the date of grant, (ii) an additional annual retainer fee

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of \$30,000, payable quarterly, if such non-employee director serves as the Chairman of the Board of Directors, (iii) an additional annual retainer fee of \$16,000, \$10,000 and \$8,000 payable quarterly, if such non-employee director serves as the chair of the Audit Committee, Compensation Committee or Nominating/Corporate Governance Committee, respectively, and (iv) an additional annual retainer fee of \$8,000, \$6,000 and \$4,000 to such non-employee director if he or she serves as a non-chair member of the Audit Committee, Compensation Committee and Nominating/Corporate Governance Committee, respectively, per committee. We also reimburse all of our directors for out-of-pocket expenses incurred in connection with the rendering of services as a director.

The following table sets forth summary information concerning the total compensation paid to our non-employee directors in 2017 for services to our company.

Name	Fees Earned or Paid in Cash (\$)	Option Awards (\$) ⁽¹⁾	Stock Awards (\$) ⁽²⁾	Total (\$)
Thomas H. Adams ⁽³⁾	90,000	18,768	52,220	160,988
John P. Brancaccio ⁽⁴⁾	70,000	18,768	60,135	148,903
Gary S. Jacob ⁽⁵⁾	54,000	18,768	53,206	125,974
Stanley Tennant ⁽⁶⁾	64,000	18,768	51,560	134,328
Paul Billings ⁽⁷⁾	64,000	18,768	47,488	130,256
Rodney Markin ⁽⁸⁾	72,000	18,768	46,351	137,119

(1) Amounts shown in this column do not reflect dollar amounts actually received by our non-employee directors. Instead, these amounts represent the aggregate grant date fair value of stock option awards determined in accordance with FASB ASC Topic 718. The valuation assumptions used in determining 2017 amounts are described in Note 5 to our financial statements included in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017. Our non-employee directors will only realize compensation to the extent the trading price of our common stock is greater than the exercise price of such stock options on the date the options are exercised.

(2) This reflects the grant date fair value of awards granted during fiscal 2017.

(3) As of December 31, 2017, 412,995 stock options were outstanding, of which 374,849 were exercisable. 16,667 stock awards were unvested as of December 31, 2017.

(4) As of December 31, 2017, 170,517 stock options were outstanding, of which 132,411 were exercisable. 16,667 stock awards were unvested as of December 31, 2017.

(5) As of December 31, 2017, 185,445 stock options were outstanding, of which 147,339 were exercisable. 16,667 stock awards were unvested as of December 31, 2017.

(6) As of December 31, 2017, 131,264 stock options were outstanding, of which 93,158 were exercisable. 16,667 stock awards were unvested as of December 31, 2017.

(7) As of December 31, 2017, 121,336 stock options were outstanding, of which 83,230 were exercisable. 16,667 stock awards were unvested as of December 31, 2017.

(8) As of December 31, 2017, 106,336 stock options were outstanding, of which 68,230 were exercisable. 16,667 stock awards were unvested as of December 31, 2017.

Employment Agreements

William Welch Employment Agreement

On May 6, 2016, we entered into an employment agreement with Mr. Welch (the "Welch Employment Agreement"). The term of the Welch Employment Agreement commenced on May 6, 2016 and will continue until May 6, 2020, following which time the Welch Employment Agreement will be automatically renewed for successive one year periods at the end of each term, unless either party delivers written notice to the other party of their intent to not renew the agreement. Pursuant to the Welch Employment Agreement, Mr. Welch's current base compensation is \$475,000 per year. Mr. Welch is eligible to receive a

cash bonus of up to 50% of his base salary per year based on meeting certain performance objectives and bonus criteria. In addition, upon entering into the Welch Employment Agreement, Mr. Welch was granted 750,000 stock options, which have an exercise price of \$4.73 per share, 187,500 of which vest on April 25, 2017 and 15,625 vest monthly subsequent thereto.

If Mr. Welch's employment is terminated by us for cause or as a result of Mr. Welch's death or permanent disability, or if Mr. Welch terminates his employment agreement voluntarily, Mr. Welch will be entitled to receive a lump sum equal to (i) any portion of unpaid base compensation then due for periods prior to termination, (ii) any bonus earned but not yet paid through the date of his termination, and (iii) all business expenses reasonably and necessarily incurred by Mr. Welch prior to the date of termination. If Mr. Welch's employment is terminated by us without cause or by Mr. Welch for good reason, Mr. Welch will be entitled to receive the amounts due upon termination of his employment by us for cause or as a result of his death or permanent disability, or upon termination by Mr. Welch of his employment voluntarily, in addition to (provided that Mr. Welch executes a written release with respect to certain matters) a severance payment equal to his base compensation for 24 months from the date of termination and the bonus and any benefits that Mr. Welch would be eligible for during such 24-month period. In addition, if Mr. Welch's employment is terminated: (a) by us without cause within 12 months prior to a change of control (as defined in the Welch Employment Agreement) that was pending during such 12 month period, (b) by Mr. Welch for good reason within 12 months after a change of control, or (c) by us without cause at any time upon or within 12 months after a change of control, Mr. Welch will be entitled to receive the amounts due upon termination of his employment by us for cause or as a result of his death or permanent disability, or upon termination by Mr. Welch of his employment voluntarily, in addition to the severance payments due if Mr. Welch's employment is terminated by us without cause or by Mr. Welch for good reason, and all of Mr. Welch's unvested stock options and other equity awards would immediately vest and become fully exercisable (x) in the event a change of control transaction is pending, for a period of six months following the date of termination, and (y) in the event a change of control transaction is not then pending, for the period of time set forth in the applicable agreement evidencing the award.

William Welch Stock Award Agreement

On August 15, 2017, we entered into a stock award agreement (the "Agreement") with Mr. Welch, pursuant to which an initial grant of 745,392 shares of common stock was issued to Mr. Welch under our 2014 Equity Incentive Plan, all of which shares vested upon grant. In addition, we agreed to make additional grants of common stock (the "Additional Grants") to the Mr. Welch over two year time period. All grants will be vested upon date of grant and are subject to a one year lock-up from each date of grant. It is intended that, in the aggregate, the shares issued to Mr. Welch under the Agreement will constitute 5% of the issued and outstanding shares of common stock as of the last grant date scheduled for October 15, 2019 (the "Award Shares"). The Additional Grants shall be adjusted as is necessary to maintain such percentage.

Pursuant to the Agreement, we have agreed to pay to or on behalf of Mr. Welch the amount necessary to satisfy the full amount of Mr. Welch's federal, state and local taxes as a result of the grant of the Award Shares. Upon the date the Executive ceases to be our employee for any reason, we may elect to repurchase all or any portion of the vested Award Shares at a price equal to the fair market value of the Award Shares. In addition, upon the consummation of our sale, a termination by us without Cause (as defined in the employment agreement dated May 6, 2016 between us and Mr. Welch (the "Employment Agreement")) or Mr. Welch's resignation for Good Reason as defined in the Employment Agreement, Mr. Welch shall be entitled to receive either (i) cash in an amount equal to the difference between the fair market value of the Award Shares then held by Mr. Welch and the fair market value of the Award Shares Mr. Welch would have received if he held 5% of the issued and outstanding shares of our common stock or (ii) such additional grants as is necessary to increase Mr. Welch's total Award Shares to equal 5% of the shares of common stock issued and outstanding as of such date.

Employment Agreement with Dr. Mark Erlander

On February 18, 2016, we entered into an employment agreement with Dr. Erlander (the "Erlander Employment Agreement"). The term of the Erlander Employment Agreement commenced on February 18, 2016 and will continue until January 1, 2020, following which time the Erlander Employment Agreement will be automatically renewed for successive one year periods at the end of each term, unless either party delivers written notice to the other party of their intent to not renew the agreement. Pursuant to the Erlander Employment Agreement, Mr. Erlander's current base compensation is \$374,400 per year. Mr. Erlander is eligible to receive a cash bonus of up to 50% of his base salary per year based on meeting certain performance objectives and bonus criteria.

If Mr. Erlander's employment is terminated by us for cause or as a result of Mr. Erlander's death or permanent disability, or if Mr. Erlander terminates his employment agreement voluntarily, Mr. Erlander will be entitled to receive a lump sum equal to (i) any portion of unpaid base compensation then due for periods prior to termination, (ii) any bonus earned but not yet paid through the date of his termination, and (iii) all business expenses reasonably and necessarily incurred by

Mr. Erlander prior to the date of termination. If Mr. Erlander’s employment is terminated by us without cause or by Mr. Erlander for good reason, Mr. Erlander will be entitled to receive the amounts due upon termination of his employment by us for cause or as a result of his death or permanent disability, or upon termination by Mr. Erlander of his employment voluntarily, in addition to (provided that Mr. Erlander executes a written release with respect to certain matters) a severance payment equal to his base compensation for 12 months from the date of termination and the bonus and any benefits that Mr. Erlander would be eligible for during such 12-month period. In addition, if Mr. Erlander’s employment is terminated: (a) by us without cause within 12 months prior to a change of control (as defined in the Erlander Employment Agreement) that was pending during such 12 month period, (b) by Mr. Erlander for good reason within 12 months after a change of control, or (c) by us without cause at any time upon or within 12 months after a change of control, Mr. Erlander will be entitled to receive the amounts due upon termination of his employment by us for cause or as a result of his death or permanent disability, or upon termination by Mr. Erlander of his employment voluntarily, in addition to the severance payments due if Mr. Erlander’s employment is terminated by us without cause or by Mr. Erlander for good reason, and all of Mr. Erlander’s unvested stock options and other equity awards would immediately vest and become fully exercisable (x) in the event a change of control transaction is pending, for a period of six months following the date of termination, and (y) in the event a change of control transaction is not then pending, for the period of time set forth in the applicable agreement evidencing the award.

Potential Payments Upon Termination Or Change In Control

Other than the provisions of the executive severance benefits to which our named executive officers would be entitled to at December 31, 2017 as set forth above, we have no liabilities under termination or change in control conditions. We do not have a formal policy to determine executive severance benefits. Each executive severance arrangement is negotiated on an individual basis.

The tables below estimate the current value of amounts payable to our named executive officers in the event that a termination of employment occurred on December 31, 2017. The closing price of our common stock, as reported on the NASDAQ Capital Market, was \$0.31 on December 29, 2017. The following tables exclude certain benefits, such as accrued vacation, that are available to all employees generally. The actual amount of payments and benefits that would be provided can only be determined at the time of a change in control and/or the named executive officer’s qualifying separation from our Company.

William Welch

	Termination	
	By Trovogene Without Cause Outside a Change In Control	By Trovogene Without Cause or by Mr. Welch for Good Reason in Connection with a Change In Control(1)
Value of Equity Securities Accelerated	\$ —	\$ 129,641
Cash Payments	998,195	998,195
Total Cash Benefits and Payments	\$ 998,195	\$ 1,127,836

(1) Relates to the termination of the Welch Employment Agreement: (a) by us without cause within 12 months prior to a change of control that was pending during such 12 month period, (b) by Mr. Welch for good reason within 12 months after a change of control, or (c) by us without cause at any time upon or within 12 months after a change of control.

Mark Erlander, Ph.D.

	Termination	
	By Trovogene Without Cause Outside a Change In Control	By Trovogene Without Cause or by Mr. Erlander for Good Reason in Connection with a Change In Control(1)
Value of Equity Securities Accelerated	\$ —	\$ 110,772
Cash Payments	386,813	386,813
Total Cash Benefits and Payments	\$ 386,813	\$ 497,585

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- (1) Relates to the termination of the Erlander Employment Agreement: (a) by us without cause within 12 months prior to a change of control that was pending during such 12 month period, (b) by Dr. Erlander for good reason within 12 months after a change of control, or (c) by us without cause at any time upon or within 12 months after a change of control.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The following table sets forth certain information regarding beneficial ownership of shares of our common stock as of February 12, 2018 by (i) each person known to beneficially own more than 5% of our outstanding common stock, (ii) each of our directors, (iii) each of our named executive officers, and (iv) all of our directors and executive officers as a group. Except as otherwise indicated, the persons named in the table below have sole voting and investment power with respect to all shares beneficially owned, subject to community property laws, where applicable.

Name of Beneficial Owner (1)	Shares of Common Stock Beneficially Owned	Percentage(2)
Executive officers and directors:		
Thomas Adams	772,494 ⁽³⁾	1.4
William Welch	1,864,520 ⁽⁴⁾	3.3
Paul Billings	106,395 ⁽⁵⁾	*
John Brancaccio	189,441 ⁽⁶⁾	*
Gary Jacob	306,793 ⁽⁷⁾	*
Stanley Tennant	394,219 ⁽⁸⁾	*
Rodney S. Markin	90,840 ⁽⁹⁾	*
Athena Countouriotis	—	—
Mark Erlander	1,365,310 ⁽¹⁰⁾	2.4
All Officers and Directors as a Group (9 persons)	5,090,012 ⁽¹¹⁾	8.7

*less than 1%

(1) The address of each person is c/o Trovogene, Inc., 11055 Flintkote Avenue, Suite A, San Diego, CA 92121 unless otherwise indicated herein.

(2) The calculation in this column is based upon 55,290,162 shares of common stock outstanding on February 12, 2018. Beneficial ownership is determined in accordance with the rules of the SEC and generally includes voting or investment power with respect to the subject securities. Shares of common stock that are currently exercisable or exercisable within 60 days of February 12, 2018 are deemed to be beneficially owned by the person holding such securities for the purpose of computing the percentage beneficial ownership of such person, but are not treated as outstanding for the purpose of computing the percentage beneficial ownership of any other person.

(3) Includes (i) 374,849 shares of common stock issuable upon exercise of stock options that are exercisable within 60 days after February 12, 2018, and (ii) 45,686 shares of common stock issuable upon exercise of warrants that are exercisable within 60 days after February 12, 2018.

(4) Includes 1,021,875 shares of common stock issuable upon exercise of stock options that are exercisable within 60 days after February 12, 2018.

(5) Includes 83,230 shares of common stock issuable upon exercise of stock options that are exercisable within 60 days after February 12, 2018.

(6) Includes (i) 132,441 shares of common stock issuable upon exercise of stock options that are exercisable within 60 days after February 12, 2018, and (ii) 13,833 shares of common stock issuable upon exercise of warrants that are exercisable within 60 days after February 12, 2018.

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- (7) Includes (i) 147,339 shares of common stock issuable upon exercise of stock options that are exercisable within 60 days after February 12, 2018, and (ii) 10,500 shares of common stock issuable upon exercise of warrants that are exercisable within 60 days after February 12, 2018.
- (8) Includes (i) 93,158 shares of common stock issuable upon exercise of stock options that are exercisable within 60 days after February 12, 2018, and (ii) 75,000 shares of common stock issuable upon exercise of warrants that are exercisable within 60 days after February 12, 2018.
- (9) Includes 68,230 shares of common stock issuable upon exercise of stock options that are exercisable within 60 days after February 12, 2018.
- (10) Includes 1,260,943 shares of common stock issuable upon exercise of stock options that are exercisable within 60 days after February 12, 2018.
- (11) Includes (i) 3,182,065 shares of common stock issuable upon exercise of stock options that are exercisable within 60 days after February 12, 2018 and (ii) 145,019 shares of common stock issuable upon exercise of warrant to purchase shares of common stock.

Section 16(A) Beneficial Ownership Reporting Compliance

Section 16(a) of the Exchange Act requires our officers and directors, and persons who own more than ten percent of a registered class of our equity securities, to file reports of ownership and changes in ownership with the SEC. Officers, directors and greater than ten percent stockholders are required by SEC regulations to furnish us with copies of all Section 16(a) forms they file.

Based on a review of the copies of such forms received, we believe that during 2016, all filing requirements applicable to our officers, directors and greater than ten percent beneficial owners were complied with.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The following is a description of transactions or series of transactions since January 1, 2017, or any currently proposed transaction, to which we were or are to be a participant and in which the amount involved in the transaction or series of transactions exceeds \$120,000, and in which any of our directors, executive officers or persons who we know hold more than five percent of any class of our capital stock, including their immediate family members, had or will have a direct or indirect material interest, other than compensation arrangements with our directors and executive officers.

In March 2016, we engaged Rutan & Tucker, LLP, a law firm to represent us with respect to various lawsuits. One of the partners from Rutan & Tucker, LLP, is the son of our Chairman of the Board. The fees for legal services are based on the hourly rates of the individuals performing the legal services. During the year ended December 31, 2017, we incurred and recorded approximately \$650,000 of legal expenses for services performed by Rutan & Tucker, LLP.

We have entered into indemnification agreements with our directors and executive officers under which we agreed to indemnify those individuals under the circumstances and to the extent provided for in the agreements, for expenses, damages, judgments, fines, settlements and any other amounts they may be required to pay in actions, suits or proceedings which they are or may be made a party or threatened to be made a party by reason of their position as a director, officer or other agent of ours, and otherwise to the fullest extent permitted under Delaware law and our By-Laws. We also have an insurance policy covering our directors and executive officers with respect to certain liabilities, including liabilities arising under the Securities Act of 1933, as amended, or otherwise.

Our board has adopted a written related party transaction policy to set forth the policies and procedures for the review, approval and ratification of related party transactions. This policy covers any financial transaction, arrangement or relationship, or any series of similar transactions, arrangements or relationships (including any indebtedness or guarantee of indebtedness) in which we are or are to be a participant, the amount involved will or may be expected to exceed \$50,000 since the beginning of our last completed fiscal year, and a related party has or will have a direct or indirect material interest. A related party is any individual who is, or who has been since the beginning of our last fiscal year, an executive officer, director or nominee for election as a director, or any person known to be the record or beneficial owner of more than 5% of any class of our voting securities, any immediate family member of any of the foregoing persons or any entity which is owned or controlled by any of the foregoing persons, or any entity in which one of the foregoing persons has a substantial ownership interest in or control over such entity. Transactions involving the employment or compensation of our executive officers or compensation to our

directors, transactions with another company at which a related party's only relationship is as a director and/or beneficial owner of less than 10% of such company's equity interests, transactions in which all of our stockholders receive proportional benefits, certain regulated transactions and certain banking-related services are not considered related-person transactions under this policy. Under our Audit Committee Charter and our related party transaction policy, our Audit Committee is responsible for reviewing and approving in advance any related party transaction. In connection with its review of a related party transaction, the Audit Committee will take into account, among other factors it deems appropriate, whether the related party transaction is on terms no less favorable than terms generally available to an unaffiliated third-party under the same or similar circumstances and the extent of the related party's interest in the related party transaction.

Director Independence

Our The Board has determined that a majority of the Board consists of members who are currently "independent" as that term is defined under NASDAQ Listing Rule 5605(a)(2). The Board considers Drs. Jacob, Billings, Tennant and Markin and Mr. Brancaccio to be "independent".

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

Audit and Non-Audit Fees

The aggregate fees billed to us by BDO, our independent registered public accounting firm, for the indicated services for each of the last two fiscal years were as follows:

	2017	2016
Audit fees (1)	\$ 272,618	\$ 275,952
Tax fees (2)	23,947	10,689
	<u>\$ 296,565</u>	<u>\$ 286,641</u>

(1) Audit fees consist of fees for professional services performed by BDO for the audit and review of our financial statements, preparation and filing of our registration statements, including issuance of comfort letters.

(2) Tax fees consist of fees for professional services performed by BDO with respect to tax compliance.

Policy on Audit Committee Pre-Approval of Audit and Permissible Non-Audit Services of Independent Auditors

Consistent with SEC policies and guidelines regarding audit independence, the Audit Committee is responsible for the pre-approval of all audit and permissible non-audit services provided by our independent registered public accounting firm on a case-by-case basis. Our Audit Committee has established a policy regarding approval of all audit and permissible non-audit services provided by our principal accountants. Our Audit Committee pre-approves these services by category and service. Our Audit Committee has pre-approved all of the services provided by our independent registered public accounting firm.

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

Exhibit Number	Description of Exhibit
(a)(1) Financial Statements	
	The financial statements required by this item are submitted in a separate section beginning on page F-1 of this Annual Report on Form 10-K.

(b) Exhibits

Exhibit Number	Description
1.2	Controlled Equity Offering SM Sales Agreement dated January 25, 2013 by and between Trovagene, Inc. and Cantor Fitzgerald & Co. (incorporated by reference to Exhibit 1.2 to the Company's Form S-3 filed on January 25, 2013).
3.1	Amended and Restated Certificate of Incorporation of Trovagene, Inc. (incorporated by reference to Exhibit 3.1 to the Company's Form 10-12G filed on November 25, 2011).
3.2	Certificate of Amendment of Amended and Restated Certificate of Incorporation of Trovagene, Inc. (incorporated by reference to Appendix B to the Company's Proxy Statement on Schedule 14A filed on March 20, 2012).
3.3	By-Laws of Trovagene, Inc. (incorporated by reference to Exhibit 3.2 to the Company's Form 10-12G filed on November 25, 2011).
4.1	Form of Common Stock Certificate of Trovagene, Inc. (incorporated by reference to Exhibit 4.1 to the Company's Form 10-12G filed on November 25, 2011).
4.2+	2004 Stock Option Plan (incorporated by reference to Exhibit 4.3 to the Company's Current Report on Form 8-K filed on July 19, 2004)
4.3+	Stock Award Agreement dated August 15, 2017 by and between Trovagene, Inc. and William J. Welch (incorporated by reference to Exhibit 4.1 to the Company's Form 10-Q filed on November 9, 2017).
4.5	Form of Warrant (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed on November 28, 2012).
4.6	Form of Warrant to Purchase Common Stock (incorporated by reference to Exhibit 4.2 to the Company's Current Report on Form 8-K filed on July 1, 2014).
4.7+	Trovagene, Inc. 2014 Equity Incentive Plan (incorporated by reference to Appendix A to the Company's Definitive Proxy Statement on Schedule 14A filed on July 23, 2014).
4.8	Form of Warrant to Purchase Common Stock (Incorporated by reference to Exhibit 4.1 to Form 8-K filed on July 26, 2016).
10.1	Summary of Terms of Lease Agreement dated as of October 28, 2009 between Trovagene, Inc. and BMR-Sorrento West LLC (incorporated by reference to Exhibit 10.3 to the Company's Form 10-12G/A filed on February 15, 2012).
10.2	Form of First Amendment to Standard Industrial Net Lease dated September 28, 2011 between Trovagene, Inc. and BMR-Sorrento West LLC (incorporated by reference to Exhibit 10.4 to the Company's Form 10-12G/A filed on February 15, 2012).
10.3	Form of Second Amendment to Standard Industrial Net Lease dated October 2011 between Trovagene, Inc. and BMR-Sorrento West LLC (incorporated by reference to Exhibit 10.5 to the Company's Form 10-12G/A filed on February 15, 2012).
10.4	Form of Third Amendment to Standard Industrial Net Lease dated October 22, 2012 between Trovagene, Inc. and BMR-Sorrento West, LP. (incorporated by reference to Exhibit 10.6 to the Company's Annual Report on Form 10-K filed on March 12, 2015).
10.5	Form of Fourth Amendment to Standard Industrial Net Lease dated December 2, 2013 between Trovagene, Inc. and BMR-Coast 9 LP. (incorporated by reference to Exhibit 10.7 to the Company's Annual Report on Form 10-K filed on March 12, 2015).
10.6	Form of Fifth Amendment to Standard Industrial Net Lease dated May 14, 2014 between Trovagene, Inc. and BMR-Coast 9 LP. (incorporated by reference to Exhibit 10.8 to the Company's Annual Report on Form 10-K filed on March 12, 2015).
10.7	Sixth Amendment to Standard Industrial Net Lease dated June 11, 2015 between Trovagene, Inc. and BMR-Coast 9 LP (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q filed on August 10, 2015).

10.8	Co-Exclusive Sublicense Agreement dated October 22, 2007 between Trovagene, Inc. and Asuragen, Inc. (incorporated by reference to Exhibit 10.6 to the Company's Form 10-12G/A filed on February 15, 2012).
10.9	Amendment to Co-Exclusive Sublicense Agreement dated June 1, 2010 between Trovagene, Inc. and Asuragen, Inc. (incorporated by reference to Exhibit 10.7 to the Company's Form 10-12G/A filed on February 15, 2012).
10.10	Sublicense Agreement dated as of August 27, 2007 between Trovagene, Inc. and Ipsogen SAS (incorporated by reference to Exhibit 10.8 to the Company's Form 10-12G/A filed on February 15, 2012).
10.11	Amendment to Co-Exclusive Sublicense Agreement dated as of September 1, 2010 between Trovagene, Inc. and Ipsogen SAS (incorporated by reference to Exhibit 10.9 to the Company's Form 10-12G/A filed on February 15, 2012).
10.12	Sublicense Agreement dated as of July 20, 2011 between Trovagene, Inc. and Fairview Health Services (incorporated by reference to Exhibit 10.11 to the Company's Form 10-12G/A filed on February 15, 2012).
10.13	Sublicense Agreement dated as of December 1, 2008 by and between Trovagene, Inc. and InVivoScribe Technologies, Inc. (incorporated by reference to Exhibit 10.13 to the Company's Form 10-12G/A filed on February 15, 2012).
10.14	Sublicense Agreement dated as of August 25, 2008 by and between Trovagene, Inc. and Laboratory Corporation of America Holdings (incorporated by reference to Exhibit 10.14 to the Company's Form 10-12G/A filed on February 15, 2012).
10.15	Form of Sublicense Agreement effective as of February 8, 2011 by and between Trovagene, Inc. and MLL Munchner Leukamielabor GmbH (incorporated by reference to Exhibit 10.15 to the Company's Form 10-12G/A filed on February 15, 2012).
10.16	Sublicense Agreement effective as of June 15, 2010 by and between Trovagene, Inc. and Skyline Diagnostics BV (incorporated by reference to Exhibit 10.16 to the Company's Form 10-12G/A filed on February 15, 2012).
10.17	Exclusive License Agreement effective as of December 12, 2011 by and between Columbia University and Trovagene, Inc. (incorporated by reference to Exhibit 10.20 to the Company's Form 10-12G/A filed on February 15, 2012).
10.18	Form of Exclusive License Agreement effective as of October 2011 by and between Gianluca Gaidano, Robert Foa and Davide Rossi and Trovagene, Inc. (incorporated by reference to Exhibit 10.21 to the Company's Form 10-12G/A filed on February 15, 2012).
10.19	Exclusive License Agreement effective as of May 2006 by and between Brunangelo Falini, Cristina Mecucci and Trovagene, Inc. (incorporated by reference to Exhibit 10.23 to the Company's Form 10-12G/A filed on February 15, 2012).
10.20	Form of First Amendment to Exclusive License Agreement effective as of August 2010 by and among Brunangelo Falini, Cristina Mecucci and Trovagene, Inc. (incorporated by reference to Exhibit 10.24 to the Company's Form 10-12G/A filed on February 15, 2012).
10.21+	Form of Indemnification Agreement to be entered into between the Company and its directors and executive officers (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on December 15, 2015).
10.22*	Patent Assignment and License Agreement dated April 23, 2014 between Trovagene, Inc. and GenSignia IP Ltd. (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q filed on May 12, 2014).
10.23+	Employment Agreement, dated February 18, 2016, by and between the Company and Mark Erlander (incorporated by reference to Exhibit 10.33 to the Company's Quarterly Report on Form 10-Q filed on May 10, 2016).
10.24+	Employment Agreement dated as of May 6, 2016 by and between the Company and William J. Welch (incorporated by reference to Exhibit 10.35 to the Company's Quarterly Report on Form 10-Q filed on May 10, 2016).
10.25	Loan and Security Agreement dated as of November 17, 2015 by and between the Company and Silicon Valley Bank (incorporated by reference to Exhibit 10.32 to the Company's Annual Report on Form 10-K filed on March 10, 2016).
10.26	Form of Seventh Amendment to Standard Industrial Net Lease dated April 4, 2016 between Trovagene, Inc. and BMR-Coast 9 LP (incorporated by reference to Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q filed on August 4, 2016).
10.27**	License Agreement dated as of March 13, 2017 between Nerviano Medical Sciences S.r.l. and Trovagene, Inc. (incorporated by reference to Exhibit 10.34 to the Company's Annual Report on Form 10-K filed on March 15, 2017).
23.1	Consent of BDO USA, LLP.
24	Power of Attorney (included on signature page hereto).

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31.1	Certification of Chief Executive Officer and Principal Financial Officer required under Rule 13a-14(a)/15d-14(a) under the Exchange Act.
32.1	Certification of Chief Executive Officer and Principal Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	XBRL Instance Document.
101.SCH	XBRL Taxonomy Extension Schema.
101.CAL	XBRL Taxonomy Extension Calculation Linkbase.
101.LAB	XBRL Taxonomy Extension Labels Linkbase.
101.PRE	XBRL Taxonomy Extension Presentation Linkbase.
101.DEF	XBRL Taxonomy Extension Definition Linkbase.

+ Indicates a management contract or compensatory plan or arrangement.

* The U.S. Securities and Exchange Commission (SEC) has granted confidential treatment with respect to certain portions of this exhibit. Omitted portions have been filed separately with the SEC.

** Portions of this exhibit were omitted and will be filed separately with the U.S. Securities and Exchange Commission pursuant to a request for confidential treatment.

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

TROVAGENE, INC.

/s/ William J. Welch

February 26, 2018

Chief Executive Officer (Principal Executive Officer and Principal Financial Officer)

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below hereby constitutes and appoints William J. Welch as his or her attorney-in-fact, with full power of substitution and resubstitution, for him or her in any and all capacities, to sign any and all amendments to this Annual Report on Form 10-K, and to file the same, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorney-in-fact full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorney-in-fact, or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, this Report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

<u>SIGNATURE</u>	<u>TITLE</u>	<u>DATE</u>
<u>/s/ William J. Welch</u> William J. Welch	Chief Executive Officer and Director (Principal Executive Officer and Principal Financial Officer)	February 26, 2018
<u>/s/ Thomas H. Adams</u> Thomas H. Adams	Chairman of the Board	February 26, 2018
<u>/s/ John P. Brancaccio</u> John P. Brancaccio	Director	February 26, 2018
<u>/s/ Gary S. Jacob</u> Gary S. Jacob	Director	February 26, 2018
<u>/s/ Paul Billings</u> Paul Billings	Director	February 26, 2018
<u>/s/ Stanley Tennant</u> Stanley Tennant	Director	February 26, 2018
<u>/s/ Rodney S. Markin</u> Rodney S. Markin	Director	February 26, 2018
<u>/s/ Athena Countouriotis</u> Athena Countouriotis	Director	February 26, 2018

TROVAGENE, INC.
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Report of Independent Registered Public Accounting Firm

Board of Directors and Stockholders
Trovagene, Inc.
San Diego, California

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Trovagene, Inc. and Subsidiary (the “Company”) as of December 31, 2017 and 2016 and the related consolidated statements of operations and comprehensive loss, stockholders’ equity, and cash flows for each of the two years in the period ended December 31, 2017, and the related notes (collectively referred to as the “consolidated financial statements”). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2017 and 2016, and the results of their operations and their cash flows for each of the two years in the period ended December 31, 2017, 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 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.

Basis for Opinion

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

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

Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ BDO USA, LLP

We have served as the Company’s auditor since 2007.

San Diego, California
February 26, 2018

**Trovagene, Inc. and Subsidiary
Consolidated Balance Sheets**

	December 31, 2017	December 31, 2016
Assets		
Current assets:		
Cash and cash equivalents	\$ 8,225,764	\$ 13,915,094
Short-term investments	—	23,978,022
Accounts receivable	77,095	100,460
Prepaid expenses and other current assets	1,165,828	956,616
Total current assets	9,468,687	38,950,192
Property and equipment, net	2,426,312	3,826,915
Other assets	389,942	1,173,304
Total Assets	\$ 12,284,941	\$ 43,950,411
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	\$ 825,244	\$ 1,130,536
Accrued liabilities	1,454,587	4,021,365
Deferred rent	334,424	285,246
Current portion of long-term debt (in default)	1,331,515	2,360,109
Total current liabilities	3,945,770	7,797,256
Long-term debt, less current portion	—	14,176,359
Derivative financial instruments—warrants	649,387	834,940
Deferred rent, net of current portion	1,183,677	1,373,717
Total liabilities	5,778,834	24,182,272
Commitments and contingencies (Note 10)		
Stockholders' equity		
Preferred stock, \$0.001 par value, 20,000,000 shares authorized, 60,600 shares outstanding at each of December 31, 2017 and 2016, designated as Series A Convertible Preferred Stock with liquidation preference of \$606,000 at each of December 31, 2017 and 2016	60	60
Common stock, \$0.0001 par value, 150,000,000 shares authorized at December 31, 2017 and 2016; 52,791,584 and 30,696,791 issued and outstanding at December 31, 2017 and 2016, respectively	5,279	3,070
Additional paid-in capital	179,546,954	167,890,984
Accumulated other comprehensive loss	—	(10,773)
Accumulated deficit	(173,046,186)	(148,115,202)
Total stockholders' equity	6,506,107	19,768,139
Total Liabilities and Stockholders' Equity	\$ 12,284,941	\$ 43,950,411

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

Trovagene, Inc. and Subsidiary
Consolidated Statements of Operations

	<u>Year Ended December 31,</u>	
	<u>2017</u>	<u>2016</u>
Revenues:		
Royalties	\$ 285,444	\$ 258,062
Diagnostic services	196,111	86,137
Clinical research services	23,849	36,873
Total revenues	505,404	381,072
Costs and expenses:		
Cost of revenue	1,811,424	1,730,512
Research and development	7,882,650	15,006,642
Selling and marketing	2,735,410	11,523,144
General and administrative	11,497,466	11,475,947
Restructuring charges	2,174,251	790,438
Total operating expenses	26,101,201	40,526,683
Loss from operations	(25,595,797)	(40,145,611)
Interest income	147,883	298,829
Interest expense	(1,033,939)	(1,674,341)
Other loss, net	(170,138)	(144,733)
Loss on extinguishment of debt	(1,655,825)	—
Gain from changes in fair value of derivative financial instruments—warrants	3,401,072	2,462,137
Net loss	(24,906,744)	(39,203,719)
Preferred stock dividend	(24,240)	(24,240)
Net loss attributable to common stockholders	\$ (24,930,984)	\$ (39,227,959)
Net loss per common share — basic	\$ (0.72)	\$ (1.30)
Net loss per common share — diluted	\$ (0.72)	\$ (1.37)
Weighted-average shares outstanding — basic	34,680,362	30,174,838
Weighted-average shares outstanding — diluted	34,680,362	30,281,263

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

Trovagene, Inc. and Subsidiary
Consolidated Statements of Comprehensive Loss

	<u>Year Ended December 31,</u>	
	<u>2017</u>	<u>2016</u>
Net loss	\$ (24,906,744)	\$ (39,203,719)
Other comprehensive loss:		
Foreign currency translation loss or reversal of previous loss	1,708	(1,708)
Unrealized gain or reversal of previous loss on securities available-for-sale	9,065	(9,065)
Total other comprehensive loss	<u>10,773</u>	<u>(10,773)</u>
Total comprehensive loss	<u>(24,895,971)</u>	<u>(39,214,492)</u>
Preferred stock dividend	<u>(24,240)</u>	<u>(24,240)</u>
Comprehensive loss attributable to common stockholders	<u>\$ (24,920,211)</u>	<u>\$ (39,238,732)</u>

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

Trovagene, Inc. and Subsidiary
Consolidated Statements of Stockholders' Equity

	Preferred Stock Shares	Preferred Stock Amount	Common Stock Shares	Common Stock Amount	Additional Paid-In Capital	Accumulated other comprehensive loss	Accumulated Deficit	Total Stockholders' Equity
Balance, January 1, 2016	60,600	\$ 60	29,737,601	\$ 2,974	\$ 157,585,498	\$ —	\$(108,887,243)	\$48,701,289
Sale of common stock, net of expenses	—	—	421,810	42	2,285,373	—	—	2,285,415
Stock based compensation	—	—	—	—	7,504,316	—	—	7,504,316
Issuance of warrant in connection with debt agreement	—	—	—	—	148,885	—	—	148,885
Issuance of common stock upon net exercise of stock options	—	—	341,333	34	(34)	—	—	—
Issuance of common stock upon exercise of stock options	—	—	98,396	10	366,956	—	—	366,966
Issuance of common stock upon net exercise of warrant	—	—	2,651	—	—	—	—	—
Issuance of common stock upon vesting of restricted stock units	—	—	95,000	10	(10)	—	—	—
Unrealized loss from foreign currency translation	—	—	—	—	—	(1,708)	—	(1,708)
Unrealized loss on securities available-for-sale	—	—	—	—	—	(9,065)	—	(9,065)
Preferred stock dividend	—	—	—	—	—	—	(24,240)	(24,240)
Net loss	—	—	—	—	—	—	(39,203,719)	(39,203,719)
Balance, December 31, 2016	60,600	60	30,696,791	3,070	167,890,984	(10,773)	(148,115,202)	19,768,139
Sale of common stock, net of expenses	—	—	20,976,914	2,097	10,859,016	—	—	10,861,113
Stock-based compensation	—	—	—	—	4,012,585	—	—	4,012,585
Derivative liability-fair value of warrants issued	—	—	—	—	(3,215,519)	—	—	(3,215,519)
Issuance of common stock upon vesting of restricted stock units	—	—	372,487	37	(37)	—	—	—
Issuance of common stock upon vesting of restricted stock awards	—	—	745,392	75	(75)	—	—	—
Reversal of previous loss from foreign currency translation	—	—	—	—	—	1,708	—	1,708
Reversal of previous loss on securities available-for-sale	—	—	—	—	—	9,065	—	9,065
Preferred stock dividend	—	—	—	—	—	—	(24,240)	(24,240)
Net loss	—	—	—	—	—	—	(24,906,744)	(24,906,744)
Balance, December 31, 2017	60,600	\$ 60	52,791,584	\$ 5,279	\$ 179,546,954	\$ —	\$(173,046,186)	\$ 6,506,107

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

Trovagene, Inc. and Subsidiary
Consolidated Statements of Cash Flows

	Year ended December 31,	
	2017	2016
Operating activities		
Net loss	\$ (24,906,744)	\$ (39,203,719)
Adjustments to reconcile net loss to net cash used in operating activities:		
Loss on disposal of assets	455,051	577,314
Impairment loss	589,700	—
Depreciation and amortization	1,247,576	1,069,547
Stock-based compensation expense	4,012,585	7,504,316
Loss on extinguishment of debt	1,655,825	—
Accretion of final fee premium	293,614	390,548
Amortization of discount on debt	113,780	173,803
Net realized loss on short-term investments	6,400	—
Amortization of premiums on short-term investments	9,230	107,261
Deferred rent	(140,863)	(201,037)
Interest income accrued on short-term investments	(90,330)	(84,182)
Change in fair value of derivative financial instruments—warrants	(3,401,072)	(2,462,137)
Changes in operating assets and liabilities:		
Increase in other assets	—	(789,739)
Decrease (increase) in accounts receivable	23,365	(1,724)
Increase in prepaid expenses and other current assets	(208,185)	(277,327)
(Decrease) increase in accounts payable and accrued expenses	(2,940,999)	2,157,221
Net cash used in operating activities	(23,281,067)	(31,039,855)
Investing activities		
Capital expenditures	(101,101)	(823,483)
Proceeds from disposals of capital equipment	1,540	—
Maturities of short-term investments	16,431,837	13,750,000
Purchases of short-term investments	(8,804,604)	(37,760,166)
Sales of short-term investments	16,434,553	—
Net cash provided by (used in) investing activities	23,962,225	(24,833,649)
Financing activities		
Proceeds from sale of common stock and warrants	11,727,153	2,364,801
Payments of stock issuance costs	(866,039)	(79,386)
Proceeds from exercise of options	—	366,966
Borrowings under equipment line of credit	—	792,251
Repayments under equipment line of credit	(626,104)	(52,175)
Proceeds from borrowings under long-term debt, net of costs	—	7,805,085
Payment upon debt extinguishment	(1,613,067)	—
Repayments of long-term debt	(15,000,000)	(8,896,166)
Net cash (used in) provided by financing activities	(6,378,057)	2,301,376
Effect of exchange rate changes on cash and cash equivalents	7,569	(5,825)
Net change in cash and cash equivalents	(5,689,330)	(53,577,953)
Cash and cash equivalents—Beginning of period	13,915,094	67,493,047
Cash and cash equivalents—End of period	\$ 8,225,764	\$ 13,915,094
Supplementary disclosure of cash flow activity:		
Cash paid for taxes	\$ 800	\$ 4,560
Cash paid for interest	\$ 668,465	\$ 1,103,677
Supplemental disclosure of non-cash investing and financing activities:		
Warrants issued in connection with long-term debt	\$ —	\$ 148,885
Preferred stock dividends accrued	\$ 24,240	\$ 24,240
Leasehold improvements paid for by lessor	\$ —	\$ 1,860,000

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

**Trovagene, Inc. and Subsidiary
Notes to Consolidated Financial Statements**

1. Business Overview and Going Concerns

Business Organization and Overview

Trovagene, Inc. (“Trovagene” or the “Company”) headquartered in San Diego, California, is a clinical-stage, precision medicine oncology therapeutics company. The Company’s primary focus is to develop oncology therapeutics for improved cancer care and to optimize drug development by leveraging its proprietary Precision Cancer Monitoring® (“PCM”) technology in tumor genomics.

Trovagene’s lead drug candidate, PCM-075, is a Polo-like Kinase 1 (“PLK1”) selective adenosine triphosphate (“ATP”) competitive inhibitor. PCM-075 has shown preclinical antitumor activity as a single agent and synergy in combination with more than ten different chemotherapeutics and targeted therapies, such as Zytiga® (abiraterone acetate), Beleodaq® (belinostat), Quizartinib (AC220), a development stage FLT3 inhibitor, and Velcade® (bortezomib) in Acute Myeloid Leukemia (“AML”), metastatic Castration-Resistant Prostate Cancer (“mCRPC”) and other hematologic and solid tumor cancers.

PCM-075 was developed to have high selectivity to PLK1, to be administered orally, and to have a relatively short drug half-life of approximately 24 hours compared to other PLK inhibitors. PCM-075 has completed a safety study in patients with advanced metastatic solid tumors, has a phase 1b/2 clinical trial in patients with AML underway, and a Phase 2 clinical trial in mCRPC planned.

Going Concern Uncertainty

Trovagene’s consolidated financial statements as of December 31, 2017 have been prepared under the assumption that Trovagene will continue as a going concern, which assumes that the Company will realize its assets and satisfy its liabilities in the normal course of business. The accompanying financial statements do not include any adjustments to reflect the possible future effects on the recoverability and classification of assets or the amounts and classifications of liabilities that may result from the outcome of the uncertainty concerning the Company’s ability to continue as a going concern.

The Company has incurred net losses since its inception and has negative operating cash flows. Considering the Company’s current cash resources, including the net proceeds received from the offerings of its equity securities in July and December 2017, management believes the Company’s existing resources will be sufficient to fund the Company’s planned operations through June 2018. The Company also received a default letter from Silicon Valley Bank (“SVB”) regarding the Loan and Security Agreement entered in November 2015 which stated that events of default had occurred and SVB will decide in its sole discretion whether or not to exercise rights and remedies. Based on its current business plan and assumptions, the Company expects to continue to incur significant losses and require significant additional capital to further advance its clinical trial programs and support its other operations. The Company has based its cash sufficiency estimates on its current business plan and its assumptions that may prove to be wrong. The Company could utilize its available capital resources sooner than it currently expects, and it could need additional funding to sustain its operations even sooner than currently anticipated. These circumstances raise substantial doubt about the Company’s ability to continue as a going concern. For the foreseeable future, the Company’s ability to continue its operations is dependent upon its ability to obtain additional capital.

The Company cannot be certain that additional funding will be available on acceptable terms, or at all. To the extent that the Company can raise additional funds by issuing equity securities, the Company’s stockholders may experience significant dilution. Any debt financing, if available, may involve restrictive covenants that impact the Company’s ability to conduct its business.

If the Company is unable to raise additional capital when required or on acceptable terms, it may have to significantly delay, scale back or discontinue the development and/or commercialization of one or more of its product candidates, all of which would have a material adverse impact on the Company’s operations. The Company may also be required to:

- Seek collaborators for product candidates at an earlier stage than otherwise would be desirable and on terms that are less favorable than might otherwise be available; and
- Relinquish licenses or otherwise dispose of rights to technologies, product candidates or products that the Company would otherwise seek to develop or commercialize themselves, on unfavorable terms.

The Company is evaluating the following options to both raise additional capital as well as reduce costs, in an effort to strengthen its liquidity position:

- Raising capital through public and private equity offerings;
- Adding capital through short-term and long-term borrowings;
- Introducing operation and business development initiatives to bring in new revenue streams;
- Reducing operating costs by identifying internal synergies;
- Engaging in strategic partnerships; and
- Taking actions to reduce or delay capital expenditures.

As of February 20, 2018, the Company has received approximately \$452,000 upon exercise of 1,814,167 warrants in connection with the December 2017 public offering. The Company continually assesses its spending plans to effectively and efficiently address its liquidity needs.

2. Basis of Presentation and Summary of Significant Accounting Policies

The accompanying consolidated financial statements of Trovagene, which include its wholly owned subsidiary, Trovagene S.r.l., have been prepared in accordance with accounting principles generally accepted in the United States of America (“GAAP”). All intercompany balances and transactions have been eliminated.

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Cash and Cash Equivalents

Cash and cash equivalents consist of operating and money market accounts as of December 31, 2017 and operating, money market accounts and commercial paper as of December 31, 2016 on deposit. Cash equivalents are considered by the Company to be highly liquid investments purchased with original maturities of three months or less from the date of purchase.

Short-Term Investments

Short-term investments consist of corporate debt securities, U.S. treasury securities, and commercial paper. The Company classifies its short-term investments as available-for-sale, as the sale of such securities may be required prior to maturity to execute management strategies. Investments classified as available-for-sale are carried at fair value, with the unrealized gains and losses reported as a component of consolidated accumulated other comprehensive income (loss) in stockholders’ equity until realized. Realized gains and losses from the sale of available-for-sale securities, if any, are determined on a specific identification basis. A decline in the market value of any available-for-sale security below cost that is determined to be other than temporary will result in an impairment charge to earnings and a new cost basis for the security is established. No such impairment charges were recorded for any period presented. Premiums and discounts are amortized or accreted over the life of the related security as an adjustment to yield using the straight-line method and included in interest income. Interest income is recognized when earned. Realized gains and losses on investments in securities were included in other income (loss) within the consolidated statements of operations. As of December 31, 2017, all of the short-term investments have been sold to satisfy the Company’s outstanding obligations under the Loan and Security Agreement dated as of June 30, 2014 upon demanding repayment by the lenders. As a result, the Company recognized net realized loss of approximately \$6,400 for the year ended December 31, 2017.

Concentration of Credit Risk

Financial instruments that potentially subject the Company to significant concentrations of credit risk consist primarily of cash and cash equivalents and short-term investments. The Company maintains deposit accounts at financial institutions that are in excess of federally insured limits. The Company has not experienced any losses in such accounts and believes it is not exposed to significant risk on its cash due to the financial position of the depository institution in which those deposits are held. We limit our exposure to credit loss by generally placing our cash and short-term investments in high credit quality financial institutions and investment in fixed income instruments denominated and payable in U.S. dollars. Additionally, we have established guidelines regarding diversification of our investments and their maturities, which are designed to maintain principal and maximize liquidity.

Revenues

Revenue is recognized when persuasive evidence that an arrangement exists, delivery has occurred, the price is fixed or determinable, and collection is reasonably assured.

Royalty and License Revenues

The Company licenses and sublicenses its patent rights to healthcare companies, medical laboratories and biotechnology partners. These agreements may involve multiple elements such as license fees, royalties and milestone payments. Revenue is recognized when the criteria described above have been met as well as the following:

- Up-front nonrefundable license fees pursuant to agreements under which the Company has no continuing performance obligations are recognized as revenues on the effective date of the agreement and when collection is reasonably assured.
- Minimum royalties are recognized as earned, and royalties are earned based on the licensee's use. The Company is unable to predict licensee's sales and thus revenue is recognized upon receipt of notification from licensee and payment when collection is assured. Notification is generally one quarter in arrears.

Diagnostic Service Revenues

Revenue for clinical laboratory tests may come from several sources, including commercial third-party payors, such as insurance companies and health maintenance organizations, government payors, such as Medicare and Medicaid in the United States, patient self-pay and, in some cases, from hospitals or referring laboratories who, in turn, might bill third-party payors for testing. The Company is recognizing diagnostic service revenue on the cash collection basis until such time as it is able to properly estimate collections on third party reimbursements.

Clinical Research Services Revenue

Revenue from clinical research services consists primarily of revenue from the sale of urine and blood collection supplies under agreements with our clinical research and business development partners. Revenue is recognized when supplies are delivered.

Allowance for Doubtful Accounts

The Company reviews the collectability of accounts receivable based on an assessment of historic experience, current economic conditions, and other collection indicators. At December 31, 2017 and 2016 the Company had not recorded an allowance for doubtful accounts. When accounts are determined to be uncollectible, they are written off against the reserve balance and the reserve is reassessed. When payments are received on reserved accounts, they are applied to the individual's account and the reserve is reassessed.

Derivative Financial Instruments—Warrants

The Company has issued common stock warrants in connection with the execution of certain equity financings. Such warrants are classified as derivative liabilities under the provisions of Financial Accounting Standards Board (“FASB”) ASC 815 *Derivatives and Hedging* (“ASC 815”) or ASC 480 *Distinguishing Liabilities from Equity* (“ASC 480”) are recorded at their fair market value as of each reporting period. Such warrants do not meet the exemption that a contract should not be considered a derivative instrument if it is (1) indexed to its own stock and (2) classified in stockholders’ equity. The warrants within the scope of ASC 480 contain a feature that could require the transfer of cash in the event a change of control occurs without an authorization of our Board of Directors, and therefore classified as a liability. Changes in fair value of derivative liabilities are recorded in the consolidated statement of operations under the caption “Change in fair value of derivative instruments.”

The fair value of warrants is determined using the Black-Scholes option-pricing model using assumptions regarding the volatility of Trovogene’s common stock price, the remaining life of the warrants, and the risk-free interest rates at each period end. The Company thus uses model-derived valuations where inputs are observable in active markets to determine the fair value and accordingly classifies such warrants in Level 3 per FASB ASC Topic 820, *Fair Value Measurements* (“ASC 820”). At December 31, 2017 and 2016, the fair value of these warrants was \$649,387 and \$834,940, respectively, and was recorded as a liability under the caption “derivative financial instruments—warrants” on the consolidated balance sheets.

Stock-Based Compensation

FASB ASC Topic 718 “*Compensation—Stock Compensation*” (“ASC 718”) requires companies to measure the cost of employee services received in exchange for the award of equity instruments based on the estimated fair value of the award at the date of grant. The expense is recognized ratably over the period during which an employee is required to provide services in exchange for the award. ASC 718 did not change the way Trovogene accounts for non-employee stock-based compensation. Trovogene continues to account for shares of common stock, stock options and warrants issued to non-employees based on the fair value of the stock, stock option or warrant, if that value is more reliably measurable than the fair value of the consideration or services received. The Company accounts for stock options issued and vesting to non-employees in accordance with FASB ASC Topic 505-50 “*Equity-Based Payment to Non-Employees*”, and, accordingly, the value of the stock compensation to non-employees is based upon the measurement date as determined at either (1) the date at which a performance commitment is reached, or (2) the date at which the necessary performance to earn the equity instruments is complete. Therefore, the fair value of these options is being “marked to market” quarterly until the measurement date is determined.

Fair Value of Financial Instruments

Financial instruments consist of cash and cash equivalents, short-term investments, accounts receivable, accounts payable, debt and derivative liabilities. The Company has adopted ASC 820 for financial assets and liabilities that are required to be measured at fair value and non-financial assets and liabilities that are not required to be measured at fair value on a recurring basis. These financial instruments are stated at their respective historical carrying amounts, which approximate fair value due to their short term nature as they reflect current market interest rates. Debt is stated at its respective historical carrying amounts, which approximate fair value as they reflect current market interest rates.

In accordance with FASB ASC Subtopic 820-10, the Company measures certain assets and liabilities at fair value on a recurring basis using the three-tier fair value hierarchy, which prioritizes the inputs used in measuring fair value. The three tiers include:

- Level 1 — Quoted prices for identical instruments in active markets.
- Level 2 — Quoted prices for similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; and model-derived valuations where inputs are observable or where significant value drivers are observable.
- Level 3 — Instruments where significant value drivers are unobservable to third parties.

Long-Lived Assets

Long-lived assets consist of property and equipment and finite-lived intangible assets. The Company records property and equipment at cost, and records other intangible assets based on their fair values at the date of acquisition. Depreciation on property and equipment is calculated using the straight-line method over the estimate useful life of five years for laboratory

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equipment and three to five years for furniture and office equipment. Amortization of leasehold improvements is computed based on the shorter of the life of the asset or the term of the lease. Amortization of intangible assets is calculated using the straight line method over the estimate useful life of the assets, based on when the Company expect to receive cash inflows generated by the intangible assets.

Impairment losses on long-lived assets used in operations are recorded when indicators of impairment are present and the undiscounted cash flows estimated to be generated by those assets are less than the assets carrying amount. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount of the assets exceeds the estimated fair value of the assets. During the year ended December 31, 2017, the Company recorded \$104,700 of impairment loss on long-lived intangible assets. No impairment losses were recorded on long-lived assets to be held and used during the year ended December 31, 2016.

Restructuring

Restructuring costs are included in loss from operations in the consolidated statements of operations. The Company has accounted for these costs in accordance with ASC Topic 420, *Exit or Disposal Cost Obligations*. One-time termination benefits are recorded at the time they are communicated to the affected employees. In March 2017, the Company announced a restructuring plan which was completed as of December 31, 2017. See Note 12 to the consolidated financial statements for further information.

Income Taxes

Income taxes are determined using the asset and liability approach of accounting for income taxes. Under this approach, deferred taxes represent the future tax consequences expected to occur when the reported amounts of assets and liabilities are recovered or paid. Deferred taxes result from differences between the financial statement and tax bases of Trovagene's assets and liabilities and are adjusted for changes in tax rates and tax laws when changes are enacted. Valuation allowances are recorded to reduce deferred tax assets when it is more likely than not that a tax benefit will not be realized. The assessment of whether or not a valuation allowance is required often requires significant judgment.

Contingencies

In the normal course of business, Trovagene is subject to loss contingencies, such as legal proceedings and claims arising out of its business, that cover a wide range of matters, including, among others, government investigations, stockholder lawsuits, product and environmental liability, and tax matters. In accordance with FASB ASC Topic 450, *Accounting for Contingencies*, Trovagene records such loss contingencies when it is probable that a liability has been incurred and the amount of loss can be reasonably estimated. Trovagene, in accordance with this guidance, does not recognize gain contingencies until realized.

Cost of Revenue

Cost of revenue represents the cost of materials, personnel costs, costs associated with processing specimens including pathological review, quality control analyses, and delivery charges necessary to render an individualized test result. Costs associated with performing tests are recorded as the tests are processed. However, the revenue on diagnostic services is recognized on a cash collection basis resulting in costs incurred before the collection of related revenue.

Research and Development

Research and development expenses, which include expenditures in connection with an in-house research and development laboratory, salaries and staff costs, purchased in-process research and development and regulatory and scientific consulting fees, as well as contract research and insurance, are accounted for in accordance with FASB ASC Topic 730-10-55-2, *Research and Development*. Also, as prescribed by this guidance, patent filing and maintenance expenses are considered legal in nature and therefore classified as general and administrative expense, if any.

While certain of the Company's research and development costs may have future benefits, the Company's policy of expensing all research and development expenditures is predicated on the fact that Trovagene has no history of successful commercialization of molecular diagnostic products to base any estimate of the number of future periods that would be benefited.

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FASB ASC Topic 730, *Research and Development* requires that non-refundable advance payments for goods or services that will be used or rendered for future research and development activities be deferred and capitalized. As the related goods are delivered or the services are performed, or when the goods or services are no longer expected to be provided, the deferred amounts are recognized as an expense.

Net Loss Per Share

Basic and diluted net loss per share is presented in conformity with FASB ASC Topic 260, *Earnings per Share*, for all periods presented. In accordance with this guidance, basic and diluted net loss per common share is determined by dividing net loss applicable to common stockholders by the weighted-average common shares outstanding during the period. Preferred dividends are included in income available to common stockholders in the computation of basic and diluted earnings per share. Shares used in calculating diluted net loss per common share exclude as anti-dilutive the following share equivalents:

	December 31,	
	2017	2016
Options to purchase Common Stock	4,490,475	5,528,628
Warrants to purchase Common stock	23,555,520	4,538,606
Restricted Stock Units	1,274,302	272,000
Series A Convertible Preferred Stock	63,125	63,125
	29,383,422	10,402,359

The following table summarizes the Company's diluted net loss per share:

	December 31,	
	2017	2016
Numerator:		
Net loss attributable to common stockholders	\$ (24,930,984)	\$ (39,227,959)
Adjustment for gain from change in fair value of derivative financial instruments—warrants	—	(2,321,053)
Net loss used for diluted loss per share	\$ (24,930,984)	\$ (41,549,012)
Denominator:		
Weighted-average shares used to compute basic net loss per share	34,680,362	30,174,838
Adjustments to reflect assumed exercise of warrants	—	106,425
Weighted-average shares used to compute diluted net loss per share	34,680,362	30,281,263
Net loss per share attributable to common stockholders:		
Basic	\$ (0.72)	\$ (1.30)
Diluted	\$ (0.72)	\$ (1.37)

Change in Accounting Principle

In March 2016, the FASB issued ASU 2016-09, *Improvements to Employee Share-Based Payment Accounting* ("ASU 2016-09"), which aims to simplify the accounting for share-based payment transactions, including accounting for income taxes, classification on the statement of cash flows, accounting for forfeitures, and classification of awards as either liabilities or equity. In addition, under the ASU 2016-09, excess income tax benefits from share-based compensation arrangements are classified as cash flow from operations, rather than cash flow from financing activities. The Company adopted ASU 2016-09 as of January 1, 2017 and has elected to continue estimating forfeitures based on historical experience. The adoption of ASU 2016-09 had no impact on the Company's financial statements.

Recent Accounting Pronouncements

In August 2016, the FASB issued Accounting Standards Update ("ASU") 2016-15, *Classification of Certain Cash Receipts and Cash Payments* ("ASU 2016-15"), which includes amendments that clarify how certain cash receipts and cash

payments are presented in the statement of cash flows. ASU 2016-15 also provides guidance clarifying when an entity should separate cash receipts and cash payments and classify them into more than one class of cash flows. The new amendments and guidance are effective for fiscal years beginning after December 15, 2017, including interim periods within those fiscal years. Early adoption is permitted provided that all amendments are adopted in the same period. The Company is currently evaluating the impact of adoption of ASU 2016-15 on its consolidated statements of cash flows.

In February 2016, the FASB issued ASU 2016-02, *Leases*. The new standard establishes a right-of-use (“ROU”) model that requires a lessee to record a ROU asset and a lease liability on the balance sheet for most leases. The new standard is effective for fiscal years beginning after December 15, 2018, including interim periods within those fiscal years. A modified retrospective transition approach is required for capital and operating leases existing at, or entered into after, the beginning of the earliest comparative period presented in the financial statements, with certain practical expedients available. The new standard will impact the Company’s accounting for its office leases and the Company is currently evaluating the impact of the new standard on its consolidated financial statements.

In May 2014, the FASB issued ASU 2014-09, *Revenue from Contracts with Customers* (“ASU 2014-09”). The new standard is based on the principle that revenue should be recognized to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. Since its initial release, the FASB has issued several amendments to the standard, which include clarification of accounting guidance related to identification of performance obligations, intellectual property licenses, and principle versus agent considerations. ASU 2014-09 and all subsequent amendments (collectively, “ASC 606”) became effective for the Company on January 1, 2018 and was adopted the standard using the modified retrospective method. The cumulative effect of applying the new standard is immaterial and we will recognize the amount in retained earnings on the date of initial application. Under ASC 606, the Company will accrue for royalties as earned and no longer record them on a lag. The Company has reviewed its revenue streams to identify potential differences in accounting under the new revenue recognition standard. The Company’s timing and measurement of revenue recognition will not be materially affected by the adoption and implementation of ASC 606.

Currently, the Company does not have any significant contracts with customers given its stage of development. The Company has derived its revenues primarily from a limited number of royalty, license and diagnostic service agreements. The consideration the Company is eligible to receive under these agreements includes upfront license payments, milestone payments and royalties. Each of these agreements has unique terms that have been evaluated separately under the new standards. The new standards differ from the current accounting standard in many respects, such as in the accounting for variable consideration, including milestone payments. For example, the Company currently recognizes milestone revenue using the milestone method specified in ASC 605-28, which generally results in recognition of milestone revenue in the period that the milestone event is achieved. However, under the new standards, it is possible to start to recognize milestone revenue before the milestone is achieved if management determines with a high degree of certainty that amounts recorded as revenues will not have to be reversed when the uncertainty associated with the variable consideration is subsequently resolved. The Company has assessed the potential impact that the new standards may have with respect to its diagnostic service revenue and has determined to recognize its diagnostic service revenue on a cash collection basis as it does currently. The Company has completed its full assessment of the impact the new standards will have on its financial statements before the year-end 2017. The assessment concludes the Company will not have a significant change in the timing and measurement of its revenue upon adoption of the new standards. The Company will adopt the new standards effective January 1, 2018 using the modified retrospective transition method. The Company’s current assessment identifies a highly immaterial adjustment to beginning retained earnings for the cumulative effect of the change.

3. Supplementary Balance Sheet Information

Short-term Investments

As of December 31, 2017, all short-term investments have been sold to satisfy the Company’s outstanding obligations under the Loan and Security Agreement dated as of June 30, 2014 upon demanding repayment by the lenders. The following table sets forth the composition of short-term investments as of December 31, 2016.

	Maturity in Years	Cost	Unrealized		Fair Value
			Gains	Losses	
Corporate debt securities	Less than 1 year	\$ 14,165,915	\$ 44	\$ (5,273)	\$ 14,160,686
Commercial paper	Less than 1 year	1,195,444	—	—	1,195,444
U.S. treasury securities	Less than 1 year	8,625,728	330	(4,166)	8,621,892
Total investment		\$ 23,987,087	\$ 374	\$ (9,439)	\$ 23,978,022

Property and Equipment

Fixed assets consist of laboratory, testing and computer equipment and fixtures stated at cost. Depreciation and amortization expense for property and equipment for the years ended December 31, 2017 and 2016 was \$1,053,913 and \$969,833, respectively. Property and equipment consisted of the following:

	As of December 31,	
	2017	2016
Furniture and office equipment	\$ 1,076,709	\$ 1,144,741
Leasehold improvements	1,994,514	1,994,514
Laboratory equipment	1,426,581	2,449,645
	4,497,804	5,588,900
Less—accumulated depreciation and amortization	(2,071,492)	(1,761,985)
Property and equipment, net	\$ 2,426,312	\$ 3,826,915

Accrued Liabilities

Accrued liabilities consisted of the following:

	As of December 31,	
	2017	2016
Accrued compensation	\$ 618,128	\$ 2,203,876
Accrued research agreements	135,139	736,199
Accrued professional fees	—	421,314
Other accrued liabilities	701,320	659,976
Total accrued liabilities	\$ 1,454,587	\$ 4,021,365

4. Stockholders' Equity

Common Stock

During the year ended December 31, 2016, the Company issued a total of 959,190 shares of common stock. The Company received gross proceeds of approximately \$2.4 million from the sale of 421,810 shares of its common stock at a weighted-average price of \$5.61 under the agreement with the Agent. In addition, 98,396 shares were issued upon exercise of options for a weighted-average price of \$3.73, 341,333 shares were issued upon net exercise of 1,236,875 options at a weighted average exercise price of \$3.81, 2,651 shares were issued upon net exercise of 8,333 warrants at a weighted-average exercise price of \$3.00, and 95,000 shares were issued upon vesting of restricted stock units.

During the year ended December 31, 2017, the Company issued a total of 22,094,793 shares of common stock. The Company received gross proceeds of approximately \$11.6 million from the sale of 20,874,833 shares of its common stock and 19,960,293 share of warrants and pre-funded warrants through public offering, registered direct offering and private placement in July and December 2017. The Company received gross proceeds of approximately \$0.1 million from the sale of 102,081 shares of its common stock at a weighted-average price of \$1.08 under the agreement with the Agent. In addition, 372,487 shares were issued upon vesting of restricted stock units ("RSU"), and 745,392 shares were issued upon vesting of restricted stock awards ("RSA").

Warrants

A summary of warrant activity and changes in warrants outstanding, including both liability and equity classifications, is presented below:

	Number of Warrants (1)	Weighted-Average Exercise Price Per Share (1)	Weighted-Average Remaining Contractual Term (1)
Balance outstanding, December 31, 2015	5,533,242	\$ 3.86	2.5
Granted	30,992	\$ 4.84	
Exercised	(8,333)	\$ 3.00	
Expired	(50,000)	\$ 8.00	
Balance outstanding, December 31, 2016	5,505,901	\$ 3.83	1.6
Granted	19,643,626	\$ 0.56	
Expired	(1,910,674)	\$ 5.32	
Balance outstanding, December 31, 2017	23,238,853	\$ 0.95	4.4

(1) Excluded the pre-funded warrants to purchase 316,667 shares of common stock at a nominal exercise price of \$0.01 per share. The pre-warrants expire when exercised in full.

The Company issued warrants to purchase 30,992 shares of common stock at an exercise price of \$4.84 per share during the year ended December 31, 2016. The warrants were issued in connection with the fifth amendment to the \$15.0 million debt agreement. The estimated fair value of the warrants was determined on the date of grant using the Black-Scholes option valuation model using the following assumptions: a risk-free interest rate of 1.59%, dividend yield of 0%, expected volatility of 130.66% and expected term of ten years. The resulting fair value of \$148,885 was recorded as a debt discount and was amortized to interest expense over the new term of the loan using the effective interest method. In June 2017, Company received a Notice of Event of Default from the lenders which stated that Events of Default had occurred and all of the obligation under the Agreement were immediately due and payable. Upon termination of the Agreement, unamortized debt discount was recorded as loss on debt extinguishment.

In connection with a direct registered offering occurred in July 2017, the Company issued warrants to purchase 4,643,626 shares of common stock at an exercise price of \$1.41 per share which expire on the five years anniversary of the original issuance date. In December 2017, the Company issued warrants to purchase 15,000,000 shares of common stock at an exercise price of \$0.30 per share in a public offering which expire on the five years anniversary of the original issuance date. The Company also issued pre-funded warrants to purchase 316,667 shares of common stock which expire when exercised in full. \$0.29 of the pre-funded warrant exercise price was paid upfront on the closing date of the public offering and the remaining exercise price is \$0.01.

Series A Convertible Preferred Stock

The material terms of the Series A Convertible Preferred Stock consist of:

1) *Dividends.* Holders of the Company's Series A Convertible Preferred Stock are entitled to receive cumulative dividends at the rate per share of 4% per annum, payable quarterly on March 31, June 30, September 30 and December 31, beginning with September 30, 2005. Dividends are payable, at the Company's sole election, in cash or shares of common stock. As of December 31, 2017 and 2016, the Company had \$316,775 and \$292,535, respectively in accrued cumulative unpaid preferred stock dividends, included in accrued liabilities in the Company's consolidated balance sheets, and \$24,240 and \$24,240 of accrued dividends was recorded during the years ended December 31, 2017 and 2016, respectively.

2) *Voting Rights.* Shares of the Series A Convertible Preferred Stock have no voting rights. However, so long as any shares of Series A Convertible Preferred Stock are outstanding, the Company may not, without the affirmative vote of the holders of the shares of Series A Convertible Preferred Stock then outstanding, (a) adversely change the powers, preferences or rights given to the Series A Convertible Preferred Stock, (b) authorize or create any class of stock senior or equal to the Series A Convertible Preferred Stock, (c) amend its certificate of incorporation or

other charter documents, so as to affect adversely any rights of the holders of Series A Convertible Preferred Stock or (d) increase the authorized number of shares of Series A Convertible Preferred Stock.

3) *Liquidation.* Upon any liquidation, dissolution or winding-up of the Company, the holders of the Series A Convertible Preferred Stock are entitled to receive an amount equal to the Stated Value per share, which is currently \$10 per share plus any accrued and unpaid dividends.

4) *Conversion Rights.* Each share of Series A Convertible Preferred Stock is convertible at the option of the holder into that number of shares of common stock determined by dividing the Stated Value, currently \$10 per share, by the conversion price, originally \$2.15 per share.

5) *Subsequent Equity Sales.* The conversion price is subject to adjustment for dilutive issuances for a period of 12 months beginning upon registration of the common stock underlying the Series A Convertible Preferred Stock. The relevant registration statement became effective on March 17, 2006 and during the following twelve month period the conversion price was adjusted to \$9.60 per share.

6) *Automatic Conversion.* If the price of the Company's common stock equals \$25.80 per share for 20 consecutive trading days, and an average of 8,333 shares of common stock per day are traded during the 20 trading days, the Company will have the right to deliver a notice to the holders of the Series A Convertible Preferred Stock, requesting the holders to convert any portion of the shares of Series A Convertible Preferred Stock into shares of common stock at the applicable conversion price. As of the date of these financial statements, such conditions have not been met.

As of each of December 31, 2017 and 2016, there were 60,600 shares of Series A Convertible Preferred Stock outstanding.

5. Stock-Based Compensation

The Trovagene, Inc. 2014 Equity Incentive Plan (the "2014 EIP"), authorizing up to 2,500,000 shares of common stock for issuance under the 2014 EIP, was approved by the Board in June 2014 and approved by the stockholders of the Company at the September 17, 2014 Annual Meeting of Stockholders. An additional 2,500,000 shares of common stock was authorized for issuance by the Board in March 2015 and was approved by the stockholders at the June 10, 2015 Annual Meeting of Stockholders. Stockholder approval was obtained on May 17, 2016 to increase the number of authorized shares in the 2014 EIP from 5,000,000 to 7,500,000. The adoption of an amendment to the Company's 2014 EIP to increase the number of shares of common stock reserved for issuance to 9,500,000 was approved by the stockholders at the June 13, 2017 Annual Meeting of Stockholders.

As of December 31, 2017, there were 3,436,788 shares available for issuance under the 2014 EIP.

Stock-based compensation has been recognized in operating results as follows:

	Years ended December 31,	
	2017	2016
In cost of revenue	\$ 83,713	\$ 122,301
In research and development expenses	1,026,497	2,420,696
In selling and marketing expense	676,635	2,111,366
In general and administrative expenses	2,350,962	2,910,156
Benefit from restructuring	(125,222)	(60,203)
Total stock-based compensation	\$ 4,012,585	\$ 7,504,316

Stock Options

The estimated fair value of stock option awards was determined on the date of grant using the Black-Scholes option valuation model with the following assumptions during the years indicated below:

	Years ended December 31,	
	2017	2016
Risk-free interest rate	1.82% - 2.03%	0.93% - 1.89%
Dividend yield	0%	0%
Expected volatility (range)	86% - 117%	80% - 134%
Expected volatility (weighted-average)	87%	103%
Expected term (in years)	5.3 years	5.5 years

Risk-free interest rate — Based on the daily yield curve rates for U.S. Treasury obligations with maturities that correspond to the expected term of the Company’s stock options.

Dividend yield — Trovogene has not paid any dividends on common stock since its inception and does not anticipate paying dividends on its common stock in the foreseeable future.

Expected volatility — Based on the historical volatility of Trovogene’s common stock.

Expected term — The expected option term represents the period that stock-based awards are expected to be outstanding based on the simplified method provided in Staff Accounting Bulletin (“SAB”) No. 107, *Share-Based Payment* (“SAB No. 107”), which averages an award’s weighted-average vesting period and expected term for “plain vanilla” share options. Under SAB No. 107, options are considered to be “plain vanilla” if they have the following basic characteristics: (1) are granted “at-the-money”; (2) exercisability is conditioned upon service through the vesting date; (3) termination of service prior to vesting results in forfeiture; (4) limited exercise period following termination of service; and (5) are non-transferable and non-hedgeable.

Forfeitures — FASB ASC Topic 718 (“ASC 718”) required forfeitures to be estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates. FASB ASU 2016-09 allows the Company to make an entity-wide accounting policy election to either estimate the number of awards that are expected to vest or account for forfeitures when they occur. The Company elected to estimate forfeitures based on its historical experience.

The weighted-average fair value per share of all options granted during the years ended December 31, 2017 and 2016, estimated as of the grant date using the Black-Scholes option valuation model, was \$0.56 and \$3.60 per share, respectively.

The unrecognized compensation cost related to non-vested stock options outstanding at December 31, 2017 and 2016 was \$2,915,970 and \$8,211,896, respectively. The weighted-average remaining amortization period at December 31, 2017 and 2016 for non-vested stock options was 2.0 years and 2.8 years, respectively.

The total intrinsic value of stock options exercised was \$0 and \$1,932,799 during the years ended December 31, 2017 and 2016, respectively. The total fair value of shares vested during the years ended December 31, 2017 and 2016 was \$3,992,127 and \$6,261,655, respectively.

A summary of stock option activity and of changes in stock options outstanding is presented below:

	Number of Options	Weighted-Average Exercise Price Per Share	Intrinsic Value	Weighted-Average Remaining Contractual Life
Balance outstanding, December 31, 2015	6,948,630	\$ 5.45	\$ 5,903,466	7.8 years
Granted	3,246,250	\$ 5.02		
Exercised	(1,335,271)	\$ 3.81		
Forfeited	(3,330,981)	\$ 5.63		
Balance outstanding, December 31, 2016	5,528,628	\$ 5.49	\$ —	7.7 years
Granted	1,059,242	\$ 0.82		
Forfeited	(2,079,938)	\$ 6.24		
Expired	(17,457)	\$ 4.74		
Balance outstanding, December 31, 2017	4,490,475	\$ 4.04	\$ —	7.1 years
Vested and exercisable, December 31, 2017	2,745,350	\$ 4.66	\$ —	6.0 years

Upon adoption of ASU 2016-09, the cash flows resulting from tax deductions in excess of the cumulative compensation cost recognized for options exercised (excess tax benefits) are classified within operating activities in the statement of cash flows. Due to Trovogene’s accumulated deficit position, no tax benefits have been recognized in the cash flow statement.

Restricted Stock Units

Under guidance provided by ASC Topic 718 “*Compensation—Stock Compensation*” for share-based payments, stock-based compensation cost for RSU is measured at the grant date based on the closing market price of the Company’s common stock at the grant date and recognized ratably over the service period through the vesting date. All RSU were granted with no purchase price. Vesting of the RSU is generally subject to service conditions.

A summary of the RSU activity is presented below:

	Number of Shares	Weighted Average Grant Date Fair Value Per Share	Intrinsic Value
Non-vested RSU outstanding, December 31, 2015	—	\$ —	\$ —
Granted	402,000	\$ 4.06	
Vested	(95,000)	\$ 4.27	
Forfeited	(35,000)	\$ 3.99	
Non-vested RSU outstanding, December 31, 2016	272,000	\$ 3.99	\$ 571,200
Granted	2,249,242	\$ 1.59	
Vested	(372,487)	\$ 3.47	
Forfeited	(874,453)	\$ 1.75	
Non-vested RSU outstanding, December 31, 2017	1,274,302	\$ 1.43	\$ 391,848

At December 31, 2017 and 2016, total unrecognized compensation costs related to non-vested RSU were \$689,365 and \$4,430, which are expected to be recognized over 2.9 years and one day, respectively. The total intrinsic values of RSU vested was \$647,885 and \$293,781 during the year ended December 31, 2017 and 2016, respectively. The total fair values of RSU vested during the year ended December 31, 2017 and 2016 were \$1,291,878 and \$405,550, respectively.

Restricted Stock Awards

During the year ended December 31, 2017, a total of 745,392 shares of RSA were granted, all of which were vested immediately. The total fair value of vested RSA during the year ended December 31, 2017 was \$596,314. The weighted-average grant date fair value of the RSA was \$0.80 per share during the year ended December 31, 2017. There were no such awards granted during the year ended December 31, 2016.

6. Derivative Financial Instruments — Warrants

Based upon the Company’s analysis of the criteria contained in ASC Topic 815-40, *Contracts in Entity’s Own Equity* (“ASC 815-40”) or ASC Topic 480-10, *Distinguishing Liabilities from Equity* (“ASC 480-10”), Trovogene determined that certain warrants issued in connection with the execution of certain equity financings must be recorded as derivative liabilities. In accordance with ASC 815-40 and ASC 480-10, the warrants are also being re-measured at each balance sheet date based on estimated fair value, and any resultant change in fair value is being recorded in the Company’s consolidated statements of operations. The Company estimates the fair value of these warrants using the Black-Scholes option pricing model.

The range of assumptions used to determine the fair value of the warrants valued using the Black-Scholes option pricing model during the periods indicated was:

	Year ended December 31	
	2017	2016
Estimated fair value of Trovagene common stock	\$0.31 - \$1.26	\$2.10 - \$4.65
Expected warrant term	1.0 - 5.5 years	2.0 - 2.8 years
Risk-free interest rate	1.27% - 2.21%	0.71% - 1.20%
Expected volatility	86% - 116%	82% - 94%
Dividend yield	—%	—%

Expected volatility is based on the historical volatility of Trovagene's common stock. The warrants have a transferability provision and based on guidance provided in SAB No. 107 for instruments issued with such a provision, Trovagene used the full contractual term as the expected term of the warrants. The risk-free interest rate is based on the U.S. Treasury security rates consistent with the expected remaining term of the warrants at each balance sheet date.

The following table sets forth the components of changes in the Company's derivative financial instruments—warrants liability balance, valued using the Black-Scholes option pricing method, for the periods indicated.

Date	Description	Number of Warrants	Derivative Instrument Liability
December 31, 2015	Balance of derivative financial instruments—warrants liability	967,295	\$ 3,297,077
	Change in fair value of derivative financial instruments—warrants during the year recognized as a gain in the statement of operations	—	(2,462,137)
December 31, 2016	Balance of derivative financial instruments—warrants liability	967,295	834,940
	Issuance of Derivative Financial Instruments	4,643,626	3,215,519
	Change in fair value of derivative financial instruments—warrants during the year recognized as a gain in the statement of operations	—	(3,401,072)
December 31, 2017	Balance of derivative financial instruments—warrants liability	5,610,921	\$ 649,387

The remaining contractual term of these warrants outstanding at December 31, 2017 and 2016 was approximately 4.4 and 2.0 years, respectively.

At December 31, 2017 and 2016, the total fair value of the above warrants accounted for as derivative financial instruments—warrants, valued using the Black-Scholes option pricing model, was \$649,387 and \$834,940, respectively, and is classified as derivative financial instruments—warrants liability on the balance sheet.

7. Fair Value Measurements

The following table presents the Company's assets and liabilities that are measured and recognized at fair value on a recurring basis classified under the appropriate level of the fair value hierarchy as of December 31, 2017 and 2016:

	Fair Value Measurements at December 31, 2017			
	Quoted Prices in Active Markets for Identical Assets and Liabilities (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
Assets:				
Money market fund (1)	\$ 4,522,631	\$ —	\$ —	\$ 4,522,631
Total Assets	\$ 4,522,631	\$ —	\$ —	\$ 4,522,631
Liabilities:				
Derivative financial instruments—warrants	\$ —	\$ —	\$ 649,387	\$ 649,387
Total Liabilities	\$ —	\$ —	\$ 649,387	\$ 649,387

	Fair Value Measurements at December 31, 2016			Total
	Quoted Prices in Active Markets for Identical Assets and Liabilities (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	
Assets:				
Money market fund (1)	\$ 12,095,620	\$ —	\$ —	\$ 12,095,620
Corporate debt securities (2)	—	14,160,686	—	14,160,686
Commercial paper (3)	—	2,393,948	—	2,393,948
U.S. treasury securities (2)	—	8,621,892	—	8,621,892
Total Assets	\$ 12,095,620	\$ 25,176,526	\$ —	\$ 37,272,146
Liabilities:				
Derivative financial instruments—warrants	\$ —	\$ —	\$ 834,940	\$ 834,940
Total Liabilities	\$ —	\$ —	\$ 834,940	\$ 834,940

(1) Included as a component of cash and cash equivalents on the accompanying consolidated balance sheet.

(2) Included in short-term investments on the accompanying consolidated balance sheet.

(3) \$1,198,504 of commercial paper was included as a component of cash and cash equivalents, and the rest of amount was included in short-term investments on the accompanying consolidated balance sheet.

The following table sets forth a summary of changes in the fair value of the Company's Level 3 liabilities for the years ended December 31, 2017 and 2016:

Description	Balance at December 31, 2016	Issuance of Derivative Financial Instruments	Unrealized (gains) or losses	Balance at December 31, 2017
Derivative financial instruments—Warrants	\$ 834,940	\$ 3,215,519	\$ (3,401,072)	\$ 649,387

Description	Balance at December 31, 2015	Unrealized (gains) or losses	Balance at December 31, 2016
Derivative financial instruments—Warrants	\$ 3,297,077	\$ (2,462,137)	\$ 834,940

The unrealized gains or losses on the derivative financial instruments—warrants are recorded as a change in fair value of derivative financial instruments—warrants in the Company's consolidated statement of operations. A financial instrument's level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement. At each reporting period, the Company reviews the assets and liabilities that are subject to ASC Topic 815-40. At each reporting period, all assets and liabilities for which the fair value measurement is based on significant unobservable inputs or instruments that trade infrequently and therefore have little or no price transparency are classified as Level 3.

8. Debt

Equipment Line of Credit

In November 2015, the Company entered into a Loan and Security Agreement ("Equipment Line of Credit") with Silicon Valley Bank that provided for cash borrowings for equipment ("Equipment Advances") of up to \$2.0 million, secured by the equipment financed. Under the terms of the agreement, interest is equal to 1.25% above the Prime Rate. At December 31, 2017, the interest rate was 5.75%. Interest only payments are due on borrowings through November 30, 2016, with both interest and principal payments commencing in December 2016. Any equipment advances after November 30, 2016 are subject to principal and interest payments immediately over a 36-month period following the advance. All unpaid principal and interest on each Equipment Advance will be due on November 1, 2019. The Company has an obligation to make a final payment equal to 7% of total amounts borrowed at the loan maturity date.

On June 20, 2017, the Company received a Notice of Event of Default (“Default Letter”) from SVB which stated that Events of Default had occurred and SVB will decide in its sole discretion whether or not to exercise rights and remedies. Pursuant to the Default Letter, the Company has classified the entire balance of \$1,331,515 as a current liability as of December 31, 2017 and also started recording accrued interest at a default rate. The Company recorded \$232,765 in interest expense related to the Equipment Line of Credit during the year ended December 31, 2017. The Company is currently working with lender for resolution.

Loan and Security Agreement

In June 2014, the Company entered into a \$15,000,000 loan and security agreement (“Agreement”) with two banks pursuant to which the lenders provided the Company with a term loan, which was funded at closing. In connection with the loan, each of the lenders received a warrant to purchase up to an aggregate of 85,470 shares of the Company’s common stock at an exercise price of \$3.51 per share, which such warrants are exercisable for ten years from the date of issuance. On July 20, 2016, the Company signed the 5th Amendment to Loan and Security Agreement (“Amendment”) to refinance its existing term loan. Under the Amendment, the interest rate was adjusted to 3.75% plus the Wall Street Journal Prime Rate (subject to a floor of 7.25%). The Company is required to make interest only payments on the outstanding amount of the loan on a monthly basis through September 1, 2017, after which equal monthly payments of principal and interest are due until the loan maturity date of February 1, 2020. In addition, the lenders received a warrant to purchase an aggregate 30,992 shares of the Company’s common stock at an exercise price of \$4.84 per share exercisable for ten years from the date of issuance. As of December 31, 2017, warrants to purchase 73,727 shares of common stock remains outstanding, of which 42,735 of these warrants were in connection with the original Agreement.

On June 1, 2017, the Company received a Notice of Event of Default from the lenders which stated that Events of Default had occurred and all of the obligation under the Agreement were immediately due and payable. On June 6, 2017, the lenders took the total pay-off amount of \$16,668,583 for the principal, interest, final payment, and other amounts out of the Company’s bank accounts which satisfied all of the Company’s outstanding obligations under the Agreement. Accordingly, the Agreement was terminated in June 2017. Upon termination of the Agreement, the prepayment fee of \$450,000, unamortized debt discount of \$400,562 and unamortized final fee of \$738,196 were recorded as loss on debt extinguishment. The Company recorded total interest expense of \$801,173 related to the Agreement during the year ended December 31, 2017.

9. Income Taxes

At December 31, 2017, Trovogene had federal net operating loss carryforwards (NOLs) of approximately \$130.5 million, which, if not used, expire beginning in 2020. Trovogene also has California NOLs of approximately \$72.1 million that will begin to expire in 2029. Trovogene also has research and development tax credits available for federal and California purposes of approximately \$2.0 million and \$1.1 million, respectively. The federal research and development tax credits will begin to expire on January 31, 2025. The California research and development tax credits are not set to expire. The utilization of these NOLs and research and development tax credits is subject to limitations based on past and future changes in ownership of Trovogene pursuant to Section 382 (“Section 382”) of the Internal Revenue Code of 1986, as amended (the “Code”). The Company has determined that ownership changes have occurred for purposes of Section 382 and, therefore, the ability of the Company to utilize its NOLs is limited.

The provision for income taxes based on losses from continuing operations consists of the following at December 31 (in thousands):

	Years ended December 31,	
	2017	2016
Current:		
State	\$ 1	\$ —
Total current provision	1	—
Deferred:		
Federal	9,781	(14,035)
State	3,171	(2,443)
Foreign	—	(114)
Total deferred expense (benefit)	12,952	(16,592)
Valuation allowance	(12,953)	16,592
Total income tax provision	\$ —	\$ —

Significant components of the Company's taxes and the rates as of December 31 are shown below (in thousands, except percentages):

	Years ended December 31,			
	2017		2016	
Tax computed at the federal statutory rate	\$ (8,591)	34 %	\$ (13,206)	34 %
State tax, net of federal tax benefit	(697)	3 %	(2,286)	6 %
Foreign tax	—	— %	(114)	— %
Permanent Items	(706)	3 %	(114)	— %
Tax credits	(431)	2 %	(1,276)	3 %
Valuation allowance increase	(11,029)	43 %	16,996	(43)%
Tax rate change	21,454	(85)%	—	— %
Provision for income taxes	\$ —	— %	\$ —	— %

The Tax Cuts and Jobs Act of 2017 ("TCJA") was signed into law on December 22, 2017. The TCJA significantly revises the U.S. corporate income tax by, among other things, lowering the statutory corporate tax rate from 35% to 21%, eliminating certain deductions, imposing a mandatory one-time tax on accumulated earnings of foreign subsidiaries, introducing new tax regimes, and changing how foreign earnings are subject to U.S. tax. The TCJA also enhanced and extended through 2026 the option to claim accelerated depreciation deductions on qualified property. We have not completed our determination of the accounting implications of the TCJA on our tax accruals. However, we have reasonably estimated the effects of the TCJA and recorded in our financial statements as of December 31, 2017 the provisional amounts for the revaluation of our net deferred tax assets and liabilities resulting from the permanent reduction in the U.S. statutory corporate tax rate to 21% from 35%. The provision estimate results in \$19.5 million of tax expense offset by an adjustment to the valuation allowance. As we complete our analysis of the TCJA, collect and prepare necessary data, and interpret any additional guidance issued by the U.S. Treasury Department, the IRS, and other standard-setting bodies, we may make adjustments to the provisional amounts. Those adjustments may materially impact our provision for income taxes in the period in which the adjustments are made.

Significant components of the Company’s deferred tax assets and liabilities from federal and state income taxes as of December 31 are shown below (in thousands):

	Years ended December 31,	
	2017	2016
Deferred tax assets:		
Tax loss carryforwards	\$ 29,713	\$ 41,502
Research and development credits and other tax credits	3,084	2,817
Stock-based compensation	3,565	4,658
Other	945	1,283
Total deferred tax assets	37,307	50,260
Valuation allowance	(37,307)	(50,260)
Net deferred tax asset	\$ —	\$ —

Trovagene records a valuation allowance against deferred tax assets to the extent that it is more likely than not that some portion, or all of, the deferred tax assets will not be realized. Due to the substantial doubt related to Trovagene’s ability to utilize its deferred tax assets, the Company recorded a valuation allowance against the deferred tax.

FASB ASC Topic 740-10-30-7, *Accounting for Income Taxes* had no effect on Trovagene’s financial position, cash flows or results of operations upon adoption, as Trovagene does not have any unrecognized tax benefits. Trovagene’s practice is to recognize interest and/or penalties related to income tax matters in income tax expense, and none have been incurred to date.

10. Commitments and Contingencies

License and Service Agreements

In March 2017, the Company entered into a license agreement with Nerviano which granted the Company development and commercialization rights to NMS-1286937, which Trovagene refers to as PCM-075. PCM-075 is an oral, investigative drug and a highly-selective adenosine triphosphate competitive inhibitor of the serine/threonine PLK 1. The Company plans to develop PCM-075 initially in patients with AML. Upon execution of the agreement, the Company paid \$2.0 million in license fees which were expensed to research and development costs during the year ended December 31, 2017. The Company is committed to pay \$1.0 million for future services provided by Nerviano, such as the costs to manufacture drug product, no later than June 30, 2019. Terms of the agreement also provide for the Company to pay royalties based on certain development and sales milestones.

The Company is a party to various agreements under which it licenses technology on an exclusive basis in the field of human diagnostics. License fees are generally calculated as a percentage of product revenues, with rates that vary by agreement. To date, payments have not been material.

Litigation

Trovagene does not believe that the Company has legal liabilities that are probable or reasonably possible that require either accrual or disclosure, except for the following: On March 28, 2016 the Company filed a complaint in the Superior Court of the State of California for the County of San Diego against the Company’s former CEO and CFO, for, among other things, breach of fiduciary duty for failing to present a lucrative corporate opportunity to the Company concerning promising new therapeutics in the field of precision medicine and instead taking that opportunity for their own personal benefit (the “Complaint”). The Complaint asks that these two former executives be required to turn over their interests in these new therapeutics to the Company. The former CEO and CFO filed a cross complaint in the Superior Court of the State of California for the County of San Diego against the Company on May 23, 2016 for, among other things, breach of contract (the “Cross Complaint”, and together with the Complaint, collectively, the “Litigation”). On July 28, 2017, the parties settled the Litigation. The settlement involved mutual releases by all parties involved. The net cost to Trovagene in connection with the settlement is approximately \$2.1 million. Of that amount, \$975,000 was the net amount paid directly to the former CEO and CFO. From time to time, the Company may become involved in various lawsuits and legal proceedings that arise in the ordinary course of business. Litigation is subject to inherent uncertainties, and an adverse result in matters may arise from time to time that may

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harm the Company's business. As of the date of this report, management believes that there are no claims against the Company, which it believes will result in a material adverse effect on the Company's business or financial condition.

Employment Agreements

The Company has longer-term contractual commitments with various employees. Certain employment agreements provide for severance payments.

Lease Agreements

The Company currently leases approximately 26,100 square feet facilities in San Diego under an operating lease that expires on December 31, 2021 at a monthly rental rate of approximately \$68,000. The Company leased certain lab and office space in Torino, Italy, of approximately 2,300 square feet at a monthly rental rate of approximately \$3,100. The lease was terminated at the end of September 2017. Rent expense for the years ended December 31, 2017 and 2016 was approximately \$663,000 and \$602,000, respectively.

The Company is also a party to various non-cancelable operating lease agreements for office equipment.

Total annual commitments under non-cancelable lease agreements for each of the years ended December 31 are as follows:

	Operating Leases	Sublease Income	Net Operating Leases
2018	\$ 881,815	\$ (216,504)	\$ 665,311
2019	906,879	(183,124)	723,755
2020	931,457	—	931,457
2021	959,401	—	959,401
2022	—	—	—
Thereafter	—	—	—
Total	<u>\$ 3,679,552</u>	<u>\$ (399,628)</u>	<u>\$ 3,279,924</u>

Public Offering and Controlled Equity Offering

On March 15, 2017, the Company filed a Form 424B5 to amend and supplement the information in the Company's registration statement and prospectus, dated June 13, 2016, to offer and sell additional shares of the Company's common stock having an aggregate offering price up to \$20,698,357. The Company entered into an agreement with Cantor Fitzgerald & Co. ("Agent") on January 25, 2013 to issue and sell up to \$30,000,000 of shares of common stock through the Agent. As payment for its services, the Agent is entitled to a 3% commission on gross proceeds. Gross proceeds of \$110,000 have been raised in 2017.

Database Usage

In March 2016 the Company entered into an agreement with an outside vendor to develop an online database for test requisition and test results. Under the agreement, the Company is obligated to pay a fixed development fee, and a usage fee each time an external user completes and submits a test order form to the database. To date, the Company has paid the fixed development fee. Costs incurred in connection with the usage fees were immaterial.

11. Employee Benefit Plan

The Company has a retirement savings plan under Section 401(k) of the Code covering its employees. The plan allows employees to defer, up to the maximum allowed, a percentage of their income on a pre-tax basis through contributions to the plans, plus any employee age 50 and over can participate in the caught-up dollars as allowed by Internal Revenue Service codes. The Company also has a Roth investment plan that is taken after taxes. The Company does not currently make matching contributions.

12. Restructuring Charges

On March 15, 2017, in connection with the addition of precision medicine therapeutics to its business, the Company announced a restructuring plan (the “Restructuring”) which included a reduction in force. As part of this restructuring, the Company elected to dissolve its wholly owned subsidiary, Trovogene Srl, in 2017, resulting in a reversal of foreign currency translation losses. The financial results of the dissolution is represented in the restructuring cost in the December 31, 2017 financial statements.

This restructuring has been completed as of December 31, 2017. The Company incurred approximately \$2.2 million in restructuring charges, which has been included as a component of operating loss for the year ended December 31, 2017. Restructuring charges include approximately \$1.1 million of costs related to termination of employees, which is net of a \$125,000 stock-based compensation expense reversal for certain terminated employees. The remaining restructuring charges of approximately \$485,000 were related to impairment of capitalized license fees. Of the total restructuring expenses recorded, approximately \$262,000 remains to be paid as of December 31, 2017 and is included in accrued liabilities on the Company’s consolidated balance sheet.

13. Related Party Transactions

In March 2016, the Company engaged Rutan & Tucker, LLP, a law firm to represent Trovogene, Inc. with respect to various lawsuits. One of the partners from Rutan & Tucker, LLP, is the son of the Company’s Chairman of the Board. The fees for legal services are based on the hourly rates of the individuals performing the legal services. During the year ended December 31, 2017 and 2016, the Company incurred and recorded approximately \$650,000 and \$537,000 of legal expenses, net of insurance reimbursements, for services performed by Rutan & Tucker, LLP, respectively.

14. Selected Quarterly Financial Data (Unaudited)

The following is a summary of the quarterly results of operations of the Company for years ended December 31, 2017 and 2016:

	Quarter Ended(1)			
	March 31	June 30	September 30	December 31
	(dollars in thousands, except per share data)			
2017				
Revenues	\$ 95	\$ 102	\$ 123	\$ 185
Operating expenses	\$ 10,221	\$ 5,990	\$ 5,921	\$ 3,969
Net loss attributable to common stockholders	\$ (10,005)	\$ (8,052)	\$ (4,298)	\$ (2,576)
Net loss per common share - basic	\$ 0.32	\$ (0.26)	\$ (0.12)	\$ (0.06)
Net loss per common share - diluted	\$ (0.32)	\$ (0.26)	\$ (0.12)	\$ (0.06)
Shares used in the calculation of net loss attributable to common stockholders - basic	30,961,014	30,991,740	36,465,672	40,182,071
Shares used in the calculation of net loss attributable to common stockholders - diluted	30,961,014	30,991,740	36,465,672	40,182,071

2016

Revenues	\$	120	\$	104	\$	89	\$	68
Operating expenses	\$	10,579	\$	10,084	\$	10,013	\$	9,850
Net loss attributable to common stockholders	\$	(10,269)	\$	(10,208)	\$	(10,197)	\$	(8,554)
Net loss per common share - basic	\$	(0.35)	\$	(0.34)	\$	(0.34)	\$	(0.28)
Net loss per common share - diluted	\$	(0.36)	\$	(0.34)	\$	(0.34)	\$	(0.34)
Shares used in the calculation of net loss attributable to common stockholders - basic		29,755,184		29,958,037		30,339,774		30,639,440
Shares used in the calculation of net loss attributable to common stockholders - diluted		30,108,377		29,958,037		30,339,774		30,711,946

(1) Basic and diluted net loss per common share are computed independently for each of the periods presented. Accordingly, the sum of the quarterly net loss per common share amount may not agree to the total for the year.

Consent of Independent Registered Public Accounting Firm

Trovagene, Inc.
San Diego, California

We hereby consent to the incorporation by reference in the Registration Statements on Form S-3 (No. 333-211705 and No. 333-208010), Form S-1 (No. 333-221115) and Form S-8 (No. 333-220060, No. 333-211846, No. 333-205424 and No. 333-190415) of Trovagene, Inc. of our reports dated February 26, 2018, relating to the consolidated financial statements, which appear in this Form 10-K.

/s/ BDO USA, LLP

San Diego, California
February 26, 2018

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER AND PRINCIPAL FINANCIAL OFFICER

I, William J. Welch, certify that:

1. I have reviewed this annual report on Form 10-K of Trovogene, Inc. (the “Registrant”);
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 annual report;
4. The registrant’s other certifying officer 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 annual 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 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; 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.

February 26, 2018

/s/ William J. Welch

William J. Welch
*Chief Executive Officer (Principal Executive Officer and Principal
Financial Officer)*

**CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER AND PRINCIPAL FINANCIAL OFFICER
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 Trovogene, Inc. (the "Company") on Form 10-K for the year ended December 31, 2017 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, William J. Welch, Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

- (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.

February 26, 2018

/s/ William J. Welch

William J. Welch
Chief Executive Officer (Principal Executive Officer and Principal Financial Officer)