As filed with the Securities and Exchange Commission on September 25, 2019

No. 333-233396

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

AMENDMENT NO. 1 TO FORM S-1
REGISTRATION STATEMENT

UNDER

THE SECURITIES ACT OF 1933

Delcath Systems, Inc.

(Exact name of registrant as specified in its charter)

Delaware	3841	06-1245881
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification No.)

1633 Broadway, Suite 22C
New York, New York 10019
(212) 489-2100

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common stock	DCTH	OTC QB

Jennifer K. Simpson
President and
Chief Executive Officer
Delcath Systems, Inc.
1633 Broadway, Suite 22C
New York, New York 10019
(212) 489-2100

(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies of all communications to:

Michele F. Vaillant, Esq.
McCarter & English, LLP
100 Mulberry Street
Newark, New Jersey 07102
(973) 639-2011

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

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

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act of 1933, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

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

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

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

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

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act. ☐

CALCULATION OF REGISTRATION FEE

Title of each class of securities to be registered	Amount to be registered(1)	Proposed maximum aggregate offering price(1)(2)	Proposed maximum aggregate offering price	Amount of registration fee(2)
Common Stock, $0.01 par value per share, underlying Series E and Series E-1 Convertible Preferred Stock and Series E and Series E-1 Warrants	980,557,497.00	$.12	$117,666,899.64	$14,261.23
Total:			$117,666,899.64	$14,261.23(3)

(1) We are registering for re-sale 980,557,497 shares of Common Stock that may be issued to the Selling Stockholders named in this registration statement following the conversion of certain shares of (i) Series E Convertible Preferred Stock and the exercise of Series E Warrants issued to the Selling Stockholders with respect to such Series E Convertible Preferred Stock and (ii) Series E-1 Convertible Preferred Stock and the exercise of Series E-1 Warrants issued to the Selling Stockholders with respect to such Series E-1 Convertible Preferred Stock. Pursuant to Rule 416(a) of the Securities Act of 1933, as amended, this registration statement also covers any additional shares of Common Stock which may become issuable to prevent dilution from stock splits, stock dividends or similar events.

(2) Estimated in accordance with Rule 457(c) solely for purposes of calculating the registration fee. The maximum price per security and the maximum aggregate offering price are based on the average of the $0.14 (high) and $0.09 (low) sale price of the Registrant's Common Stock as reported on the OTC QB on August 19, 2019, which date is within five business days prior to filing this Registration Statement.

(3) Registrant previously paid $14,261.23.

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

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The information contained in this prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

Preliminary Prospectus Subject to Completion, Dated September 25, 2019

980,557,497 Shares of Common Stock

This prospectus relates to the re-sale by the selling stockholders identified in this prospectus, or their assigns (each a "Selling Stockholder" and, collectively, the "Selling Stockholders") of up to an aggregate of 980,557,497 shares of common stock, $0.01 par value per share (the "Common Stock"), of Delcath Systems, Inc., a Delaware corporation ("Delcath" or the "Company").

The shares offered by this prospectus may be sold by the Selling Stockholders or their transferees, pledgees, donees or assigns or other successors-in-interest that receive any of the shares as a gift, distribution, or other non-sale related transfer from time to time in the over-the-counter market or any other national securities exchange or automated interdealer quotation system on which our Common Stock is then listed or quoted, through negotiated transactions or otherwise at market prices prevailing at the time of sale or at negotiated prices, as described under "Plan of Distribution" herein.

The Selling Stockholders received (i) an aggregate of 32,572 shares of our Series E Convertible Preferred Stock and Series E Warrants to purchase 542,866,333 shares of our Common Stock pursuant to a Securities Purchase Agreement entered into with the Company on July 11, 2019 and as a result of the conversion of certain Bridge Notes on July 16, 2019 and (ii) an aggregate of 9,510 shares of our Series E-1 Convertible Preferred Stock and Series E-1 Warrants to purchase 158,507,237 shares of our Common Stock pursuant to a Securities Purchase Agreement entered into with the Company on August 15, 2019. We are not selling any shares of Common Stock in this resale offering. We are registering shares that are issuable to the Selling Stockholders upon the conversion of the Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock and the shares of Common Stock underlying the exercise of the Series E Warrants and the Series E-1 Warrants (collectively, the "Registered Shares").

All net proceeds from the sale of the shares of Common Stock covered by this prospectus will go to the Selling Stockholders. We will receive none of the proceeds from the sale of the shares of Common Stock covered by this prospectus by the Selling Stockholders. We may receive proceeds upon the exercise of outstanding warrants for shares of Common Stock covered by this prospectus if the warrants are exercised for cash. We will bear all expenses of registration incurred in connection with this offering, but all selling and other expenses incurred by the Selling Stockholders will be borne by them.

Our Common Stock trades on the OTC QB marketplace maintained by OTC Markets Group, Inc. under the symbol "DCTH".

The Selling Stockholders may be deemed "underwriters" within the meaning of the Securities Act of 1933, as amended**,** in connection with the resale of the Registered Shares.

This offering will terminate on the earlier of (i) the date when all of the Registered Shares have been sold pursuant to this prospectus or Rule 144 under the Securities Act, and (ii) the date that all of the securities may be sold pursuant to Rule 144 without volume or manner-of-sale restrictions, unless we terminate it earlier.

Investing in the Common Stock offered by this prospectus is speculative and involves a high degree of risk. See "Risk Factors" beginning on page 7.

NEITHER THE SECURITIES AND EXCHANGE COMMISSION NOR ANY STATE SECURITIES COMMISSION HAS APPROVED OR DISAPPROVED OF THESE SECURITIES OR PASSED UPON THE ADEQUACY OR ACCURACY OF THIS PROSPECTUS. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

The date of this prospectus is , 2019

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ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed on behalf of the Selling Stockholders with the Securities and Exchange Commission (the "Commission") to permit the Selling Stockholders to sell the Registered Shares described in this prospectus in one or more transactions. The Selling Stockholders and the plan of distribution of the Registered Shares being offered by them are described in this prospectus under the headings "Selling Stockholders" and "Plan of Distribution."

You should rely only on the information contained in this prospectus. We have not authorized any person to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. We are not making an offer to sell these securities in any jurisdiction where the offer or sale is not permitted. The information contained in this prospectus is accurate only as of the date of this document, regardless of the time of delivery of this prospectus or the time of issuance or sale of any securities. Our business, financial condition, results of operations and prospects may have changed since that date. You should read this prospectus in its entirety before making an investment decision. You should also read and consider the information in the documents to which we have referred you in the section of this prospectus entitled "Where You Can Find More Information."

Industry and Market Data

This prospectus includes industry data and forecasts that we have obtained from industry publications and surveys, public filings and internal company sources. Industry publications and surveys and forecasts generally state that the information contained therein has been obtained from sources believed to be reliable, but there can be no assurance as to the accuracy or completeness of the included information. Statements as to our market position and market estimates are based on independent industry publications, government publications, third party forecasts, management's estimates and assumptions about our markets and our internal research. While we are not aware of any misstatements regarding the market, industry or similar data presented herein, such data involve risks and uncertainties and are subject to change based on various factors, including those discussed under the headings "Risk Factors" and "Cautionary Statement Concerning Forward-Looking Statements" in this prospectus.

PROSPECTUS SUMMARY

The following summary highlights information contained elsewhere in this prospectus. It does not contain all of the information you need to consider in making your investment decision. Before making an investment decision, you should read this entire prospectus carefully and you should consider, among other things, the matters set forth under "Risk Factors" and our financial statements and related notes thereto appearing elsewhere in this prospectus. In this prospectus, except as otherwise indicated, "Delcath," "Delcath Systems," "the Company," "we," "our," and "us" refer to Delcath Systems, Inc., a Delaware corporation and its subsidiaries. "Delcath" is our registered United States trademark.

Company Overview

Delcath Systems, Inc. is an interventional oncology company focused on the treatment of primary and metastatic liver cancers. Our investigational product, "Melphalan Hydrochloride for Injection for use with the Delcath Hepatic Delivery System" ("Melphalan/HDS"), is designed to administer high-dose chemotherapy to the liver while controlling systemic exposure and associated side effects.

In the United States, Melphalan/HDS is considered a combination drug and device product, is referred to by its chemical name and delivery system, Melphalan/HDS, and is regulated as a drug by the Federal Food and Drug Administration (the "FDA"). The FDA has granted us six orphan drug designations, including three orphan designations for the use of the drug melphalan for the treatment of patients with ocular melanoma liver metastases ("mOM"), hepatocellular carcinoma ("HCC") and intrahepatic cholangiocarcinoma, a type of primary livery cancer ("ICC"). Melphalan/HDS has not been approved for sale in the United States.

In Europe, our delivery system, without the drug, is commercially available under the trade name Delcath Hepatic CHEMOSAT® Delivery System for Melphalan (marketed under the name CHEMOSAT and referred to herein as "CHEMOSAT"), where it has been used at major medical centers to treat a wide range of cancers of the liver. The current version of CHEMOSAT is regulated as a Class IIb medical device and received its CE Mark in 2012. We are in an early phase of commercializing CHEMOSAT in select markets in the European Union (the "EU") where the prospect of securing reimbursement coverage for the procedure is strongest. In 2015 national reimbursement coverage for CHEMOSAT procedures was awarded in Germany. In 2016, coverage levels were negotiated between hospitals in Germany and regional sickness funds. Coverage levels determined via this process are expected to be renegotiated annually. In 2017, Dutch health authorities added CHEMOSAT to their treatment guidelines for patients with ocular melanoma metastatic to the liver, an important step toward eventual reimbursement in the Dutch market.

Our primary research focus is on mOM and ICC and certain other cancers that are metastatic to the liver. Currently there are few effective treatment options for certain cancers in the liver. Traditional treatment options include surgery, systemic chemotherapy, liver transplant, radiation therapy, interventional radiology techniques, and isolated hepatic perfusion. We believe that Melphalan/HDS and CHEMOSAT represent a potentially important advancement in regional therapy for primary liver cancer and certain other cancers metastatic to the liver and are uniquely positioned to treat the entire liver either as a standalone therapy or as a complement to other therapies. We believe the disease states we are investigating represent a multi-billion dollar global market opportunity and a clear unmet medical need.

Our clinical development program for Melphalan/HDS is comprised of the FOCUS Clinical Trial for Patients with Hepatic Dominant Ocular Melanoma (the "FOCUS Trial"), a global registration clinical trial that is investigating objective response rate in mOM, and the ALIGN Trial, a global Phase 3 clinical trial for ICC (the "ALIGN Trial"). Our product also includes a registry for CHEMOSAT commercial cases performed in Europe and sponsorship of select Investigator Initiated Trials.

The direction and focus of our product is informed by prior clinical development conducted between 2004 and 2010, commercial CHEMOSAT treatment of patients in Europe, and prior regulatory experience with the FDA. Experience gained from this research and development, early European commercial cases and United States regulatory opinion has led to the implementation of several safety improvements to our product and the associated medical procedure.

While we currently utilize third parties to manufacture some components of our product, we also have our own medical device manufacturing operations for certain components of our product and assemble, label and package our products in Queensbury, New York. See the discussion below under the caption "Manufacturing and Quality Assurance." We commercialize our product in Europe through alliances with third parties.

Cancers in the Liver—A Significant Unmet Need

Cancers of the liver remain a major unmet medical need globally. According to the American Cancer Society's *Cancer Facts & Figures 2018* report, cancer is the second leading cause of death in the United States, with an estimated 609,640 deaths and 1.7 million new cases expected to be diagnosed in 2018. Cancer is one of the leading causes of death worldwide, accounting for approximately 9.6 million deaths and 18.1 million new cases in 2018 according to GLOBOCAN, the database of the International Association of Cancer Registries. The financial burden of cancer is enormous for patients, their families and society. The Agency for Healthcare Quality and Research estimates that the direct medical costs (total of all healthcare expenditures) for cancer in the United States in 2015 was $80.2 billion. The liver is often the life-limiting organ for cancer patients and one of the leading causes of cancer death. Patient prognosis is generally poor once cancer has spread to the liver.

Liver Cancers—Incidence and Mortality

There are two types of liver cancers: primary liver cancer and metastatic liver disease. Primary liver cancer (hepatocellular carcinoma or HCC, including intrahepatic bile duct cancers or ICC) originates in the liver or biliary tissue and is particularly prevalent in populations where the primary risk factors for the disease, such as hepatitis-B, hepatitis-C, high levels of alcohol consumption, aflatoxin, cigarette smoking and exposure to industrial pollutants, are present. Metastatic liver disease, also called liver metastasis, or secondary liver cancer, is characterized by microscopic cancer cell clusters that detach from the primary site of disease and travel via the blood stream and lymphatic system into the liver, where they grow into new tumors. These metastases often continue to grow even after the primary cancer in another part of the body has been removed. Given the vital biological functions of the liver, including processing nutrients from food and filtering toxins from the blood, it is not uncommon for metastases to settle in the liver. In many cases patients die not as a result of their primary cancer, but from the tumors that metastasize to their liver. In the United States, metastatic liver disease is more prevalent than primary liver cancer.

Ocular Melanoma

Ocular melanoma is one of the cancer histologies with a high likelihood of metastasizing to the liver. Based on third party research that we commissioned in 2018, we estimate that up to 4,700 cases of ocular melanoma are diagnosed in the United States and Europe annually, and that approximately 55% of these patients will develop metastatic disease. Of metastatic cases of ocular melanoma, we estimate that approximately 90% of patients will develop liver involvement. Once ocular melanoma has spread to the liver, current evidence suggests median overall survival for these patients is generally six to eight months. Currently, there is no standard of care for patients with ocular melanoma liver metastases. Based on the research conducted in 2018, we estimate that approximately 2,000 patients with ocular melanoma liver metastases in the United States and Europe may be eligible for treatment with the Melphalan/HDS.

Intrahepatic Cholangiocarcinoma

Hepatobiliary cancers include HCC and ICC, and are among the most prevalent and lethal forms of cancer. According to GLOBOCAN, an estimated 78,500 new cases of hepatobiliary cancers are diagnosed in the United States and Europe annually. According to the American Cancer Society, approximately 42,030 new cases of these cancers are expected to be diagnosed in the United States in 2019, leading to approximately 31,780 deaths.

ICC is the second most common primary liver tumor and accounts for 3% of all gastrointestinal cancers and 15% of hepatobiliary cases diagnosed in the United States and Europe annually. We believe that 90% of ICC patients are not candidates for surgical resection, and that approximately 20-30% of these may be candidates for certain focal interventions. According to third party research that we commissioned in 2018 we estimate that approximately 11,000 ICC patients in the United States and Europe annually could be candidates for treatment with Melphalan/HDS, which we believe represents a significant market opportunity.

According to the American Cancer Society, the overall five-year survival rate for hepatobiliary cancers in the United States is approximately 18%. For patients diagnosed with a localized stage of disease, the American Cancer Society estimates 5-year survival at 31%. The American Cancer Society estimates that 5-year survival for all cancers is 68%.

About CHEMOSAT and Melphalan/HDS

Our product administers concentrated regional chemotherapy to the liver. This “whole organ” therapy is performed by isolating the circulatory system of the liver, infusing the liver with a chemotherapeutic agent, and then filtering the blood prior to returning it to the patient. During the procedure, known as percutaneous hepatic perfusion, PHP®, (“PHP therapy”), three catheters are placed percutaneously through standard interventional radiology techniques. The catheters temporarily isolate the liver from the body’s circulatory system, allow administration of the chemotherapeutic agent melphalan hydrochloride directly to the liver, and collect blood exiting the liver for filtration by our proprietary filters. The filters absorb chemotherapeutic agent in the blood, thereby reducing systemic exposure to the drug and related toxic side effects, before the filtered blood is returned to the patient’s circulatory system.

PHP therapy is performed in an interventional radiology suite in approximately two to three hours. Patients remain in an intensive care or step-down unit overnight for observation following the procedure. Treatment with CHEMOSAT and Melphalan/HDS is repeatable, and a new disposable system is used for each treatment. Patients treated in clinical settings are permitted up to six treatments. In commercial treatment settings, patients have received up to eight treatments. In the United States, melphalan hydrochloride for injection will be included as part of the product offering, if approved. In Europe, the system is sold separately and used in conjunction with melphalan hydrochloride commercially available from a third party. In our clinical trials, melphalan hydrochloride for injection is provided to both European and United States clinical trial sites.

Risks of Investing

Investing in our securities involves substantial risks. Potential investors are urged to read and consider the risk factors relating to an investment in the Common Stock set forth under “Risk Factors” in this prospectus as well as other information we include in this prospectus.

Trading Market

Our Common Stock trades on the OTC Marketplace (OTC QB) under the symbol “DCTH”.

Corporate Information

We were incorporated in the State of Delaware in August 1988. Our principal executive offices are located at 1633 Broadway, Suite 22C, New York, New York 10019. Our telephone number is (212) 489-2100. Our website address is http://www.delcath.com . Information contained in our website does not constitute any part of, and is not incorporated into, this prospectus.

SUMMARY OF THE OFFERING

Common Stock offered by the Selling Stockholders:	Up to 980,557,497 shares of our Common Stock are being offered by the Selling Stockholders (including (i) an aggregate of 490,278,749 shares of as converted Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock and (ii) 490,278,498 shares of Common Stock subject to the exercise of accompanying Series E Warrants and Series E-1 Warrants).
Selling Stockholders:	See “Selling Stockholders” beginning on page 58.
Offering prices:	The shares offered by this prospectus may be offered and sold at prevailing market prices or such other prices as the Selling Stockholders may determine.
Common Stock outstanding Before Offering:	18,277,807 shares*
After Offering:	998,835,304 shares
Terms of the Offering:	The Selling Stockholders will determine when and how they sell the Registered Shares offered in this prospectus, as described in “Plan of Distribution” beginning on page 66.
Use of proceeds:	We are not selling any of the shares of Common Stock being offered by this prospectus and will receive no proceeds from the sale of the shares by the Selling Stockholders. All of the proceeds from the sale of Common Stock offered by this prospectus will go to the Selling Stockholders at the time they offer and sell such shares. We will bear all costs associated with registering the shares of Common Stock offered by this prospectus. See “Use of Proceeds” beginning on page 32.
Risk factors	See “Risk Factors” and other information included in this prospectus for a discussion of the factors you should carefully consider before deciding to invest in our securities.
Trading Symbol on OTC QB:	DCTH
Transfer agent and registrar	American Stock Transfer and Trust Company, LLC

* Based on 18,277,807 shares of Common Stock outstanding on September 25, 2019. We are authorized to issue 1,000,000,000 shares of Common Stock.

RISK FACTORS

Risks Related to Our Business and Financial Condition

An investment in our securities involve a high degree of risk. You should carefully consider the risks described below, together with the financial and other information contained in this annual report, before you decide to purchase our securities. If any of the following risks actually occurs, our business, financial condition, results of operations, cash flows and prospects could be materially and adversely affected. If any of these risks actually occur, our business, financial condition and results of operations would suffer. In that event, the trading price of our Common Stock and the market value of the securities offered hereby could decline, and you may lose all or part of your investment.

Our independent registered public accounting firm has expressed substantial doubt about our ability to continue as a going concern.

Our independent registered public accounting firm issued a report dated June 14, 2019 in connection with the audit of our financial statements as of December 31, 2018, which included an explanatory paragraph describing the existence of conditions that raise substantial doubt about our ability to continue as a going concern. In addition, the notes to our financial statements for the year ended December 31, 2018, included in our Annual Report on Form 10-K filed with the Commission on June 14, 2019, contain a disclosure describing the existence of conditions that raise substantial doubt about our ability to continue as a going concern. Our ability to continue as a going concern is dependent upon our ability to obtain substantial additional funding in connection with our continuing operations. Adequate additional financing may not be available to us on acceptable terms, or at all. If the Company is unable to raise additional capital and/or enter into strategic alliances when needed or on attractive terms, Delcath would be forced to delay, reduce or eliminate its research and development programs or any commercialization efforts. The Company's consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty. If the Company is not able to continue as a going concern, it is likely that holders of its Common Stock will lose all of their investment.

Drug development is an inherently uncertain process with a high risk of failure at every stage of development. Delcath received a complete response letter from the FDA declining to approve our existing New Drug Application, or NDA, in its current form.

Preclinical testing and clinical trials are long, expensive and highly uncertain processes and failure can unexpectedly occur at any stage of clinical development. Drug development is very risky, and it takes several years to complete clinical trials. The start or end of a clinical trial is often delayed or halted due to changing regulatory requirements, manufacturing challenges, required clinical trial administrative actions, slower than anticipated patient enrollment, changing standards of care, availability or prevalence of use of a comparator treatment or required prior therapy, clinical outcomes including insufficient efficacy, safety concerns, or our own financial constraints.

In response to our NDA, which the Company submitted to FDA in August 2012 seeking approval for use of our Melphalan/HDS Kit for the treatment of patients with ocular melanoma of the liver, in September 2013, the FDA denied approval of the NDA in its current form and issued a complete response letter (CRL). A CRL is issued by the FDA when the review of an NDA is completed, and deficiencies remain that preclude approval of the NDA in its current form. The deficiencies in the CRL included, but were not limited to, a statement that Delcath must perform additional "well-controlled randomized trial(s) to establish the safety and efficacy of Melphalan/HDS Kit using overall survival as the primary efficacy outcome measure" and which "demonstrates that the clinical benefits of Melphalan/HDS Kit outweigh its risks." The FDA also required that the additional clinical trial(s) be conducted using the product the Company intends to market. Prior to conducting additional clinical trials, Delcath must satisfy certain other requirements of the CRL, including, but not limited to, product quality testing and human factors information.

Delcath has initiated a pivotal Phase 3 trial in ocular melanoma metastases. Delcath had a SPA agreement with FDA for this study, which was initially designed as a randomized trial with a primary endpoint of overall survival. We subsequently amended the protocol so that the trial is a non-randomized, single-arm study with a primary endpoint of objective response rate. Although the changes to the protocol invalidated the SPA agreement, FDA stated that it would not object to Delcath conducting a study outside of a SPA agreement. However, Delcath will need to justify how the results of the study support a favorable risk-benefit assessment, particularly whether the response rate is sufficient to overcome the toxicity of Melphalan/HDS.

In addition, Delcath conducts and participates in numerous clinical trials with a variety of study designs, patient populations and trial endpoints to support additional indications for Melphalan/HDS and HDS with other drug therapies. In 2014, Delcath initiated a Phase 2 clinical trial with Melphalan/HDS for hepatocellular carcinoma ("HCC") in both the United States and Europe. In 2015, the Phase 2 clinical trial for HCC was expanded to include a cohort of patients with intrahepatic cholangiocarcinoma, a type of primary livery cancer ("ICC"). The trial for this cohort was conducted at the same centers participating in the Phase 2 HCC trial. Unfavorable or inconsistent clinical data from clinical trials, including the Phase 2 clinical trial for HCC, the market's perception of these clinical data or FDA's perception of this clinical data, may adversely impact our ability to obtain approval, and our financial condition. Additionally, even if the results of our Phase 2 clinical trial for HCC and ICC are positive, there is a substantial risk that it will fail to have positive results in Phase 3 clinical trials with regard to efficacy, safety or other clinical outcomes and may never obtain regulatory approval.

The Company does not expect to generate significant revenue for the foreseeable future.

Delcath's entire focus has been on developing, commercializing, and obtaining regulatory authorizations and approvals of CHEMOSAT® and Melphalan/HDS and currently has only developed this system for the treatment of cancers in the liver. If CHEMOSAT and Melphalan/HDS for the treatment of cancers in the liver fail as commercial products, the Company has no other products to sell. In addition, since CHEMOSAT currently is approved for commercialization solely in the European Economic Area (the "EEA") and limited other jurisdictions, if medac, our third-party distributor, is unsuccessful in commercializing the product in the EEA and/or if Melphalan/HDS is not approved in the United States and elsewhere, the Company will have no means of generating revenue. In September 2013, the FDA issued a CRL with respect to the Company's NDA for Melphalan/HDS. A CRL is issued by the FDA when the review of a file is completed and questions remain that preclude approval of the NDA in its then current form. Accordingly, Delcath does not expect to realize any revenues from product sales in the United States in the next several years, if at all. As a result, our revenue sources are, and will remain, extremely limited until the Company's product candidates are approved by the FDA or other additional foreign regulatory agencies and successfully marketed. CHEMOSAT and Melphalan/HDS may not be successful in clinical trials, approved by the FDA or other additional foreign regulatory agency or marketed at any time in the foreseeable future or at all.

Continuing losses may exhaust our capital resources.

As of June 30, 2019, the Company had $352,000 in cash and cash equivalents. Delcath has had minimal revenue to date, and has a substantial accumulated deficit, recurring operating losses and negative cash flow. For the years ended December 31, 2018 and 2017, the Company incurred net losses of approximately $19.2 million and $45.1 million, respectively and expects to continue to incur losses in 2019. Subsequent to June 30, 2019 the Company closed on a $20.0 million private placement in July 2019 and a $9.5 private placement in August 2019 which management believes will fund the Company through the first half of 2020. To date, the Company has funded operations through a combination of private placements and public offerings of its securities, including convertible notes. If Delcath continues to incur losses, the Company may exhaust its capital resources, and as a result may be unable to complete its clinical trials, engage in product development and the regulatory approval process and commercialization of CHEMOSAT and Melphalan/HDS or any other versions of these products. If Delcath is unable to raise capital or generate sufficient revenue, it may not be able to pay its debts when they become due and may have to seek protection from the bankruptcy courts or enter into a receivership.

If the Company cannot raise additional capital, its potential to generate future revenues will be significantly limited since it may not be able to further commercialize CHEMOSAT and Melphalan/HDS, complete its clinical trials or conduct future product development and clinical trials.

The Company will require additional financing to complete its clinical trial program or seek other approvals, to conduct future development and clinical trials and to further commercialize its product in the EEA and any other markets where the Company may receive approval for its products. In addition, Delcath is obligated to make payments under long-term research and development obligations and lease agreements. If financing is unavailable to make the required payments under these agreements, the Company could be subject to legal liability and its ability to complete product development projects or clinical trials could be impaired. The Company does not know if additional financing will be available when needed at all or on acceptable terms. If unable to obtain additional financing as needed, the Company may not be able to further commercialize CHEMOSAT and Melphalan/HDS, obtain regulatory approvals or complete its development projects or clinical trials, which would result in a complete loss of an investment in our securities.

Our liquidity and capital requirements will depend on numerous factors, including:

- clinical studies, including a Phase 3 clinical trial in ocular melanoma liver metastases and a registration trial in ICC;
- the timing and costs of our various United States and foreign regulatory filings, obtaining approvals and complying with regulations;
- the timing and costs associated with developing our manufacturing operations;
- the timing of product commercialization activities, including marketing and distribution arrangements overseas;
- the timing and costs involved in preparing, filing, prosecuting, defending and enforcing intellectual property rights; and
- the impact of competing technological and market developments.

Insufficient funds may require us to curtail or stop our commercialization activities, regulatory submissions or ongoing activities for regulatory approval, research and development and clinical trials, which will significantly limit our potential to generate future revenues.

Risks Related to FDA and Foreign Regulatory Approval

Our failure to obtain, or delays in obtaining, regulatory approvals may have a material adverse effect on our business, financial condition and results of operations.

CHEMOSAT and Melphalan/HDS are subject to extensive and rigorous government regulation by the FDA and other foreign regulatory agencies. The FDA regulates the research, development, pre-clinical and clinical testing, manufacture, safety, effectiveness, record keeping, reporting, labeling, storage, approval, advertising, promotion, sale, distribution, import and export of pharmaceutical and medical device products. Failure to comply with FDA and other applicable regulatory requirements may, either before or after product approval, subject us to either civil or criminal administrative or judicially-imposed sanctions and/or other penalties.

In the United States, the FDA regulates drug and device products under the Federal Food, Drug, and Cosmetic Act and its implementing regulations. Melphalan/HDS is subject to regulation by the FDA as a combination product, which means it is composed of both a drug product and device product. If marketed individually, each component would therefore be subject to different regulatory pathways and reviewed by different centers within the FDA. A combination product, however, is assigned to a center that will have primary jurisdiction over its pre-market review and regulation based on a determination of the product's primary mode of action, which is the single mode of action that provides the most important therapeutic action. In the case of Melphalan/HDS, the primary mode of action is attributable to the drug component of the product, which means that the Center for Drug Evaluation and Research has primary jurisdiction over its pre-market development and review.

The Company is not permitted to market Melphalan/HDS in the United States unless and until it obtains regulatory approval from the FDA. To market the product in the United States, Delcath must submit to the FDA and obtain FDA approval of an NDA. An NDA must be supported by extensive clinical and preclinical data, as well as extensive information regarding chemistry, manufacturing and controls, or CMC, to demonstrate the safety and effectiveness of the applicable product candidate. The number and types of preclinical studies and clinical trials that will be required varies depending on the product candidate, the disease or condition that the product candidate is designed to target and the regulations applicable to any particular product candidate. Despite the time and expense associated with preclinical and clinical studies, failure can occur at any stage, and the Company could encounter problems that cause it to repeat or perform additional preclinical studies, CMC studies or clinical trials. The FDA and similar foreign authorities could delay, limit or deny approval of a product candidate for many reasons, including because they:

- may not deem a product candidate to be adequately safe and effective;
- may determine that the risk: benefit profile is not favorable;
- may not find the data from preclinical studies, CMC studies and clinical trials to be sufficient to support a claim of safety and efficacy;
- may interpret data from preclinical studies, CMC studies and clinical trials significantly differently than the Company;
- may not approve the manufacturing processes or facilities associated with our product candidates;
- may change approval policies (including with respect to our product candidates' class of drugs) or adopt new regulations; or
- may not accept a submission due to, among other reasons, the content or formatting of the submission.

Furthermore, we cannot be certain that we or our present or future third-party manufacturers or suppliers will be able to comply with the cGMP regulations and other ongoing FDA regulatory requirements. If we or our present or future third-party manufacturers or suppliers are not able to comply with these requirements, the FDA may require us to recall our products from distribution or withdraw any potential approvals of an NDA for that product.

Undesirable side effects caused by any product candidate that Delcath develops could result in the denial of regulatory approval by the FDA or other regulatory authorities for any or all targeted indications or cause us to evaluate the future of our development programs. The regulatory review and approval process is lengthy, expensive and inherently uncertain. As part of the U.S. Prescription Drug User Fee Act, the FDA has a goal to review and act on a percentage of all submissions in a given time frame. In August 2012, the Company submitted the Melphalan/HDS NDA seeking an indication for ocular melanoma liver metastases. In September 2013, the FDA declined to approve the NDA and issued a CRL. The deficiencies in the CRL included, but were not limited to, a statement that the Company must perform additional "well-controlled randomized trial(s) to establish the safety and efficacy of Melphalan/HDS using overall survival as the primary efficacy outcome measure" and which "demonstrates that the clinical benefits of Melphalan/HDS outweigh its risks." The FDA also requires that the additional clinical trial(s) be conducted using the product the Company intends to market. Prior to conducting additional clinical trials, Delcath must satisfy certain other requirements of the CRL, including, but not limited to, product quality testing and human factors information. However, even if the Company completes its clinical trials and satisfies all the requirements of the CRL, it may not obtain regulatory approval from the FDA. Continued failure to obtain, or additional delays in obtaining, regulatory approvals may:

- adversely affect the commercialization of the current version of CHEMOSAT and Melphalan/HDS or any products that the Company develops in the future;
- impose additional costs on Delcath;
- diminish any competitive advantages that may be attained; and
- adversely affect the Company's ability to generate revenues.

Delcath has obtained the right to affix the CE Mark for the Delcath Hepatic CHEMOSAT Delivery System as a medical device for the delivery of melphalan. Since the Company may only promote the device within this specific indication, if physicians are unwilling to obtain melphalan separately for use with CHEMOSAT, Delcath's ability to commercialize CHEMOSAT in the EEA will be significantly limited.

In the EEA, CHEMOSAT is regulated as a Class IIb medical device indicated for the intra-arterial administration of a chemotherapeutic agent, melphalan hydrochloride, to the liver with additional extracorporeal filtration of the venous blood return. Delcath's ability to market and promote CHEMOSAT is limited to this approved indication. To the extent that the Company's promotion of CHEMOSAT is found to be outside the scope of its approved indication, Delcath may be subject to fines or other regulatory action, limiting its ability to commercialize CHEMOSAT in the EEA.

The Company is limited to marketing CHEMOSAT in the EEA as a medical device for the delivery of melphalan. If physicians are unwilling to obtain melphalan separately for use with CHEMOSAT, Delcath's ability to commercialize CHEMOSAT in the EEA will be significantly limited. Delcath's product instructions and indication reference the chemotherapeutic agent melphalan. However, no melphalan labels in the EEA reference Delcath's product, and the labels vary from country to country with respect to the approved indication of the drug and its mode of administration. As a result, the delivery of melphalan with Delcath's device may not be within the applicable label with respect to some indications in some Member States of the EEA where the drugs are authorized for marketing. Physicians intending to use CHEMOSAT must obtain melphalan separately for use with CHEMOSAT and must use melphalan independently at their discretion. If physicians are unwilling to obtain melphalan separately from CHEMOSAT and/or to prescribe the use of melphalan independently, the Company's sales opportunities in the EEA will be significantly impaired.

While the Company has obtained the right to affix the CE Mark, it will be subject to significant ongoing regulatory obligations and oversight in the EEA and in any other country where it receives marketing authorization or approval.

In April 2012, the Company obtained the required certification from its European Notified Body, enabling Delcath to complete an EC Declaration of Conformity with the essential requirements of the EU Medical Devices Directive and affix the CE Mark to the Generation Two version of CHEMOSAT. In order to maintain the right to affix the CE Mark in the EEA, the Company is subject to compliance obligations, and any material changes to the approved product, such as manufacturing changes, product improvements or revised labeling, may require further regulatory review. Additionally, the Company is subject to ongoing audits by its European Notified Body, and the right to affix the CE Mark to the Generation Two version of CHEMOSAT may be withdrawn for a number of reasons, including the later discovery of previously unknown problems with the product.

To the extent that CHEMOSAT or Melphalan/HDS is approved by the FDA or any other regulatory agency, Delcath will be subject to similar ongoing regulatory obligations and oversight in those countries where approval is obtained. For example, the Company may be subject to limitations on the approved indicated uses for which the product may be marketed or to the conditions of approval, or requirements for potentially costly post-marketing testing, including Phase IV clinical trials, and surveillance to monitor the safety and efficacy of the product candidate. In addition, if the FDA approves a product candidate, the manufacturing processes, labeling, packaging, distribution, adverse event reporting, storage, advertising, promotion and recordkeeping for the product will be subject to extensive and ongoing regulatory requirements. These requirements include submissions of safety and other post-marketing information and reports, registration, as well as continued compliance with current good manufacturing practice ("cGMPs"), good clinical practices ("GCPs"), and good laboratory practices, which are regulations and guidelines enforced by the FDA for all products in clinical development, for any pre-clinical or clinical trials that the Company conducts post-approval. In addition, post-marketing requirements for CHEMOSAT and Melphalan/HDS may include implementation of a risk evaluation and mitigation strategies ("REMS") program to ensure that the benefits of the product outweigh its risks. A REMS may include a medication guide, a patient package insert, a communication plan to healthcare professionals, restrictions on distribution or use and/or other elements to assure safe use of the product.

Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with our third-party manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may result in, among other things:

- refusals or delays in the approval of applications or supplements to approved applications;
- refusal of a regulatory authority to review pending market approval applications or supplements to approved applications;
- restrictions on the marketing or manufacturing of the product, withdrawal of the product from the market or voluntary or mandatory product recalls or seizures;
- fines, Warning Letters or untitled letters, or holds on clinical trials;
- import or export restrictions;
- injunctions or the imposition of civil or criminal penalties;
- restrictions on product administration, requirements for additional clinical trials or changes to product labeling or REMS programs; or
- recommendations by regulatory authorities against entering into governmental contracts with us.

If the Company is not able to maintain regulatory compliance, it may lose any marketing approval that it may have obtained and may not achieve or sustain profitability, which would have a material adverse effect on the business, results of operations, financial condition and prospects of the Company.

The development and approval process in the United States will take many years, require substantial resources and may never lead to the approval of Melphalan/HDS by the FDA for use in the United States.

The Company cannot sell or market Melphalan/HDS with melphalan or other chemotherapeutic agents in the United States without prior FDA approval of an NDA for Melphalan/HDS. Although melphalan and other drugs have been approved by the FDA for use as chemotherapeutic agents, regulatory approval is required in the United States for the combined medical device component and drug component and the specific indication, dose and route of administration of melphalan or other chemotherapeutic agents or compounds used in our system. The Company is seeking approval of Melphalan/HDS for a substantially higher dose of melphalan than prior approved doses of melphalan and such other chemotherapeutic agents or other compounds. Delcath must obtain separate regulatory approvals for Melphalan/HDS with melphalan and every other chemotherapeutic agent or other compound used with the system that Delcath intends to market, and all the manufacturing facilities used to manufacture components or assemble our system must be inspected and meet legal requirements. Securing regulatory approval requires the submission of extensive pre-clinical and clinical data and other supporting information for each proposed therapeutic indication in order to establish to the FDA's satisfaction the product's safety, efficacy, potency and purity for each intended use. The pre-clinical testing and clinical trials of Melphalan/HDS with melphalan or any other chemotherapeutic agent or compound the Company uses in its system must comply with the regulations of the FDA and other federal, state and local government authorities in the United States. Clinical development is a long, expensive and uncertain process and is subject to delays. Delcath may encounter delays or rejections for various reasons, including its inability to enroll enough patients to complete the clinical trials. Moreover, approval policies or regulations may change. If the Company does not obtain and maintain regulatory approval for Melphalan/HDS and the use of melphalan or other chemotherapeutic agents, the value of the Company, results of operations and its ability to raise additional capital will be harmed.

In August 2012, Delcath submitted a NDA seeking an indication for ocular melanoma liver metastases for Melphalan/HDS. In September 2013, the FDA issued a CRL indicating that the Company must perform additional well-controlled randomized trial(s) to establish the safety and efficacy of Melphalan/HDS using overall survival as the primary efficacy outcome measure and which demonstrates that the clinical benefits of Melphalan/HDS outweigh its risks. Our current Phase 3 trial in ocular melanoma liver metastases, the FOCUS

Trial, is not randomized and uses a different primary efficacy outcome measure. Failure to obtain FDA approval will have a material adverse effect on Delcath's business, financial condition and results of operations.

Even if the Company obtains regulatory approval for Melphalan/HDS in the United States, its ability to market Melphalan/HDS would be limited to those uses that are approved.

The FDA closely regulates the post-approval marketing and promotion of drugs, including standards and regulations for direct-to-consumer advertising, dissemination of off-label information, industry-sponsored scientific and educational activities and promotional activities involving the Internet. Drugs may be marketed only for the approved indications and in accordance with the provisions of the approved label. If the FDA approves an application for Melphalan/HDS, our ability to market and promote Melphalan/HDS would be limited to the approved indication, so even with FDA approval, Melphalan/HDS may only be promoted in this limited market. Physicians may prescribe legally available drugs for uses that are not described in the product's labeling and that differ from those tested by us and approved by the FDA. The FDA does not regulate the behavior of physicians in their choice of treatments. The FDA does, however, impose stringent restrictions on manufacturers' communications regarding off-label use, and FDA approval may otherwise limit our sales practices and our ability to promote, sell and distribute the product. Thus, the Company may only market Melphalan/HDS, if approved by the FDA, for its approved indication and could be subject to enforcement action for off-label marketing. Further, if there are any modifications to the product, including changes in indications, labeling or manufacturing processes or facilities, Delcath may be required to submit and obtain FDA approval of a new or supplemental NDA, which may require the Company to develop additional data or conduct additional preclinical studies and clinical trials. Failure to comply with these requirements can result in adverse publicity, Warning Letters, corrective advertising and potential civil and criminal penalties.

If future clinical trials are unsuccessful, significantly delayed or not completed, the Company may not be able to market Melphalan/HDS for other indications.

The clinical trial data on our product is limited to specific types of liver cancer. In 2010, the Company concluded a Phase 3 clinical trial of Melphalan/HDS in patients with metastatic ocular and cutaneous melanoma to the liver and also completed a multi-arm Phase 2 clinical trial of Melphalan/HDS in patients with primary and metastatic melanoma stratified into four arms.

The Company has initiated an open-label Phase 3 clinical trial in ocular melanoma liver metastases called the FOCUS Trial. The Company has also initiated a Phase 3 registration trial to treat patients with intrahepatic cholangiocarcinoma (ICC), called the ALIGN trial, for which the Company has received agreement on a SPA from the FDA.

It may take several years to complete the testing of Melphalan/HDS for use in the treatment of these indications, and failure can occur at any stage of development, for many reasons, including:

- any pre-clinical or clinical test may fail to produce results satisfactory to the FDA or foreign regulatory authorities;
- pre-clinical or clinical data can be interpreted in different ways, which could delay, limit or prevent regulatory approval;
- negative or inconclusive results from a pre-clinical study or clinical trial or adverse medical events during a clinical trial could cause a pre-clinical study or clinical trial to be repeated or a program to be terminated, even if other studies or trials relating to the program are successful;
- the FDA or foreign regulatory authorities can place a clinical hold on a trial if, among other reasons, it finds that patients enrolled in the trial are or would be exposed to an unreasonable and significant risk of illness or injury;

- Delcath may encounter delays or rejections based on changes in regulatory agency policies during the period in which it is developing a system or the period required for review of any application for regulatory agency approval;
- enrollment in the Company's clinical trials may proceed more slowly than expected;
- the Company's clinical trials may not demonstrate the safety and efficacy of any system or result in marketable products;
- the FDA or foreign regulatory authorities may request additional clinical trials, including an additional Phase 3 trial, relating to the Company's NDA submissions;
- the FDA or a foreign regulatory authority may change its approval policies or adopt new regulations that may negatively affect or delay Delcath's ability to bring a system to market or require additional clinical trials; and
- a system may not be approved for all the requested indications.

The failure or delay of clinical trials could cause an increase in the cost of product development, delay filing of an application for marketing approval or cause the Company to cease the development of Melphalan/HDS for other indications. If Delcath is unable to develop Melphalan/HDS for other indications, the future growth of our business could be negatively impacted. In addition, Delcath has limited clinical data relating to the effectiveness of Melphalan/HDS in certain types of cancer. Such limited data could slow the adoption of CHEMOSAT and Melphalan/HDS and significantly reduce Delcath's ability to commercialize CHEMOSAT and Melphalan/HDS.

The Company relies on third parties to conduct certain elements of the clinical trials for CHEMOSAT and Melphalan/HDS, and if they do not perform their obligations to Delcath, the Company may not be able to obtain regulatory approvals for its system.

The Company designs the clinical trials for Melphalan/HDS, but relies on academic institutions, corporate partners, contract research organizations and other third parties to assist in managing, monitoring and otherwise carrying out these trials. Delcath relies heavily on these parties for the execution of its clinical studies and control only certain aspects of their activities. Accordingly, the Company may have less control over the timing and other aspects of these clinical trials than if Delcath conducted them entirely on its own. The Company relies upon third parties to conduct monitoring and data collection of its ongoing and future clinical trials, including its Phase 3 ocular melanoma trial and pivotal ICC trial. Although Delcath relies on these third parties to manage the data from these clinical trials, Delcath is responsible for confirming that each of its clinical trials is conducted in accordance with its general investigational plan and protocol. Moreover, the FDA and foreign regulatory agencies require Delcath to comply with GCPs for conducting, recording and reporting the results of clinical trials to assure that the data and results are credible and accurate and that the trial participants are adequately protected. The FDA enforces these GCP regulations through periodic inspections of trial sponsors, principal investigators and trial sites. The Company's reliance on third parties does not relieve it of these responsibilities and requirements and if Delcath or the third parties upon whom the Company relies for its clinical trials fail to comply with the applicable GCPs, the data generated in its clinical trials may be deemed unreliable and the FDA or other foreign regulatory agencies may require Delcath to perform additional trials before approving our marketing application. The Company cannot assure you that, upon inspection, the FDA will determine that any of its clinical trials comply or complied with GCPs. In addition, Delcath's clinical trials must be conducted with product that complies with the FDA's cGMP requirements. The Company's failure to comply with these regulations may require it to repeat clinical trials, which would delay the regulatory approval process, and may result in a failure to obtain regulatory approval for Melphalan/HDS if these requirements are not met.

Purchasers of CHEMOSAT in the EEA may not receive third-party reimbursement or such reimbursement may be inadequate. Without adequate reimbursement, Delcath may not be able to successfully commercialize CHEMOSAT in the EEA.

The Company has obtained the right to affix the CE Mark for CHEMOSAT, and under the medac License, medac intends to seek third-party or government reimbursement within those countries in the EEA where it expects to market and sell CHEMOSAT. In Germany, the Company had received a ZE diagnostic-related group code ("ZE Code"), which, beginning in 2016, permits hospitals in Germany to obtain reimbursement for CHEMOSAT procedures. Negotiations on the amount of reimbursement to be received under the ZE Code were concluded in 2016 and the procedure was reimbursed under the ZE Code in 2017. Reimbursement negotiations under the ZE system are conducted annually. Consequently, reimbursement obtained may not be for the full amount sought. In countries where medac is able to obtain reimbursement, local policy could limit the Company's ability to obtain adequate and consistent reimbursement and limit other sales opportunities in those countries.

In other countries, until medac obtains government reimbursement, it will rely on private payors or local pre-approved funds where available. There are also no assurances that third-party payors or government health agencies of Member States of the EEA will reimburse use of CHEMOSAT in the long term or at all. Further, each country has its own protocols regarding reimbursement, so successfully obtaining third party or government health agency reimbursement in one country does not necessarily translate to similar reimbursement in other EEA countries. Physicians, hospitals and other health care providers may be reluctant to purchase CHEMOSAT if they do not receive substantial reimbursement for the cost of using the product from third-party payors or government entities. The lack of adequate reimbursement may significantly limit sales opportunities in the EEA.

The success of our products may be harmed if the government, private health insurers and other third-party payers do not provide sufficient coverage or reimbursement.

The Company's ability to commercialize CHEMOSAT under the medac License and Melphalan/HDS successfully will depend in part on the extent to which reimbursement for the costs of such products and related treatments will be available from government health administration authorities, private health insurers and other third-party payors. Melphalan/HDS is currently not approved by the FDA. Medicare, Medicaid, private health insurance plans and their foreign equivalents will not reimburse the use of Melphalan/HDS since the product is currently not approved outside the EEA. Delcath will seek reimbursement by third-party payors of the cost of Melphalan/HDS after its use is approved, but there are no assurances that adequate third-party coverage will be available for Delcath to establish and maintain price levels sufficient for the Company to realize an appropriate return on its investment in developing new therapies. Government, private health insurers and other third-party payors are increasingly attempting to contain healthcare costs by limiting both coverage and the level of reimbursement for new therapeutic products approved for marketing. Accordingly, even if coverage and reimbursement are provided by government, private health insurers and third-party payors for uses of our products, market acceptance of these products would be adversely affected if the reimbursement available proves to be unprofitable for healthcare providers.

Implementation of healthcare reforms in the United States and in significant overseas markets may limit the ability to commercialize CHEMOSAT and Melphalan/HDS and the demand for CHEMOSAT and Melphalan/HDS. Healthcare providers may respond to such cost-containment pressures by choosing lower cost products or other therapies. In March 2010, the Patient Protection and Affordable Care Act and Health Care and Education Reconciliation Act of 2010 ("ACA") was enacted into law in the United States, which included a number of provisions aimed at improving quality and decreasing costs. The Trump administration has taken executive actions and has eliminated the individual shared responsibility penalty portion of ACA. A court decision finding that the ACA is unconstitutional is on appeal.

CHEMOSAT and Melphalan/HDS may not achieve sufficient acceptance by the medical community to sustain our business.

The commercial success of CHEMOSAT and Melphalan/HDS, if approved, will depend upon their acceptance by the medical community and third-party payers as clinically useful, cost effective and safe. Acceptance by the medical community may depend on the extent to which leaders in the scientific and medical communities publish scientific papers in reputable academic journals. If testing and clinical practice do not confirm the safety and efficacy of CHEMOSAT and Melphalan/HDS or even if further testing and clinical practice produce positive results but the medical community does not view these favorably, and CHEMOSAT and Melphalan/HDS as effective and desirable, our efforts to market CHEMOSAT and Melphalan/HDS may fail, which would cause us to cease operation.

Consolidation in the healthcare industry could lead to demands for price concessions.

The cost of healthcare has risen significantly over the past decade and numerous initiatives and reforms initiated by legislators, regulators and third-party payors to curb these costs have resulted in a consolidation trend in the medical device industry. Group purchasing organizations, independent delivery networks and large single accounts in the United States and foreign markets may result in a consolidation of purchasing decisions for potential healthcare provider customers. The Company expects that market demand, government regulation, third-party reimbursement policies and societal pressures will continue to change the worldwide healthcare industry, resulting in further business consolidations and alliances which may exert further downward pressure on the price of CHEMOSAT and Melphalan/HDS and adversely impact our business, financial condition and results of operations.

Further, third-party payors may deny reimbursement if they determine that CHEMOSAT and/or Melphalan/HDS is not used in accordance with established payor protocols regarding cost effective treatment methods or is used outside its approved indication or for forms of cancer or with drugs not specifically approved by the FDA or other foreign regulatory bodies in the future. Without reimbursement, physicians, hospitals and other health care providers will be less likely to purchase CHEMOSAT and/or Melphalan/HDS, thereby harming our results of operations.

Risks Related to Manufacturing, Commercialization and Market Acceptance of CHEMOSAT and Melphalan/HDS

There are three third-party manufacturers of melphalan in certain countries of the EEA of which the Company is aware. If any of these manufacturers fails to provide end-users with adequate supplies of melphalan or fails to comply with the requirements of regulatory authorities, Delcath may be unable to successfully commercialize our product in the EEA.

Under the current regulatory scheme in the EEA, CHEMOSAT is approved for marketing as a device only, and doctors will separately obtain melphalan for use with CHEMOSAT. Although melphalan has been approved in the EEA for over a decade, the Company is aware that there are currently three approved manufacturers of melphalan in certain countries of the EEA. As a result, there may not be sufficient supply of melphalan for use with CHEMOSAT, and any adverse change in a manufacturer’s commercial operations or regulatory approval status may seriously impair Delcath’s sales opportunities in the EEA. Additionally, melphalan is not available in certain foreign countries outside the EEA where Delcath may seek to market CHEMOSAT. If supply of melphalan remains limited or unavailable, the Company will be unable to commercialize CHEMOSAT in these markets, thereby limiting future sales opportunities.

If the Company cannot maintain or enter into acceptable arrangements for the production of melphalan and other chemotherapeutic agents it will be unable to successfully commercialize Melphalan/HDS in the United States or complete its global Phase 3 trial in ocular melanoma liver metastases, registration trial in ICC, or any future clinical trials.

The Company has entered into a manufacturing and supply agreement with Synerx Pharma, LLC ("Synerx") and Bioniche Teoranta ("Bioniche") an affiliate of Mylan, Inc., for the supply of its branded melphalan for injection. The agreement with Synerx and Bioniche currently represents Delcath's sole source of branded melphalan in the United States. The Company intends to use the melphalan supplied by Synerx and Bioniche to conduct its global Phase 3 trials for ocular melanoma liver metastases and ICC. Delcath may pursue agreements with additional contract manufacturers to produce melphalan and other chemotherapeutic agents that it will use in the future for its clinical trial program and the commercialization of CHEMOSAT and Melphalan/HDS, as well as for labeling and finishing services. The Company may not be able to enter into such arrangements on acceptable terms or at all. Every manufacturer is subject to inspection by FDA and must meet all cGMP regulatory requirements. To manufacture melphalan or other chemotherapeutic agents on its own, Delcath would first have to develop a manufacturing facility that complies with FDA requirements and regulations for the production of melphalan and each other chemotherapeutic agent the Company chooses to manufacture for its system. Developing these resources would be an expensive and lengthy process and would have a material adverse effect on the Company's revenues and profitability. If Delcath is unable to obtain sufficient melphalan and labeling services on acceptable terms, if it should encounter delays or difficulties in its relationships with current and future suppliers or if current and future suppliers of melphalan do not comply with applicable regulations for the manufacturing and production of melphalan, Delcath's business, financial condition and results of operations may be materially harmed.

If we cannot successfully manufacture CHEMOSAT and Melphalan/HDS, our ability to develop and commercialize the system would be impaired.

We manufacture certain components of our products, including our proprietary filter media, and assemble and package CHEMOSAT and Melphalan/HDS at our facility in Queensbury, New York. We have established our European headquarters and packaging/labeling/distribution facility in Galway, Ireland where we intend to conduct final manufacturing and assembly in the future. We currently utilizes third-parties to manufacture some components of CHEMOSAT and Melphalan/HDS.

We have a limited manufacturing history and we may not be able to manufacture our products in sufficient commercial quantities, in a cost-effective manner or in compliance with the regulatory requirements applicable to such manufacturing. Additionally, we may have difficulty obtaining components for our products from our third-party suppliers in a timely manner or at all which may adversely affect our ability to deliver CHEMOSAT and Melphalan/HDS to purchasers.

In addition to limiting sales opportunities, delays in manufacturing CHEMOSAT and Melphalan/HDS may adversely affect our ability to obtain regulatory approval in the United States and other jurisdictions. Our ability to conduct timely clinical trials in the United States and abroad depends on our ability to manufacture the system, including sourcing the chemotherapeutic agents or other compounds through third parties in accordance with FDA and other regulatory requirements. If we are unable to manufacture CHEMOSAT and Melphalan/HDS in a timely manner, we may not be able to conduct the clinical trials required to obtain regulatory approval and commercialize our product.

The Company has implemented updated quality systems throughout our organization designed to enable us to satisfy the various international quality system regulations including those of the FDA with respect to products sold in the United States and those established by the International Standards Organization ("ISO") with respect to products sold in the EEA. The Company is required to maintain ISO 13485 certification for medical devices to be sold in the EEA, which requires, among other items, an implemented quality system that applies to component

quality, supplier control, product design and manufacturing operations. On February 17, 2011, we announced that we had achieved ISO 13485 certification for our Queensbury manufacturing facility. On December 28, 2011, we announced that we had achieved ISO 13485 certification for our Galway, Ireland facility. All Delcath facilities are presently ISO 13485:2016 certified. If our Queensbury, NY fails to maintain compliance with ISO 13485 and FDA cGMP or fails to pass facility inspection or audits, our ability to manufacture at the facility could be limited or terminated. In the future, we may manufacture and assemble CHEMOSAT and Melphalan/HDS in our Galway, Ireland facility or elsewhere in the EEA, and any facilities in the EEA would have to obtain and maintain similar approvals or certifications of compliance.

The Company does not have written contracts with all of its suppliers for the manufacture of components for CHEMOSAT and Melphalan/HDS.

The Company does not have written contracts with all suppliers for the manufacture of components for CHEMOSAT and Melphalan/HDS. If Delcath is unable to obtain an adequate supply of the necessary components or negotiate acceptable terms, it may not be able to manufacture CHEMOSAT and Melphalan/HDS in commercial quantities or in a cost-effective manner, and commercialization of CHEMOSAT and Melphalan/HDS in the United States, the EEA and elsewhere may be delayed. In addition, certain components are available from only a limited number of sources. Components of CHEMOSAT and Melphalan/HDS are currently manufactured for Delcath in small quantities and may require significantly greater quantities to further commercialize the product. The Company may not be able to find alternate sources of comparable components. If Delcath is unable to obtain adequate supplies of components from existing suppliers or needs to switch to an alternate supplier and obtain FDA or other regulatory agency approval of that supplier, commercialization of CHEMOSAT and Melphalan/HDS may be delayed.

Even if the Company receives FDA or other foreign regulatory approvals, Delcath may be unsuccessful in commercializing CHEMOSAT and Melphalan/HDS in markets outside the EEA, because of inadequate infrastructure or an ineffective commercialization strategy.

Outside the EEA, even if the Company obtains regulatory approval from the FDA or other foreign regulatory agencies, its ability to commercialize CHEMOSAT and Melphalan/HDS may be limited due to Delcath's inexperience in developing a sales, marketing and distribution infrastructure. If the Company is unable to develop this infrastructure in the United States or elsewhere or to collaborate with an alliance partner to market its products in the United States or foreign countries, particularly in Asia, Delcath's efforts to commercialize CHEMOSAT and Melphalan/HDS or any other product outside of the EEA may be less successful.

Even if the Company is successful in commercializing CHEMOSAT and Melphalan/HDS in the EEA, Delcath may not be successful in the United States and other foreign countries. Each country requires a different commercialization strategy, so the Company's EEA marketing strategy may not translate to other markets. Without a successful commercialization strategy tailored for each market, Delcath's efforts to promote and market CHEMOSAT in each of its target markets may fail in any or all of those markets.

The Company's plan to use collaborative arrangements with third parties to help finance and to market and sell CHEMOSAT and Melphalan/HDS may not be successful.

The Company may be unable to enter into collaborative agreements without additional clinical data or unable to continue a collaborative agreement as a result of unsuccessful future clinical trials. Additionally, Delcath may face competition in its search for alliances. As a result, the Company may not be able to enter into any additional alliances on acceptable terms, if at all. The Company's collaborative relationships may never result in the successful development or commercialization of CHEMOSAT and Melphalan/HDS or any other product. The success of any collaboration will depend upon Delcath's ability to perform its obligations under any agreements as well as factors beyond its control, such as the commitment of its collaborators and the timely performance of their obligations. The terms of any such collaboration may permit Delcath's collaborators to abandon the alliance

at any time for any reason or prevent us from terminating arrangements with collaborators who do not perform in accordance with the Company's expectations or its collaborators may breach their agreements with the Company. In addition, any third parties with which the Company collaborates may have significant control over important aspects of the development and commercialization of Delcath's products, including research and development, market identification, marketing methods, pricing, composition of sales force and promotional activities. Delcath is not able to control or influence the amount and timing of resources that any collaborator may devote to the Company's research and development programs or the commercialization, marketing or distribution of its products. The Company may not be able to prevent any collaborators from pursuing alternative technologies or products that could result in the development of products that compete with CHEMOSAT and Melphalan/HDS or the withdrawal of their support for its products. The failure of any such collaboration could have a material adverse effect on its business.

If the Company fails to overcome the challenges inherent in international operations, its business and results of operations may be materially adversely affected.

Currently the Company has only received authorization to market CHEMOSAT in the EEA, and intends to seek similar authorization or approvals in other foreign countries. As a result, Delcath expects international sales of its products to account for a significant portion of its revenue, which exposes Delcath to risks inherent in international operations. To accommodate the Company's international sales, Delcath will need to further invest financial and management resources to develop an international infrastructure that will meet the needs of its customers. Accordingly, Delcath will face additional risks resulting from its international operations including:

- difficulties in enforcing agreements and collecting receivables in a timely manner through the legal systems of many countries outside the United States;
- the failure to satisfy foreign regulatory requirements to market its products on a timely basis or at all;
- availability of, and changes in, reimbursement within prevailing foreign healthcare payment systems;
- difficulties in managing foreign relationships and operations, including any relationships that the Company establishes with foreign sales or marketing employees and agents;
- limited protection for intellectual property rights in some countries;
- fluctuations in currency exchange rates;
- the possibility that foreign countries may impose additional withholding taxes or otherwise tax its foreign income, impose tariffs or adopt other restrictions on foreign trade;
- the possibility of any material shipping delays;
- significant changes in the political, regulatory, safety or economic conditions in a country or region;
- protectionist laws and business practices that favor local competitors; and
- trade restrictions, including the imposition of, or significant changes to, the level of tariffs, customs duties and export quotas.

If the Company fails to overcome the challenges it encounters in its international operations, Delcath's business and results of operations may be materially adversely affected.

Rapid technological developments in treatment methods for liver cancer and competition with other forms of liver cancer treatments could affect the Company's ability to achieve meaningful revenues or profit.

Competition in the cancer treatment industry is intense. CHEMOSAT and Melphalan/HDS compete with all forms of liver cancer treatments that are alternatives to the "gold standard" treatment of surgical resection. Many of the Company's competitors have substantially greater resources and considerable experience in conducting

clinical trials and obtaining regulatory approvals. If these competitors develop more effective or more affordable products or treatment methods, or achieve earlier product development, Delcath's revenues or profitability will be substantially reduced.

Delcath has the following six orphan drug designations:

- the drug melphalan for the treatment of patients with cutaneous melanoma (November 2008)
- the drug melphalan for the treatment of patients with ocular melanoma (November 2008)
- the drug melphalan for the treatment of patients with neuroendocrine tumors (May 2009)
- the drug doxorubicin for the treatment of patients with primary liver cancer (August 2009)
- the drug melphalan for the treatment of HCC (October 2013)
- the drug melphalan or the treatment of ICC (July 2015)

If another company has orphan drug designations for the same drug and indication and receives marketing approval before Delcath does, then the Company will be blocked from marketing approval for seven years from the date of its approval for the same indication of use unless the Company can make a showing of the clinical superiority of its drug.

The loss of key personnel could adversely affect the Company's business.

Our success depends upon the efforts of our employees. The loss of any of the Company's senior executives or other key employees could harm its business. Competition for experienced personnel is intense and, if key individuals leave us, we could be adversely affected if suitable replacement personnel are not quickly identified and hired. The competition for qualified individuals exists in all functional areas, which makes it difficult to attract and retain the qualified employees we need to operate our business. Our success also depends in part on our ability to attract and retain highly qualified scientific, technical, commercial and administrative personnel. If we are unable to attract new employees and retain our current key employees, Delcath's ability to compete could be adversely affected and the development and commercialization of our products could be delayed or negatively impacted.

We rely on the proper function, availability and security of information technology systems to operate our business and a cyber-attack or other breach of these systems could have a material adverse effect on our business, financial condition or results of operations.

We rely on information technology systems to process, transmit, and store electronic information in our day-to-day operations. Similar to other companies, the size and complexity of our information technology systems makes them vulnerable to a cyber-attack, malicious intrusion, breakdown, destruction, loss of data privacy, or other significant disruption. Our information systems require an ongoing commitment of significant resources to maintain, protect, and enhance existing systems and develop new systems to keep pace with continuing changes in information processing technology, evolving systems and regulatory standards. Any failure by us to maintain or protect our information technology systems and data integrity, including from cyber-attacks, intrusions or other breaches, could result in the unauthorized access to personally identifiable information, theft of intellectual property or other misappropriation of assets, or otherwise compromise our confidential or proprietary information and disrupt our operations. Any of these event may cause us to have difficulty preventing, detecting, and controlling fraud, be subject to legal claims and liability, have regulatory sanctions or penalties imposed, have increases in operating expenses, incur expenses or lose revenues as a result of a data privacy breach or theft of intellectual property, or suffer other adverse consequences, any of which could have a material adverse effect on our business, financial condition or results of operations.

We are subject to certain data privacy and security requirements, which are complex and varied among jurisdictions. Any failure to ensure adherence to these requirements could subject us to fines and penalties, and damage our reputation.

We are required to comply with numerous federal and state laws, including state security breach notification laws, state health information privacy laws and federal and state consumer protection laws, which govern the collection, use and disclosure of personal information. Other countries also have, or are developing, laws governing the collection, use and transmission of personal information. In addition, most healthcare providers who may prescribe the products we currently sell or may sell in the future and from whom we may obtain patient health information are subject to privacy and security requirements under the Health Insurance Portability and Accountability Act of 1996 and comparable state laws. The legislative landscape for privacy and data protection continues to evolve, and there has been an increasing amount of focus on privacy and data protection issues with the potential to affect our business, including recently enacted laws in a majority of states requiring security breach notifications. Any of these laws could create liability for us or increase our cost of doing business, and any failure to comply could result in harm to our reputation, and potentially fines and penalties.

Risks Related to Intellectual Property

Intellectual property rights may not provide adequate protection, which may permit third parties to compete against us more effectively.

Our success depends significantly on our ability to maintain and protect our proprietary rights in the technologies and inventions used in or embodied by our product. To protect our proprietary technology, we rely on patent protection, as well as a combination of copyright, trade secret and trademark laws, as well as nondisclosure, confidentiality, license and other contractual restrictions in our manufacturing, consulting, employment and other third party agreements. These legal means may afford only limited protection, however, and may not adequately protect our rights or permit us to gain or keep any competitive advantage.

We have not and may not be able to adequately protect our intellectual property rights throughout the world.

Filing, prosecuting and defending patents on our product and technologies in any or all countries throughout the world could be prohibitively expensive. The requirements for patentability may differ in certain countries, particularly developing countries, and the breadth of patent claims allowed can be inconsistent. In addition, the laws of some foreign countries may not protect our intellectual property rights to the same extent as laws in the United States. Consequently, we may not be able to prevent third parties from copying our inventions in all countries outside the United States. Competitors may use our technologies in jurisdictions where we have not obtained patent protection that covers the commercial products to develop their own competing products that are the same or substantially the same as our commercial product and, further, may export otherwise infringing products to territories where we have patent protection, but judicial systems do not adequately enforce patents to cause infringing activities to be ceased.

We do not have patent rights in certain foreign countries in which a market for our product and technologies exists or may exist in the future. Moreover, in foreign jurisdictions where we do have patent rights, proceedings to enforce such rights could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly, and our patent applications at risk of not issuing, and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate and the damages or other remedies awarded, if any, may not be commercially meaningful. Thus, we may not be able to stop a competitor from marketing and selling in foreign countries products that are the same as or similar to our product and technologies.

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

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

Our success depends in part on our ability to obtain patents, which can be an expensive, time consuming, and uncertain process, and the value of the patents is dependent in part on the breadth of coverage and the relationship between the coverage and the commercial product.

The patent position of medical drug and device companies is generally highly uncertain. The degree of patent protection we require may be unavailable or severely limited in some cases and may not adequately protect our rights or permit us sufficient exclusivity, or to gain or keep our competitive advantage. For example:

- we might not have been the first to invent or the first to file patent applications on the inventions covered by each of our pending patent applications and issued patents;
- others may independently develop similar or alternative technologies or duplicate any of our technologies;
- the patents of others may have an adverse effect on our business;
- any patents we obtain or license from others in the future may not encompass commercially viable products, may not provide us with any competitive advantages or may be challenged by third parties;
- any patents we obtain or license from others in the future may not be valid or enforceable; and
- we may not develop additional proprietary technologies that are patentable The process of applying for patent protection itself is time consuming and expensive and we cannot assure you that we have prepared or will be able to prepare, file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner. It is possible that innovation over the course of development and commercialization may lead to changes in CHEMOSAT and Melphalan/HDS methods and/or devices that cause such methods and/or devices to fall outside the scope of the patent protection we have obtained and the patent protection we have obtained may become less valuable. It is also possible that we will fail to identify patentable aspects of inventions made in the course of development and commercialization activities before it is too late to obtain patent protection on them. In addition, our patents and applications may not be prosecuted and enforced in a manner consistent with the best interests of our business. It is possible that defects of form in the preparation or filing of our patents or patent applications may exist, or may arise in the future, for example, with respect to proper priority claims, inventorship, claim scope or patent term adjustments. Moreover, we cannot assure you that all of our pending patent applications will issue as patents or that, if issued, they will issue in a form that will be advantageous to us.

Our success depends in part on our ability to commercialize CHEMOSAT and Melphalan/HDS prior to the expiration of our patent protection.

Due to the uncertainty of the patent prosecution process, there are no guarantees that any of our pending patent applications will result in the issuance of a patent. Even if we are successful in obtaining a patent, patents have a limited lifespan. In the United States, the natural expiration of a utility patent typically is generally 20 years after it is filed. Various extensions may be available; however, the life of a patent, and the protection it affords, is limited. Without patent protection for our CHEMOSAT and Melphalan/HDS methods and devices, we may be open to competition from generic versions of such methods and devices.

We may in the future become involved in lawsuits to protect or enforce our intellectual property, or to defend our products against assertion of intellectual property rights by a third party, which could be expensive, time consuming and unsuccessful.

Competitors may infringe our patents or misappropriate or otherwise violate our intellectual property rights. To stop any such infringement or unauthorized use, litigation may be necessary. Our intellectual property has not been tested in litigation. There is no assurance that any of our issued patents will be upheld if later challenged or will provide significant protection or commercial advantage. A court may declare our patents invalid or unenforceable, may refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question, or may interpret the claims of our patents narrowly, thereby substantially narrowing the scope of patent protection they afford. Because of the length of time and expense associated with bringing new medical drugs and devices to the market, the healthcare industry has traditionally placed considerable emphasis on patent and trade secret protection for significant new technologies. Other parties may challenge patents, patent claims or patent applications licensed or issued to us or may design around technologies we have patented, licensed or developed.

In addition, third parties may initiate legal or administrative proceedings against us to challenge the validity or scope of our intellectual property rights, or may allege an ownership right in our patents, as a result of their past employment or consultancy with us. Many of our current and potential competitors have the ability to dedicate substantially greater resources to defend their intellectual property rights than we can. Accordingly, despite our efforts, we may not be able to prevent third parties from infringing upon or misappropriating our intellectual property. Competing products may also be sold in other countries in which our patent coverage might not exist or be as strong. If we lose a foreign patent lawsuit, alleging our infringement of a competitor's patents, we could be prevented from marketing our product in one or more foreign countries.

The medical device industry has been characterized by frequent and extensive intellectual property litigation. Our competitors or other patent holders may assert that our products and the methods employed in our products are covered by their patents. Although we have performed a search for third-party patents and believe we have adequate defenses available if faced with any allegations that we infringe these third-party patents, it is possible that CHEMOSAT and Melphalan/HDS could be found to infringe these patents. It is also possible that our competitors or potential competitors may have patents, or have applied for, will apply for, or will obtain patents that will prevent, limit or interfere with our ability to make, have made, use, sell, import or export our product. If our products or methods are found to infringe, we could be prevented from manufacturing or marketing our product.

Companies in the medical drug/device industry may use intellectual property infringement litigation to gain a competitive advantage. In the United States, patent applications filed in recent years are confidential for 18 months, while older applications are not publicly available until the patent issues. As a result, avoiding patent infringement may be difficult. Litigation may be necessary to enforce any patents issued or assigned to us or to determine the scope and validity of third-party proprietary rights. Litigation could be costly and could divert our attention from our business. There are no guarantees that we will receive a favorable outcome in any such litigation. If a third party claims that we infringed its patents, any of the following may occur:

- we may become liable for substantial damages for past infringement if a court decides that our technologies infringe upon a competitor's patent;
- a court may prohibit us from selling or licensing our product without a license from the patent holder, which may not be available on commercially acceptable terms or at all, or which may require us to pay substantial royalties or grant cross-licenses to our patents; and
- we may have to redesign our product so that it does not infringe upon others' patent rights, which may not be possible or could require substantial funds or time.

Litigation related to infringement and other intellectual property claims such as trade secrets, with or without merit, is unpredictable, can be expensive and time-consuming, and can divert management's attention from our core business. If we lose this kind of litigation, a court could require us to pay substantial damages, treble damages, and attorneys' fees, and could prohibit us from using technologies essential to our product, any of which would have a material adverse effect on our business, results of operations, and financial condition. If relevant patents are upheld as valid and enforceable and we are found to infringe, we could be prevented from selling our product unless we can obtain licenses to use technology or ideas covered by such patents. We do not know whether any necessary licenses would be available to us on satisfactory terms, if at all. If we cannot obtain these licenses, we could be forced to design around those patents at additional cost or abandon the product altogether. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. There could also be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could cause the price of our Common Stock to decline.

If others have filed patent applications with respect to inventions for which we already have patents issued to us or have patent applications pending, we may be forced to participate in interference or derivation proceedings declared by the USPTO to determine priority of invention, which could also be costly and could divert our attention from our business. If the USPTO declares an interference and determines that our patent or application is not entitled to a priority date earlier than that of the other patent application, our ability to maintain or obtain those patent rights will be curtailed. Similarly, if the USPTO declares a derivation proceeding and determines that the invention covered by our patent application was derived from another, we will not be able to obtain patent coverage of that invention.

Because of the extensive time required for development, testing and regulatory review of a potential product, it is possible that, before CHEMOSAT and Melphalan/HDS or any other Delcath product can be commercialized, any related patent may expire or remain in force for only a short period following commercialization, thereby reducing any advantages of the patent. Not all of our United States patent rights have corresponding patent rights effective in Europe or other foreign jurisdictions. Similar considerations apply in any other country where we are prosecuting patent applications, have been issued patents, or have decided not to pursue patent protection relating to our technology. The laws of foreign countries may not protect our intellectual property rights to the same extent as do laws of the United States.

Changes in patent law could diminish the value of patents in general, thereby impairing our ability to protect our product and our technologies.

Legislation introduced earlier this decade increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents. The Leahy-Smith Act includes a number of significant changes to United States patent law. These include provisions that affect the way patent applications are prosecuted, redefine prior art, may affect patent litigation, and switch the United States patent system from a "first-to-invent" system to a "first-inventor-to-file" system. Under a "first-inventor-to-file" system, assuming the other requirements for patentability are met, the first inventor to file a patent application generally will be entitled to the patent on an invention regardless of whether another inventor had made the invention earlier. The USPTO recently developed new regulations and procedures to govern administration of the Leahy-Smith Act, and many of the substantive changes to patent law associated with the Leahy-Smith Act, in particular, the first-inventor-to-file provisions, only became effective on March 16, 2013. As case law continues to develop in response to this legislation, it is not yet clear what the full impact of the Leahy-Smith Act will have on the operation of our business. However, the Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents.

In addition, patent reform legislation may pass in the future that could lead to additional uncertainties and increased costs surrounding the prosecution, enforcement, and defense of our patents and applications. Furthermore, the United States Supreme Court and the United States Court of Appeals for the Federal Circuit have made, and will likely continue to make, changes in how the patent laws of the United States are interpreted. Similarly, foreign courts have made, and will likely continue to make, changes in how the patent laws in their respective jurisdictions are interpreted. We cannot predict future changes in the interpretation of patent laws or changes to patent laws that might be enacted into law by United States and foreign legislative bodies. Those changes may materially affect our patents or patent applications and our ability to obtain and enforce or defend additional patent protection in the future.

Our trademarks may be infringed or successfully challenged, resulting in harm to our business.

We rely on our trademarks as one means to distinguish our product from the products of our competitors, and we have registered or applied to register many of these trademarks. The USPTO or foreign trademark offices may deny our trademark applications, however, and even if published or registered, these trademarks may be ineffective in protecting our brand and goodwill and may be successfully opposed or challenged. Third parties may oppose our trademark applications, or otherwise challenge our use of our trademarks. In addition, third parties may use marks that are confusingly similar to our own, which could result in confusion among our customers, thereby weakening the strength of our brand or allowing such third parties to capitalize on our goodwill. In such an event, or if our trademarks are successfully challenged, we could be forced to rebrand our product, which could result in loss of brand recognition and could require us to devote resources to advertising and marketing new brands. Our competitors may infringe our trademarks and we may not have adequate resources to enforce our trademark rights in the face of any such infringement.

We may rely primarily on trade secret protection for important proprietary technologies in the European Economic Area.

In addition to patent and trademark protection, we also rely on trade secrets, including unpatented know-how, technology and other proprietary information, to maintain our competitive position. Specifically in the European Economic Area ("EEA"), we rely on design patent and trade secret protection for CHEMOSAT and Melphalan/HDS. Without utility patent protection in the EEA covering the current version of CHEMOSAT and Melphalan/HDS, CHEMOSAT and Melphalan/HDS will only be covered by design patent and trade secret protection. Unlike patents, trade secrets are only recognized under applicable law if they are kept secret by restricting their disclosure to third parties. We protect our trade secrets and proprietary knowledge in part through confidentiality

agreements with employees, consultants and other parties. However, certain consultants and third parties with whom we have business relationships, and to whom in some cases we have disclosed trade secrets and other proprietary knowledge, may also provide services to other parties in the medical device industry, including companies, universities and research organizations that are developing competing products. In addition, some of our former employees who were exposed to certain of our trade secrets and other proprietary knowledge in the course of their employment may seek employment with, and become employed by, our competitors. We cannot be assured that consultants, employees and other third parties with whom we have entered into confidentiality agreements will not breach the terms of such agreements by improperly using or disclosing our trade secrets or other proprietary knowledge. Monitoring unauthorized uses and disclosures of our intellectual property is difficult, and we do not know whether the steps we have taken to protect our intellectual property will be effective. In addition, we may not be able to obtain adequate remedies for any such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time-consuming, and the outcome is unpredictable. In addition, some courts inside and outside the United States are less willing or unwilling to protect trade secrets.

Trade secret protection does not prevent independent discovery of the technology or proprietary information or use of the same. Competitors may independently duplicate or exceed our technology in whole or in part. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent them, or those to whom they communicate it, from using that technology or information to compete with us. If we are not successful in maintaining the confidentiality of our technology, the loss of trade secret protection or know-how relating to CHEMOSAT and Melphalan/HDS will significantly impair our ability to commercialize CHEMOSAT in the EEA, and our value and results of operations will be harmed. In particular, we rely on trade secret protection for the filter media, which is a key component of our system.

Similar considerations apply in other foreign countries where we receive approval as mentioned in the section "*Management's Discussion and Analysis of Financial Condition and Results of Operations—Intellectual Property and Other Rights*". Since we do not have issued patents for the current version of CHEMOSAT and Melphalan/HDS in these countries, our ability to successfully commercialize CHEMOSAT and Melphalan/HDS will depend on our ability to maintain trade secret protection in these markets.

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

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

Risks Related to Products Liability

The Company may be the subject of product liability claims or product recalls, and it may be unable to maintain insurance adequate to cover potential liabilities.

The Company's business exposes Delcath to potential liability risks that may arise from clinical trials and the testing, manufacture, marketing, sale and use of CHEMOSAT and Melphalan/HDS. In addition, because CHEMOSAT and Melphalan/HDS are intended for use in patients with cancer, there is an increased risk of death among the patients treated with Delcath's system which may increase the risk of product liability lawsuits related to clinical trials or commercial sales. The Company may be subject to claims against it even if the injury is due to the actions of others. For example, if the medical personnel that use Delcath's system on patients are not properly trained or are negligent in the use of the system, the patient may be injured, which may subject Delcath to claims. Were such a claim asserted, the Company would likely incur substantial legal and related expenses even if Delcath prevails on the merits. Claims for damages, whether or not successful, could cause delays in clinical trials and result in the loss of physician endorsement, adverse publicity and/or limit the Company's ability to market and sell the system, resulting in loss of revenue. In addition, it may be necessary for Delcath to recall products that do not meet approved specifications, which would also result in adverse publicity, as well as resulting in costs connected to the recall and loss of revenue. A successful products liability claim or product recall would have a material adverse effect on Delcath's business, financial condition and results of operations. The Company currently carries product liability and clinical trial insurance coverage, but it may be insufficient to cover one or more large claims.

Risks Related to Delcath's Common Stock

The market price of Delcath Common Stock has been, and may continue to be volatile and fluctuate significantly, which could result in substantial losses for investors.

The trading price for Delcath's Common Stock has been, and the Company expects it to continue to be, volatile. The price at which Delcath's Common Stock trades depends upon a number of factors, including historical and anticipated operating results, the Company's financial situation, announcements of technological innovations or new products by Delcath or its competitors, its ability or inability to raise the additional capital needed and the terms on which it may be raised, and general market and economic conditions. Some of these factors are beyond the Company's control. Broad market fluctuations may lower the market price of Delcath's Common Stock and affect the volume of trading, regardless of the Company's financial condition, results of operations, business or prospects. Among the factors that may cause the market price of its Common Stock to fluctuate are the risks described in this "Risk Factors" section and other factors, including:

- fluctuations in quarterly operating results or the operating results of competitors;
- variance in financial performance from the expectations of investors;
- changes in the estimation of the future size and growth rate of its markets;
- changes in accounting principles or changes in interpretations of existing principles, which could affect financial results;
- failure of its products to achieve or maintain market acceptance or commercial success;
- conditions and trends in the markets served;
- changes in general economic, industry and market conditions;
- success of competitive products and services;
- changes in market valuations or earnings of competitors;
- changes in pricing policies or the pricing policies of competitors;
- announcements of significant new products, contracts, acquisitions or strategic alliances by the Company or its competitors;

- potentially negative announcements, such as a review of any of our filings by the SEC, changes in accounting treatment or restatements of previously reported financial results or delays in our filings with the SEC:
- changes in legislation or regulatory policies, practices or actions;
- the commencement or outcome of litigation involving Delcath, its general industry or both;
- our filing for protection under federal bankruptcy laws;
- recruitment or departure of key personnel;
- changes in capital structure, such as future issuances of securities or the incurrence of additional debt;
- actual or expected sales of Common Stock by stockholders; and
- the trading volume of Delcath's Common Stock.

In addition, the stock markets, in general, the OTC and the market for pharmaceutical companies in particular, may experience a loss of investor confidence. Such loss of investor confidence may result in extreme price and volume fluctuations in Delcath's Common Stock that are unrelated or disproportionate to the operating performance of its business, financial condition or results of operations. These broad market and industry factors may materially harm the market price of Delcath's Common Stock and expose it to securities class action litigation. Such litigation, even if unsuccessful, could be costly to defend and divert management's attention and resources, which could further materially harm the Company's financial condition and results of operations.

The exercise price and number of certain outstanding warrants may be adjusted by certain Trigger Events and in future offerings.

The exercise price of the 490,278,748 Series E and Series E-1 warrants issued in the Company's July 2019 and August 2019 private placements may, upon each of (i) the third trading day following the date that the Company effects a reverse stock split, (ii) the date that this registration statement is declared effective by the Commission and (iii) in the event that all of the registrable securities (as defined in the Registration Rights Agreement) are not then registered on an effective registration statement, the date that all of the shares underlying the Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock and accompanying warrants may be sold pursuant to Rule 144, be reduced, and only reduced, to equal the lesser of (x) the then effective conversion price or exercise price, as applicable, and (y) 90% of the average of the five daily volume weighted average prices of the Common Stock immediately prior to such dates. In the event of a reduction in the Exercise Price, the aggregate number of warrant shares shall be increased such that the aggregate exercise price of the warrants on the day immediately following such reduction in the exercise price is equal to the aggregate Exercise Price immediately prior to such adjustment. Additionally, from the date of issuance of the Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock and Warrants until such time that the Company's Common Stock is listed or quoted on a national exchange, the conversion price and the exercise price are subject to price-based anti-dilution protections. In addition to the potential dilutive effect of this provision, there is the potential that a large number of the shares may be sold in the public market at any given time, which could place additional downward pressure on the trading price of Delcath's Common Stock.

The Company has a history of reverse splits, which have severely impacted its Common Stock price.

Since Delcath's initial public offering in 2000, it has executed four reverse stock splits, for a cumulative ratio since its IPO of 1:44,800,000. Each such reverse split has resulted in an effective decline in the price of Delcath's Common Stock. For example, the most recent reverse split of 1:500 was effected on May 2, 2018, resulting in an opening price of $2.50. As of September 24, 2019, the closing price for Delcath's Common Stock was $0.1080. In addition, the Common Stock underlying warrants issued in connection with the July 11, 2019 and August 15, 2019 Securities Purchase Agreements are exercisable upon the event of a contemplated reverse stock split as described under the heading "Private Placement of Securities" beginning on page 32.

Anti-takeover provisions in the Company's Certificate of Incorporation and By-laws may reduce the likelihood of a potential change of control, or make it more difficult for its stockholders to replace management.

Certain provisions of the Company's Certificate of Incorporation and By-laws could have the effect of making it more difficult for its stockholders to replace management at a time when a substantial number of stockholders might favor a change in management. These provisions include:

- providing for a staggered board; and
- authorizing the board of directors to fill vacant directorships or increase the size of its board of directors.

Furthermore, Delcath's board of directors has the authority to issue up to 10,000,000 shares of preferred stock in one or more series and to determine the rights and preferences of the shares of any such series without stockholder approval. Any series of preferred stock is likely to be senior to the Common Stock with respect to dividends, liquidation rights and, possibly, voting rights. The board's ability to issue preferred stock may have the effect of discouraging unsolicited acquisition proposals, thus adversely affecting the market price of Delcath's Common Stock.

Our common stock is governed under The Securities Enforcement and Penny Stock Reform Act of 1990.

The Securities Enforcement and Penny Stock Reform Act of 1990 requires additional disclosure relating to the market for penny stocks in connection with trades in any stock defined as a penny stock. The Commission has adopted regulations that generally define a penny stock to be any equity security that has a market price of less than $5.00 per share, subject to certain exceptions. Such exceptions include any equity security listed on NASDAQ and any equity security issued by an issuer that has (i) net tangible assets of at least $2,000,000, if such issuer has been in continuous operation for three years; (ii) net tangible assets of at least $5,000,000, if such issuer has been in continuous operation for less than three years; or (iii) average annual revenue of at least $6,000,000, if such issuer has been in continuous operation for less than three years. Unless an exception is available, the regulations require the delivery, prior to any transaction involving a penny stock, of a disclosure schedule explaining the penny stock market and the risks associated therewith. These additional requirements may discourage broker-dealers from effecting transactions in securities that are classified as penny stocks, which could severely limit the market price and liquidity of such securities and the ability of purchasers to sell such securities in the secondary market.

The Company has never declared or paid any dividends to the holders of its Common Stock and does not expect to pay cash dividends in the foreseeable future.

The Company currently intends to retain all earnings for use in connection with the expansion of its business and for general corporate purposes. The board of directors will have the sole discretion in determining whether to declare and pay dividends in the future. The declaration of dividends will depend on profitability, financial condition, cash requirements, future prospects and other factors deemed relevant by the Company's board of directors. Delcath's ability to pay cash dividends in the future could be limited or prohibited by the terms of financing agreements that it may enter into or by the terms of any preferred stock that may be authorized and issued. The Company does not expect to pay dividends in the foreseeable future. As a result, holders of Delcath's Common Stock must rely on stock appreciation for any return on their investment.

If the Company engages in acquisitions, reorganizations or business combinations, it will incur a variety of risks that could adversely affect its business operations or its stockholders.

The Company may consider strategic alternatives, such as acquiring businesses, technologies or products or entering into a business combination with another company. If Delcath does pursue such a strategy, the Company could, among other things:

- issue equity securities that would dilute current stockholders' percentage ownership;

- incur substantial debt that may place strains on its operations;
- spend substantial operational, financial and management resources in integrating new businesses, personnel, intellectual property, technologies and products;
- assume substantial actual or contingent liabilities;
- reprioritize its programs and even cease development and commercialization of CHEMOSAT and Melphalan/HDS;
- suffer the loss of key personnel, or
- merge with, or otherwise enter into a business combination with, another company in which Delcath stockholders would receive cash or shares of the other company or a combination of both on terms that certain of the Company's stockholders may not deem desirable.

Although we intend to evaluate and consider different strategic alternatives, we have no agreements or understandings with respect to any acquisition, reorganization or business combination at this time.

CAUTIONARY STATEMENT CONCERNING FORWARD-LOOKING STATEMENTS

This prospectus contains certain "forward-looking statements" within the meaning of the "safe harbor" provisions of the Private Securities Litigation Reform Act of 1995 with respect to our business, financial condition, liquidity and results of operations. Words such as "anticipates," "expects," "intends," "plans," "predicts," "believes," "seeks," "estimates," "could," "would," "will," "may," "can," "continue," "potential," "should," and the negative of these terms or other comparable terminology often identify forward-looking statements. Statements in this prospectus that are not historical facts are hereby identified as "forward-looking statements" for the purpose of the safe harbor provided by Section 21E of the Securities Exchange Act of 1934, as amended, and Section 27A of the Securities Act of 1933, as amended. These forward-looking statements are not guarantees of future performance and are subject to risks and uncertainties that could cause actual results to differ materially from the results contemplated by the forward-looking statements. See "Risk Factors" beginning on page 7.

- our estimates regarding sufficiency of our cash resources, anticipated capital requirements and our need for additional financing;
- the commencement of future clinical trials and the results and timing of those clinical trials;
- our ability to successfully commercialize CHEMOSAT and Melphalan/HDS, generate revenue and successfully obtain reimbursement for the procedure and System;
- the progress and results of our research and development programs;
- submission and timing of applications for regulatory approval and approval thereof;
- our ability to successfully source certain components of the system and enter into supplier contracts;
- our ability to successfully manufacture CHEMOSAT and Melphalan/HDS;
- our ability to successfully negotiate and enter into agreements with distribution, strategic and corporate partners; and
- our estimates of potential market opportunities and our ability to successfully realize these opportunities.

Many of the important factors that will determine these results are beyond our ability to control or predict. You are cautioned not to put undue reliance on any forward-looking statements, which speak only as of the date of this prospectus. Except as otherwise required by law, we do not assume any obligation to publicly update or release any revisions to these forward-looking statements to reflect events or circumstances after such applicable date or to reflect the occurrence of unanticipated events. You should, however, review the factors and risks we describe in the "Risk Factor" section hereof beginning on page 7 and in reports we will file from time to time with the Commission after the date of this prospectus.

USE OF PROCEEDS

We are not selling any of the shares of Common Stock being offered by this prospectus and will receive no proceeds from the sale of the shares by the Selling Stockholders. All of the proceeds from the sale of Common Stock offered by this prospectus will go to the Selling Stockholders at the time they offer and sell such shares. We will bear all costs associated with registering the shares of Common Stock offered by this prospectus.

PRIVATE PLACEMENT OF SECURITIES

July 2019 PIPE Financing

On July 11, 2019, Delcath and certain accredited investors entered into a securities purchase agreement (the "July Securities Purchase Agreement") pursuant to which Delcath sold to investors an aggregate of 20,000 shares of Series E convertible preferred stock, par value $0.01 per share (the "Series E Convertible Preferred Stock"), having the rights and privileges described in the Company's certificate of designations for such Series E Convertible Preferred Stock, at a price of $1,000 per share (the "July 2019 PIPE Financing"). Pursuant to the July Securities Purchase Agreement, the Company also issued to each Investor a warrant (a "Warrant") to purchase a number of shares of common stock of the Company, equal to the number of shares of common stock issuable upon conversion of the Series E Convertible Preferred Stock purchased by the investor, at an exercise price of $0.06, subject to adjustment in accordance with the terms of the Warrants, and exercisable at any time from the date that Delcath effects a reverse stock split until the fifth anniversary of the date of the reverse stock split.

Each share of the Series E Convertible Preferred Stock has a stated value equal to $1,000 (the "Stated Value") and is convertible at any time at the option of the holder into the number of shares of the Company's Common Stock determined by dividing the stated value by the conversion price of $0.06 (subject to certain limitations and adjustments for reverse and forward stock splits, recapitalizations and similar transactions following the date of the July Securities Purchase Agreement) (the "Conversion Price"). Except for certain adjustments, the holders of Series E Convertible Preferred Stock will be entitled to receive dividends on shares of Series E Convertible Preferred Stock equal (on an as if converted basis) to and in the same form as dividends paid on shares of the Common Stock. Any such dividends that are not paid to the holders of the Series E Convertible Preferred Stock will increase the Stated Value. No other dividends will be paid on shares of Series E Convertible Preferred Stock. Holders of shares of Series E Convertible Preferred Stock are entitled to vote with the holders of shares of Common Stock, and not as a separate class, on an as-converted basis subject to the Beneficial Ownership Limitation contained in the certificate of designations.

The Beneficial Ownership Limitation (with respect to conversion of Series E Convertible Preferred Stock). The certificate of designations provides that the Company shall not effect any conversion of the Series E Convertible Preferred Stock, and a holder of such shares shall not have the right to convert any portion of the Series E Convertible Preferred Stock, to the extent that, after giving effect to the conversion, the holder (together with its affiliates and any persons acting as a group together with the holder or any of the holder's affiliates) (such persons, "Attribution Parties"), would beneficially own in excess of the Beneficial Ownership Limitation. For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by such holder and its affiliates and Attribution Parties shall include the number of shares of Common Stock issuable upon conversion of the Series E Convertible Preferred Stock with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which are issuable upon (i) conversion of the remaining, unconverted Stated Value of Series E Convertible Preferred Stock beneficially owned by such holder or any of its affiliates or Attribution Parties and (ii) exercise or conversion of the unexercised or unconverted portion of any other securities of the Company subject to a limitation on conversion or exercise analogous to the limitation contained in the certificate of designations (including, without limitation, the Series E-1 Convertible Preferred Stock and related warrants discussed below), beneficially owned by such holder or any of its affiliates or Attribution Parties. Except as set forth in the preceding sentence, beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. To the

extent that the Beneficial Ownership Limitation applies, the determination of whether the Series E Convertible Preferred Stock is convertible (in relation to other securities owned by such holder together with any affiliates and Attribution Parties) and of how many shares of Series E Convertible Preferred Stock are convertible shall be in the sole discretion of such holder, and the submission of a notice of conversion to the Company shall be deemed to be such holder's determination of whether the shares of Series E Convertible Preferred Stock may be converted (in relation to other securities owned by such holder together with any affiliates and Attribution Parties) and how many shares of the Series E Convertible Preferred Stock are convertible, in each case subject to the Beneficial Ownership Limitation. The "Beneficial Ownership Limitation" shall be 4.99% (or, upon written election by a holder which is delivered to the Company prior to the issuance of any shares of Series E Convertible Preferred Stock to such holder, 9.99%) of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock issuable upon conversion of Series E Convertible Preferred Stock held by the applicable holder. A holder, upon notice to the Company, may increase or decrease the Beneficial Ownership Limitation applicable to its Series E Convertible Preferred Stock provided that the Beneficial Ownership Limitation in no event exceeds 9.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock upon conversion of Series E Convertible Preferred Stock held by the holder. Any such increase in the Beneficial Ownership Limitation will not be effective until the 61st day after such notice is delivered to the Company and shall only apply to such holder and no other holder.

*The Beneficial Ownership Limitation (with respect to the exercise of Warrants).*The exercise of the Warrants is also subject to a Beneficial Ownership Limitation and, accordingly, the Company shall not effect any exercise of a Warrant, and a holder of a Warrant shall not have the right to exercise any portion of a Warrant to the extent that after giving effect to such issuance after exercise as set forth on the applicable notice of exercise, the holder (together with the holder's affiliates and Attribution Parties would beneficially own in excess of the Beneficial Ownership Limitation. For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by the holder and its affiliates and Attribution Parties shall include the number of shares of Common Stock issuable upon exercise of the Warrant with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which would be issuable upon (i) exercise of the remaining, nonexercised portion of the Warrant beneficially owned by the holder or any of its affiliates or Attribution Parties and (ii) exercise or conversion of the unexercised or nonconverted portion of any other securities of the Company (including, without limitation, any other Common Stock equivalents) subject to a limitation on conversion or exercise analogous to the Beneficial Ownership Limitation beneficially owned by the holder or any of its affiliates or Attribution Parties. Except as set forth in the preceding sentence, beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. The determination of whether a Warrant is exercisable (in relation to other securities owned by the holder of the Warrant together with any affiliates and Attribution Parties) and of which portion of the Warrant is exercisable shall be in the sole discretion of the holder, and the submission of a notice of exercise shall be deemed to be the holder's determination of whether the Warrant is exercisable (in relation to other securities owned by the holder together with any affiliates and Attribution Parties) and of which portion of the Warrant is exercisable, in each case subject to the Beneficial Ownership Limitation. The "Beneficial Ownership Limitation" shall be 4.99% (or, upon written election by a holder which is delivered to the Company prior to the issuance of any shares of Common Stock upon exercise of a Warrant to such holder, 9.99%) of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock issuable upon exercise of the Warrant. The holder, upon notice to the Company, may increase or decrease the Beneficial Ownership Limitation provided that the Beneficial Ownership Limitation in no event exceeds 9.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock upon exercise of the Warrant held by the holder. Any increase in the Beneficial Ownership Limitation will not be effective until the 61st day after such notice is delivered to the Company.

The shares of Series E Convertible Preferred Stock are currently convertible into an aggregate of 74,347,693 shares of Common Stock. The affirmative vote of the holders of a majority of the then outstanding shares of the Series E Convertible Preferred Stock is required to increase the number of authorized shares of Series E

Convertible Preferred Stock or to alter or change adversely the powers, preferences or rights given to the Series E Convertible Preferred Stock, or to amend the Company's organizational documents in any manner that adversely affects the rights of the holders of the Series E Convertible Preferred Stock. Upon any liquidation of the Company, the holders of the Series E Convertible Preferred Stock will be entitled to receive out of the assets of the Company an amount equal to the Stated Value plus any accrued and unpaid dividends thereon for each share of Series E Convertible Preferred Stock before any distribution or payment will be made to the holders of the Common Stock.

In connection with the July 2019 PIPE Financing, the Company and the investors in the Series E Convertible Preferred Stock entered into a Registration Rights Agreement dated July 11, 2019 providing for the registration for resale of the Common Stock underlying the Series E Convertible Preferred Stock and Warrants, pursuant to a shelf registration statement that was required to be filed with the Commission on or prior to August 21, 2019.

The Conversion Price and the exercise price relating to the 2019 Warrants may, upon each of (i) the third trading day following the date that the Company effects a reverse stock split, (ii) the date that the initial registration statement to be filed pursuant to the Registration Rights Agreement is declared effective by the Commission, and (iii) in the event that all of the registrable securities (as defined in the registration rights agreement) are not then registered on an effective registration statement, the date that all of the shares underlying the Series E Convertible Preferred Stock and 2019 Warrants may be sold pursuant to Rule 144, be reduced, and only reduced, to equal the lesser of (x) the then effective Conversion Price or exercise price, as applicable, and (y) 90% of the average of the five daily volume weighted average prices of the Common Stock immediately prior to such dates. In the event of a reduction in the exercise price, the aggregate number of Warrant Shares shall be increased such that the aggregate exercise price of the Warrants on the day immediately following such reduction in the Exercise Price is equal to the aggregate Exercise Price immediately prior to such adjustment. In addition, from the date of issuance of the Series E Convertible Preferred Stock and 2019 Warrants until such time that the Company's Common Stock is listed or quoted on a national exchange, the Conversion Price and the Exercise Price are subject to price-based anti-dilution protections.

Pursuant to certain Waiver Agreements, certain other holders of Common Stock (the "MFN Common Stockholders") were issued 923 shares of Series E Convertible Preferred Stock, in the aggregate, and Warrants to purchase up to 15,382,992 shares of Common Stock, in the aggregate, in exchange for the MFN Common Stockholders' waiver of certain most favored nations rights granted to them pursuant to exchange agreements between the Company and the MFN Common Stockholders, which exchange agreements were previously reported by the Company.

Following the closing of the July 2019 PIPE Financing, the Company entered into agreements with the holders of (i) its 8% Senior Secured Promissory Notes in an aggregate amount (principal plus accrued interest) of approximately $10.8 million (the "Bridge Notes"), and (ii) its 8% Senior Secured Promissory Notes in an aggregate principal amount of $2.0 million ("Surviving Notes"). Pursuant to such agreements, the Bridge Notes were converted into shares of Series E Preferred Stock and Warrants at the same $1,000 price per Unit as applied to the July 2019 PIPE Financing. The Surviving Notes became convertible into shares of Series E Preferred Stock and Warrants at the price of $1,500 per Unit.

On August 15, 2019, Delcath and investors representing at least 50.1% in interest of the securities issued in the July 2019 PIPE Financing entered into an amendment (the "Amendment") of the July Securities Purchase Agreement to amend the definition of "Exempt Issuance" contained therein in order to enable the Company to have the ability to issue up to (i) $12 million of Series E-1 Preferred Stock and Warrants in a private placement on or prior to August 19, 2019 and (ii) $960,000 of Series E-1 Preferred Stock and Warrants to the placement agent for such private placement in lieu of the cash fees otherwise payable to the placement agent under a placement agent agreement between the Company and such placement agent.

August 2019 PIPE Financing

On August 15, 2019, Delcath and certain accredited investors entered into a securities purchase agreement (the "August Securities Purchase Agreement") pursuant to which Delcath expects to sell and issue to such investors an aggregate of 9,510 shares of Series E-1 Convertible Preferred Stock, par value $0.01 per share (the "Series E-1 Convertible Preferred Stock") and to issue to each investor a warrant to purchase a number of shares of Common Stock of the Company, par value $0.01 per share, equal to the number of shares of Common Stock issuable upon conversion of the Series E-1 Convertible Preferred Stock. The Series E-1 Convertible Preferred Stock and the related warrants to be issued pursuant to the August Securities Purchase Agreement shall be subject to the same terms and conditions and prices as the Series E Convertible Preferred Stock as described above. Closing of the private placement of the Series E-1 Convertible Preferred Stock is expected to occur on or before August 19, 2019 subject to the satisfaction or waiver of various closing conditions.

Registration Rights

In connection with the above-referenced private placements, the Company and the Selling Stockholders entered into a Registration Rights Agreements dated July 11, 2019 and as of August 15, 2019 (collectively, the "Registration Rights Agreements") providing for the registration for resale of the Common Stock underlying the Series E Preferred Stock and Warrants pursuant to a registration statement that was required to be filed with the Commission on or prior to August 21, 2019 which this Registration Statement is intended to fulfills. The Company has agreed to use its best efforts to cause this Registration Statement to be declared effective as soon as possible, but in no event later than 75 days of the closing of the July 2019 PIPE Financing (or 120 days in the event of a full review of the registration statement by the Commission), and to keep this Registration Statement continuously effective for a period that extends from the first date on which the Commission issues an order of effectiveness in relation to this Registration Statement until such date that all registrable securities covered by this Registration Statement have been sold thereunder or pursuant to Rule 144 or may be sold without volume or manner-of-sale restrictions pursuant to Rule 144 and without the requirement for the Company to be in compliance with the current public information requirement under Rule 144, as determined by the counsel to the Company pursuant to a written opinion letter to such effect. If the Company does not meet its obligations with respect to the effectiveness of this Registration Statement, the Company must pay, on a monthly basis, to each Investor party to the Registration Rights Agreements an amount in cash, as partial liquidated damages, equal to 1% of the aggregate amount invested by each of them in the PIPE financings (increasing to 1.5% following the 2nd month anniversary), up to a maximum of 8% of the aggregate investment amount for each of them. The Registration Rights Agreements prohibit the Company from filing any other registration statements until all the securities registrable under the Registration Rights Agreements are registered pursuant to a registration statement that is declared effective by the Commission.

Placement Agent Agreements

Pursuant to an engagement letter dated July 1, 2019 between Company and Roth Capital Partners, LLC ("Roth"), for a period of 30 days from the date of the agreement, the Company engaged Roth to serve as its exclusive placement agent with respect to private placements of the Company's equity securities. The engagement entitled Roth to a cash fee of 7% of the gross proceeds received by the Company from the sale of the Company's equity securities, as well as reimbursement for Roth's reasonable out of pocket expenses. The Company has paid Roth from the proceeds of the July 2019 PIPE financing.

Pursuant to an engagement letter dated August 14, 2019 between Company and Roth, the Company engaged Roth to serve as its exclusive placement agent for a period of 15 days from the date of the engagement with respect to private placements of the Company's equity securities in a "PIPE" transaction. Pursuant to the engagement at the closing of the August 2019 PIPE Financing, Roth was entitled to a cash fee equal to (i) 7% of the first $2,255,000 of gross proceeds plus (ii) 8% of gross proceeds in excess of $2,255,000 received by the Company in the August 2019 PIPE financing. Roth is also entitled to be reimbursed by the Company for its reasonable out of pocket expenses. The placement agent agreement contains customary representations, warranties and covenants of the parties and indemnification provisions under which the Company has agreed to indemnity Roth against certain liabilities.

MARKET FOR OUR COMMON STOCK AND RELATED STOCKHOLDER MATTERS

Market Information

Our Common Stock is quoted on the OTC Marketplace – OTC QB under the symbol "DCTH." The quotations reflect inter-dealer prices, without retail mark-up, mark-down or commissions, and may not necessarily represent actual transactions.

As of September 25, 2019, there were 18.3 million shares of our Common Stock outstanding and approximately 40 holders of record of our Common Stock. However, we believe that there are more beneficial holders of our Common Stock as many beneficial holders hold their stock in "street name."

The last reported trading price of our Common Stock on September 24, 2019 was $0.1080.

Dividend Policy

We have never declared or paid any dividends to the holders of our Common Stock and we do not expect to pay cash dividends in the foreseeable future. We currently intend to retain any earnings for use in connection with the expansion of our business and for general corporate purposes.

Securities Authorized for Issuance under Equity Compensation Plans

The following table sets forth information, as of December 31, 2018, about our equity compensation plans (including the potential effect of debt instruments convertible into Common Stock) in effect as of that date:

Plan category	(a) Number of securities to be issued upon exercise of outstanding options, warrants and rights(1)(2)	(b) Weighted-average exercise price of outstanding option, warrants and rights(1)	(c) Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a))(1)
Equity compensation plans approved by security holders	—	$ —	—
Equity compensation plans not approved by security holders	—	—	—
Totals	—	$ —	—

(1) Reflects a one-for-three hundred and fifty (1:350) reverse stock split effected on November 6, 2017 and a one-for-five hundred (1:500) reverse split effected on May 2, 2018.

(2) Net of equity instruments forfeited, exercised or expired.

BUSINESS

Overview

Delcath Systems, Inc. is an interventional oncology company focused on the treatment of primary and metastatic liver cancers. Our investigational product—Melphalan Hydrochloride for Injection for use with the Delcath Hepatic Delivery System ("Melphalan/HDS") —is designed to administer high-dose chemotherapy to the liver while controlling systemic exposure and associated side effects. In Europe, our system is commercially available under the trade name Delcath Hepatic CHEMOSAT ® Delivery System for Melphalan ("CHEMOSAT"), where it has been used at major medical centers to treat a wide range of cancers of the liver.

Our primary research focus is on ocular melanoma liver metastases ("mOM") and intrahepatic cholangiocarcinoma ("ICC"), a type of primary liver cancer, and certain other cancers that are metastatic to the liver. We believe the disease states we are investigating represent a multi-billion dollar global market opportunity and a clear unmet medical need.

Our clinical development program ("CDP") for Melphalan/HDS is comprised of The FOCUS Clinical Trial for Patients with Hepatic Dominant Ocular Melanoma (the "FOCUS Trial"), a global registration clinical trial that is investigating objective response rate in mOM, and the ALIGN Trial, a global Phase 3 clinical trial for ICC (the "ALIGN Trial"). Our CDP also includes a registry for CHEMOSAT commercial cases performed in Europe and sponsorship of select investigator-initiated trials ("IITs").

We were formed as a Delaware corporation in 1988. We maintain a public internet site at www.delcath.com . The information on our website does not constitute a part of, and is not incorporated in, this prospectus.

Employees

As of September 25, 2019, we had a total of 30 full time employees located in the United States and in Europe. None of our employees are represented by a labor union or covered by a collective bargaining agreement. We believe our relationship with our employees is good.

Properties

Delcath's corporate offices currently occupy 6,877 square feet of office space at 1633 Broadway, Suite 22C, New York, New York under a sub-lease agreement that expires in February 2021. The Company leases an additional space in the United States comprised of approximately 6,000 square feet at 95-97 Park Road in Queensbury, New York. The lease agreement expires in November 2020. Delcath also owns a building comprised of approximately 10,320 square feet at 566 Queensbury Avenue in Queensbury, New York. These facilities house manufacturing, quality assurance and quality control, research and development, and office space functions. The Company also owns approximately four acres of land at 12 and 14 Park Road in Queensbury, New York. In addition, the Company leases a facility for office and manufacturing comprised of approximately 19,200 square feet at 19 Mervue, Industrial Park in Galway, Ireland under a lease agreement that expires in August 2021. The Company has sublet a portion of this facility to an unaffiliated third-party. The Company believes substantially all of its property and equipment is in good condition and that it has sufficient capacity to meet current operational needs. See Note 13 to the Company's audited consolidated financial statements contained in our Annual Report on Form 10-K for more details.

Legal Proceedings

On May 9, 2018, the Company received a Demand Letter from a vendor for an outstanding balance owed at that time of $2.1 million. The Company has worked with the vendor since that time to establish a payment plan for the balance owed.

We are engaged in various other legal actions, claims and proceedings arising in the ordinary course of business, including claims related to breach of contracts and intellectual property matters resulting from our business activities. As with most actions such as these, an estimation of any possible and/or ultimate liability cannot always be determined.

There are no material proceedings known to us to be contemplated by any governmental authority.

There are no material proceedings known to us, pending or contemplated, in which any of our directors, officers or affiliates or any of our principal security holders, or any associate of any of the foregoing, is a party or has an interest adverse to us.

MANAGEMENT, EXECUTIVE COMPENSATION AND CORPORATE GOVERNANCE

Below are the names and certain information regarding the Company's executive officers and directors:

Name	Age	Position Held
Jennifer K. Simpson, Ph.D.	51	Director, President and Chief Executive Officer
Barbra C. Keck	41	Chief Financial Officer and Secretary
John Purpura	58	Executive Vice President, Global Head of Operations
William D. Rueckert	66	Director
Roger G. Stoll, Ph.D.	76	Director, Chairman
John R. Sylvester(1)	55	Director
Marco Taglietti, M.D.	59	Director

(1) John R. Sylvester was appointed to the Board of Directors effective July 24, 2019 to fill the vacancy created by former director, Simon Pedder, who resigned as a member of the Board of Directors of the Company effective April 10, 2019. Mr. Pedder's decision to resign was not the result of any disagreement with the Company on any matter relating to its operations, policies or practices.

Jennifer K. Simpson was appointed as a Director in October 2015. Dr. Simpson joined Delcath as Executive Vice President, Global Marketing in March 2012 and was promoted to Executive Vice President, Global Head of Business Operations in April 2013 and Interim Co-President and Co-Chief Executive Officer, Executive Vice President, Global Head of Business Operations in September 2013. In September 2014, Dr. Simpson was named Interim President and Chief Executive Officer and named President and Chief Executive Officer in October 2015. From May 2011 to March 2012, Dr. Simpson served as the Vice President, Global Marketing, Oncology Brand Lead at ImClone Systems, Inc. (a wholly owned subsidiary of Eli Lilly and Company), where she was responsible for all product commercialization activities and launch preparation for one of the late-stage assets. From June 2009 to May 2011, Dr. Simpson served as the Vice President, Product Champion and from 2008 to 2009 as the Associate Vice President, Product Champion for ImClone's product Ramucirumab. From 2006 to 2008, Dr. Simpson served as Product Director, Oncology Therapeutics Marketing at Ortho Biotech (now Janssen Biotech), a Pennsylvania-based biotech company that focuses on innovative solutions in immunology, oncology and nephrology. Earlier in her career, Dr. Simpson spent over a decade as a hematology/oncology nurse practitioner and educator. Dr. Simpson earned a Ph.D. in Epidemiology from the University of Pittsburgh, an M.S. in Nursing from the University of Rochester, and a B.S. in Nursing from the State University of New York at Buffalo.

Barbra C. Keck joined Delcath as Controller in January 2009, was promoted to Vice President in October 2009, to Senior Vice President in March 2015 and to Chief Financial Officer in February 2017. Prior to joining Delcath, she was an audit assistant with Deloitte & Touche, LLP from August 2008 to December 2008. From June 2006 to August 2008, Ms. Keck was the Assistant to the Vice President and Dean of Baruch College, Zicklin School of Business, and from September 2005 to May 2006 she was the Donor Relations and Communications Manager for Young Audiences New York. From 2002 to 2005, Ms. Keck was the Manager, UD Arts Series at the University of Dayton, where she also served as the Manager, Arts and Cultural Events from 1999 to 2002. Between those positions, from 2002 to 2003, she was the Director of Teacher Programs at the Muse Machine. Ms. Keck served as the General Manager of Dayton Bach Society and the Manager of UD Arts Series from 1999 to 2002. She earned her M.B.A. in Accountancy from Baruch College and Bachelor of Music in Music Education from the University of Dayton.

John Purpura joined Delcath as Executive Vice President, Regulatory Affairs and Quality Assurance in November 2009 and was promoted to Executive Vice President, Global Head of Operations on July 19, 2016. Prior to joining Delcath, he was with Bracco Diagnostics (formerly E-Z-EM,Inc.) as Vice President and then Executive Director of International Regulatory Affairs from 2007 to 2008 and Head of Regulatory Affairs for North America and Latin America from 2008 to 2009. Prior to E-Z-EM, Inc., Mr. Purpura had an 11-year career

with Sanofi-Aventis, ultimately serving as Associate Vice President for Regulatory CMC from 2005 to 2007. From 1985 to 1995, he had various quality and regulatory management roles with Bolar Pharmaceuticals, Luitpold Pharmaceuticals and Eon Labs Manufacturing. He earned his M.S. in Management & Policy and B.S. degrees in Chemistry and Biology at the State University of New York at Stony Brook.

William D. Rueckert was appointed as a Director in December 2014. Mr. Rueckert has served on many public and private corporate boards in both the life science and banking industries. He is currently President of Oyster Management Group, LLC, an investment partnership specializing in community banking. From 2007 until 2012 he served on the board of Novogen Ltd. (ASX, NASDAQ) a biotechnology company based in Sydney, Australia. He acted as Chairman from 2010 until 2012, and as acting CEO led the restructuring of the company, spinning off its major subsidiary, Marshall Edwards, Inc. (now MEI Pharma, Inc. NASDAQ.) He is currently a director of MEI Pharma, Inc. (NASDAQ), a San Diego based company that is developing novel oncology therapies. Until its sale to H. Lundbeck A/S, he was a director of Chelsea Therapeutics International, Ltd. (NASDAQ) whose drug candidate, Northera, was approved by the FDA in 2014. He has also served on the boards of several banks including Westport Bank and Trust, Lafayette American Bank and Hudson United Bank (all NASDAQ.) He currently serves on the board of Fairfield County Bank, a mutually owned, community bank based in Ridgefield, Connecticut, and Bleachers, Inc., a privately held company that streams live and archived sports and entertainment events from independent schools. Among his civic associations, Mr. Rueckert is a Director and President of the Cleveland H. Dodge Foundation, Co-Chairman of the Board of Trustees of Teachers College, Columbia University, a Director of the Y Retirement Fund, a Trustee of International House, an Emeritus Director of the YMCA of Greater New York, a Trustee of the American University of Beirut and a Director of Wave Hill, Inc. He earned a BA in Spanish in 1977 from the University of New Hampshire. The Nominating Committee considered Mr. Rueckert's experience and qualifications, in addition to his relevant executive management and operational pharmaceutical experience, as well as the overall composition of the Board, in making the determination that Mr. Rueckert should serve as director of Delcath.

Roger G. Stoll, PhD. was appointed as a director of the Company in December 2008. He became Executive Chairman in September, 2014 and has served as Chairman of the Board since October 1, 2015. From 2002 to 2010 he served as Chairman and Chief Executive Officer of Cortex Pharmaceuticals, Inc. In August of 2010 he was appointed Executive Chairman of the board of directors of Cortex and retired in 2012. From 2001 to 2002 he was a consultant to several east coast venture capital firms and startup ventures. From 1998 to 2001, he was Executive Vice President of Fresenius Medical Care-North America, in charge of the dialysis products division and the diagnostic business units, which included hemodialysis machines, dialysis filters, dialysate solutions, and attendant devices used in the dialysis procedure. From 1991—1998, Dr. Stoll was Chief Executive of Ohmeda, a global leader in anesthetic agents, critical care drugs and related operating room devices with sales of $1 billion annually. From 1994 until the sale of Ohmeda in 1998, he was also a member of the board of directors of The BOC Group,plc in London. From 1986—1991, Dr. Stoll held several positions of increasing responsibility at Bayer, AG including, Chief Administrative Office, President of Consumer Healthcare business unit, and Executive Vice-President and General Manager for its worldwide Diagnostic Business Group w which included the acquisition of The Tecnicon Company and globally integrating the Bayer and Techincon business units. This resulted in a global diagnostic business in excess of $1billion in sales annually. Prior to that he worked for American Hospital Supply Corporation, where he rose from Director of Clinical Pharmacology to President of the American Critical Care drug division of AHSC. He began his pharmaceutical career at the Upjohn Company working in drug metabolism and pharmacokinetic studies in a clinical development unit in 1972. Dr. Stoll obtained his BS in Pharmacy degree at Ferris State University, his PhD in Biopharmaceutics and drug metabolism at the University of Connecticut and was a post-doctoral fellow for two years at the University of Michigan. He served on the board of Agensys, Inc from 2003 until its sale to Astellas in late 2007. Also on the board of Questcor Pharmaceuticals, and Chelsea Therapeutics until it was acquired in 2008 by Lundbeck A/S. From 1991 to 2002 he also served on the board of directors of St.Jude Medical. He also served on the boards of HIMA and PMA (now PhRMA). Dr. Stoll also serves on the University of Connecticut School of Pharmacy Advisory Board. The nominations committee considered Dr. Stoll's experience and qualifications in both pharmaceuticals and medical devices and equipment in addition to his relevant executive management

experience. as well as, the overall composition of the Board, in making the determination that Dr. Stoll should serve as a director of Delcath.

John R. Sylvester was appointed as a Director in July 2019. He is currently serving as Chief Commercial Officer of BTG plc, which he joined in 2011 and has had roles leading both their Interventional Oncology and Interventional Vascular businesses as well as a period as Chief Development Officer accountable for Strategy, M&A and Market access. This culminated in an exit to Boston Scientific for $4.2 billion. Prior to BTG, John was Managing Director of Biocompatibles plc, building their Interventional Oncology business which led to a successful exit to BTG for £166.0 million. John joined Biocompatibles following a period as the Vice President of Marketing for Baxter Healthcare's $750.0 million European Medication Delivery business based in Brussels then Zurich accountable for six strategic business units incorporating drugs, devices and drug device combinations. Before this, John held a number of senior commercial roles in the industrial sector. Immediately prior to Baxter Healthcare, John was the General Manager of a Minerals company with $4.0 billion of assets on three continents, $500.0 million of sales and 1,500 employees. John graduated with joint honors in Biochemistry and Applied Molecular Biology from the University of Manchester Institute of Science and Technology (U.M.I.S.T.)

Dr. Marco Taglietti, M.D. was appointed as a Director in December 2014. Dr. Taglietti serves as CEO and on the Board of Directors of NASDAQ-listed SCYNEXIS, Inc., a pharmaceutical company committed to the discovery, development and commercialization of novel anti-infectives. Prior to its acquisition in February 2014, Dr. Taglietti served as Executive Vice President, Research and Development, and Chief Medical Officer of Forest Laboratories. He also served as President of the Forest Research Institute. Prior to joining Forest Labs in 2007, Dr. Taglietti held the position of Senior Vice President, Head of Global Research and Development, at Stiefel Laboratories, Inc. for three years. He joined Stiefel after 12 years at Schering-Plough Corporation where he last held the position of Vice President, Worldwide Clinical Research for Anti-Infectives, Oncology, CNS, Endocrinology and Dermatology. Dr. Taglietti began his career at Marion Merrell Dow Research Institute. He received his medical degree and board certifications from the University of Pavia in Italy. The Nominating Committee considered Dr. Taglietti's experience and qualifications, in addition to his relevant executive management and operational pharmaceutical experience, as well as the overall composition of the Board, in making the determination that Dr. Taglietti should serve as director of Delcath.

Executive Compensation.

Our Compensation Committee is responsible for formulating and establishing our overall compensation philosophy with respect to our executive officers. The Company believes that a strong executive management team comprised of talented individuals in key positions at the Company is critical to the development and growth of our business and to increasing stockholder value. Accordingly, a key objective of executive compensation is to attract and retain talented and experienced individuals, while motivating them to perform and make decisions consistent with the Company's business objectives, goals and culture. We emphasize pay-for-performance by linking executive compensation to Company performance. For each executive, the amount of pay that is actually realized is primarily driven by the Company's performance and each executive's contribution to that performance.

Our Compensation Committee considers the input it receives from our stockholders when designing and evaluating our executive compensation practices. *Compensation Components*. The three primary components of executive compensation are base salary, annual incentive cash awards and long-term equity incentive awards:

- *Base Salary.* We pay our executive officers a base salary, which our Compensation Committee reviews and determines annually. Base salaries are used to compensate our executive officers for performing the core responsibilities of their positions and to provide them with a level of security with respect to a portion of their total compensation. Base salaries are set in part based on the executive's unique skills, experience and expected contribution to the Company, as well as individual performance, including the

impact of such performance on our business results, and the period of the executive's performance. Decisions regarding base salary increases take into account the executive's current base salary, third-party benchmark and survey data, and the salary compensation paid to executive officers within and outside the Company, as well as the Company's overall performance, its ability to afford such increases, its success in achieving its operational and strategic goals and objectives, and the executive officer's contribution to Company performance.

- *Annual Incentive Cash Awards.* Annual incentive compensation is intended to establish a direct correlation between annual cash awards and the performance of the Company. The Company's Annual Incentive Plan ("AIP") is an annual incentive cash bonus plan designed to align the interests of participants with the interests of the Company and its stockholders. The AIP is designed to strengthen the link between a participant's pay and his or her overall performance and the Company's performance, focus participants on critical individual and corporate objectives, offer a competitive cash incentive, and encourage and reward performance and competencies critical to the Company's success.
- *Long-Term Incentive Compensation.* In addition to using base salaries and annual incentive cash bonuses, which our Compensation Committee views as short-term compensation, a portion of our executive compensation is in the form of long-term equity compensation. Our Long-Term Incentive Plan ("LTIP") is an annual equity-based incentive plan designed to align participants' interests with those of the Company and its stockholders by rewarding participants for their contributions to the long-term success of the Company. The LTIP is designed to incentivize Company leaders to focus on the long-term performance of the Company, offer participants competitive, market-based long-term incentive award opportunities, and strengthen the link between a participant's compensation and his or her overall performance and the Company's overall long-term performance. We believe the LTIP assists us in achieving an appropriate balance between short- and long-term executive compensation.

Base Salary. The following table summarizes the amount of base salary and year-over-year increase for each of our named executive officers for 2017 and 2018:

Executive	Hire Date	2016 Base Salary	Percent Increase in 2017	2017 Base Salary	Percent Increase in 2018	2018 Base Salary
Jennifer K. Simpson, Ph.D.	3/23/2012	$439,810	3.0%	$453,004	3.0%	$ 466,594
Barbra C. Keck, M.B.A.	1/5/2009	$247,200	21.4%	$300,000	8.0%	$ 324,000
John Purpura, M.S.	11/16/2009	$307,000	3.0%	$316,210	5.9%	$ 335,000

Annual Incentive Plan. Under the AIP, annual incentive target award opportunities are expressed as a percentage of a participant's actual base salary for the performance year, beginning January 1. The following table sets forth, for each executive, the applicable target bonus percentage of base salary to which each executive could have been entitled. Given the Company's current position, no annual bonus was awarded or paid to any named executive officer for 2018.

Executive	Target Bonus Expressed as % of Base Salary	Dollars ($)	Actual Payout as % of Base Salary	Dollars ($)
Jennifer K. Simpson, Ph.D.	50.0%	$233,297	0.0%	$ —
Barbra C. Keck, M.B.A.	45.0%	$145,800	0.0%	$ —
John Purpura, M.S.	45.0%	$150,750	0.0%	$ —

For 2018, AIP goals were based entirely on Company performance to focus all the executives on the same critical challenges facing the Company. Company performance in 2018 has been measured based upon achievement of objectives in the following areas: (1) Clinical Trials; (2) Capital; and (3) Sales. While certain performance goals

were met in 2018, the Board determined that no annual bonus should be granted to our named executive officers due to the Company's current position and challenges.

Long Term Incentive Plan. Grants under the LTIP are typically comprised of a mix of restricted stock and stock option awards granted in the first quarter of each year with the number of shares subject to the awards designed to deliver a competitive value targeted at the mid-market of the executive compensation comparison group. These guidelines are reviewed periodically based on prevailing compensation comparison group levels, however, and the Compensation Committee then uses these guidelines to determine long-term equity incentive awards for our named executive officers based upon a holistic assessment of Company and individual performance for the prior year and its view of the appropriate incentives to best help achieve the Company's business objectives. Our ability to provide awards at the mid-market level has been difficult to do in the past few years due to share availability. Such awards in the past few years have typically been at or below the market 25th percentile.

There were no long-term equity awards to our named executive officers in 2018. Due to the lack of available shares for issuance under the Company's 2009 Stock Incentive Plan, the Board of Directors did not grant any long-term equity awards to our named executive officers in 2018 which in no way should create any negative inference concerning the Compensation Committee's evaluation of their performance.

Summary Compensation Table.

The following table sets forth the total compensation awarded to, earned by or paid to: (i) each person who served as a principal executive officer during 2018, and (ii) our two other most highly-compensated executive officers who were serving as executive officers on December 31, 2018. We refer to these individuals as our "named executive officers."

Name and Position	Year	Salary ($)(1)	Bonus ($)(2)	Stock Awards ($)(3)	Options Awards ($)	Non-Equity Incentive Plan Compensation ($)	All Other Compensation ($)	Total ($)
Jennifer K. Simpson, Ph.D.	2018	$466,594	$ 75,000	$ —	$ —	$ —	$ —	$541,594
President and Chief Executive Officer	2017	453,004	147,226	7,476	—	—	—	607,706
Barbra C. Keck, M.B.A.	2018	324,000	50,000	—	—	—	—	374,000
Chief Financial Officer and Secretary	2017	293,400	68,250	4,788	—	—	—	366,438
John Purpura, M.S.	2018	335,000	50,000	—	—	—	—	385,000
Executive Vice President, Global Head of Operations	2017	316,210	92,491	7,140	—	—	—	415,841

(1) For 2018, Dr. Simpson was paid $177,102, Ms. Keck was paid $128,037 and Mr. Purpura was paid $132,053. The balance of their salaries has been accrued.

(2) For 2017 and 2018, all bonus amounts have been accrued and not yet paid.

(3) Due to the lack of available shares for issuance under the Company's 2009 Stock Incentive Plan, the Board of Directors did not grant any long-term equity awards to our named executive officers in 2017 or 2018 which in no way should create any negative inference concerning the Compensation Committee's evaluation of their performance.

Outstanding Equity Awards at Fiscal Year-End Table—2018.

The following table sets forth information relating to unexercised options and unvested restricted shares held by the named executive officers as of December 31, 2018. As a result of the May 2, 2018 reverse stock split, the Company's 2009 Stock Incentive Plan has no active grants and no further shares available to be granted.

Name	Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Option Exercise Price	Option Expiration Date	Number of Shares of Stock That Have Not Vested (#)	Market Value of Shares of Stock That Have Not Vested ($)
Jennifer K. Simpson, Ph.D.	—	—	—	—	—	—
Barbra C. Keck, M.B.A.	—	—	—	—	—	—
John Purpura, M.S.	—	—	—	—	—	—

Potential Payments upon Termination or Change of Control.

The following table shows the potential incremental value transfer to each named executive officer under various termination or change-in-control scenarios as of December 31, 2018, the last business day of 2018. Unvested, unexercised stock options and unvested restricted stock awards are valued at the closing market price of the Company's Common Stock on that date. The actual amounts to be paid out in respect of the named executive officers can only be determined at the time of such named executive officer's actual separation from the Company.

Name	Retirement or Voluntary Termination Without "Good Reason"	Termination for "Cause"	Involuntary Termination (Termination Without Cause, or Termination for Good Reason)	Upon a Change in Control	Death or Disability Termination
Jennifer K. Simpson, Ph.D.	—	—	$ 726,650	$726,650	—
Barbra C. Keck, M.B.A.	—	—	$ 530,860	$530,860	—
John Purpura, M.S.	—	—	$ 518,240	$518,240	—

Severance Arrangements

The Company has entered into an Executive Security Agreement with each of the named executive officers. The Executive Security Agreements provide for the payment of severance to each of our named executive officers upon a qualifying termination (a termination which is involuntary but not "for cause" or a termination for "good reason" as defined therein) to be paid within 10 days of such event as follows: (i) all base salary owed to the date of the qualifying event, (ii) a one-time lump sum fee equal to the named executive officer's monthly base salary for a term of two years for Jennifer Simpson and 18 months for Barbra Keck and John Purpura, and (iii) COBRA payments should the named executive officer remain on the Company's health benefit plans. The named executive officer would also be entitled to a pro-rata portion of any AIP payment for the fiscal year in which termination of employment occurs due by March 15th of the following year. The term of the Executive Security Agreements continues until terminated by mutual agreement of each named executive officer and the Company.

Director Compensation—2018

The Compensation Committee reviews and recommends to the Board of Directors appropriate director compensation programs for service as directors, committee chairs, and committee members.

In lieu of per-meeting fees, non-employee directors of the Company are paid an annual retainer of $43,000 and certain additional annual retainers for chairing or serving as a member of the committees of the Board as follows:

Name	Annual Retainer
Board Service	$ 43,000
Chair of Audit Committee	$ 20,000
Member of Audit Committee	$ 8,000
Chair of Compensation and Stock Option Committee	$ 12,000
Member of Compensation and Stock Option Committee	$ 5,000
Chair of Nominating and Corporate Governance Committee	$ 8,000
Member of Nominating and Corporate Governance Committee	$ 4,000

Dr. Stoll receives an annual retainer fee as Director and Chairman of the Board of $68,000. Additionally, we reimburse all non-employee directors for their reasonable out-of-pocket travel expenses incurred in attending meetings of our Board of Directors or any committees of the Board. Due to the lack of shares available for issuance under the Company's 2009 Stock Incentive Plan, the Board of Directors did not grant any equity awards to non-employee directors during 2018 which in no way should create any negative inference concerning the Compensation Committee's evaluation of their performance.

The following table sets forth the compensation awarded to, earned by or paid to each non-employee director who served on our Board of Directors in 2018.

Name	Fees Earned or Paid in Cash	Stock Awards	Option Awards	All Other Compensation	Total
Simon Pedder, Ph.D. (1)	$56,000	$ —	$ —	$ —	$56,000
William D. Rueckert	72,000	—	—	—	72,000
Roger G. Stoll, Ph.D.	84,000	—	—	—	84,000
Marco Taglietti, M.D.	59,000	—	—	—	59,000

(1) Dr. Pedder resigned as a director effective April 10, 2019. John R. Sylvester was appointed director effective July 24, 2019 to fill the vacancy created and therefore did not receive any compensation for the year ending December 31, 2018.

(2) No non-employee director was paid his 2018 fees. All amounts have been accrued and certain amounts were invested by directors in the July 2019 Private Placement.

Corporate Governance

Board of Directors. We have currently have five directors serving on the Board of Directors. The Board of Directors oversees the business affairs of the Company and monitors the performance of management. In accordance with our corporate governance principles, our Board does not involve itself in day-to-day operations. The directors keep themselves informed through discussions with the Chairman of the Board, Roger G. Stoll, Jennifer K. Simpson, in her capacity as Director and Chief Executive Officer, or CEO, and other key executives, and by reading the reports and other materials that management sends them and by participating in Board and committee meetings. Our directors hold office until their successors have been elected and qualified unless the director resigns or is removed or by reason of death or other cause is unable to serve in the capacity of director.

Board Independence. The Board has determined that four of our five directors (each of Roger G. Stoll, William D. Rueckert, John R. Sylvester and Marco Taglietti) are "independent" directors within the meaning of the NASDAQ listing rules.

Attendance. The Board of Directors met 12 times in 2018 (including regularly scheduled and special meetings). During 2018, each director attended at least 75% of the aggregate of: (i) the total number of meetings of the

Board (held during the period for which he or she served as a director) and (ii) the total number of meetings held by all committees of the Board of Directors on which he or she served (held during the period that he or she served). It is Delcath's policy that, absent unusual or unforeseen circumstances, all directors are expected to attend annual meetings of stockholders.

Board Leadership Structure. Roger G. Stoll, Ph.D. was appointed Executive Chairman effective September 2014 and designated Chairman in connection with the appointment of Dr. Simpson as director effective October 2015. Dr. Stoll has been a member of the Board of Directors since 2008.

It is our policy to separate the Chairman and Chief Executive Officer roles. We believe this structure is appropriate for Delcath because it allows our President and CEO to concentrate on Delcath's day-to-day operations, while providing for effective oversight by the Chairman, who is involved in strategic and key matters, such as business strategy, major transactions and the broader business of Delcath. For a company like Delcath that is focused on the development, approval and commercialization of a specialized product in an extremely technical, highly regulated and intensely competitive industry, we believe our President and CEO is in the best position to lead our management team, in part because of the depth of her experience in conducting clinical trials in oncology, and to respond to the current pressures and needs of a company in the stage of growth and development of Delcath, with assistance from our Chairman who also focuses the Board's attention on the broader issues of corporate business strategy and corporate governance. We believe that splitting the roles between Chairman, on the one hand, and President and CEO, on the other hand, minimizes any potential conflicts that may result from combining the roles of CEO, President and Chairman, and maximizes the effectiveness of our management and governance processes to the benefit of our stockholders. Our President and CEO and Chairman regularly consult with each other as part of this structure.

Board's Role in Risk Oversight. The Board as a whole is responsible for risk oversight, with reviews in certain areas being conducted by the relevant Board committees. Each of the Board's committees oversees the management of risks associated with their respective areas of responsibility. In performing this oversight function, the committees are assisted by management which provides visibility about the identification, assessment and monitoring of potential risks and management's strategy to mitigate such risks. Key members of management responsible for a particular area report directly to the Board committee charged with oversight of the associated function and, if the circumstances require, the whole Board. The Board committees review various risk exposures with the full Board and otherwise keep the full Board abreast of the committees' risk oversight activities throughout the year, as necessary or appropriate.

Risk Assessment of Compensation Programs. Our Compensation and Stock Option Committee annually evaluates whether our compensation programs encourage excessive risk-taking by employees at the expense of long-term Company value. Based upon its assessment, including a review of the overall annual award limitations and individual annual limitations in the Company's stock incentive plans and the Compensation Committee's role in the consideration and approval of certain awards, the Compensation and Stock Option Committee does not believe that our compensation programs encourage excessive or inappropriate risk-taking, motivate imprudent risk-taking or create risks that are reasonably likely to have a material adverse effect on the Company.

Board Committees. Our Board has three standing committees: an Audit Committee, a Compensation and Stock Option Committee and a Nominating and Corporate Governance Committee. No individual director is the chairman of more than one committee. Mr. Sylvester joined the board in July 2019 and has not been appointed to any committee yet.

Audit Committee. The Audit Committee provides assistance to the Board in fulfilling its oversight responsibilities with respect to the Company's financial statements, the Company's system of internal accounting and financial controls and the independent audit of the Company's financial statements. Functions of the Audit Committee include:

- the selection, evaluation and, where appropriate, replacement of our outside auditors;

- an annual review and evaluation of the qualifications, performance and independence of our outside auditors;
- the approval of all auditing services and permitted non-audit services provided by our outside auditors;
- the review of the adequacy and effectiveness of our accounting and internal controls over financial reporting; and
- the review and discussion with management and with our outside auditors of the Company's financial statements to be filed with the Commission.

The Board has determined that each member of the Audit Committee, William D. Rueckert (Chair), Marco Taglietti and Roger G. Stoll qualifies as an "audit committee financial expert" as defined by SEC rules. During 2018, the Audit Committee met five times. Each member of the Audit Committee is "independent" within the meaning of the NASDAQ listing rules and otherwise meets the financial statement proficiency requirements of the NASDAQ listing rules. The Audit Committee has a written charter, which is available on our website; go to www.delcath.com, click on "Investors," then "Corporate Governance."

Compensation and Stock Option Committee. The Compensation and Stock Option Committee (the "Compensation Committee") assists the Board of Directors in the discharge of the Board's responsibilities with respect to the compensation of Delcath's directors, executive officers, and other key employees and consultants. The Compensation Committee establishes our overall compensation philosophy and is authorized to approve the compensation payable to our executive officers, including our named executive officers, and other key employees, including all perquisites, equity incentive awards, cash bonuses, and severance packages. The Compensation Committee also administers certain of the Company's employee benefit plans, including its equity incentive plans, and is responsible for assessing the independence of compensation consultants and legal advisors. The Compensation Committee has concluded that each of Wexler, Burkhart, Hirschberg & Unger, LLP, outside legal counsel to the Compensation Committee and the Company, as well as Pearl Meyer & Partners, compensation consultant to the Compensation Committee, qualified as independent. The Compensation Committee exercises sole power to retain compensation consultants and advisors and to determine the scope of the associated engagements. The current members of the Compensation and Stock Option Committee are Marco Taglietti (Chair) and William D. Rueckert, and Roger G. Stoll, each of whom is "independent" within the meaning of NASDAQ listing rules. During 2018, the Compensation and Stock Option Committee met one time. The Compensation and Stock Option Committee has a written charter, which is available on our website; go to www.delcath.com, click on "Investors," then "Corporate Governance."

Nominating and Corporate Governance Committee. The Nominating and Corporate Governance Committee (the "Nominating Committee") is responsible for identifying individuals qualified to become Board members, and recommends to the Board the director nominees to be proposed by the Board for election by the stockholders (as well as any director nominees to be appointed by the Board to fill interim vacancies). The Nominating Committee also recommends the directors to be selected for membership on each Board committee.

The Nominating Committee is also responsible for developing and recommending to the Board appropriate corporate governance guidelines and policies, and for leading the Board in its annual review of the Board's performance.

The current members of the Nominating Committee are Roger G. Stoll (Chairman), William D. Rueckert and Marco Taglietti, each of whom is "independent," within the meaning of NASDAQ listing rules. During 2018, the Nominating Committee met one time. The Nominating Committee has a written charter, which is available on our website; go to www.delcath.com, click on "Investors," then "Corporate Governance."

The Nominating Committee, with, when it deems it necessary, the assistance of a third-party search firm, identifies candidates for director nominees. In considering candidates for the Board, the Nominating Committee

considers each candidate's credentials as a whole, including, but not necessarily limited to, outstanding achievement in a candidate's personal career, broad and relevant experience, integrity, sound and independent judgment, experience and knowledge of the business environment and markets in which the Company operates, business acumen, and willingness and ability to devote adequate time to Board duties. The Nominating Committee considers the diversity of its members in the context of the Board as a whole, including the personal characteristics, experience and background of directors and nominees to facilitate Board deliberations that reflect a broad range of perspectives.

Recommendations by Stockholders of Director Nominees. The Nominating Committee will consider any recommendation by a stockholder of a candidate for nomination as a director. If a stockholder wants to recommend a director candidate for consideration by the Nominating Committee, the stockholder should submit the name of the proposed nominee, together with the reasons why the stockholder believes the election of the candidate would be beneficial to the Company and its stockholders and the information about the nominee that would be required in a proxy statement requesting proxies to vote in favor of the candidate. The stockholder's submission must be accompanied by the written consent of the proposed nominee to being nominated by the Board and the candidate's agreement to serve if nominated and elected. Any such submission should be directed to the Nominating Committee at Delcath's principal office, 1633 Broadway, Suite 22C, New York, New York 10019. If a stockholder intends to nominate a person for election to the Board of Directors at an annual meeting, the stockholder must provide Delcath with written notice of his or her intention no later than the deadline for receiving a stockholder proposal for inclusion in Delcath's proxy statement for such meeting and must otherwise comply with our amended and restated certificate of incorporation. Copies of any recommendation received in accordance with these procedures will be distributed to each member of the Nominating Committee. One or more members of the Nominating Committee may contact the proposed candidate to request additional information.

Stockholder Communications with the Board of Directors. Any stockholder wishing to communicate with the Board or with any specified director should address his or her communication to the Board of Directors or to the particular director(s) in care of the Corporate Secretary, Delcath Systems, Inc., 1633 Broadway, Suite 22C, New York, New York 10019. All such written communication, other than items determined by our legal counsel to be inappropriate for submission to the intended recipient(s), will be submitted to the Board or to the particular director(s). Any stockholder communication not so delivered, will be made available upon request to any director. Examples of stockholder communications that would be considered inappropriate for submission include, without limitation, customer complaints, business solicitations, product promotions, job inquiries, junk mail and mass mailings, as well as material that is unduly hostile, threatening, illegal or similarly unsuitable.

Compensation Committee Interlocks and Insider Participation. During 2018, Marco Taglietti, Simon Pedder and William D. Rueckert served as members of our Compensation and Stock Option Committee. None of the current members or members serving during 2018 of the Compensation and Stock Option Committee is a current or former officer or employee of Delcath at the time of their service on the Compensation and Stock Option Committee, nor did any Compensation and Stock Option Committee member engage in any "related person" transaction that would be required to be disclosed under Item 404 of Regulation S-K. During 2018, none of Delcath's executive officers served on the compensation committee (or equivalent) or on the board of directors of another entity whose executive officers served on the Compensation and Stock Option Committee or our Board of Directors.

Code of Ethics. We maintain a Code of Business Conduct and Ethics (Code) that applies to all employees, including our principal executive officer, principal financial officer, principal accounting officer, controller and persons performing similar functions, and including our independent directors, who are not employees of the Company, with regard to their Delcath-related activities. The Code incorporates guidelines designed to deter wrongdoing and to promote honest and ethical conduct and compliance with applicable laws, rules and regulations. The Code also incorporates our expectations of our employees that enable us to provide accurate and timely disclosure in our filings with the SEC and other public communications. In addition, the Code incorporates guidelines pertaining to topics such as complying with applicable laws, rules, and regulations;

insider trading; reporting Code violations; and maintaining accountability for adherence to the Code. The full text of our Code is published on our website at http://delcath.com/investors/governance. We intend to disclose future amendments to certain provisions of our Code, or waivers of such provisions granted to our principal executive officer, principal financial officer or principal accounting officer and persons performing similar functions on our website.

SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

Based solely upon information made available to us, the following table sets forth information regarding the beneficial ownership of our Common Stock and Series E Preferred Stock as of September 25, 2019, held by: (i) each director and director nominees; (ii) each of the named executive officers; (iii) all of our directors and executive officers as a group; and (iv) each additional person or group who is known by us to own beneficially more than 5% of our Common Stock or Series E Preferred Stock. Except as indicated in the footnotes below, the address of the persons or groups named below is c/o Delcath Systems, Inc., 1633 Broadway, Suite 22C, New York, New York 10019.

	Shares Beneficially Owned (1)				
Name of Beneficial Owner:	Common Stock	Percent	Series E and E-1 Convertible Preferred Stock	Percent	Percent of Total Voting Power
Named Executive Officers and Directors:					
Jennifer K. Simpson, Ph.D.	270,000(2)	1.4%	147(3)	*	2.1%
Barbra C. Keck, M.B.A.	195,000(4)	1.0%	68(5)	*	1.0%
John Purpura, M.S.	193,001(6)	1.0%	65(7)	*	*
Roger G. Stoll, Ph.D.	80,901(8)	*	93(9)	*	1.3%
William D. Rueckert	84,709(10)	*	60(11)	*	*
Marco Taglietti, M.D.	75,001(12)	*	60(13)	*	*
John Sylvester	—	*	—	*	*
All directors and executive officers as a group (7 people) (8):	**898,612(14)**	**4.7%**	**493(15)**	**1.5%**	**7.1%**
5% Stockholders					
Altium Capital Management, LP Altium Growth Fund, LP Altium Growth GP, LLC 551 Fifth Ave, FL 19 New York, NY 10176	—		3,400(16)	9.9%	5.9%
Rosalind Master Fund L.P. Rosalind Opportunities Fund I L.P. 77 Bloor St W, 3rd FL Toronto, Ontario M5S 1M2	—		19,675(17)	9.9%	27.3%
Hudson Bay Master Fund Ltd (18) 777 Third Ave, 30th Floor New York, NY 10017	—		2,437(18)	9.9%	4.7%

* Less than 1%

(1) Except as indicated in these footnotes: (i) the persons named in this table have sole voting and investment power with respect to all shares of Common Stock and Series E Convertible Preferred Stock beneficially owned; (ii) the number of shares beneficially owned by each person as of September 25, 2019, includes any vested and unvested shares of restricted stock, options and warrants that such person or group has the right to acquire within 60 days of September 25, 2019. Shares issuable pursuant to restricted stock, options and warrants are deemed outstanding for computing the percentage of the person holding such restricted stock, options and warrants but are not deemed outstanding for computing the percentage of any other person.

(2) Includes 262,500 shares of Common Stock, which Dr. Simpson has the right to acquire upon exercise of outstanding options exercisable within 60 days of September 25, 2019.

(3) The 147 shares of Series E Convertible Preferred Stock are convertible into 2,450,000 shares of Common Stock subject to the Beneficial Ownership Limitation and does not include the 2,450,000 shares of

Common Stock that may be obtained by Dr. Simpson upon the exercise of a warrant held by her, which is subject to the Beneficial Ownership Limitation and not exercisable until the first trading day that the Common Stock trades on a split adjusted basis following the effectiveness of the proposed reverse stock split.

(4) Includes 187,500 shares of Common Stock, which Ms. Keck has the right to acquire upon exercise of outstanding options exercisable within 60 days of September 25, 2019.

(5) The 68 shares of Series E Convertible Preferred Stock are convertible into 1,133,333 shares of Common Stock subject to the Beneficial Ownership Limitation and does not include the 1,133,333 shares of Common Stock that may be obtained by Ms. Keck upon the exercise of a warrant held by her, which is subject to the Beneficial Ownership Limitation and not exercisable until the first trading day that the Common Stock trades on a split adjusted basis following the effectiveness of the proposed reverse stock split.

(6) Includes 187,500 shares of Common Stock, which Mr. Purpura has the right to acquire upon exercise of outstanding options exercisable within 60 days of September 25, 2019.

(7) The 65 shares of Series E Convertible Preferred Stock are convertible into 1,083,333 shares of Common Stock subject to the Beneficial Ownership Limitation and does not include the 1,083,333 shares of Common Stock that may be obtained by Mr. Purpura upon the exercise of a warrant held by him, which is subject to the Beneficial Ownership Limitation and not exercisable until the first trading day that the Common Stock trades on a split adjusted basis following the effectiveness of the proposed reverse stock split.

(8) Includes 75,000 shares of Common Stock, which Dr. Stoll has the right to acquire upon exercise of outstanding options exercisable within 60 days of September 25, 2019.

(9) The 93 shares of Series E Convertible Preferred Stock are convertible into 1,550,000 shares of Common Stock subject to the Beneficial Ownership Limitation and does not include the 1,550,000 shares of Common Stock that may be obtained by Mr. Stoll upon the exercise of a warrant held by him, which is subject to the Beneficial Ownership Limitation and not exercisable until the first trading day that the Common Stock trades on a split adjusted basis following the effectiveness of the proposed reverse stock split.

(10) Includes 75,000 shares of Common Stock, which Mr. Rueckert has the right to acquire upon exercise of outstanding options exercisable within 60 days of September 25, 2019.

(11) The 60 shares of Series E Convertible Preferred Stock are convertible into 1,000,000 shares of Common Stock subject to the Beneficial Ownership Limitation and does not include the 1,000,000 shares of Common Stock that may be obtained by Mr. Rueckert upon the exercise of a warrant held by him, which is subject to the Beneficial Ownership Limitation and not exercisable until the first trading day that the Common Stock trades on a split adjusted basis following the effectiveness of the proposed reverse stock split.

(12) Includes 75,000 shares of Common Stock, which Dr. Taglietti has the right to acquire upon exercise of outstanding options exercisable within 60 days of September 25, 2019.

(13) The 60 shares of Series E Convertible Preferred Stock are convertible into 1,000,000 shares of Common Stock subject to the Beneficial Ownership Limitation and does not include the 1,000,000 shares of Common Stock that may be obtained by Mr. Taglietti upon the exercise of a warrant held by him, which is subject to the Beneficial Ownership Limitation and not exercisable until the first trading day that the Common Stock trades on a split adjusted basis following the effectiveness of the proposed reverse stock split.

(14) Includes 862,500 shares of Common Stock, which certain directors and executive officers have the right to acquire upon exercise of outstanding options exercisable within 60 days August 15, 2019.

(15) The aggregate 493 shares of Series E Convertible Preferred Stock are convertible into an aggregate of 8,216,667 shares of Common Stock subject to the Beneficial Ownership Limitation and does not include the aggregate 8,216,667 shares of Common Stock that may be obtained by such persons upon the exercise of warrants held by them, subject to the Beneficial Ownership Limitation and not exercisable until the first trading day that the Common Stock trades on a split adjusted basis following the effectiveness of the proposed reverse stock split.

(16) The information provided is based on a Statement on Schedule 13G jointly filed on July 15, 2019 by and on behalf of each of Altium Growth Fund, LP, Altium Capital Management, LP, and Altium Growth GP, LLC which acquired shares of Series E Preferred Stock and warrants in our July 2019 PIPE Financing. Altium Growth Fund, LP is the record and direct beneficial owner of the securities referenced. Altium Capital Management, LP is the investment adviser of, and may be deemed to beneficially own securities, owned by, Altium Growth Fund, LP. Altium Growth GP, LLC is the general partner of, and may be deemed to beneficially own securities owned by, Altium Growth Fund, LP. The reporting persons hold shared voting and dispositive power with respect to 2,300 shares of Series E Convertible Preferred Stock and 1,100 shares of Series E-1 Convertible Preferred Stock which could be converted into 56,666,666 shares of Common Stock or that may be voted pursuant to the as-converted voting provisions of the Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock subject to the Blockers described below. The referenced securities do not include 56,666,666 shares of Common Stock that may be obtained upon the exercise of warrants held by the reporting persons subject to the Blockers described below. Each reporting person disclaims beneficial ownership of the securities referenced. Each of the reporting persons may be deemed to be a member of a group with respect to Delcath or securities of Delcath for the purposes of Section 13(d) or 13(g) of the Securities Act of 1933, as amended. Pursuant to the terms of (i) the certificate of designations of Delcath containing the terms of the Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock, the reporting persons cannot convert their shares of Series E Convertible Preferred Stock or Series E-1 Convertible Preferred Stock to the extent the reporting persons would beneficially own, after any such conversion, more than 9.99% of the outstanding shares of Common Stock (the “Preferred Stock Blockers”) and (ii) the as to the warrants referenced, the reporting persons cannot exercise such warrants to the extent the reporting persons would beneficially own, after any such exercise, more than 4.99% of the outstanding shares of Common Stock (the “Warrant Blockers” and collectively with the Preferred Stock Blockers, the “Blockers”), and the percentage set forth above gives effect to the Blockers. Consequently, as of September 25, 2019, the reporting persons were not able to exercise all of the reported Series E Convertible Preferred Stock, the Series E-1 Convertible Preferred Stock or any of the reported warrants due to the Blockers.

(17) The information provided is based on a Statement on Schedule 13G jointly filed on August 1, 2019 by and on behalf of Rosalind Advisors, Inc., Rosalind Opportunities Fund I L.P., Rosalind Master Fund L.P. and Steven Salamon with respect to beneficial ownership of shares of Series E Convertible Preferred Stock and warrants acquired in our July 2019 PIPE Financing. Rosalind Advisors, Inc. (the “Advisor”) is the investment advisor to Rosalind Opportunities Fund I L.P. and Rosalind Master Fund L.P. and may be deemed to be the beneficial owner of shares held by Rosalind Opportunities Fund I L.P. and Rosalind Master Fund L.P. Steven Salamon is the portfolio manager of the Advisor and may be deemed to be the beneficial owner of shares of Series E Convertible Preferred Stock and underlying warrants for Common Stock held by Rosalind Master Fund L.P. The Rosalind Opportunities Fund I L.P. holds shared voting and dispositive power with respect to 10,400 shares of Series E Convertible Preferred Stock and 2,260 shares of Series E-1 Convertible Preferred Stock that can be converted into 211,000,000 shares of Common Stock or that may be voted pursuant to the as-converted voting provisions of the Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock subject to the Blockers described below. The Rosalind Master Fund L.P. holds shared dispositive and voting power with respect to 6,400 shares of Series E Convertible Preferred Stock and 615 shares of Series E-1 Convertible Preferred Stock that could be converted into 116,916,666 shares of Common Stock or that may be voted pursuant to the as-converted voting provisions of the Series E Convertible Preferred Stock subject to the Blockers described below. The Advisor and Steven Salamon hold shared voting and dispositive power with respect to 19,675 shares of Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock that could be converted into 327,916,666 shares of Common Stock or that may be voted pursuant to the as-converted voting provisions of the Series E Convertible Preferred Stock or Series E-1 Convertible Preferred Stock subject to the Blockers described below. Notwithstanding the foregoing, the Advisor and Mr. Salamon disclaim beneficial ownership of any such shares. The referenced securities do not include 327,916,666 shares of Common Stock that may be obtained upon the exercise of warrants held by the reporting persons subject to the Blockers described below. Each reporting person disclaims beneficial ownership of the securities

referenced. Each of the reporting persons may be deemed to be a member of a group with respect to Delcath or securities of Delcath for the purposes of Section 13(d) or 13(g) of the Securities Act of 1933, as amended. Pursuant to the terms of (i) the certificate of designations of Delcath containing the terms of the Series E Convertible Preferred Stock or the Series E-1 Convertible Preferred Stock, the reporting persons cannot convert their shares of Series E Convertible Preferred Stock or Series E-1 Convertible Preferred Stock to the extent the reporting persons would beneficially own, after any such conversion, more than 9.99% of the outstanding shares of Common Stock (the "Preferred Stock Blockers") and (ii) as to the warrants referenced, the reporting persons cannot exercise such warrants to the extent the reporting persons would beneficially own, after any such exercise, more than 4.99% of the outstanding shares of Common Stock (the "Warrant Blockers" and collectively with the Preferred Stock Blockers, the "Blockers"), and the percentage set forth above gives effect to the Blockers. Consequently, as of September 25, 2019, the reporting persons were not able to exercise all of the reported Series E Convertible Preferred Stock or Series E-1 Convertible Preferred Stock or any of the reported warrants due to the Blockers.

(18) Based on the information available to the Company, Hudson Bay Master Fund Ltd, which acquired shares of Series E Convertible Preferred Stock, Series E-1 Convertible Preferred Stock, Series E Warrants and Series E-1 Warrants in our July and August 2019 PIPE financings. Hudson Bay Master Fund Ltd is the record and direct beneficial owner of the securities referenced. Hudson Bay Capital Management LP, the investment manager of Hudson Bay Master Fund Ltd., has voting and investment power over these securities. Sander Gerber is the managing member of Hudson Bay Capital GP LLC, which is the general partner of Hudson Bay Capital Management LP. Hudson Bay Capital Management LP may be deemed to be the beneficial owner of all shares of Common Stock underlying the securities held by Hudson Bay Master Fund Ltd. Mr. Gerber disclaims beneficial ownership of these securities. Hudson Bay Capital Management LP holds sole voting and dispositive power with respect to 2,437 shares of Series E Convertible Preferred Stock and 25 shares of Series E-1 Convertible Preferred Stock could be converted into 41,033,333 shares of Common Stock or that may be voted pursuant to the as-converted voting provisions of the Series E Convertible Preferred Stock or Series E-1 Convertible Preferred Stock subject to the Blockers described below. The referenced securities do not include 41,033,333 shares of Common Stock that may be obtained upon the exercise of warrants held by the reporting persons subject to the Blockers described below. Each reporting person disclaims beneficial ownership of the securities referenced. Pursuant to the terms of (i) the certificate of designations of Delcath containing the terms of the Series E Convertible Preferred Stock or Series E-1 Convertible Preferred Stock, the reporting persons cannot convert their shares of Series E Convertible Preferred Stock to the extent the reporting persons would beneficially own, after any such conversion, more than 9.99% of the outstanding shares of Common Stock (the "Preferred Stock Blockers") and (ii) as to the warrants referenced, the reporting persons cannot exercise such warrants to the extent the reporting persons would beneficially own, after any such exercise, more than 9.99% of the outstanding shares of Common Stock (the "Warrant Blockers" and collectively with the Preferred Stock Blockers, the "Blockers"), and the percentage set forth above gives effect to the Blockers. Consequently, as of September 25, 2019, the reporting persons were not able to exercise all of the reported Series E Convertible Preferred Stock, Series E-1 Convertible Preferred Stock or any of the reported warrants due to the Blockers.

CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS

Transactions with Related Persons. We have adopted a written policy for the review and approval or ratification of transactions between Delcath and Related Parties (as defined below). Under the policy, our Nominating Committee will review the material facts of proposed transactions involving Delcath in which a Related Party will have a direct or indirect material interest. The Nominating Committee will either approve or disapprove Delcath's entry into the transaction or, if advance approval is not feasible, will consider whether to ratify the transaction. The Nominating Committee may establish guidelines for ongoing transactions with a Related Party, and will review such transactions at least annually. If the aggregate amount of the transaction is expected to be less than $200,000, such approval or ratification may be made by the Chair of the Committee. In determining whether to approve or ratify a transaction with a Related Party, the Nominating Committee (or Chair) will consider, among other factors, whether the transaction is on terms no less favorable than terms generally available to an unaffiliated third-party and the extent of the Related Party's interest in the transaction.

Certain transactions are deemed pre-approved under the policy, including compensation of executive officers and directors (except that employment of an immediate family member of an executive officer requires specific approval), and transactions with a company at which the Related Party's only relationship is as a non-officer employee, director, or less than 10% owner if the aggregate amount involved does not exceed 2% of such company's total annual revenues (or, in the case of charitable contributions by Delcath, 2% of the charity's total annual receipts). Pre-approval is not required if the amount involved in the transaction is not expected to exceed $120,000 in any calendar year.

For purposes of the policy, a Related Party is generally anyone who since the beginning of the last full fiscal year is or was an executive officer, director or director nominee, owner of more than 5% of the Common Stock, or immediate family member of any of such persons.

No Related Party transactions occurred during 2018 and 2017.

Certain Anti-Takeover Provisions of Delaware Law and our Certificate of Incorporation and Bylaws

We are not subject to Section 203 of the Delaware General Corporation Law, which prohibits Delaware corporations from engaging in a wide range of specified transactions with any interested stockholder, defined to include, among others, any person other than such corporation and any of its majority owned subsidiaries who own 15% or more of any class or series of stock entitled to vote generally in the election of directors, unless, among other exceptions, the transaction is approved by (i) our board of directors prior to the date the interested stockholder obtained such status or (ii) the holders of two-thirds of the outstanding shares of each class or series of stock entitled to vote generally in the election of directors, not including those shares owned by the interested stockholder.

Staggered Board of Directors

Our certificate of incorporation and by-laws provide that our board of directors be classified into three classes of directors of approximately equal size. As a result, in most circumstances, a person can gain control of our board only by successfully engaging in a proxy contest at two or more annual meetings.

Authorized But Unissued Shares

Our authorized but unissued shares of preferred stock are available for future issuances without stockholder approval and could be utilized for a variety of corporate purposes, including future offerings to raise additional capital, corporate acquisitions, employee benefit plans and stockholder rights plans. The existence of authorized but unissued and unreserved preferred stock could render more difficult or discourage an attempt to obtain control of us by means of a proxy contest, tender offer, merger or otherwise.

DESCRIPTION OF COMPANY SECURITIES

The following description of our Common Stock and preferred stock summarizes the material terms and provisions of our Common Stock and preferred stock. The following description of our capital stock does not purport to be complete and is subject to, and qualified in its entirety by, our Amended and Restated Certificate of Incorporation, as amended, and our Amended and Restated By-Laws, which are exhibits to the registration statement of which this prospectus forms a part, and by applicable law. We refer in this section to our Amended and Restated Certificate of Incorporation, as amended, as our certificate of incorporation, and we refer to our Amended and Restated By-Laws as our by-laws. The terms of our Common Stock and preferred stock may also be affected by Delaware law.

Authorized Capital Stock

Our authorized capital stock consists of 1,000,000,000 shares of our Common Stock, $0.01 par value per share, and 10,000,000 shares of undesignated preferred stock, $0.01 par value per share. As of September 25, 2019, we had 18.3 million shares of Common Stock outstanding and 32,572 shares of Series E Convertible Preferred Stock and 9,510 shares of Series E-1 Convertible Preferred Stock outstanding. As of September 25, 2019, we had 701,373,599 shares of Common Stock issuable upon the exercise of outstanding warrants, including (i) 29 Common Stock Warrants and (ii) Series E and Series E-1 Warrants at a weighted average exercise price of $0.06 per share.

Common Stock

Voting

Holders of our Common Stock are entitled to one vote per share on matters to be voted on by stockholders and also are entitled to receive such dividends, if any, as may be declared from time to time by our board of directors in its discretion out of funds legally available therefor. Holders of our Common Stock have exclusive voting rights for the election of our directors and all other matters requiring stockholder action, except with respect to amendments to our certificate of incorporation that alter or change the powers, preferences, rights or other terms of any outstanding preferred stock if the holders of such affected series of preferred stock are entitled to vote on such an amendment or filling vacancies on the board of directors.

Dividends

Holders of Common Stock are entitled to share ratably in any dividends declared by our board of directors, subject to any preferential dividend rights of any outstanding preferred stock. Dividends consisting of shares of Common Stock may be paid to holders of shares of Common Stock. We do not intend to pay cash dividends in the foreseeable future.

Liquidation and Dissolution

Upon our liquidation or dissolution, the holders of our Common Stock will be entitled to receive pro rata all assets remaining available for distribution to stockholders after payment of all liabilities and provision for the liquidation of any shares of preferred stock at the time outstanding.

Other Rights and Restrictions

Our Common Stock has no preemptive or other subscription rights, and there are no conversion rights or redemption or sinking fund provisions with respect to such stock. Our Common Stock is not subject to redemption by us. Our certificate of incorporation and bylaws do not restrict the ability of a holder of Common Stock to transfer the stockholder’s shares of Common Stock. If we issue shares of Common Stock under this prospectus, the shares will be fully paid and non-assessable and will not have, or be subject to, any preemptive or similar rights.

Preferred Stock

Our board of directors has the authority to issue up to 10,000,000 shares of preferred stock in one or more series and to determine the rights and preferences of the shares of any such series without stockholder approval, of which Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock is outstanding. Our board of directors may issue preferred stock in one or more series and has the authority to fix the designation and powers, rights and preferences and the qualifications, limitations, or restrictions with respect to each class or series of such class without further vote or action by the stockholders. The ability of our board of directors to issue preferred stock without stockholder approval could have the effect of delaying, deferring or preventing a change of control of us or the removal of existing management.

In connection with the July 11, 2019 Private Placement, the Company filed a certificate of designation of Preferences, Rights and Limitations of Series E Convertible Preferred Stock with the Secretary of State of the State of Delaware (the "Delaware SOS"), for the purpose of amending its Amended and Restated Certificate of Incorporation to classify and designate 40,000 authorized but unissued shares of the Company's preferred stock as shares of Series E Preferred Stock. The preferences, conversion and other rights, voting powers, restrictions, limitations as to dividends and other distributions, qualifications and terms and conditions of redemption of the Series E Convertible Preferred Stock are set forth in the Certificate of Designation and are described below and under "Private Placement of Securities" beginning on page 32. The certificate of designation became effective on July 11, 2019 upon acceptance for filing by the Delaware SOS.

In connection with the August 15, 2019 Private Placement, the Company filed a certificate of designation of Preferences, Rights and Limitations of Series E-1 Convertible Preferred Stock with Delaware SOS, for the purpose of amending its Amended and Restated Certificate of Incorporation to classify and designate 12,960 authorized but unissued shares of the Company's preferred stock as shares of Series E-1 Convertible Preferred Stock. The preferences, conversion and other rights, voting powers, restrictions, limitations as to dividends and other distributions, qualifications and terms and conditions of redemption of the Series E-1 Convertible Preferred Stock are set forth in the certificate of designation and are described below and under "Private Placement of Securities" beginning on page 32. The certificate of designation became effective on August 15, 2019 upon acceptance for filing by the Delaware SOS.

Each share of the Series E and Series E-1 Convertible Preferred Stock has a par value of $0.01 per share and a stated value equal to $1,000 (the "Stated Value") and is convertible at any time at the option of the holder into the number of shares of Common Stock determined by dividing the stated value by the conversion price of $0.06, subject to certain limitations and adjustments (the "Conversion Price"). Except for certain adjustments, the holders of Series E and Series E-1 Convertible Preferred Stock will be entitled to receive dividends on shares of Series E and Series E-1 Convertible Preferred Stock equal (on an as if converted basis) to and in the same form as dividends paid on shares of the Common Stock. Any such dividends that are not paid to the holders of the Series E and Series E-1 Convertible Preferred Stock will increase the Stated Value. No other dividends will be paid on shares of Series E and Series E-1 Convertible Preferred Stock. The Series E and Series E-1 Convertible Preferred Stock will vote on an as converted basis on all matters submitted to the holders of Common Stock for approval, subject to certain limitations and exceptions. The affirmative vote of the holders of a majority of the then outstanding shares of the Series E and Series E-1 Convertible Preferred Stock is required to increase the number of authorized shares of Series E and Series E-1 Convertible Preferred Stock or to alter or change adversely the powers, preferences or rights given to the Series E and Series E-1 Convertible Preferred Stock, or to amend the Company's organizational documents in any manner that adversely affects the rights of the holders of the Series E and Series E-1 Convertible Preferred Stock. Upon any liquidation of the Company, the holders of the Series E and Series E-1 Convertible Preferred Stock will be entitled to receive out of the assets of the Company an amount equal to the Stated Value plus any accrued and unpaid dividends thereon for each share of Series E and Series E-1 Convertible Preferred Stock before any distribution or payment will be made to the holders of the Common Stock.

The Conversion Price and the Exercise Price may, upon each of (i) the third trading day following the date that the Company effects a reverse stock split, (ii) the date that the initial registration statement to be filed pursuant to the Registration Rights Agreement (as further discussed below) is declared effective by the United States Securities and Exchange Commission ("SEC"), and (iii) in the event that all of the registrable securities (as defined in the Registration Rights Agreement) are not then registered on an effective registration statement, the date that all of the shares underlying the Preferred Stock and Warrants may be sold pursuant to Rule 144, be reduced, and only reduced, to equal the lesser of (x) the then effective Conversion Price or Exercise Price, as applicable, and (y) 90% of the average of the five daily volume weighted average prices of the Common Stock immediately prior to such dates. In the event of a reduction in the Exercise Price, the aggregate number of Warrant Shares shall be increased such that the aggregate Exercise Price of the Warrants on the day immediately following such reduction in the Exercise Price is equal to the aggregate Exercise Price immediately prior to such adjustment. In addition, from the date of issuance of the Preferred Stock and Warrants until such time that the Company's Common Stock is listed or quoted on a national exchange, the Conversion Price and the Exercise Price are subject to price-based anti-dilution protections.

Warrants

The following is a brief summary of material provisions of the warrants related to the shares of Common Stock offered for resale and issuable upon the exercise of such warrants issued to the Selling Stockholders described herein.

Pursuant to the Securities Purchase Agreements dated July 11, 2019 and August 15, 2019, the Company issued warrants to purchase a number of shares of common stock of the Company, par value $0.01 per share ("Common Stock"), equal to the number of shares of Common Stock issuable upon conversion of the Series E and Series E-1 Convertible Preferred Stock purchased. Each Warrant has an exercise price equal to $0.06, subject to adjustment in accordance with the terms of the Warrants (the "Exercise Price"), and will be exercisable at any time beginning on the date that the Company effects a reverse stock split until 5:00 p.m. (NYC time) on the date that is five years following the date that the Company effects a reverse stock split.

The Conversion Price and the Exercise Price may, upon each of (i) the third trading day following the date that the Company effects a reverse stock split, (ii) the date that the initial registration statement to be filed pursuant to the Registration Rights Agreement (as further discussed below) is declared effective by the Commission, and (iii) in the event that all of the registrable securities (as defined in the Registration Rights Agreement) are not then registered on an effective registration statement, the date that all of the shares underlying the Preferred Stock and Warrants may be sold pursuant to Rule 144, be reduced, and only reduced, to equal the lesser of (x) the then effective Conversion Price or Exercise Price, as applicable, and (y) 90% of the average of the five daily volume weighted average prices of the Common Stock immediately prior to such dates. In the event of a reduction in the Exercise Price, the aggregate number of Warrant Shares shall be increased such that the aggregate Exercise Price of the Warrants on the day immediately following such reduction in the Exercise Price is equal to the aggregate Exercise Price immediately prior to such adjustment. In addition, from the date of issuance of the Preferred Stock and Warrants until such time that the Company's Common Stock is listed or quoted on a national exchange, the Conversion Price and the Exercise Price are subject to price-based anti-dilution protections.

Trading Information

Our Common Stock trades on the OTC Marketplace (OTC QB) under the symbol "DCTH".

Transfer Agent and Registrar

The transfer agent and registrar for our Common Stock is American Stock Transfer & Trust Company.

SELLING STOCKHOLDERS

The Common Stock being offered by the Selling Stockholders are those previously issued or issuable to the Selling Stockholders upon the conversion of Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock, and those issuable to the Selling Stockholders upon exercise of Warrants. For additional information regarding these securities, see "Private Placement of Shares of Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock and Warrants" above. We are registering the securities in order to permit the Selling Stockholders to offer the Registered Shares for resale from time to time. Except for the certain institutional shareholders of these shares of Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock and the Warrants as disclosed in the table below, the Selling Stockholders have not had any material relationship with us within the past three years.

The table below lists (a) the names of the Selling Stockholders whose shares are being offered by this prospectus, (b) information regarding the beneficial ownership of shares of Common Stock by each of the Selling Stockholders, including the number of shares of Common Stock beneficially owned by each Selling Stockholder based on its ownership of the shares of Series E Convertible Preferred Stock, Series E-1 Convertible Preferred Stock, Series E Warrants and Series E-1 Warrants as of September 25, 2019, assuming the conversion of the shares of Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock and the exercise of the Series E Warrants and Series E-1 Warrants held by the Selling Stockholders on that date, without regard to any limitations on exercises; and (c) the amount and (if one percent or more) the percentage of the class to be owned by such security holder after completion of the offering.

In accordance with the terms of a Registration Rights Agreement between the Company and the Selling Stockholders, this prospectus generally covers the resale of the sum of (i) the number of shares of Common Stock issued or issuable to the Selling Stockholders upon the conversion in full of the Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock assuming a Conversion Price (as defined in the Certificates of Designation) equal to $0.06 (subject to adjustment for reverse and forward stock splits, recapitalizations and similar transactions following the date of the Purchase Agreement)) immediately following the Reverse Stock Split Date (as defined in the Certificates of Designation) in the "Private Placement of Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock and Warrants" described above and (ii) the maximum number of shares of Common Stock issuable upon exercise of the Warrants assuming Reset Exercise Price (as defined in the Warrants) equal to $0.06 (subject to adjustment for reverse and forward stock splits, recapitalizations and similar transactions following the date of the Securities Purchase Agreements)) immediately following the Reverse Stock Split Date (as defined in the Certificates of Designation), determined as if the outstanding Warrants were exercised in full as of the trading day immediately preceding the date this registration statement was initially filed with the Commission, each as of the trading day immediately preceding the applicable date of determination and all subject to adjustment as provided in the registration right agreement, without regard to any limitations on the exercise of the Warrants. The fourth column assumes the sale of all of the shares offered by the Selling Stockholders pursuant to this prospectus.

Notwithstanding the foregoing, until the Reverse Stock Split Date, the total number of shares of Common Stock that can be offered by this prospectus is limited to 980,555,497 shares and, accordingly, as reflected in the table below, the number of shares to be sold by each Selling Stockholder has been reduced on a pro rata basis such that the maximum number of shares to be sold pursuant to this prospectus is reduced to 980,555,497.

Under the terms of the Warrants, a Selling Stockholder may not exercise the Warrants to the extent such exercise would cause such Selling Stockholder, together with its affiliates and attribution parties, to beneficially own a number of shares of Common Stock which would exceed 4.99% (or, upon written election by a Holder which is delivered to the Company prior to the issuance of any shares of Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock to such Holder, 9.99%) of the Company's then outstanding Common Stock following such exercise, excluding for purposes of such determination shares of Common Stock issuable upon exercise of the warrants which have not been exercised. The number of shares in the second column does not

reflect this limitation. The Selling Stockholders may sell all, some or none of their shares in this offering. See “Plan of Distribution.”

Information about the Selling Stockholders may change over time. Any changed information will be set forth in an amendment to the registration statement or supplement to this prospectus, to the extent required by law.

Delcath Systems, Inc. S-1
Seller Stockholder Table

Investor Name	Total Shares Beneficially Owned Prior to Offering(1)	Maximum Number of Shares to be Sold Pursuant to the Prospectus(2)	Number of Shares Beneficially Owned After Offering(3)(4)	% of Class After Offering*
Investor Company ITF Rosalind Master Fund L.P.(5)	233,833,334	176,108,328	57,725,006	5.78
Rosalind Opportunities Fund I L.P.(5)	422,000,000	317,823,439	104,176,561	10.43
Altium Growth Fund, LP(6)	113,333,332	85,355,425	27,977,907	2.80
Hudson Bay Master Fund Ltd.(7)	82,070,936	61,810,586	20,260,350	2.03
Empery Asset Master Ltd(8)	22,366,666	16,845,144	5,521,522	—
Empery Tax Efficient, LP(9)	6,706,781	5,051,119	1,655,662	—
Empery Tax Efficient II, LP(10)	42,515,694	32,020,104	10,495,590	1.05
Sabby Volatility Warrant Master Fund, Ltd.(11)	50,000,000	37,656,806	12,343,194	1.24
Bigger Capital Fund, LP(12)	21,406,442	16,121,964	5,284,478	—
District 2 Capital Fund LP(13)	26,666,666	20,083,629	6,583,037	—
Verition Multi-Strategy Master Fund Ltd(14)	20,000,000	15,062,722	4,937,278	—
Andrew William Dunn	13,333,334	10,041,815	3,291,519	—
John Mozas	6,666,666	5,020,907	1,645,759	—
Thomas P. Dea	3,333,334	2,510,454	822,880	—
Next Edge Bio-Tech Plus Fund(15)	8,333,334	6,276,135	2,057,199	—
Alto Opportunity Master Fund, SPC—Segregated Master Portfolio B(16)	12,904,270	9,718,672	3,185,598	—
Anson Investments Master Fund LP(17)	13,737,604	10,346,286	3,391,318	—
Investor Company ITF Covista Value Fund LP(18)	8,333,334	6,276,135	2,057,199	—
CVI Investments, Inc.(19)	12,904,270	9,718,672	3,185,598	—
Puritan Partners LLC(20)	11,666,668	8,786,589	2,880,079	—
Intracoastal Capital, LLC(21)	3,424,718	2,579,279	845,439	—
KBB Asset Management, LLC(22)	703,220	529,620	173,600	—
L1 Capital Global Opportunities Master Fund(23)	2,250,306	1,694,787	555,519	—
Kingsbrook Opportunities Master Fund LP(24)	1,441,602	1,085,723	355,879	—
Simon Pedder	1,866,666	1,405,854	460,812	—
Triple Gate Partners, LP(25)	40,000,000	30,125,444	9,874,556	—
Leede Jones Gable Inc. ITF Renita Saran	833,334	627,614	205,720	—
Leede Jones Gable Inc. ITF Carson Seabolt	3,333,334	2,510,454	822,880	—
Leede Jones Gable Inc. ITF Scott Koyich	2,500,000	1,882,840	617,160	—
Leede Jones Gable Inc. ITF Shane Meyers	3,333,334	2,510,454	822,880	—
Leede Jones Gable Inc. ITF Chris Wardle	6,666,666	5,020,907	1,645,759	—
Leede Jones Gable Inc. ITF Skanderbeg Capital Advisors Inc(26)	10,000,000	7,531,361	2,468,639	—
Leede Jones Gable Inc. ITF Jason Grelowski	2,500,000	1,882,840	617,160	—
Leede Jones Gable Inc. ITF Marianne Wardle	6,666,666	5,020,907	1,645,759	—
Leede Jones Gable Inc. ITF Antony Lundy	500,000	376,568	123,432	—

Delcath Systems, Inc. S-1
Seller Stockholder Table

Investor Name	Total Shares Beneficially Owned Prior to Offering(1)	Maximum Number of Shares to be Sold Pursuant to the Prospectus(2)	Number of Shares Beneficially Owned After Offering(3)(4)	% of Class After Offering*
Leede Jones Gable Inc. ITF Kathryn Mortimer	2,500,000	1,882,840	617,160	—
Leede Jones Gable Inc. ITF Victoria Ross	3,000,000	2,259,408	740,592	—
Credential Qtrade Securities Inc. ITF Partners's Fund A/C#Q5K5BB5E(27)	14,000,000	10,543,906	3,456,094	—
Credential Qtrade Securities Inc. ITF Partners's Fund A/C#Q5K5BLRB(27)	8,333,334	6,276,135	2,057,199	—
Brant Investments Ltd(27)	4,333,334	3,263,590	1,069,744	—
National Bank Financial Inc. ITF Alpha North Partners Fund Inc. Acct#26XAAYU(28)	6,666,666	5,020,907	1,645,759	—
Charlestown Jupiter Fund, LLC(29)	10,000,000	7,531,361	2,468,639	—
Taurus Capital Partners LLC(30)	8,333,334	6,276,135	2,057,199	—
Suzaku Holdings LLC(31)	3,333,334	2,510,454	822,880	—
Altamont Pharmaceutical Holdings LLC(32)	3,333,334	2,510,454	822,880	—
Weisbrod Family Office LLC(33)	5,000,000	3,765,681	1,234,319	—
BMO Nesbitt Burns Inc. ITF Lynwood Opportunities Master Fund A/C 402-21922-25(34)	4,166,666	3,138,067	1,028,599	—
Mathias Bigger—UTMA(12)	3,333,334	2,510,454	822,880	—
Andreas Bigger Irrevocable Trust Agreement(12)	3,333,334	2,510,454	822,880	—
Orca Capital GMBH(35)	3,333,334	2,510,454	822,880	—
KJ Harrison & Partners(36)	833,334	627,614	205,720	—
Total:	**1,301,965,849**	**980,557,497**	**321,408,352**	

* Percentage not listed if less than 1%.

(1) Includes shares of Common Stock issued upon conversion of Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock and exercise of Series E Warrants and Series E-1 Warrants.

(2) Represents the maximum number of shares each Selling Shareholder may sell pursuant to this registration statement based on a pro rata portion of the 980,557,497 shares of Common Stock authorized and unissued.

(3) Assumes the sale of all Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock as converted and all exercised Series E Warrants and Series E-1 Warrants, subject to the Beneficial Ownership Limitations with respect thereto. Information regarding the Beneficial Ownership Limitations is included under "Private Placement of Securities" beginning on page 32.

(4) Detail of number of shares being offered is included in the table below.

(5) Steven Salamon has the power to vote or dispose of the shares owned by Rosalind Master Fund L.P. and by Rosalind Opportunities Fund I L.P. The investor's address is 175 Bloor Street East, Suite 1316, Toronto, Ontario, M4W 3R8 Canada. Steven Salamon disclaims beneficial ownership over these securities.

(6) Altium Capital Management, LP, the investment manager of Altium Growth Fund, LP, has voting and investment power over these securities. Jacob Gottlieb is the managing member of Altium Capital Growth GP, LLC, which is the general partner of Altium Growth Fund, LP. Each of Altium Growth Fund, LP and Jacob Gottlieb disclaims beneficial ownership over these securities.

(7) Hudson Bay Capital Management LP, the investment manager of Hudson Bay Master Fund Ltd., has voting and investment power over these securities. Sander Gerber is the managing member of Hudson Bay Capital GP LLC, which is the general partner of Hudson Bay Capital Management LP. Each of Hudson Bay Master Fund Ltd. and Sander Gerber disclaims beneficial ownership over these securities.

(8) Empery Asset Management LP, the authorized agent of Empery Asset Master Ltd ("EAM"), has discretionary authority to vote and dispose of the shares held by EAM and may be deemed to be the beneficial owner of these shares. Martin Hoe and Ryan Lane, in their capacity as investment managers of Empery Asset Management LP, may also be deemed to have investment discretion and voting power over the shares held by EAM. EAM, Mr. Hoe and Mr. Lane each disclaim any beneficial ownership of these shares.

(9) Empery Asset Management LP, the authorized agent of Empery Tax Efficient, LP ("ETE"), has discretionary authority to vote and dispose of the shares held by ETE and may be deemed to be the beneficial owner of these shares. Martin Hoe and Ryan Lane, in their capacity as investment managers of Empery Asset Management LP, may also be deemed to have investment discretion and voting power over the shares held by ETE. ETE, Mr. Hoe and Mr. Lane each disclaim any beneficial ownership of these shares.

(10) Empery Asset Management LP, the authorized agent of Empery Tax Efficient II, LP ("ETE II"), has discretionary authority to vote and dispose of the shares held by ETE II and may be deemed to be the beneficial owner of these shares. Martin Hoe and Ryan Lane, in their capacity as investment managers of Empery Asset Management LP, may also be deemed to have investment discretion and voting power over the shares held by ETE II. ETE II, Mr. Hoe and Mr. Lane each disclaim any beneficial ownership of these shares.

(11) Sabby Management, LLC serves as the investment manager of Sabby Volatility Warrant Master Fund, Ltd. Hal Mintz is the manager of Sabby Management, LLC and has voting and investment control of the securities held by Sabby Volatility Warrant Master Fund, Ltd. Each of Sabby Management, LLC and Hal Mintz disclaims beneficial ownership over the securities beneficially owned by Sabby Volatility Warrant Master Fund, Ltd., except to the extent of their respective pecuniary interest therein. The address of Sabby Volatility Warrant Master Fund, Ltd. is c/o Sabby Mgt. LLC, 10 Mountainview Rd., Suite 205, Upper Saddle River, NJ 07458

(12) Michael Bigger has the power to vote or dispose of the shares owned by Bigger Capital Fund, LP, Matthias Bigger – UTMA and the Andreas Bigger Irrevocable Trust Agreement. The investor's address is 159 Jennings Road, Cold Spring Harbor, New York 11724. Michael Bigger disclaims beneficial ownership over these securities.

(13) Michael Bigger has the power to vote or dispose of the shares owned by District 2 Capital Fund LP. The investor's address is 175 W Carver, Huntington, New York 11743. Michael Bigger disclaims beneficial ownership over these securities.

(14) Nick Maounis has the power to vote or dispose of the shares owned by Verition Multi Strategy Master Fund Ltd. The investor's address is c/o Maples Corporate Services Ltd., Ugland House, P.O. Box 309, George Town, Grand Cayman, KY1-1104. Nick Maounis disclaims beneficial ownership over these securities.

(15) Eden Rahim has the power to vote or dispose of the shares owned by Next Edge Bio-Tech Plus Fund. The investor's address is 1 Toronto St. Suite 200, MSC 2V6 Toronto, Ontario, Canada. Eden Rahim disclaims beneficial ownership over these securities.

(16) Ayrton Capital LLC, the investment manager to Alto Opportunity Master Fund, SPC - Segregated Master Portfolio B, has discretionary authority to vote and dispose of the shares held by Alto Opportunity Master Fund, SPC - Segregated Master Portfolio B and may be deemed to be the beneficial owner of these shares. Waqas Khatri, in his capacity as Managing Member of Ayrton Capital LLC, may also be deemed to have investment discretion and voting power over the shares held by Alto Opportunity Master Fund, SPC - Segregated Master Portfolio B. Alto Opportunity Master Fund, SPC - Segregated Master Portfolio B and Mr. Khatri each disclaim any beneficial ownership of these shares. The address of Ayrton Capital LLC is 222 Broadway, 19th Fl, New York, NY 10038.

(17) Anson Advisors Inc and Anson Funds Management LP, the Co-Investment Advisers of Anson Investments Master Fund LP ("Anson"), hold voting and dispositive power over the Common Shares held by Anson. Bruce Winson is the managing member of Anson Management GP LLC, which is the general partner of Anson Funds Management LP. Moez Kassam and Amin Nathoo are directors of Anson Advisors Inc. Mr. Winson, Mr. Kassam and Mr. Nathoo each disclaim beneficial ownership of these Common Shares except

to the extent of their pecuniary interest therein. The principal business address of Anson is Walkers Corporate Limited, Cayman Corporate Centre, 27 Hospital Road, George Town, Grand Cayman KY1-9008, Cayman Islands.

(18) Rann Cannon has the power to vote or dispose of the shares owned by Investor Company ITF Covista Value Fund LP. The investor's address is c/o TD Waterhouse, 77 Bloor St. W, 3rd Floor, Toronto, Ontario M5S1M2. Rann Cannon disclaims beneficial ownership over these securities.

(19) Heights Capital Management, Inc., the authorized agent of CVI Investments, Inc. ("CVI"), has discretionary authority to vote and dispose of the shares held by CVI and may be deemed to be the beneficial owner of these shares. Martin Kobinger, in his capacity as Investment Manager of Heights Capital Management, Inc, may also be deemed to have investment discretion and voting power over the shares held by CVI. Mr. Kobinger disclaims any beneficial ownership of the shares.

(20) Richard Smithline has the power to vote or dispose of the shares owned by Puritan Partners LLC. The investor's address is c/o Centrecourt Asset Management, 369 Lexington Avenue, 25th Floor, New York, New York 10017. Richard Smithline disclaims beneficial ownership over these securities.

(21) Mitchell P. Kopin and Daniel B. Asher, each of whom is a manager of Intracoastal Capital LLC ("Intracoastal"), have shared voting control and investment discretion over the securities reported herein that are held by Intracoastal. As a result, each of Mr. Kopin and Mr. Asher may be deemed to have beneficial ownership (as determined under Section 13(d) of the Securities and Exchange Act of 1934, as amended (the "Exchange Act")) of the securities reported herein that are held by Intracoastal.

(22) Steve Segal has the power to vote or dispose of the shares owned by KBB Asset Management, LLC. The investor's address is 29 Maple Street, Essex Junction, Vermont 05452. Steve Segal disclaims beneficial ownership over these securities.

(23) David Feldman has the power to vote or dispose of the shares owned by L1 Capital Global Opportunities Master Fund. The investor's address is 161A Shedden Road, 1 Artillery Court, PO Box 10085, Grand Cayman, KY1-1001, Cayman Islands. David Feldman disclaims beneficial ownership over these securities.

(24) Kingsbrook Partners LP ("Kingsbrook Partners") is the investment manager of Kingsbrook Opportunities Master Fund LP ("Kingsbrook Opportunities") and consequently has voting control and investment discretion over securities held by Kingsbrook Opportunities. Kingsbrook Opportunities GP LLC ("Opportunities GP") is the general partner of Kingsbrook Opportunities and may be considered the beneficial owner of any securities deemed to be beneficially owned by Kingsbrook Opportunities. KB GP LLC ("GP LLC") is the general partner of Kingsbrook Partners and may be considered the beneficial owner of any securities deemed to be beneficially owned by Kingsbrook Partners. Ari J. Storch, Adam J. Chill and Scott M. Wallace are the sole managing members of Opportunities GP and GP LLC and as a result may be considered beneficial owners of any securities deemed beneficially owned by Opportunities GP and GP LLC. Each of Kingsbrook Partners, Opportunities GP, GP LLC and Messrs. Storch, Chill and Wallace disclaims beneficial ownership of these securities.

(25) Norbert Gotiesman has the power to vote or dispose of the shares owned by Triple Gate Partners, LP. The investor's address is 445 Central Avenue, #317, Cedarhurst, New York 11516. Norbert Gotiesman disclaims beneficial ownership over these securities.

(26) Mario Vetro and Carson Seabolt have the power to vote or dispose of the shares owned by Leede Jones Gable Inc. ITF Skanderbeg Capital Advisors Inc. The investor's address is 488-1090 Georgia Street, W. Vancouver, British Columbia, V6E 3V7. Mario Vetro and Carson Seabolt disclaim beneficial ownership over these securities.

(27) Rob Ballard has the power to vote or dispose of the shares owned by Credential Qtrade Securities Inc. ITF Partners' Fund A/C#Q5K5BLRB, Credential Qtrade Securities Inc. ITF Partners' Fund A/C#Q5K5BB5E and Brant Investments Ltd. The investor's address is 1320-665 West Georgia St., Vancouver BC V6C 3E8. Rob Ballard disclaims beneficial ownership over these securities.

(28) Steve Palmer has the power to vote or dispose of the shares owned by National Bank Financial ITF AlphaNorth Partners Fund Inc. The investor's address is 333 Bay St. Suite 630, Toronto, Ontario M511 2R2. Steve Palmer disclaims beneficial ownership over these securities.

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Seller Stockholder Table

(29) Raj Maheshwari has the power to vote or dispose of the shares owned by Charlestown Jupiter Fund, LLC. The investor's address is 17 State Street, Suite 3811, New York, New York 10004. Raj Maheshwari disclaims beneficial ownership over these securities.
(30) Malcom F. Maclean IV has the power to vote or dispose of the shares owned by Taurus Capital Partners LLC. The investor's address is 727 Ocampo Drive, Pacific Palisades, California 90272. Malcom F. Maclean IV disclaims beneficial ownership over these securities.
(31) Taro Masuyama has the power to vote or dispose of the shares owned by Suzaku Holdings LLC. The investor's address is 291 Central Park West, #5W, New York, New York 10024. Taro Masuyama disclaims beneficial ownership over these securities.
(32) Mark Pearson has the power to vote or dispose of the shares owned by Altamont Pharmaceutical Holdings LLC. The investor's address is 3031 Tisch Way, #505, San Jose, California 95128. Mark Pearson disclaims beneficial ownership over these securities.
(33) Stuart Weisbrod, Ph.D. has the power to vote or dispose of the shares owned by the Weisbrod Family Office LLC. The investor's address is 6939 Queenferry Circle, Boca Raton, Florida 33496. Stuart Weisbrod, Ph.D. disclaims beneficial ownership over these securities.
(34) Lynwood Capital Management Inc., through an investment advisory agreement, has the power to vote or dispose of the shares owned by BMO Nesbitt Burns Inc. ITF Lynwood Opportunities Master Fund A/C 402-21922-25. The investor's address is FG Services Ltd. Inc., #2206, Cassia Court, 72 Market Street, Camana Bay, Grand Cayman, KY1-1204, Cayman Islands. Ben Shapiro, a director of Lynwood, disclaims beneficial ownership over these securities.
(35) Tina Richter has the power to vote or dispose of the shares owned by Orca Capital GMBH. The investor's address is Sperling 2, 85276 Pffiffenhofen, Germany. Tina Richter disclaims beneficial ownership over these securities.
(36) Ashley Kennedy has the power to vote or dispose of the shares owned by K.J. Harrison & Partners. The investor's address is 60 Bedford Road, Toronto, Ontario M5R 2K2. Ashley Kennedy disclaims beneficial ownership over these securities.

Delcath Systems, Inc. S-1
Seller Stockholder Table
(Detail)

Investor Name	Shares Issued Upon Conversion of Series E Shares	Shares Issued Upon Conversion of Series E Warrants	Shares Issued Upon Conversion of Series E-1 Shares	Shares Issued Upon Conversion of Series E-1 Warrants	Total Shares Issued Upon Conversion of Series E & E-1 Shares and Warrants
INVESTOR COMPANY ITF Rosalind Master Fund L.P.	106,666,667	106,666,667	10,250,000	10,250,000	233,833,334
Rosalind Opportunities Fund I L.P.	173,333,333	173,333,333	37,666,667	37,666,667	422,000,000
Altium Growth Fund, LP	38,333,333	38,333,333	18,333,333	18,333,333	113,333,332
Hudson Bay Master Fund Ltd.	40,618,801	40,618,801	416,667	416,667	82,070,936
Empery Asset Master Ltd	11,183,333	11,183,333	—	—	22,366,666
Empery Tax Efficient, LP	3,353,333	3,353,448	—	—	6,706,781
Empery Tax Efficient II, LP	21,257,833	21,257,861	—	—	42,515,694
Sabby Volatility Warrant Master Fund, Ltd.	25,000,000	25,000,000	—	—	50,000,000
Bigger Capital Fund, LP	10,703,221	10,703,221	—	—	21,406,442
District 2 Capital Fund LP	13,333,333	13,333,333	—	—	26,666,666
Verition Multi-Strategy Master Fund Ltd	10,000,000	10,000,000	—	—	20,000,000

Delcath Systems, Inc. S-1
Seller Stockholder Table
(Detail)

Investor Name	Shares Issued Upon Conversion of Series E Shares	Shares Issued Upon Conversion of Series E Warrants	Shares Issued Upon Conversion of Series E-1 Shares	Shares Issued Upon Conversion of Series E-1 Warrants	Total Shares Issued Upon Conversion of Series E & E-1 Shares and Warrants
Andrew William Dunn	6,666,667	6,666,667	—	—	13,333,334
John Mozas	3,333,333	3,333,333	—	—	6,666,666
Thomas P. Dea	1,666,667	1,666,667	—	—	3,333,334
Next Edge Bio-Tech Plus Fund	4,166,667	4,166,667	—	—	8,333,334
Alto Opportunity Master Fund, SPC—Segregated Master Portfolio B	6,452,135	6,452,135	—	—	12,904,270
Anson Investments Master Fund LP	6,452,135	6,452,135	416,667	416,667	13,737,604
Covista Value Fund LP	4,166,667	4,166,667	—	—	8,333,334
CVI Investments, Inc.	6,452,135	6,452,135	—	—	12,904,270
Puritan Partners LLC	4,166,667	4,166,667	1,666,667	1,666,667	11,666,668
Intracoastal Capital, LLC	1,712,359	1,712,359	—	—	3,424,718
KBB Asset Management, LLC	351,610	351,610	—	—	703,220
L1 Capital Global Opportunities Master Fund	1,125,153	1,125,153	—	—	2,250,306
Kingsbrook Opportunities Master Fund LP	720,801	720,801	—	—	1,441,602
Simon Pedder	933,333	933,333	—	—	1,866,666
Triple Gate Partners, LP	—	—	20,000,000	20,000,000	40,000,000
Leede Jones Gable Inc. ITF Renita Saran	—	—	416,667	416,667	833,334
Leede Jones Gable Inc. ITF Carson Seabolt	—	—	1,666,667	1,666,667	3,333,334
Leede Jones Gable Inc. ITF Scott Koyich	—	—	1,250,000	1,250,000	2,500,000
Leede Jones Gable Inc. ITF Shane Meyers	—	—	1,666,667	1,666,667	3,333,334
Leede Jones Gable Inc. ITF Chris Wardle	—	—	3,333,333	3,333,333	6,666,666
Leede Jones Gable Inc. ITF Skanderbeg Capital Advisors Inc	—	—	5,000,000	5,000,000	10,000,000
Leede Jones Gable Inc. ITF Jason Grelowski	—	—	1,250,000	1,250,000	2,500,000
Leede Jones Gable Inc. ITF Marianne Wardle	—	—	3,333,333	3,333,333	6,666,666
Leede Jones Gable Inc. ITF Antony Lundy	—	—	250,000	250,000	500,000
Leede Jones Gable Inc. ITF Kathryn Mortimer	—	—	1,250,000	1,250,000	2,500,000
Leede Jones Gable Inc. ITF Victoria Ross	—	—	1,500,000	1,500,000	3,000,000
Credential Qtrade Securities Inc. ITF Partners's Fund A/C#Q5K5BB5E	—	—	7,000,000	7,000,000	14,000,000

Delcath Systems, Inc. S-1
Seller Stockholder Table
(Detail)

Investor Name	Shares Issued Upon Conversion of Series E Shares	Shares Issued Upon Conversion of Series E Warrants	Shares Issued Upon Conversion of Series E-1 Shares	Shares Issued Upon Conversion of Series E-1 Warrants	Total Shares Issued Upon Conversion of Series E & E-1 Shares and Warrants
Credential Qtrade Securities Inc. ITF Partners's Fund A/C#Q5K5BLRB	—	—	4,166,667	4,166,667	8,333,334
Brant Investments Ltd	—	—	2,166,667	2,166,667	4,333,334
National Bank Financial Inc. ITF Alpha North Partners Fund Inc. Acct#26XAAYU	—	—	3,333,333	3,333,333	6,666,666
Charlestown Jupiter Fund, LLC	—	—	5,000,000	5,000,000	10,000,000
Taurus Capital Partners LLC	—	—	4,166,667	4,166,667	8,333,334
Suzaku Holdings LLC	—	—	1,666,667	1,666,667	3,333,334
Altamont Pharmaceutical Holdings LLC	—	—	1,666,667	1,666,667	3,333,334
Weisbrod Family Office LLC	—	—	2,500,000	2,500,000	5,000,000
BMO Nesbitt Burns Inc. ITF Lynwood Opportunities Master Fund A/C 402-21922-25	—	—	2,083,333	2,083,333	4,166,666
Mathias Bigger—UTMA	—	—	1,666,667	1,666,667	3,333,334
Andreas Bigger Irrevocable Trust Agreement	—	—	1,666,667	1,666,667	3,333,334
Orca Capital GMBH	—	—	1,666,667	1,666,667	3,333,334
KJ Harrison & Partners	—	—	416,667	416,667	833,334
Total:	**502,149,516**	**502,149,659**	**148,833,337**	**148,833,337**	**1,301,965,849**

PLAN OF DISTRIBUTION

Each Selling Stockholder of the securities and any of their pledgees, assignees and successors-in-interest may, from time to time, sell any or all of their securities covered hereby on the principal trading market (any of the markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: the NYSE American, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market, the New York Stock Exchange, OTCQB or OTCQX, or the "Pink Sheets" published by OTC Markets Group, Inc. (or any successors to any of the foregoing) or any other stock exchange, market or trading facility on which the securities are traded or in private transactions. These sales may be at fixed or negotiated prices. The Company will not receive any of the proceeds from the sale by the Selling Stockholders of the securities. A Selling Stockholder may use any one or more of the following methods when selling securities:

- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the securities as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;;
- privately negotiated transactions;
- settlement of short sales;
- in transactions through broker-dealers that agree with the Selling Stockholders to sell a specified number of such securities at a stipulated price per security;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- a combination of any such methods of sale; or
- any other method permitted pursuant to applicable law

The Selling Stockholders may also sell securities under Rule 144 or any other exemption from registration under the Securities Act of 1933, as amended, if available, rather than under this prospectus.

Broker-dealers engaged by the Selling Stockholders may arrange for other brokers-dealers to participate in sales. Broker-dealers may receive commissions or discounts from the Selling Stockholders (or, if any broker-dealer acts as agent for the purchaser of securities, from the purchaser) in amounts to be negotiated, but, except as set forth in a supplement to this Prospectus, in the case of an agency transaction not in excess of a customary brokerage commission in compliance with FINRA Rule 2440; and in the case of a principal transaction a markup or markdown in compliance with FINRA IM-2440.

In connection with the sale of the securities or interests therein, the Selling Stockholders may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of the securities in the course of hedging the positions they assume. The Selling Stockholders may also sell securities short and deliver these securities to close out their short positions, or loan or pledge the securities to broker-dealers that in turn may sell these securities. The Selling Stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or create one or more derivative securities which require the delivery to such broker-dealer or other financial institution of securities offered by this prospectus, which securities such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction).

The Selling Stockholders and any broker-dealers or agents that are involved in selling the securities may be deemed to be "underwriters" within the meaning of the Securities Act in connection with such sales. In such

event, any commissions received by such broker-dealers or agents and any profit on the resale of the securities purchased by them may be deemed to be underwriting commissions or discounts under the Securities Act. Each Selling Stockholder has informed the Company that it does not have any written or oral agreement or understanding, directly or indirectly, with any person to distribute the securities.

The Company is required to pay certain fees and expenses incurred by the Company incident to the registration of the securities. The Company has agreed to indemnify the Selling Stockholders against certain losses, claims, damages and liabilities, including liabilities under the Securities Act.

We agreed to keep this prospectus effective until the earlier of (i) the date on which the securities may be freely resold by the Selling Stockholders without registration and without regard to any volume or manner-of-sale limitations by reason of Rule 144, without the requirement for the Company to be in compliance with the current public information under Rule 144 under the Securities Act or any other rule of similar effect or (ii) all of the securities have been sold pursuant to this prospectus or Rule 144 under the Securities Act or any other rule of similar effect, under circumstances in which any legend borne by such securities relating to restrictions on transferability thereof, under the Securities Act or otherwise, is removed. The resale securities will be sold only through registered or licensed brokers or dealers if required under applicable state securities laws. In addition, in certain states, the resale securities covered hereby may not be sold unless they have been registered or qualified for sale in the applicable state or an exemption from the registration or qualification requirement is available and is complied with.

Under applicable rules and regulations under the Exchange Act, any person engaged in the distribution of the resale securities may not simultaneously engage in market making activities with respect to the securities for the applicable restricted period, as defined in Regulation M, prior to the commencement of the distribution. In addition, the Selling Stockholders will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including Regulation M, which may limit the timing of purchases and sales of the securities by the Selling Stockholders or any other person. We will make copies of this prospectus available to the Selling Stockholders and have informed them of the need to deliver a copy of this prospectus to each purchaser of the securities at or prior to the time of the sale (including by compliance with Rule 172 under the Securities Act).

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

The following discussion and analysis of the financial condition and results of operations of Delcath Systems, Inc. ("Delcath" or the "Company") should be read in conjunction with the unaudited interim condensed consolidated financial statements and notes thereto included elsewhere in this prospectus.

Disclosure Regarding Forward-Looking Statements

This prospectus contains certain "forward-looking statements" within the meaning of the "safe harbor" provisions of the Private Securities Litigation Reform Act of 1995 with respect to our business, financial condition, liquidity and results of operations. Words such as "anticipates," "expects," "intends," "plans," "predicts," "believes," "seeks," "estimates," "could," "would," "will," "may," "can," "continue," "potential," "should," and the negative of these terms or other comparable terminology often identify forward-looking statements. Statements in this prospectus that are not historical facts are hereby identified as "forward-looking statements" for the purpose of the safe harbor provided by Section 21E of the Exchange Act and Section 27A of the Securities Act. These forward-looking statements are not guarantees of future performance and are subject to risks and uncertainties that could cause actual results to differ materially from the results contemplated by the forward-looking statements, including the risks discussed below and in the "Risk Factors" section of this prospectus. These forward-looking statements include, but are not limited to, statements about:

- our estimates regarding sufficiency of our cash resources, anticipated capital requirements and our need for additional financing;
- the commencement of future clinical trials and the results and timing of those clinical trials;
- our ability to successfully commercialize CHEMOSAT and Melphalan/HDS, generate revenue and successfully obtain reimbursement for the procedure and system;
- the progress and results of our research and development programs;
- submission and timing of applications for regulatory approval and approval thereof;
- our ability to successfully source certain components of the system and enter into supplier contracts;
- our ability to successfully manufacture CHEMOSAT and Melphalan/HDS;
- our ability to successfully negotiate and enter into agreements with distribution, strategic and corporate partners; and
- our estimates of potential market opportunities and our ability to successfully realize these opportunities.

Many of the important factors that will determine these results are beyond our ability to control or predict. You are cautioned not to put undue reliance on any forward-looking statements, which speak only as of the date of this prospectus. Except as otherwise required by law, we do not assume any obligation to publicly update or release any revisions to these forward-looking statements to reflect events or circumstances after the date of this prospectus or to reflect the occurrence of unanticipated events.

Company Overview

Delcath Systems, Inc. is an interventional oncology company focused on the treatment of primary and metastatic liver cancers. Our investigational product—Melphalan Hydrochloride for Injection for use with the Delcath Hepatic Delivery System ("Melphalan/HDS")—is designed to administer high-dose chemotherapy to the liver while controlling systemic exposure and associated side effects. In Europe, our system is commercially available under the trade name Delcath Hepatic CHEMOSAT ® Delivery System for Melphalan ("CHEMOSAT"), where it has been used at major medical centers to treat a wide range of cancers of the liver.

Our primary research focus is on ocular melanoma liver metastases ("mOM") and intrahepatic cholangiocarcinoma ("ICC"), a type of primary liver cancer, and certain other cancers that are metastatic to the liver. We believe the disease states we are investigating represent a multi-billion dollar global market opportunity and a clear unmet medical need.

Our clinical development program ("CDP") for Melphalan/HDS is comprised of The FOCUS Clinical Trial for Patients with Hepatic Dominant Ocular Melanoma (the "FOCUS Trial"), a global registration clinical trial that is investigating objective response rate in mOM, and the ALIGN Trial, a global Phase 3 clinical trial for ICC (the "ALIGN Trial"). Our CDP also includes a registry for CHEMOSAT commercial cases performed in Europe and sponsorship of select investigator-initiated trials ("IITs").

The direction and focus of our CDP for CHEMOSAT and Melphalan/HDS is informed by; prior clinical development conducted between 2004 and 2010, commercial experience with CHEMOSAT cases performed on patients in Europe, and prior regulatory engagement with the FDA. Experience gained from this research and development, early European commercial cases and United States regulatory opinion has led to the implementation of several safety improvements to our product and the associated medical procedure.

In the United States, Melphalan/HDS is considered a combination drug and device product and is regulated as a drug by the FDA. The FDA has granted us six orphan drug designations, including three orphan designations for the use of the drug melphalan for the treatment of patients with mOM, hepatocellular carcinoma and ICC. Melphalan/HDS has not been approved for sale in the United States.

In Europe, the current version of our CHEMOSAT product is regulated as a Class IIb medical device and received its CE Mark in 2012. We are in an early phase of commercializing the CHEMOSAT system in select markets in the European Union (EU) where the prospect of securing reimbursement coverage for the procedure is strongest. In 2015 national reimbursement coverage for CHEMOSAT procedures was awarded in Germany. In 2016, coverage levels were negotiated between hospitals in Germany and regional sickness funds. Coverage levels determined via this process are expected to be renegotiated annually. In 2017, Dutch health authorities added CHEMOSAT to their treatment guidelines for patients with ocular melanoma metastatic to the liver, an important step toward eventual reimbursement in the Dutch market.

Currently there are few effective treatment options for certain cancers in the liver. Traditional treatment options include surgery, systemic chemotherapy, liver transplant, radiation therapy, interventional radiology techniques, and isolated hepatic perfusion. We believe that CHEMOSAT and Melphalan/HDS represent a potentially important advancement in regional therapy for primary liver cancer and certain other cancers metastatic to the liver and are uniquely positioned to treat the entire liver either as a standalone therapy or as a complement to other therapies.

Cancers in the Liver—A Significant Unmet Need

Cancers of the liver remain a major unmet medical need globally. According to the American Cancer Society's ("ACS") *Cancer Facts & Figures 2018* report, cancer is the second leading cause of death in the United States, with an estimated 609,640 deaths and 1.7 million new cases expected to be diagnosed in 2018. Cancer is one of the leading causes of death worldwide, accounting for approximately 9.6 million deaths and 18.1 million new cases in 2018 according to GLOBOCAN, the database of the International Association of Cancer Registries. The financial burden of cancer is enormous for patients, their families and society. The Agency for Healthcare Quality and Research estimates that the direct medical costs (total of all healthcare expenditures) for cancer in the United States in 2015 was $80.2 billion. The liver is often the life-limiting organ for cancer patients and one of the leading causes of cancer death. Patient prognosis is generally poor once cancer has spread to the liver.

Liver Cancers—Incidence and Mortality

There are two types of liver cancers: primary liver cancer and metastatic liver disease. Primary liver cancer (hepatocellular carcinoma or "HCC", including ICC, originates in the liver or biliary tissue and is particularly

prevalent in populations where the primary risk factors for the disease, such as hepatitis-B, hepatitis-C, high levels of alcohol consumption, aflatoxin, cigarette smoking and exposure to industrial pollutants, are present. Metastatic liver disease, also called liver metastasis, or secondary liver cancer, is characterized by microscopic cancer cell clusters that detach from the primary site of disease and travel via the blood stream and lymphatic system into the liver, where they grow into new tumors. These metastases often continue to grow even after the primary cancer in another part of the body has been removed. Given the vital biological functions of the liver, including processing nutrients from food and filtering toxins from the blood, it is not uncommon for metastases to settle in the liver. In many cases patients die not as a result of their primary cancer, but from the tumors that metastasize to their liver. In the United States, metastatic liver disease is more prevalent than primary liver cancer.

Ocular Melanoma

Ocular melanoma is one of the cancer histologies with a high likelihood of metastasizing to the liver. Based on third party research that we commissioned in 2018, we estimate that up to 4,700 cases of ocular melanoma are diagnosed in the United States and Europe annually, and that approximately 55% of these patients will develop metastatic disease. Of metastatic cases of ocular melanoma, we estimate that approximately 90% of patients will develop liver involvement. Once ocular melanoma has spread to the liver, current evidence suggests median overall survival for these patients is generally six to eight months. Currently there is no standard of care for patients with ocular melanoma liver metastases. Based on the research conducted in 2018, we estimate that approximately 2,000 patients with ocular melanoma liver metastases in the United States and Europe may be eligible for treatment with the Melphalan/HDS.

Intrahepatic Cholangiocarcinoma

Hepatobiliary cancers include HCC and ICC and are among the most prevalent and lethal forms of cancer. According to GLOBOCAN, an estimated 78,500 new cases of hepatobiliary cancers are diagnosed in the United States and Europe annually. According to the ACS, approximately 42,030 new cases of these cancers are expected to be diagnosed in the United States in 2019, leading to approximately 31,780 deaths.

ICC is the second most common primary liver tumor and accounts for 3% of all gastrointestinal cancers and 15% of hepatobiliary cases diagnosed in the United States and Europe annually. We believe that 90% of ICC patients are not candidates for surgical resection, and that approximately 20-30% of these may be candidates for certain focal interventions. According to third party research that we commissioned in 2018 we estimate that approximately 9,300 ICC patients in the United States and Europe annually could be candidates for treatment with Melphalan/HDS, which we believe represents a significant market opportunity.

According to the ACS, the overall five-year survival rate for hepatobiliary cancers in the United States is approximately 18%. For patients diagnosed with a localized stage of disease, the ACS estimates 5-year survival at 31%. The ACS estimates that 5-year survival for all cancers is 68%.

About CHEMOSAT and Melphalan/HDS

Our product administers concentrated regional chemotherapy to the liver. This “whole organ” therapy is performed by isolating the circulatory system of the liver, infusing the liver with a chemotherapeutic agent, and then filtering the blood prior to returning it to the patient. During the procedure, known as percutaneous hepatic perfusion, PHP ®, (“PHP therapy”), three catheters are placed percutaneously through standard interventional radiology techniques. The catheters temporarily isolate the liver from the body’s circulatory system, allow administration of the chemotherapeutic agent melphalan hydrochloride directly to the liver, and collect blood exiting the liver for filtration by our proprietary filters. The filters absorb chemotherapeutic agent in the blood, thereby reducing systemic exposure to the drug and related toxic side effects, before the filtered blood is returned to the patient’s circulatory system.

PHP therapy is performed in an interventional radiology suite in approximately two to three hours. Patients remain in an intensive care or step-down unit overnight for observation following the procedure. Treatment with CHEMOSAT and Melphalan/HDS is repeatable, and a new disposable system is used for each treatment. Patients treated in clinical settings are permitted up to six treatments. In commercial treatment settings, patients have received up to eight treatments. In the United States, melphalan hydrochloride for injection will be included as part of the system, if approved. In Europe, the system is sold separately and used in conjunction with melphalan hydrochloride commercially available from a third party. In our clinical trials, melphalan hydrochloride for injection is provided to both European and United States clinical trial sites.

Risks associated with the CHEMOSAT and Melphalan/HDS Procedure

As with many cancer therapies, treatment with CHEMOSAT and Melphalan/HDS is associated with adverse events, some of which can be potentially life threatening.

Procedure and Product Refinements

In 2012, we introduced the Generation Two version of the CHEMOSAT system, which offered improved hemofiltration and other device component product enhancements. Reports from treating physicians in both Europe and the United States using the Generation Two CHEMOSAT and Melphalan/HDS, in a commercial setting, have suggested that these product improvements and procedure refinements have improved the safety profile. Since 2017, physicians in Europe and the United States have presented and published the results of research that signaled an improved safety profile, as well as efficacy in multiple tumor types. Collection of adequate safety data on all aspects of the procedure is a major focus of the clinical trials in our current CDP.

Prior United States Regulatory Experience

In August 2012 we submitted a New Drug Application (“NDA”) under Section 505(b)(2) of the Federal Food Drug Cosmetic Act (FFDCA) seeking an indication for the percutaneous intra-arterial administration of melphalan for use in the treatment of patients with metastatic melanoma in the liver, subsequently amended to ocular melanoma metastatic to the liver. Data submitted to the Food and Drug Administration (FDA) included the early clinical trial versions of the system, along with early clinical procedure techniques based on research conducted between 2005 and 2010. A full discourse of this NDA submission, including the outcome of an ODAC panel on May 2, 2013 and the FDA’s issuance of a Complete Response Letter, in September 2013, is provided in our Annual Report for the fiscal year ended December 31, 2018.

Active Clinical Development Program

The focus of our CDP is to generate clinical data for the CHEMOSAT and Melphalan/HDS in various disease states and validate the safety profile of the current version of the product and treatment procedure. We believe that the improvements we have made to CHEMOSAT and Melphalan/HDS and to the PHP therapy have addressed the adverse event profile and procedure-related risks observed during previous Phase 2 and 3 clinical trials. Our CDP is also designed to support clinical adoption of and reimbursement for CHEMOSAT in Europe, and to support regulatory approvals in various jurisdictions, including the United States.

The FOCUS Trial—NCT02678572

On July 27, 2018, after extensive discussions with FDA, we announced an amendment to our Phase 3, randomized clinical trial in ocular melanoma liver metastases which altered the trial protocol to a non-randomized, single-arm study. Under the terms of the amendment, the trial, now titled *A Single-arm, Multi-Center, Open-Label Study to Evaluate the Efficacy, Safety and Pharmacokinetics of Melphalan/HDS Treatment in Patients with Hepatic-Dominant Ocular Melanoma*, will enroll a minimum of 80 patients with ocular melanoma metastatic to the liver. Under the new protocol, the primary endpoint for the amended FOCUS trial

will be objective response rate ("ORR"). Secondary endpoints will include duration of response, disease control rate, overall survival and progression-free survival. Additional exploratory outcome measures include time to objective response, hepatic progression-free survival, hepatic objective response, and quality of life, safety and other pharmacokinetic measures. Inclusion and exclusion criteria remain unchanged. Patients previously enrolled in the Melphalan/HDS arm of the trial under the previous protocol will continue to be treated and statistically evaluated as part of the amended trial.

The rarity of ocular melanoma, absence of crossover to the experimental trial arm, and the availability of PHP® Therapy in a commercial setting in Europe have all combined to impede enrollment in this trial under its previous protocol. This amendment was intended to accelerate our timeline to complete trial enrollment while providing a strong scientific case to support an application for approval. However, accrual of new patients in this trial slowed due to the cash limitations we operated under in recent months. With the new capital investment we announced on July 11, 2019 we believe we can complete patient enrollment in this trial during the second half of 2019.

The amendment invalidated the prior Special Protocol Assessment ("SPA") agreement for the prior version of the trial. Full details of the registration clinical trial are available at www.clinicaltrials.gov.

The FOCUS Trial is being conducted at leading cancer centers in the United States and Europe. The Moffitt Cancer Center in Tampa, Florida was activated as a participating center in January 2016 with Jonathan Zager, M.D., FACS, Professor of Surgery in the Cutaneous Oncology and Sarcoma Departments and a Senior Member at Moffitt Cancer Center, serving as the trial's lead investigator. In October 2018, we announced continued rollout of the amended protocol to participating centers in the United States, and expect approximately 30 leading cancer centers in the United States and Europe to participate in the trial.

We believe that ocular melanoma liver metastases represent a significant unmet medical need, and that pursuit of an indication in this disease state represents the fastest path to potential marketing approval of the Melphalan/HDS in the United States.

The ALIGN Trial—NCT03086993

In April 2018 we announced the initiation of a new pivotal trial of Melphalan/HDS to treat patients with ICC titled *A Randomized, Controlled Study to Compare the Efficacy, Safety and Pharmacokinetics of Melphalan/HDS Treatment Given Sequentially Following Cisplatin/Gemcitabine versus Cisplatin/Gemcitabine (Standard of Care) in Patients with Intrahepatic Cholangiocarcinoma (The ALIGN Trial)*. The ALIGN trial is being conducted under a SPA announced in March of 2017. Under the terms of the SPA, the ALIGN Trial will enroll approximately 295 ICC patients at approximately 40 clinical sites in the U.S. and Europe. The primary endpoint is overall survival ("OS") and secondary and exploratory endpoints include safety, progression-free survival ("PFS"), ORR and quality-of-life measures. The ALIGN Trial is designed to be cost effective and pursued in a financially prudent manner when financial resources permit. The SPA agreement for the ALIGN TRIAL indicates that the pivotal trial design adequately addresses objectives that, if met, would support regulatory requirements for approval of Melphalan/HDS in ICC. However, final determinations for marketing application approval are made by FDA after a complete review of a marketing application and are based on the totality of data in the application.

In October 2018, we announced the enrollment of the first patient in The ALIGN Trial *at The University of Tennessee Health Science Center, Methodist University Hospital, and West Cancer Center* in Memphis, Tennessee.

Phase 2 Hepatocellular Carcinoma (HCC) & Intrahepatic Cholangiocarcinoma (ICC) Program

In 2014 we initiated a Phase 2 clinical trial program in Europe and the United States, with the goal of obtaining an efficacy and safety signal for Melphalan/HDS in the treatment of HCC and ICC. Due to differences in

treatment practice patterns between Europe and the United States, we established separate European and United States trial protocols for the HCC Phase 2 program with different inclusion and exclusion patient selection criteria:

Protocol 201 NCT02406508—Conducted in the United States, this trial was intended to assess the safety and efficacy of Melphalan/HDS followed by sorafenib. **This trial was terminated earlier than planned and is now closed to enrollment.**

Protocol 202 NCT02415036—Conducted in Europe, this trial was intended to assess the safety and efficacy of Melphalan/HDS without sorafenib. The trial will also evaluate overall response rate via mRECIST criteria, progression free survival, characterize the systemic exposure of melphalan and assess patient quality of life. **This trial was terminated earlier than planned and is now closed to enrollment.**

ICC Cohort—In 2015 we expanded *Protocol 202* to include a cohort of patients with ICC. The trial for this cohort was conducted at the same centers participating in the Phase 2 HCC trial. **This trial has completed enrollment and data from this study are being analyzed and will be disseminated publicly by the investigators.**

ICC Retrospective Data Collection—The original goal to obtain an efficacy signal for the Phase 2 ICC cohort has been satisfied by the result of multicenter patient outcomes identified in the retrospective data collection of our commercial ICC cases conducted by our European investigators. These promising outcomes and observations were discussed with Key Opinion Leaders at a Delcath-organized medical advisory panel meeting and led to the agreement that PHP therapy does "demonstrate an efficacy signal in ICC and is worthy of full clinical investigation." Data from this retrospective data collection provided important scientific support during our negotiations with the FDA for our SPA for the Pivotal ICC Trial. Data for the retrospective data collection were published in European Radiology in a paper titled "Percutaneous Hepatic Perfusion (Chemosaturation) with Melphalan in Patients with Intrahepatic Cholangiocarcinoma: European Multicentre Study on Safety, Short Term Effects and Survival". Details of the findings from this study are discussed below under "Recent Data Presentations".

With the objective of identifying an efficacy signal worthy of further clinical investigation now met, we have terminated enrollment in our Phase 2 program and have closed the Phase 2 trials in order to focus available resources on the FOCUS Trial and the ALIGN Trial.

Clinical trials are long, expensive and highly uncertain processes and failure can unexpectedly occur at any stage of clinical development. The start or end of a clinical trial is often delayed or halted due to changing regulatory requirements, manufacturing challenges, required clinical trial administrative actions, slower than anticipated patient enrollment, changing standards of care, availability or prevalence of use of a comparator treatment or required prior therapy. A substantial portion of the Company's operating expenses consist of research and development expenses incurred in connection with its clinical trials. See the Company's consolidated financial statements included in Item 8 of its Annual Report for the fiscal year ended December 31, 2018.

European Investigator Initiated Trials

In addition to the clinical trials in our CDP, we are supporting data generation in other areas. We are currently conducting one IIT in colorectal carcinoma metastatic to the liver ("mCRC") at Leiden University Medical Center in the Netherlands. We continue to evaluate other IITs as suitable opportunities present in Europe. We believe IITs will serve to build clinical experience at key cancer centers and will help support efforts to obtain full reimbursement in Europe.

European Clinical Data Generation

On April 2, 2015, we announced the activation of our prospective patient registry in Europe to collect uniform essential patient safety, efficacy, and QoL information using observational study methods. This registry will

gather data in multiple tumor types from commercial cases performed by participating cancer centers in Europe. A prospective registry is an organized system that uses observational study methods to collect defined clinical data under normal conditions of use to evaluate specified outcomes for a population defined by a particular disease, condition, or exposure. Registry data is considered to be supportive data and, as such, cannot be used for either registration approval, promotional or competitive claims. However, we believe the patient registry will provide a valuable supportive data repository that contains real-world evidence, from a commercial setting, that can be used to identify further clinical development opportunities, support clinical adoption and reimbursement in Europe.

Recent Data Presentations

In July 2019 we announced that results from a single-institution retrospective study conducted by University Hospital of Tubingen in Germany on the use of the Delcath Hepatic CHEMOSAT® Delivery System to treat patients with metastatic ocular melanoma with liver metastases were published in the journal *Cancer Imaging*.

The study, *Chemosaturation with percutaneous hepatic perfusion of melphalan for liver dominant metastatic uveal melanoma: a single center experience*, by Dr. Christoph Artzner, et al, evaluated the safety and efficacy of PHP® therapy in 16 patients with unresectable liver metastases from ocular melanoma treated with CHEMOSAT between June 2015 and December 2018. Tumor response was evaluated following each PHP treatment using Response Evaluation Criteria in Solid Tumors, and serious adverse events (“SAEs”) were evaluated using Common Criteria for Adverse Events.

The 16 patients underwent a total of 28 PHP treatments. Results of the study in the 15 evaluable patients showed that after the first PHP treatment, nine patients (60%) had a partial response (PR), five patients (33%) stable disease, and one patient (7%) had progressive disease for an initial disease control rate of 93%. Median progression free survival (PFS) after the first treatment was 11.1 months. Six patients received a second PHP treatment, three patients received three treatments, and a single patient received six treatments. Median overall survival (OS) was 27.4 months.

Safety analysis showed that grade three SAEs were observed in 14% of treatments, and these were anemia, leukopenia and thrombocytopenia. The sole grade four SAE observed was in one patient who suffered a cardiac arrest during the first PHP treatment and was removed from the study. Subsequent evaluation discovered this patient had coronary artery occlusion which was successfully treated. Retrospective evaluation of this patient’s pre-procedure imaging revealed signs of coronary artery disease, and investigators subsequently modified their screening procedures for cardiovascular risk factors. Investigators stated that most SAEs were grade one or two and that 5% of the reported grade three and four SAEs required additional intervention.

Investigators concluded that for patients with liver-dominant metastatic uveal melanoma, treatment with PHP Therapy had “observed rates for OS and PFS that exceeded the reported outcomes for traditional systemic treatment.” Investigators stated that SAEs were frequent, but most did not require additional intervention, and that care should be taken in patients with suspected coronary heart disease.

In April 2019 we announced that results from a prospective Phase 2 study conducted by Leiden University Medical Center (“LUMC”) in the Netherlands on the use of CHEMOSAT to treat patients with metastatic ocular melanoma with liver metastases were presented at the European Conference on Interventional Oncology annual meeting.

The LUMC study titled “Percutaneous hepatic perfusion with melphalan in patients with unresectable liver metastases from ocular melanoma using the Delcath System’s second-generation hemofiltration system: a prospective phase II study” was conducted by a team led and presented by Dr. Mark Burgmans. The study evaluated 35 patients with unresectable liver metastases from ocular melanoma treated with CHEMOSAT between February 2014 and June 2017. The 35 patients underwent a total of 72 PHP therapy treatments, and

tumor response was evaluable in 32 patients. Primary endpoints were overall response, overall survival, and progression free survival. Secondary measures included safety measures and hematologic toxicity.

Results of the study showed that one patient had a complete response and 22 had partial response, for a combined overall response rate of 74.1%. Overall survival was 20.3 months and mean progression free survival was 8.1 months.

Safety analysis showed a total of 14 serious adverse events were recorded. The hematologic toxicities were in a majority of the cases self-limiting and manageable. Investigators concluded that “PHP Therapy with the Generation Two version of CHEMOSAT is an effective and safe treatment for patients with hepatic metastases from ocular melanoma.”

The presentation at the European Conference, an Interventional Oncology updated data previously presented at the 2018 annual conference of the Cardiovascular and Interventional Radiological Society of Europe.

Market Access and Commercial Clinical Adoption

Europe

Delcath’s European subsidiary, Delcath Systems, Ltd., is headquartered in Galway, Ireland. Our marketing strategy in the European Economic Area (the “EEA”) includes establishing strategic alliances with partners that include license, supply, sales and marketing arrangements. In December 2018, Delcath entered into a definitive licensing agreement (the “medac License”) for CHEMOSAT commercialization in Europe with medac Gesellschaft für klinische Spezialpräparate mbH (“medac”), a privately held, multi-national pharmaceutical company based in Wedel, Germany. Founded in 1970, medac specializes in the treatment and diagnosis of oncological, urological and autoimmune diseases. medac has offices globally, worldwide partner agreements in over 90 countries, and approximately 1,200 employees.

Under the terms of the medac License, Delcath Systems, Ltd. exclusively licenses to medac the right to sell and market CHEMOSAT in all member states of the European Union, Norway, Liechtenstein, Switzerland, and the United Kingdom. The medac License provides for payment by medac to Delcath in a combination of upfront and success-based milestone payments as well as a fixed transfer price per unit of CHEMOSAT and specified royalties.

We believe that medac is a well-suited partner to help advance CHEMOSAT commercialization in the European Union and neighboring countries. medac has offices throughout Europe, a well-established network among oncology key opinion leaders, and organizational scale necessary to help establish CHEMOSAT in the European treatment landscape for cancers of the liver.

Since launching CHEMOSAT in Europe, over 700 commercial treatments have been performed at over 25 leading European cancer centers. Physicians in Europe have used CHEMOSAT to treat patients with a variety of cancers in the liver, primarily ocular melanoma liver metastases, and other tumor types, including cutaneous melanoma, hepatocellular carcinoma, cholangiocarcinoma, and liver metastases from colorectal cancer, breast, pancreatic and neuroendocrine. In 2017, we announced our first patient to receive eight CHEMOSAT treatments, and have seen the average number of repeat treatments performed on a per patient basis consistently increase.

During the quarter ended June 30, 2019 we continued to work closely with medac on advancement of the commercialization of CHEMOSAT in Europe. Medac has remained supportive during the first half of this year and is confident in the opportunities for CHEMOSAT in Europe.

European Reimbursement

A critical driver of utilization growth for CHEMOSAT in Europe is the expansion of reimbursement mechanisms for the procedure in our priority markets. In Europe, there is no centralized pan-European medical device

reimbursement body. Reimbursement is administered on a regional and national basis. Medical devices are typically reimbursed under Diagnosis Related Groups ("DRG") as part of a procedure. Prior to obtaining permanent DRG reimbursement codes, in certain jurisdictions, we are actively seeking interim reimbursement from existing mechanisms that include specific interim reimbursement schemes, new technology payment programs as well as existing DRG codes. In most EU countries, the government provides healthcare and controls reimbursement levels. Since the EU has no jurisdiction over patient reimbursement or pricing matters in its member states, the methodologies for determining reimbursement rates and the actual rates may vary by country.

Effective with the execution of our license agreement with medac, medac will provide support for reimbursement applications in the European markets covered by our agreement.

Germany

In October 2015, we announced that the Institut für das Entgeltsystem im Krankenhaus (InEk), the German federal reimbursement agency, established a national Zusatzentgeld (ZE) reimbursement code for procedures performed with CHEMOSAT in Germany. The ZE diagnostic-related group (DRG) code is a national reimbursement code that augments existing DRG codes until a specific new DRG code can be created and will replace the previous Neue Untersuchungs und Behandlungsmethoden (NUB) procedure that required patients in Germany to apply individually for reimbursement of their CHEMOSAT treatment. With the establishment of a ZE code for CHEMOSAT, the procedure is now permanently represented in the DRG catalog in Germany. Coverage levels under this process are negotiated between hospitals in Germany and regional sickness funds, with coverage levels renegotiated annually.

United Kingdom

In May 2014, the National Institute for Clinical Excellence ("NICE"), a non-departmental public body that provides guidance and advice to improve health and social care in the UK, completed a clinical review of CHEMOSAT. The NICE review indicated that as the current body of evidence on the safety and efficacy of PHP with CHEMOSAT for primary or metastatic liver cancer is limited, the procedure should be performed within the context of research by clinicians with specific training in its use and techniques. Delcath expects to consult again with the Interventional Procedures Advisory Committee at NICE in England, to provide recent clinical evidence with a view to moving existing Interventional Procedural Guidance from research to specialist status. medac will continue consultations begun by Delcath with the Interventional Procedures Advisory Committee at NICE in England, providing recent clinical evidence with a view to moving existing Interventional Procedural Guidance from a research recommendation to specialist recommendation. This would enable greater scope for commercialization access to the therapy because it would allow more use by National Health Service ("NHS") clinicians of the therapy. It might also pave the way for a full Medical Technology Assessment as a way towards longer term reimbursement within the NHS.

In the short term, public patients will continue to be treated in the UK through clinical trials. Private patients will continue to be treated through the established private treatment pathway such as private insurance coverage or self-pay.

Netherlands

In the Netherlands CHEMOSAT has been performed at the Netherlands Cancer Institute in 2013 and at Leiden University Medical Centre since 2014. In June 2017 the Medical Oncology National Treatment Guidelines for Uveal Melanoma were updated and now include recommendations to consider CHEMOSAT in the treatment of liver metastases. We are hopeful that inclusion in the national guidelines and the support of clinicians treating patients with CHEMOSAT will support an application for reimbursement in this market.

Regulatory Status

Our products are subject to extensive and rigorous government regulation by foreign regulatory agencies and the FDA. Foreign regulatory agencies, the FDA and comparable regulatory agencies in state and local jurisdictions impose extensive requirements upon the clinical development, pre-market clearance and approval, manufacturing, labeling, marketing, advertising and promotion, pricing, storage and distribution of pharmaceutical and medical device products. Failure to comply with applicable foreign regulatory agency or FDA requirements may result in Warning Letters, fines, civil or criminal penalties, suspension or delays in clinical development, recall or seizure of products, partial or total suspension of production or withdrawal of a product from the market.

United States Regulatory Environment

In the United States, the FDA regulates drug and device products under the FFDCA, and its implementing regulations. The Delcath Melphalan/HDS is subject to regulation as a combination product, which means it is composed of both a drug product and device product. If marketed individually, each component would therefore be subject to different regulatory pathways and reviewed by different centers within the FDA. A combination product, however, is assigned to a center that will have primary jurisdiction over its pre-market review and regulation based on a determination of its primary mode of action, which is the single mode of action that provides the most important therapeutic action. In the case of the Melphalan/HDS, the primary mode of action is attributable to the drug component of the product, which means that the Center for Drug Evaluation and Research, has primary jurisdiction over its pre-market development and review.

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

- submission to the FDA of an IND, which must become effective before human clinical trials may begin and must be updated periodically, but at least annually;
- completion of extensive preclinical laboratory tests and preclinical animal studies, all performed in accordance with the FDA's Good Laboratory Practice, or GLP, regulations;
- performance of adequate and well-controlled human clinical trials to establish the safety and efficacy of the product candidate for each proposed indication;
- submission to the FDA of an NDA after completion of all pivotal clinical trials;
- a determination by the FDA within 60 days of its receipt of an NDA to file the NDA for review;
- satisfactory completion of an FDA pre-approval inspection of the manufacturing facilities at which the product is produced and tested to assess compliance with current good manufacturing practice, or cGMP, regulations; and
- satisfactory completion of an FDA pre-approval inspection of the manufacturing facilities at which the product is produced and tested to assess compliance with current good manufacturing practice, or cGMP, regulations; and
- FDA review and approval of an NDA prior to any commercial marketing or sale of the drug in the United States.

The development and approval process requires substantial time, effort and financial resources, and we cannot be certain that any approvals for our product will be granted on a timely basis, if at all.

The results of preclinical tests (which include laboratory evaluation as well as GLP studies to evaluate toxicity in animals) for a particular product candidate, together with related manufacturing information and analytical data, are submitted as part of an IND to the FDA. The IND automatically becomes effective 30 days after receipt by

the FDA, unless the FDA, within the 30-day time period, raises concerns or questions about the conduct of the proposed clinical trial, including concerns that human research subjects will be exposed to unreasonable health risks. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. IND submissions may not result in FDA authorization to commence a clinical trial. A separate submission to an existing IND must also be made for each successive clinical trial conducted during product development. Further, an independent institutional review board, or IRB, for each medical center proposing to conduct the clinical trial must review and approve the plan for any clinical trial before it commences at that center and it must monitor the study until completed. The FDA, the IRB or the sponsor may suspend a clinical trial at any time on various grounds, including a finding that the subjects or patients are being exposed to an unacceptable health risk. Clinical testing also must satisfy extensive good clinical practice regulations and regulations for informed consent and privacy of individually identifiable information. Similar requirements to the United States IND are required in the European Economic Area and other jurisdictions in which we may conduct clinical trials.

Clinical Trials

For purposes of NDA submission and approval, clinical trials are typically conducted in the following sequential phases, which may overlap:

- Phase 1 Clinical Trials. Studies are initially conducted in a limited population to test the product candidate for safety, dose tolerance, absorption, distribution, metabolism and excretion, typically in healthy humans, but in some cases in patients.
- Phase 2 Clinical Trials. Studies are generally conducted in a limited patient population to identify possible adverse effects and safety risks, explore the initial efficacy of the product for specific targeted indications and to determine dose range or pharmacodynamics. Multiple Phase 2 clinical trials may be conducted by the sponsor to obtain information prior to beginning larger and more expensive Phase 3 clinical trials.
- Phase 3 Clinical Trials. These are commonly referred to as pivotal studies. When Phase 2 evaluations demonstrate that a dose range of the product is effective and has an acceptable safety profile, Phase 3 clinical trials are undertaken in large patient populations to further evaluate dosage, provide substantial evidence of clinical efficacy and further test for safety in an expanded and diverse patient population at multiple, geographically dispersed clinical trial centers.
- Phase 4 Clinical Trials. The FDA may approve an NDA for a product candidate, but require that the sponsor conduct additional clinical trials to further assess the drug after NDA approval under a post-approval commitment. In addition, a sponsor may decide to conduct additional clinical trials after the FDA has approved an NDA. Post-approval trials are typically referred to as Phase 4 clinical trials.

Sponsors of clinical trials may submit proposals for the design, execution, and analysis for their pivotal trials under a SPA. A SPA is an evaluation by the FDA of a protocol with the goal of reaching an agreement that the Phase 3 trial protocol design, clinical endpoints, and statistical analyses are acceptable to support regulatory approval of the drug product candidate with respect to effectiveness for the indication studied. Under a SPA, the FDA agrees to not later alter its position with respect to adequacy of the design, execution or analyses of the clinical trial intended to form the primary basis of an effectiveness claim in an NDA, without the sponsor’s agreement, unless the FDA identifies a substantial scientific issue essential to determining the safety or efficacy of the drug after testing begins.

Prior to initiating our currently ongoing Phase 3 clinical trial(s), we submitted a proposal for the design, execution and analysis under a SPA.

New Drug Applications

The results of drug development, preclinical studies and clinical trials are submitted to the FDA as part of an NDA. NDAs also must contain extensive chemistry, manufacturing and control information. An NDA must be

accompanied by a significant user fee, which may be waived in certain circumstances. Once the submission has been accepted for filing, the FDA's goal is to review applications within ten months of submission or, if the application relates to an unmet medical need in a serious or life-threatening indication, six months from submission. The review process is often significantly extended by FDA requests for additional information or clarification. The FDA may refer the application to an advisory committee for review, evaluation and recommendation as to whether the application should be approved. For new oncology products, the FDA will often solicit an opinion from an ODAC, a panel of expert authorities knowledgeable in the fields of general oncology, pediatric oncology, hematologic oncology, immunologic oncology, biostatistics, and other related professions. The ODAC panel reviews and evaluates data concerning the safety and effectiveness of marketed and investigational human drug products for use in the treatment of cancer, and makes appropriate recommendations to the Commissioner of Food and Drugs. The FDA is not bound by the recommendation of an advisory committee. The FDA may deny approval of an NDA by issuing a Complete Response Letter (CRL) if the applicable regulatory criteria are not satisfied. A CRL may require additional clinical data and/or an additional pivotal Phase 3 clinical trial(s), and/or other significant, expensive and time-consuming requirements related to clinical trials, preclinical studies or manufacturing. Data from clinical trials are not always conclusive and the FDA may interpret data differently than we or our collaborators interpret data. Approval may be contingent on a Risk Evaluation and Mitigation Strategy (REMS) that limits the labeling, distribution or promotion of a drug product. Once issued, the FDA may withdraw product approval if ongoing regulatory requirements are not met or if safety problems occur after the product reaches the market. In addition, the FDA may require testing, including Phase IV clinical trials, and surveillance programs to monitor the safety effects of approved products which have been commercialized, and the FDA has the power to prevent or limit further marketing of a product based on the results of these post-marketing programs or other information.

There are three primary regulatory pathways for a New Drug Application under Section 505 of the FFDCA: Section 505 (b)(1), Section 505 (b)(2) and Section 505(j). A Section 505 (b)(1) application is used for approval of a new drug (for clinical use) whose active ingredients have not been previously approved. A Section 505 (b)(2) application is used for a new drug that relies on data not developed by the applicant. Section 505(b)(2) of the FFDCA was enacted as part of the Drug Price Competition and Patent Term Restoration Act of 1984, also known as the Hatch-Waxman Act. This statutory provision permits the approval of an NDA where at least some of the information required for approval comes from studies not conducted by or for the applicant and for which the applicant has not obtained a right of reference. The Hatch-Waxman Act permits the applicant to rely in part upon the FDA's findings of safety and effectiveness for previously approved products. Section 505(j) application, also known as an abbreviated NDA, is used for a generic version of a drug that has already been approved.

Orphan Drug Exclusivity

Some jurisdictions, including the United States, may designate drugs for relatively small patient populations as orphan drugs. Pursuant to the Orphan Drug Act, the FDA grants orphan drug designation to drugs intended to treat a rare disease or condition, which is generally a disease or condition that affects fewer than 200,000 individuals in the United States. The orphan designation is granted for a combination of a drug entity and an indication and therefore it can be granted for an existing drug with a new (orphan) indication. Applications are made to the Office of Orphan Products Development at the FDA and a decision or request for more information is rendered in 60 days. NDAs for designated orphan drugs are exempt from user fees, obtain additional clinical protocol assistance, are eligible for tax credits up to 50% of research and development costs, and are granted a seven-year period of exclusivity upon approval. The FDA cannot approve the same drug for the same condition during this period of exclusivity, except in certain circumstances where a new product demonstrates superiority to the original treatment. Exclusivity begins on the date that the marketing application is approved by the FDA for the designated orphan drug, and an orphan designation does not limit the use of that drug in other applications outside the approved designation in either a commercial or investigational setting.

The FDA has granted Delcath six orphan drug designations. In November 2008, the FDA granted Delcath two orphan drug designations for the drug melphalan for the treatment of patients with cutaneous melanoma, as well

as patients with ocular melanoma. In May 2009, the FDA granted Delcath an additional orphan drug designation of the drug melphalan for the treatment of patients with neuroendocrine tumors. In August 2009, the FDA granted Delcath an orphan drug designation of the drug doxorubicin for the treatment of patients with primary liver cancer. In October 2013, the FDA granted Delcath an orphan drug designation of the drug melphalan for the treatment of HCC. In July 2015, the FDA granted Delcath an orphan drug designation of the drug melphalan for the treatment of cholangiocarcinoma, which includes ICC.

The granting of orphan drug designations does not mean that the FDA has approved a new drug. Companies must still pursue the rigorous development and approval process that requires substantial time, effort and financial resources, and we cannot be certain that any approvals for our product will be granted at all, or on a timely basis.

Intellectual Property and Other Rights

Our success depends in part on our ability to obtain patents and trademarks, maintain trade secret and know-how protection, enforce our proprietary rights against infringers, and operate without infringing on the proprietary rights of third parties. Because of the length of time and expense associated with developing new products and bringing them through the regulatory approval process, the health care industry places considerable emphasis on obtaining patent protection and maintaining trade secret protection for new technologies, products, processes, know-how, and methods. The Company currently holds rights in eight U.S. utility patents, one U.S. design patent, five pending U.S. utility patent applications, six issued foreign counterpart utility patents (including the validation of a European patent directed to our filter apparatus in eight European countries, six issued foreign counterpart design patents, and eight pending foreign counterpart patent applications. In July 2017, a patent directed to our chemotherapy filtration system was issued by the U.S. Patent and Trademark Office. In October 2018 and February 2019 patents directed to our chemotherapy filtration system and a method of using our filter and frame apparatus were issued by the United States Patent and Trademark Office. A Notice of Allowance was obtained from the United States Patent and Trademark Office for the patent application entitled “Apparatus For Removing Chemotherapy Compounds from Blood” with allowed claims to a kit of parts capable of being assembled for delivering a small molecule chemotherapeutic agent to a subject. The allowed claims are directed to CHEMOSAT. A Hong Kong patent directed to our Filter and Frame Apparatus was issued in March of 2018. A European patent was granted for our chemotherapy filtration system in November 2018 and a European patent application directed to a method of using our filter and frame apparatus was granted in April 2019 by the European Patent Office.

When appropriate, the Company actively pursues protection of our proprietary products, technologies, processes, and methods by filing United States and international patent and trademark applications. We seek to pursue additional patent protection for technology invented through research and development, manufacturing, and clinical use of the CHEMOSAT and Melphalan/HDS that will enable us to expand our patent portfolio around advances to our current systems, technology, and methods for our current applications as well as beyond the treatment of cancers in the liver.

There can be no assurance that the pending patent applications will result in the issuance of patents, that patents issued to or licensed by us will not be challenged or circumvented by competitors, or that these patents will be found to be valid or sufficiently broad to protect our technology or provide us with a competitive advantage.

To maintain our proprietary position, we also rely on trade secrets and proprietary technological experience to protect proprietary manufacturing processes, technology, and know-how relating to our business. We rely, in part, on confidentiality agreements with our marketing partners, employees, advisors, vendors and consultants to protect our trade secrets and proprietary technological expertise. In addition, we also seek to maintain our trade secrets through maintenance of the physical security of the premises where our trade secrets are located. There can be no assurance that these agreements will not be breached, that we will have adequate remedies for any breach, that others will not independently develop equivalent proprietary information or that third parties will not otherwise gain access to our trade secrets and proprietary knowledge.

In certain circumstances, United States patent law allows for the extension of a patent's duration for a period of up to five years after FDA approval. The Company intends to seek extension for one of our patents after FDA approval if it has not expired prior to the date of approval. In addition to our proprietary protections, the FDA has granted Delcath five orphan drug designations that provide us a seven-year period of exclusive marketing beginning on the date that our NDA is approved by the FDA for the designated orphan drug. While the exclusivity only applies to the indication for which the drug has been approved, the Company believes that it will provide us with added protection once commercialization of an orphan drug designated product begins.

There has been and continues to be substantial litigation regarding patent and other intellectual property rights in the pharmaceutical and medical device areas. If a third party asserts a claim against Delcath, the Company may be forced to expend significant time and money defending such actions and an adverse determination in any patent litigation could subject us to significant liabilities to third parties, require us to redesign our product, require us to seek licenses from third parties, and, if licenses are not available, prevent us from manufacturing, selling or using our system. Additionally, Delcath plans to enforce its intellectual property rights vigorously and may find it necessary to initiate litigation to enforce our patent rights or to protect our trade secrets or know-how. Patent litigation can be costly and time consuming and there can be no assurance that the outcome will be favorable to us.

Patent No.	Title	Issuance Date	Owned or Licensed	Expiration Date
7,022,097	Method For Treating Glandular Diseases and Malignancies	4/4/2006	Owned	6/24/2023
9,707,331	Apparatus For Removing Chemotherapy Compounds from Blood	7/18/2017	Owned	9/17/2034

Patent No.	Title	Issuance Date	Owned or Licensed	Expiration Date
10,098,997	Apparatus For Removing Chemotherapy Compounds from Blood	10/16/2018	Owned	11/7/2032
D708749	Dual Filter	7/8/2014	Owned	7/8/2028
9,314,561	Filter and Frame Apparatus and Method of Use	4/19/2016	Owned	2/7/2034
10,195,334	Filter and Frame Apparatus and Method of Use	2/5/2019	Owned	1/16/2033
9,541,544	A Method of Selecting Chemotherapeutic Agents for an Isolated Organ or Regional Therapy	1/10/2017	Owned	8/28/2033

Patent Applications in the United States

Application No.	Application Title	Filing Date	Owned or Licensed
16/127,008	Apparatus For Removing Chemotherapy Compounds from Blood	9/10/2018	Owned
16/231,486	Filter and Frame Apparatus and Method of Use	12/22/2018	Owned
15/346,239	A Method of Selecting Chemotherapeutic Agents for an Isolated Organ or Regional Therapy	11/8/2016	Owned

Foreign Patents

Patent No.	Title	Issuance Date	Owned or Licensed	Expiration Date
84.098	Dual Filter (Argentina)	6/29/2012	Owned	6/29/2027
343454	Dual Filter (Australia)	7/23/2012	Owned	6/25/2022
146201	Dual Filter (Canada)	5/15/2013	Owned	5/15/2023
ZL 201230277905.5	Dual Filter (China)	3/20/2013	Owned	6/22/2022
1333173	Dual Filter (Europe)	6/27/2012	Owned	6/25/2037
1456186	Dual Filter Cartridge for Fluid Filtration (Japan)	10/26/2012	Owned	10/26/2032
2797644	Filter and Frame Apparatus and Method of Use (Belgium)	4/12/2017	Owned	12/29/2032
2797644	Filter and Frame Apparatus and Method of Use (France)	4/12/2017	Owned	12/29/2032
602012031191.6	Filter and Frame Apparatus and Method of Use (Germany)	4/12/2017	Owned	12/29/2032
2797644	Filter and Frame Apparatus and Method of Use (Great Britain)	4/12/2017	Owned	12/29/2032
2797644	Filter and Frame Apparatus and Method of Use (Ireland)	4/12/2017	Owned	12/29/2032
502017000073120	Filter and Frame Apparatus and Method of Use (Italy)	4/12/2017	Owned	12/29/2032
2797644	Filter and Frame Apparatus and Method of Use (Luxembourg)	4/12/2017	Owned	12/29/2032
2797644	Filter and Frame Apparatus and Method of Use (Switzerland)	4/12/2017	Owned	12/29/2032
2776086	Apparatus For Removing Chemotherapy Compounds from Blood (Europe)	11/29/2018	Owned	11/7/2032
1203425	Filter and Frame Apparatus and Method of Use (Hong Kong)	3/23/2018	Owned	12/29/2032
3238762	Filter and Frame Apparatus and Method of Use (Europe)	4/17/2019	Owned	12/29/2032

Foreign Patent Applications

Application No.	Title	Filing Date	Owned or Licensed
17,176,952.400	Apparatus For Removing Chemotherapy Compounds from Blood (Europe)	11/7/2012	Owned
18164476.6	Filter and Frame Apparatus and Method of Use (Europe)	12/29/2012	Owned

Other Regulatory Requirements

Products manufactured or distributed pursuant to FDA approvals are subject to continuing regulation by the FDA, including recordkeeping, annual product quality review and reporting requirements. Adverse event experience with the product must be reported to the FDA in a timely fashion and pharmacovigilance programs to proactively look for these adverse events are mandated by the FDA. Drug manufacturers and 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 and certain state agencies for compliance with ongoing regulatory requirements, including cGMPs, which impose certain procedural and documentation requirements upon us and our third-party manufacturers. Following such inspections, the FDA may issue notices on Form 483 and Untitled Letters or Warning Letters that could cause us or our third-party manufacturers to modify certain activities. A

Form 483 Notice, if issued at the conclusion of an FDA inspection, can list conditions the FDA investigators believe may have violated cGMP or other FDA regulations or guidelines. In addition to Form 483 Notices and Untitled Letters or Warning Letters, failure to comply with the statutory and regulatory requirements can subject a manufacturer to possible legal or regulatory action, such as suspension of manufacturing, seizure of product, injunctive action or possible civil penalties. We cannot be certain that we or our present or future third-party manufacturers or suppliers will be able to comply with the cGMP regulations and other ongoing FDA regulatory requirements. If we or our present or future third-party manufacturers or suppliers are not able to comply with these requirements, the FDA may require us to recall our products from distribution or withdraw any potential approvals of an NDA for that product.

The FDA closely regulates the post-approval marketing and promotion of drugs, including standards and regulations for direct-to-consumer advertising, dissemination of off-label information, industry-sponsored scientific and educational activities and promotional activities involving the Internet. Drugs may be marketed only for the approved indications and in accordance with the provisions of the approved label. Further, if there are any modifications to the drug, including changes in indications, labeling, or manufacturing processes or facilities, we may be required to submit and obtain FDA approval of a new or supplemental NDA, which may require us to develop additional data or conduct additional preclinical studies and clinical trials. Failure to comply with these requirements can result in adverse publicity, Warning Letters, corrective advertising and potential civil and criminal penalties.

Physicians may prescribe legally available products for uses that are not described in the product's labeling and that differ from those tested by us and approved by the FDA. Such off-label uses are common across medical specialties, in particular in oncology. Physicians may believe that such off-label uses are the best treatment for many patients in varied circumstances. The FDA does not regulate the behavior of physicians in their choice of treatments. The FDA does, however, impose stringent restrictions on manufacturers' communications regarding off-label use.

European Regulatory Environment

In the EEA, the CHEMOSAT system is subject to regulation as a medical device. The EEA is composed of the 27 Member States of the EU plus Norway, Iceland and Liechtenstein. Under the EU Medical Devices Directive (Directive No 93/42/ECC of 14 June 1993, as last amended), drug delivery products such as the CHEMOSAT system is governed by the EU laws on pharmaceutical products only if they are (i) placed on the market in such a way that the device and the pharmaceutical product form a single integral unit which is intended exclusively for use in the given combination, and (ii) the product is not reusable. In such cases, the drug delivery product is governed by the EU Code on Medicinal Products for Human Use (Directive 2001/83/EC, as last amended), while the essential requirements of the EU Medical Devices Directive apply to the safety and performance-related device features of the product. Because we do not intend to place the CHEMOSAT system on the EEA market as a single integral unit with melphalan, the product is governed solely by the EU Medical Devices Directive, while the separately marketed drug is governed by the EU Code relating to Medicinal Products for Human Use and other EU legislation applicable to drugs for human use.

Before we may commercialize a medical device in the EEA, we must comply with the essential requirements of the EU Medical Devices Directive. Compliance with these requirements entitles a manufacturer to affix a CE conformity mark, without which the products cannot be commercialized in the EEA. To demonstrate compliance with the essential requirements and obtain the right to affix the CE conformity mark, medical device manufacturers must undergo a conformity assessment procedure, which varies according to the type of medical device and its classification. In April 2011, we obtained authorization to affix a CE Mark for the Generation One CHEMOSAT system and began European commercialization with this version of the CHEMOSAT system in early 2012. In April 2012, the Company obtained authorization to affix a CE Mark for the Generation Two CHEMOSAT system, and since this time all procedures in Europe have been performed with this version of the system.

The Medical Devices Directive establishes a classification system placing devices into Class I, IIa, IIb, or III, depending on the risks and characteristics of the medical device. For certain types of low risk medical devices (i.e., Class I devices which are non-sterile and do not have a measuring function), the manufacturer may issue an EC Declaration of Conformity based on a self-assessment of the conformity of its products with the essential requirements of the EU Medical Devices Directives. Other devices are subject to a conformity assessment procedure requiring the intervention of a Notified Body, which is an organization designated by a Member State of the EEA to conduct conformity assessments.

CHEMOSAT is regulated as a Class IIb medical device. As a Class IIb medical device, the Notified Body is not required to carry out an examination of the product's design dossier as part of its conformity assessment prior to commercialization. The Company must continue to comply with the essential requirements of the EU Medical Devices Directive (Directive 93/42 EC) and is subject to a conformity assessment procedure requiring the intervention of a Notified Body. The conformity assessment procedure for Class IIb medical devices requires the manufacturer to apply for the assessment of its quality system for the design, manufacture and inspection of its medical devices by a Notified Body. The Notified Body will audit the system to determine whether it conforms to the provisions of the Medical Devices Directive. If the Notified Body's assessment is favorable, it will issue a Full Quality Assurance Certificate, which enables the manufacturer to draw a Declaration of Conformity and affix the CE mark to the medical devices covered by the assessment. Thereafter, the Notified Body will carry out periodic audits to ensure that the approved quality system is applied by the manufacturer.

A manufacturer without a registered place of business in a Member State of the EU which places a medical device on the market under its own name must designate an Authorized Representative established in the European Union who can act before, and be addressed by, the Competent Authorities on the manufacturer's behalf with regard to the manufacturer's obligations under the EU Medical Devices Directive. We appointed such a representative prior to establishing our infrastructure in the EEA. With the Delcath Systems Ltd. infrastructure now firmly in place, the Authorized Representative responsibilities have been formally transferred internally and there is no longer a need for a third-party representative.

In the EEA, we must also comply with the Medical Device Vigilance System, which is designed to improve the protection of health and safety of patients, users and others by reducing the likelihood of recurrence of incidents related to the use of a medical device. Under this system, incidents are defined as any malfunction or deterioration in the characteristics and/or performance of a device, as well as any inadequacy in the labeling or the instructions for use which, directly or indirectly, might lead to or might have led to the death of a patient, or user or of other persons or to a serious deterioration in their state of health. When a medical device is suspected to be a contributory cause of an incident, its manufacturer or authorized representative in the EU must report it to the Competent Authority of the Member State where the incident occurred. Incidents are generally investigated by the manufacturer. The manufacturer's investigation is monitored by the Competent Authority, which may intervene, or initiate an independent investigation if considered appropriate. An investigation may conclude in the adoption of a Field Safety Corrective Action (FSCA). An FSCA is an action taken by a manufacturer to reduce a risk of death or serious deterioration in the state of health associated with the use of a medical device that is already placed on the market. An FSCA may include device recall, modification exchange and destruction. FSCAs must be notified by the manufacturer or its authorized representative to its customers and/or the end users of the medical device via a Field Safety Notice.

In the EEA, the off-label promotion of a pharmaceutical product is strictly prohibited under the EU Community Code on Medicinal Products, which provides that all information provided within the context of the promotion of a drug must comply with the information contained in its approved summary of product characteristics. Our product instructions and indication reference the chemotherapeutic agent melphalan hydrochloride. However, no melphalan labels in the EEA reference our product, and the labels vary from country to country with respect to the approved indication of the drug and its mode of administration. In the exercise of their professional judgment in the practice of medicine, physicians are generally allowed, under certain conditions, to use or prescribe a product in ways not approved by regulatory authorities. Physicians intending to use our device must obtain

melphalan separately for use with the CHEMOSAT system and must use melphalan independently at their discretion.

In the EEA, the advertising and promotion of our products is also subject to EEA Member States laws implementing the EU Medical Devices Directive, Directive 2006/114/EC concerning misleading and comparative advertising and Directive 2005/29/EC on unfair commercial practices, as well as other EEA Member State legislation governing the advertising and promotion of medical devices. These laws may further limit or restrict the advertising and promotion of our products to the general public and may also impose limitations on our promotional activities with health care professionals.

Failure to comply with the EEA Member State laws implementing the Medical Devices Directive, with the EU and EEA Member State laws on the promotion of medicinal products or with other applicable regulatory requirements can result in enforcement action by the EEA Member State authorities, which may include any of the following: fines, imprisonment, orders forfeiting products or prohibiting or suspending their supply to the market, or requiring the manufacturer to issue public warnings, or to conduct a product recall.

The European Commission recently reviewed the Medical Device Directive legislative framework and promulgated REGULATION (EU) 2017/745 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 April 2017 on medical devices, amending Directive 2001/83/EC, Regulation EC) No 178/2002 and Regulation (EC) No 1223/2009 and repealing Council Directives 90/385/EEC and 93/42/EEC. This new Medical Device Regulation became effective on May 25, 2017, marking the start of a 3-year transition period for manufacturers selling medical device in Europe to comply with the new medical device regulation (“MDR”) which governs all facets of medical devices. The transition task is highly complex and touches every aspect of product development, manufacturing production, distribution and post marketing evaluation.

Effectively addressing these changes will require a complete review of our device operations to determine what is necessary to comply. We do not believe the MDR regulatory changes will impact our business at this time, though implementation of the medical device legislation may adversely affect our business, financial condition and results of operations or restrict our operations.

Other International Regulations

We continue to evaluate commercial opportunities in select markets when resources are available and at an appropriate time.

Competition

The healthcare industry is characterized by extensive research, rapid technological progress and significant competition from numerous healthcare companies and academic institutions. Competition in the cancer treatment industry is intense. We believe that the primary competitive factors for products addressing cancer include safety, efficacy, ease of use, reliability and price. We also believe that physician relationships, especially relationships with leaders in the medical and surgical oncology communities, are important competitive factors. We also believe that the current global economic conditions and new healthcare reforms could put competitive pressure on us, including reduced selling prices and potential reimbursement rates, and overall procedure rates. Certain markets in Europe are experiencing the effects of continued economic weakness, which is affecting healthcare budgets and reimbursement.

CHEMOSAT and Melphalan/HDS competes with all forms of liver cancer treatments, including surgery, systemic chemotherapy, focal therapies and palliative care. In the disease states we are targeting there are also numerous clinical trials sponsored by third-parties, which can compete for potential patients in the near term and may ultimately lead to new competitive therapies.

For ocular melanoma liver metastases, there are currently no approved or effective treatment options, and patients are generally treated with a variety of focal and regional techniques. There are numerous companies developing and marketing devices for the performance of focal therapies, including Covidian, Biocompatibles, Merit, CeleNova, SirTex, AngioDynamics, and many others.

For ICC, gemcitabine plus cisplatin remains the standard of care for the treatment of ICC in patients who are not candidates for surgery.

Several therapies have been recently approved for unresectable or metastatic cutaneous melanoma, which may encompass liver metastases. Dabrafenib (Tafinlar™, GlaxoSmithKline), is indicated as single agent for the treatment of patients with unresectable or metastatic melanoma with BRAF V600E mutation, and in combination with trametinib in unresectable or metastatic melanoma with BRAF V600E or V600K mutations. Furthermore, trametinib (MEKINIST™, GlaxoSmithKline) is indicated as single agent (in addition to in combination with dabrafinib) for treatment of patients with unresectable or metastatic melanoma with BRAF V600E or V600K mutations. Previously approved melanoma therapies such as the biologic ipilimumab (Yervoy™, Bristol Myers Squibb) and the B-RAF targeted drug vemurafenib (Zelboraf™, Genentech) may also make up the competitive landscape for the treatment of metastatic liver disease.

Many of these treatments are approved in Europe and other global markets.

Many of our competitors have substantially greater financial, technological, research and development, marketing and personnel resources. In addition, some of our competitors have considerable experience in conducting clinical trials, regulatory, manufacturing and commercialization capabilities. Our competitors may develop alternative treatment methods, or achieve earlier product development, in which case the likelihood of us achieving meaningful revenues or profitability will be substantially reduced.

Manufacturing and Quality Assurance

We manufacture certain critical medical device components including our proprietary filter media and assemble and package the CHEMOSAT and Melphalan/HDS at our facility in Queensbury, New York. We have established our European headquarters and distribution facility in Galway, Ireland where we conduct final manufacturing, processing and assembly. Delcath currently utilizes third-parties to manufacture some components of the CHEMOSAT and Melphalan/HDS. The CHEMOSAT and Melphalan/HDS and its components must be manufactured and sterilized in accordance with approved manufacturing and pre-determined performance specifications. In addition, certain components will require sterilization prior to distribution and Delcath relies on third-party vendors to perform the sterilization process.

We are committed to providing high quality products to our customers. To honor this commitment, Delcath has implemented updated quality systems throughout our organization. Delcath’s quality system starts with the initial product specification and continues through the design of the product, component specification process and the manufacturing, sale and servicing of the product. These systems are designed to enable us to satisfy the various international quality system regulations including those of the FDA with respect to products sold in the United States and those established by the International Standards Organization (ISO) with respect to products sold in the EEA. The Company is required to maintain ISO 13485 certification for medical devices to be sold in the EEA, which requires, among other items, an implemented quality system that applies to component quality, supplier control, product design and manufacturing operations. On February 17, 2011, we announced that we had achieved ISO 13485 certification for our Queensbury manufacturing facility. On December 28, 2011, we announced that we had achieved ISO 13485 certification for our Galway, Ireland facility. All Delcath manufacturing facilities are presently ISO 13485:2016 certified.

Recent Events

Private Placements

On July 11, 2019 and August 15, 2019, the Company and certain accredited investors entered into securities purchase agreements (the "Securities Purchase Agreements") pursuant to which the Company sold to investors an aggregate of 20,000 shares of Series E Convertible Preferred Stock, par value $0.01 per share and 9,150 shares of Series E-1 Convertible Preferred Stock, par value $0.01 per share, having the rights and privileges described in the Company's certificate of designations for such Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock, at a price of $1,000 per share . Pursuant to the Securities Purchase Agreements, the Company also issued to each Investor a warrant (a "2019 Warrant") to purchase a number of shares of common stock of the Company equal to the number of shares of common stock issuable upon conversion of the Series E Preferred Stock purchased by the investor. Each 2019 Warrant has an exercise price of $0.06, subject to adjustment in accordance with the terms of the 2019 Warrants (the "Exercise Price"), and is exercisable at any time beginning on the date that the Company effects a reverse stock split until 5:00 p.m. (NYC time) on the fifth anniversary of the date of the reverse stock split. The Company received gross proceeds from the private placements of $29.5 million, before deducting cash fees in the amount of $1.4 million payable to Roth Capital Partners, LLC ("Roth") for serving as placement agent and cash fees in the amount of $0.6 million payable to Roth for serving as placement agent for certain prior securities offerings by the Company, and other transaction costs, fees and expenses payable by the Company.

Board of Directors

On July 24, 2019, the Board appointed John R. Sylvester to fill the vacancy on the Board created by the resignation of Simon Pedder, such appointment was effective immediately. Mr. Sylvester is currently serving as Chief Commercial Officer of BTG plc, an international specialist healthcare company that develops and commercializes products targeting critical care, cancer and other disorders. Mr. Sylvester joined BTG in 2011 and has had roles leading both BTG's Interventional Oncology and Interventional Vascular businesses as well as a period as Chief Development Officer accountable for Strategy, M&A and Market access. Mr. Sylvester has been involved in several significant business turn-arounds as well as establishing new innovative healthcare technologies as the standard of care. His previous leadership positions include Managing Director at Biocompatibles PLC, Vice President Marketing, European Medicines Delivery at Baxter International Inc., and General Manager, Europe and Asia at Imerys SA.

Overview for Q2 2019 MD&A

Delcath Systems, Inc. is an interventional oncology company focused on the treatment of primary and metastatic liver cancers. Our investigational product—Melphalan Hydrochloride for Injection for use with the Delcath Hepatic Delivery System ("Melphalan/HDS")—is designed to administer high-dose chemotherapy to the liver while controlling systemic exposure and associated side effects. In Europe, our system is commercially available under the trade name Delcath Hepatic CHEMOSAT ® Delivery System for Melphalan ("CHEMOSAT"), where it has been used at major medical centers to treat a wide range of cancers of the liver.

Our primary research focus is on ocular melanoma liver metastases ("mOM") and intrahepatic cholangiocarcinoma ("ICC"), a type of primary liver cancer, and certain other cancers that are metastatic to the liver. We believe the disease states we are investigating represent a multi-billion dollar global market opportunity and a clear unmet medical need.

Our clinical development program ("CDP") for Melphalan/HDS is comprised of The FOCUS Clinical Trial for Patients with Hepatic Dominant Ocular Melanoma (the "FOCUS Trial"), a global registration clinical trial that is investigating objective response rate in mOM, and the ALIGN Trial, a global Phase 3 clinical trial for ICC (the "ALIGN Trial"). Our CDP also includes a registry for CHEMOSAT commercial cases performed in Europe and sponsorship of select investigator-initiated trials ("IITs").

The direction and focus of our CDP for CHEMOSAT and Melphalan/HDS is informed by; prior clinical development conducted between 2004 and 2010, commercial experience with CHEMOSAT cases performed on patients in Europe, and prior regulatory engagement with the FDA. Experience gained from this research and development, early European commercial cases and United States regulatory opinion has led to the implementation of several safety improvements to our product and the associated medical procedure.

In the United States, Melphalan/HDS is considered a combination drug and device product and is regulated as a drug by the FDA. The FDA has granted us six orphan drug designations, including three orphan designations for the use of the drug melphalan for the treatment of patients with mOM, hepatocellular carcinoma and ICC. Melphalan/HDS has not been approved for sale in the United States.

In Europe, the current version of our CHEMOSAT product is regulated as a Class IIb medical device and received its CE Mark in 2012. We are in an early phase of commercializing the CHEMOSAT system in select markets in the European Union (EU) where the prospect of securing reimbursement coverage for the procedure is strongest. In 2015 national reimbursement coverage for CHEMOSAT procedures was awarded in Germany. In 2016, coverage levels were negotiated between hospitals in Germany and regional sickness funds. Coverage levels determined via this process are expected to be renegotiated annually. In 2017, Dutch health authorities added CHEMOSAT to their treatment guidelines for patients with ocular melanoma metastatic to the liver, an important step toward eventual reimbursement in the Dutch market.

Currently there are few effective treatment options for certain cancers in the liver. Traditional treatment options include surgery, systemic chemotherapy, liver transplant, radiation therapy, interventional radiology techniques, and isolated hepatic perfusion. We believe that CHEMOSAT and Melphalan/HDS represent a potentially important advancement in regional therapy for primary liver cancer and certain other cancers metastatic to the liver and are uniquely positioned to treat the entire liver either as a standalone therapy or as a complement to other therapies.

Our Ability to Continue as a Going Concern

The notes contained in our Annual Report on Form 10-K for year ended December 31, 2018 and Quarterly Report on Form 10-Q for the quarter ended June 30, 2019 include a disclosure describing the existence of conditions that raise substantial doubt about our ability to continue as a going concern. Our ability to continue as a going concern is dependent upon our ability to obtain substantial additional funding in connection with our continuing operations. Adequate additional financing may not be available to us on acceptable terms, or at all. If we are unable to raise additional capital and/or enter into strategic alliances when needed or on attractive terms, we would be forced to delay, reduce or eliminate our research and development programs or any commercialization efforts. Our consolidated financial statements as of December 31, 2018 have been prepared under the assumption that we will continue as a going concern. If we are not able to continue as a going concern, it is likely that holders of our Common Stock will lose all of their investment. Our consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Our independent registered public accounting firm has issued its report dated June 14, 2019 in connection with the audit of our consolidated financial statements as of December 31, 2018 that included an explanatory paragraph describing the existence of conditions that raise substantial doubt about our ability to continue as a going concern.

Liquidity and Capital Resources (for the year ended December 31, 2018)

The Company’s future results are subject to substantial risks and uncertainties. As noted above, Delcath has operated at a loss for its entire history and anticipates that losses will continue over the coming year. There can be no assurance that Delcath will ever generate significant revenues or achieve profitability. The Company expects to use cash, cash equivalents and investment proceeds to fund its operating activities. Delcath’s future liquidity and capital requirements will depend on numerous factors, including the progress of clinical trials and research and product development programs, obtaining approvals and complying with

regulations; the timing and effectiveness of product commercialization activities, including marketing arrangements; the timing and costs involved in preparing, filing, prosecuting, defending and enforcing intellectual property rights; and the effect of competing technological and market developments.

At December 31, 2018, the Company had cash and cash equivalents totaling $2.5 million, as compared to cash and cash equivalents totaling $4.0 million at December 31, 2017. During the year ended December 31, 2018, the Company used $14.7 million of cash for its operating activities, which compares to $15.4 million used for operating activities during the year ended December 31, 2017. The increase of $0.7 million was primarily driven by an increase in operating expenses primarily related to the Company's clinical trial effort discussed in the Overview section above. In light of recent financing activities described below, the Company believes it has sufficient capital to fund its operating activities through June 2019.

Our consolidated financial statements as of December 31, 2018 have been prepared under the assumption that we will continue as a going concern for the next twelve months. We expect to incur significant expenses and operating losses for the foreseeable future. These factors raise substantial doubt about our ability to continue as a going concern. Because Delcath's business does not generate positive cash flow from operating activities, the Company will need to obtain substantial additional capital in order to fund clinical trial research and support our development efforts and to fully commercialize our product. The Company believes it will be able to raise additional capital in the event it is in its best interest to do so. The Company anticipates raising such additional capital by either selling shares of Delcath's capital stock, borrowing money or entering into strategic alliances with appropriate partners. To the extent additional capital is not available when needed or on acceptable terms, the Company may be forced to abandon some or all of its development and commercialization efforts, which would have a material adverse effect on the prospects of its business. Further, the Company's assumptions relating to its cash requirements may differ materially from its actual requirements because of a number of factors, including significant unforeseen delays in the regulatory approval process, changes in the timing, scope, focus and direction of clinical trials and costs related to commercializing the product.

The Company has funded its operations through a combination of private placements and public offerings of securities in 2000, 2003, 2009, 2010, 2011, 2012, 2013, 2015, 2016 and 2018, including registered direct offerings in 2007, 2009 and 2013, "at the market" equity offering programs in 2012 and 2013, a rights offering in 2018 and by the private placement of convertible notes in 2016 and 2018. For a detailed discussion of the Company's various sales of debt and equity securities see Notes 10 and 11 to the Company's audited consolidated financial statements contained in our Annual Report on Form 10-K.

In October 2018, the Company filed a registration statement on Form S-3 with the SEC, which was declared effective on December 21, 2018 and allowed the Company to offer and sell, from time to time in one or more offerings, up to $100.0 million of Common Stock, preferred stock, warrants, debt securities and stock purchase contracts as it deems prudent or necessary to raise capital at a later date. The Company has lost its Form S-3 eligibility due to the late filing of our Annual Report on Form 10-K for the fiscal year ended December 31, 2018 and our Quarterly Report on Form 10-Q for the fiscal quarter ended March 31, 2019.

Since the close of our most recent fiscal year, we have borrowed an aggregate of $3.3 million from institutional investors. See Note 15 to the Company's audited consolidated financial statements contained in our Annual Report on Form 10-K for a discussion of these subsequent events.

Contractual Obligations, Commercial Commitments and Off-Balance Sheet Arrangements

The Company is obligated to make future payments under various operating lease agreements. The following table provides a summary of significant contractual obligations at December 31, 2018:

	Payments Due by Period				
(in millions)	Total	Less than 1 year	1-3 years	3-5 years	More than 5 years
Operating Activities:					
Future minimum lease payments, net of receipts due under subleases	$2.1	$ 0.9	$ 1.3	$ —	$ —

Delcath's operating lease obligations at December 31, 2018 include:

(in millions)	Annual Lease Payment	Expiration
1633 Broadway, Suite 22C, NY, NY	$ 0.5	February 2021
810 Seventh Ave, 35Fl, NY, NY[1]	0.5	March 2021
95 Park Road, Queensbury, NY	0.05	November 2020
19 Mervue Galway, Ireland[2]	0.2	August 2021
Total	$ 1.3	

1 A certain amount of expense related to the lease at 810 Seventh Ave. has been offset by two sub-leases
2 A certain amount of expense related to the lease at 19 Mervue has been offset by a sub-lease

See Part I, Item 2, "Properties" and Notes 9 and 13 to the Company's audited consolidated financial statements contained in our Annual Report on Form 10-K.

Future Capital Needs; Additional Future Funding

The Company's future results are subject to substantial risks and uncertainties. The Company has operated at a loss for its entire history and there can be no assurance that it will ever achieve consistent profitability. Based upon recent financing activities described above, the Company believes that it has adequate resources to fund operations through June 2019. Additional working capital will be required to continue operations. There can be no assurance that such working capital will be available on acceptable terms, if at all.

Results of Operations for the three and six months ended June 30, 2019; Comparisons of Results of Operations for Three and six months ended June 30, 2018

Three months ended June 30, 2019 and June 30, 2018

Revenue

The Company recorded approximately $0.2 million in revenue related to product sales for the three months ended June 30, 2019 and $0.9 million in revenue related to product sales for the three months ended June 30, 2018. The decrease was slightly offset by $0.2 million in other revenue. Other revenue and the decrease in product revenue are both related to the Company entering into a licensing agreement with medac as discussed further in the Market Access and Commercial Clinical Adoption section above.

Cost of Goods Sold

For the three months ended June 30, 2019, the Company recorded cost of goods sold of approximately $0.2 million compared to $0.2 million for the three months ended June 30, 2018. The decrease of approximately $50,000 is related to an adjustment in the allocation of expenses into COGS during 2019.

Selling, General and Administrative Expenses

For the three months ended June 30, 2019 and 2018, selling, general and administrative expenses were $2.7 million and $2.6 million, respectively. The increase for the three months ended June 30, 2019 is primarily related to expenses related to the litigation discussed further in Part 2, Item 1. Legal Proceedings and non-cash equity compensation expense.

Research and Development Expenses

For the three months ended June 30, 2019 and 2018, research and development expenses decreased to $1.7 million from $4.1 million. The decrease was primarily due a reduced rate of enrollment and related professional services related to the ongoing accrual of the Company's Phase 3 FOCUS trial which is discussed in further detail in the Active Clinical Development Program section above. The reduction is related to the cash constraints the Company experienced during the first half of 2019.

Change in the fair value of the warrant liability

For the three months ended June 30, 2019 the change in the fair value of the warrant liability was approximately $10,000 as compared to $2.5 million for the three months ended June 30, 2018. The decrease of $2.5 million is due to the reclassification of certain warrants from liability to equity in 2018 and the continued mark-to-market adjustments to the remaining Warrant liability as discussed in more detail in Note 10 to the Company's interim condensed consolidated financial statements contained in this Quarterly Report on Form 10-Q.

Other Income/Expense

Other expense and interest expense are primarily related to the amortization of debt discounts discussed in Note 8 of the Company's condensed consolidated financial statements contained in this Quarterly Report on Form 10-Q, as well as foreign currency exchange gains and losses.

Interest income is from a money market account and interest earned on operating accounts.

Net Loss

The Company recorded a net loss for the three months ended June 30, 2019 of $6.0 million, a decrease of $0.7 million, or 10.5%, compared to net loss of $6.7 million for the same period in 2018. This increase in net loss is primarily due to a $2.4 million decrease in operating expenses, and a $1.8 million change in non-cash expense items including the fair value of the warrant liability, loss on the issuance of financial instruments and interest expense.

Six months ended June 30, 2019 and June 30, 2018

Revenue

The Company recorded approximately $0.3 million in revenue related to product sales for the six months ended June 30, 2019 and $1.6 million in revenue related to product sales for the six months ended June 30, 2018. The decrease was slightly offset by $0.4 million in other revenue. Other revenue and the decrease in product revenue are both related to the Company entering into a licensing agreement with medac as discussed further in the Market Access and Commercial Clinical Adoption section above.

Cost of Goods Sold

For the six months ended June 30, 2019, the Company recorded cost of goods sold of approximately $0.3 million compared to $0.4 million for the six months ended June 30, 2018. The decrease is related to is related to an adjustment in the allocation of expenses into COGS during 2019.

Selling, General and Administrative Expenses

For the six months ended June 30, 2019 and 2018, selling, general and administrative expenses were $5.2 million and $5.0 million, respectively. The increase for the six months ended June 30, 2019 is primarily related to expenses related to the litigation discussed further in Part 2, Item 1. Legal Proceedings and non-cash equity compensation expense.

Research and Development Expenses

For the six months ended June 30, 2019 and 2018, research and development expenses decreased to $5.0 million from $9.8 million. The decrease was primarily due a reduced rate of enrollment and related professional services related to the ongoing accrual of the Company's FOCUS trial which is discussed in further detail in the Active Clinical Development Program section above. The reduction is related to the cash constraints the Company experienced during the first half of 2019.

Change in the fair value of the warrant liability

For the six months ended June 30, 2019 the change in the fair value of the warrant liability was approximately $10,000 as compared to $17.2 million for the six months ended June 30, 2018. The decrease of $17.2 million is due to the reclassification of certain warrants from liability to equity in 2018 and the continued mark-to-market adjustments to the remaining Warrant liability as discussed in more detail in Note 10 to the Company's interim condensed consolidated financial statements contained in this Quarterly Report on Form 10-Q.

Other Income/Expense

Other expense and interest expense are primarily related to the amortization of debt discounts discussed in Note 8 of the Company's condensed consolidated financial statements contained in this Quarterly Report on Form 10-Q, as well as foreign currency exchange gains and losses.

Interest income is from a money market account and interest earned on operating accounts.

Net Loss

The Company recorded a net loss for the six months ended June 30, 2019 of $13.9 million, a decrease of $14.4 million compared to net income of $0.5 million for the same period in 2018. This increase in net loss is primarily due to a $17.2 million change in the fair value of the warrant liability, a non-cash item, a $4.6 million decrease in operating expenses and a $0.8 decrease in gross profits.

Liquidity and Capital Resources

The Company's capital resources as of June 30, 2019 were not sufficient to fund planned operations during 2019. However, subsequent to June 30, 2019 the Company closed on a $20.0 million private placement which will fund the Company through 2019. See Note 14 to the Company's condensed consolidated financial statements contained in this Quarterly Report on Form 10-Q for a discussion of these subsequent events.

The Company will need to raise additional capital under structures available to it including debt and/or equity offerings this year. If these sources do not provide the capital necessary to fund the Company's operations, the Company will need to curtail certain aspects of its operations or consider other means of obtaining additional financing, although there is no guarantee that the Company could obtain the financing necessary to continue its operations.

The Company's future results are subject to substantial risks and uncertainties. As noted above, Delcath has operated at a loss for its entire history and anticipates that losses will continue over the coming years. There can be no assurance that Delcath will ever generate significant revenues or achieve profitability. The Company expects to use cash, cash equivalents and investment proceeds to fund its clinical and operating activities. Delcath's future liquidity and capital requirements will depend on numerous factors, including the initiation and progress of clinical trials and research and product development programs; obtaining approvals and complying with regulations; the timing and effectiveness of product commercialization activities, including marketing arrangements; the timing and costs involved in preparing, filing, prosecuting, defending and enforcing intellectual property rights; and the effect of competing technological and market developments.

At June 30, 2019, the Company had cash, cash equivalents and restricted cash totaling $1.4 million, as compared to cash, cash equivalents and restricted cash totaling $3.6 million at December 31, 2018 and $2.3 million at June 30, 2018. During the three and six months ended June 30, 2019 and 2018, the Company used $6.0 million and $9.3 million respectively, of cash in its operating activities.

Our condensed consolidated financial statements as of June 30, 2019 have been prepared under the assumption that we will continue as a going concern for the next twelve months. We expect to incur

significant expenses and operating losses for the foreseeable future. These factors raise substantial doubt about our ability to continue as a going concern. Because Delcath's business does not generate positive cash flow from operating activities, the Company will need to obtain substantial additional capital in order to fund clinical trial research and support development efforts relating to Ocular Melanoma liver metastases, ICC, HCC or other indications, and to fully commercialize the product. The Company believes it will be able to raise additional capital in the event it is in its best interest to do so. The Company anticipates raising such additional capital by either borrowing money, selling shares of Delcath's capital stock, or entering into strategic alliances with appropriate partners. To the extent additional capital is not available when needed or on acceptable terms, the Company may be forced to abandon some or all of its development and commercialization efforts, which would have a material adverse effect on the prospects of its business. Further, the Company's assumptions relating to its cash requirements may differ materially from its actual requirements because of a number of factors, including significant unforeseen delays in the regulatory approval process, changes in the timing, scope, focus and direction of clinical trials and costs related to commercializing the product.

The Company has funded its operations through a combination of private placements and public offerings of its securities in each of 2000, 2003, 2009, 2010, 2011, 2012, 2013, 2015, 2016, 2018 and 2019, including registered direct offerings in 2007, 2009 and 2013, "at the market" equity offering programs in 2012 and 2013, and by the private placement of convertible notes in 2016 and 2018, and, most recently, on July 15, 2019, the Company raised $20.0 million in the closing of a private placement of convertible preferred stock and warrants to purchase common stock. For a detailed discussion of the Company's various sales of debt and equity securities see Notes 8, 9, and 14 to the Company's condensed consolidated financial statements contained in this Quarterly Report on Form 10-Q as well as Notes 10 and 11 to the Company's audited consolidated financial statements contained in its Annual Report for the fiscal year ended December 31, 2018.

In October 2018, the Company filed a registration statement on Form S-3 with the SEC, which was declared effective on December 21, 2018 and allowed the Company to offer and sell, from time to time in one or more offerings, up to $100.0 million of common stock, preferred stock, warrants, debt securities and stock purchase contracts as it deems prudent or necessary to raise capital at a later date. The Company has lost its Form S-3 eligibility due to the late filing of its Annual Report for the year ended December 31, 2018.

The Company intends to use the net proceeds from any future offerings for general corporate purposes, including, but not limited to, funding of clinical trials, obtaining regulatory approvals, commercialization of its products, capital expenditures and working capital.

Results of Operations for the Year Ended December 31, 2018; Comparisons of Results of the Years Ended December 31, 2018 and 2017

Revenue

The Company recorded approximately $3.4 million in product revenue during the year ended December 31, 2018. During the same period in 2017, Delcath recorded $2.7 million in total revenue related to product sales. The year over year increase is a result of greater product sales in 2018 as Delcath continues to see increased market acceptance of its product in the EU, particularly in Germany where the establishment of the ZE code has contributed to increased treatments.

Additionally, the Company recorded approximately $29,000 in other revenue which is related to the amortization of certain payments pursuant to a definitive licensing agreement for CHEMOSAT commercialization in Europe between the Company and medac Gesellschaft für klinische Spezialpräparate mbH ("Medac") signed on December 17, 2018 and discussed further in Part I, Item 1 under the section captioned "Market Access and Commercial Clinical Adoption" above.

The adoption of ASC 606 on January 1, 2018 had no impact on the amount and timing of revenue recognition related to product sales.

Cost of Goods Sold

During the year ended December 31, 2018, the Company recognized cost of goods sold of approximately $1.0 million related to product revenue of $3.4 million as compared to cost of goods sold of approximately $0.7 million related to product revenue of $2.7 million in the comparable prior period.

The increase in cost of goods sold is commensurate with the increase in revenue.

Selling, General and Administrative Expenses

For the year ended December 31, 2018, selling, general and administrative expenses increased to $9.8 million from $9.7 million for the year ended December 31, 2017. The slight increase reflects the Company's efforts to focus its resources on its clinical development program.

Research and Development Expenses

For the year ended December 31, 2018, research and development expenses increased to $19.7 million from $10.5 million for the year ended December 31, 2017. The increase of $9.2 million is primarily due to the ongoing efforts of the FOCUS Trial which is discussed in further detail in Part 1, Item 1 in the section captioned "Current Clinical Development Program" above.

Other Income/Expense and Interest Expense

Other expense is primarily related to foreign currency exchange gains and losses.

Interest expense is related to the restructuring lease liability discussed in Note 9 of the Company's audited consolidated financial statements contained in our Annual Report on Form 10-K and the amortization of debt discounts discussed in Note 10 of the Company's audited consolidated financial statements contained in our Annual Report on Form 10-K.

Interest income is from a money market account and interest earned on operating accounts.

Change in Fair Value of Derivative Liability

For the year ended December 31, 2018, derivative instrument income increased to $19.7 million from $15.1 million for the year ended December 31, 2017. The increase of $4.6 million is primarily related to the mark-to-market adjustments to the warrant liability discussed in more detail in Note 12 to the Company's audited consolidated financial statements contained in our Annual Report on Form 10-K.

Net Loss

The Company had a net loss for the year ended December 31, 2018 of $19.2 million, a decrease of $25.9 million, or 57.4%, compared to the net loss for the same period in 2017. This decrease is due in significant part to a $34.7 million decrease in various non-cash items primarily related to the amortization of debt discounts and other transaction costs related to convertible notes issued in 2016 and 2018, and discussed in greater detail in Note 10 of the Company's consolidated financial statements contained in our Annual Report on Form 10-K, offset by a $9.3 million increase in operating expenses primarily related to increased investment in clinical trial initiatives.

Income Taxes

The Company has not recorded a provision for income taxes for the years ending December 31, 2018 and 2017, respectively, due to being in a net tax operating loss position for each of those years.

On December 22, 2017, the 2017 Tax Cuts and Jobs Act (the "Tax Act") was enacted into law and the new legislation contains several key tax provisions that affected the Company, including a one-time mandatory

transition tax on accumulated foreign earnings and a reduction of the corporate income tax rate to 21% effective January 1, 2018, among others. The Company was required to recognize the effect of the tax law changes in the period of enactment, such as determining the transition tax, remeasuring our U.S. deferred tax assets and liabilities as well as reassessing the net realizability of our deferred tax assets and liabilities. In December 2017, the Securities and Exchange Commission issued Staff Accounting Bulletin No. 118, Income Tax Accounting Implications of the Tax Cuts and Jobs Act ("SAB 118"), which allowed the Company to record provisional amounts during a measurement period not to extend beyond one year of the enactment date. Since the Tax Act was passed late in the fourth quarter of 2017, and ongoing guidance and accounting interpretation were expected in 2018, the Company considered the accounting of deferred tax re-measurements and the transition tax to be incomplete due to the forthcoming guidance and our ongoing analysis of final year-end data and tax positions. However, during the year ended December 31, 2017 the Company was able to determine a provisional amount of $143,500 (offset by valuation allowance) and $0, respectively, related to the deferred tax re-measurement and one-time transition tax. See Note 14 to the Company's audited consolidated financial statements contained in our Annual Report on Form 10-K. The Company finalized its accounting of the effects of tax reform in 2018, which resulted in insignificant adjustments.

Application of Critical Accounting Policies

The Company's consolidated financial statements have been prepared in accordance with generally accepted accounting principles in the United States of America ("GAAP"). Certain accounting policies have a significant impact on amounts reported in the consolidated financial statements. A summary of those significant accounting policies can be found in Note 3 to the Company's audited consolidated financial statements contained in our Annual Report on Form 10-K.

The Company considers the valuation allowance for the deferred tax assets to be a significant accounting estimate. A valuation allowance has been recorded against the Company's deferred tax assets as management believes it is more likely than not that the deferred tax assets will not be realized. In assessing whether it is more likely than not that the Company will realize the benefits of its deferred tax assets, management considers all forms of available evidence, including the Company's history of cumulative losses, estimates of future taxable income and losses (including reversals of deferred tax liabilities), and available tax planning strategies. Since the Company is in a cumulative loss position, it cannot rely on future taxable income as a source of taxable income because the Company views a cumulative loss position as significant objective negative evidence that would be difficult to overcome with the other subjective tests discussed. The Company does not have taxable income in prior years to absorb the carryback of net operating losses, nor has it implemented tax-planning strategies that would, if necessary, be implemented to allow for the usage of net operating losses.

Prior to ASU 2016-16, GAAP prohibited the recognition of current and deferred income taxes for intra-entity asset transfers until the asset has been sold to an outside party. ASU 2016-16 eliminates this prohibition for intra-entity transfers of assets other than inventory but retain the prohibition for intra-entity transfers of inventory. This standard is effective for public entities for fiscal years beginning after December 15, 2017. On January 1, 2012, Delcath Systems, Inc. sold a portion of its intellectual property to affiliate, Delcath Holdings Limited, resulting in a taxable gain of $15.8 million in the U.S. based on the fair market value of the intangible that was transferred. The arms-length price, which was determined in accordance with Section 482 of the Internal Revenue Code, is a significant accounting estimate. Prior to ASU 2016-2016, the gain was deferred under GAAP principles until the asset is sold outside of the consolidated financial statements. The remaining deferred gain on the intercompany sale of intangible assets is $2.0 million as of December 31, 2017. The Company adopted ASU 2016-16, effective on January 1, 2018. As a result of adoption, the Company immediately recognized the $2.0 million deferred gain and none remains as of December 31, 2018.

The Company has adopted the provisions of Accounting Standard Codification ("ASC") 718, Stock-Based Compensation, which establishes accounting for equity instruments exchanged for employee services.

Under the provisions of ASC 718, share-based compensation is measured at the grant date, based upon the fair value of the award, and is recognized as an expense over the option holders' requisite service period (generally the vesting period of the equity grant). The Company expenses its share-based compensation under the accelerated method, which treats each vesting tranche as if it were an individual grant.

The Company has adopted the provisions of ASC 505-50, Equity-Based Payments to Non-Employees, which establishes accounting for equity-based payments to non-employees. Measurement of compensation cost related to common shares issued to non-employees for services is based on the value of the services provided or the fair value of the shares issued. Each transaction is reviewed to determine the more reliably measurable basis for the valuation. The measurement of non-employee stock-based compensation is subject to periodic adjustment as the underlying equity instrument vests. Non-employee stock-based compensation charges are amortized over the vesting period or period of performance of the services.

The Company has adopted the provisions of ASC 820, Fair Value Measurement, which defines fair value, establishes a framework for measuring fair value, and expands disclosures about fair value measurements.

ASC 820 emphasizes that fair value is a market-based measurement, not an entity-specific measurement. Therefore, a fair value measurement should be determined based on the assumptions that market participants would use in pricing the asset or liability. As a basis for considering market participant assumptions in fair value measurements, ASC 820 establishes a fair value hierarchy that distinguishes between market participant assumptions based on market data obtained from sources independent of the reporting entity (observable inputs that are classified within Levels 1 and 2 of the hierarchy) and the reporting entity's own assumptions about market participant assumptions (unobservable inputs classified within Level 3 of the hierarchy).

Level 1 inputs utilize quoted prices (unadjusted) in active markets for identical assets or liabilities that the Company has the ability to access. Level 2 inputs are inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly or indirectly. Level 2 inputs may include quoted prices for similar assets and liabilities in active markets, as well as inputs that are observable for the asset or liability (other than quoted prices), such as interest rates, foreign exchange rates, and yield curves that are observable at commonly quoted intervals. Level 3 inputs are unobservable inputs for the asset or liability which are typically based on an entity's own assumptions, as there is little, if any, related market activity. In instances where the determination of the fair value measurement is based on inputs from different levels of the fair value hierarchy, the level in the fair value hierarchy within which the entire fair value measurement falls is based on the lowest level input that is significant to the fair value measurement in its entirety. The Company's assessment of the significance of a particular input to the fair value measurement in its entirety requires judgment and considers factors specific to the asset or liability. See Note 12 to the Company's audited consolidated financial statements contained in our Annual Report on Form 10-K for assets and liabilities the Company has evaluated under ASC 820.

CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS

On April 3, 2018, the Audit Committee (the "Audit Committee" of the Board of Directors of the Company approved the engagement of Marcum LLP ("Marcum") as the Company's independent registered public accounting firm for the Company's fiscal year ended December 31, 2018, and the dismissal of Grant Thornton LLP ("Grant Thornton") as the Company's independent registered public accounting firm.

Grant Thornton's audit reports on the Company's consolidated financial statements as of and for the fiscal years ended December 31, 2017 and 2016 did not contain an adverse opinion or a disclaimer of opinion and were not qualified or modified as to uncertainty, audit scope or accounting principles, except that the report included an explanatory paragraph describing the existence of conditions that raise substantial doubt about the Company's ability to continue as a going concern.

The Company provided Grant Thornton with a copy of the disclosures to be made in its Current Report on Form 8-K and requested that Grant Thornton furnish a letter addressed to the Securities and Exchange Commission stating whether or not it agrees with the statements made herein. Grant Thornton furnished a letter indicating that it agreed with the Company's statements concerning Grant Thornton contained therein.

During the fiscal years ended December 31, 2017, and 2016, and the subsequent interim periods through April 9, 2018, there were (i) no disagreements (as described in Item 304(a)(1)(iv) of Regulation S-K and the related instructions) between the Company and Grant Thornton on any matter of accounting principles or practices, financial statement disclosure, or auditing scope or procedure, which, if not resolved to Grant Thornton's satisfaction, would have caused Grant Thornton to make reference thereto in their reports on the financial statements for such years, and (ii) no "reportable events" within the meaning of Item 304(a)(1)(v) of Regulation SK. During the fiscal years ended December 31, 2017, and 2016, and the subsequent interim periods through April 9, 2018, neither the Company nor anyone acting on its behalf has consulted with Marcum regarding (i) the application of accounting principles to a specific transaction, either completed or proposed, or the type of audit opinion that might be rendered on the Company's financial statements or the effectiveness of internal control over financial reporting, and neither a written report or oral advice was provided to the Company by Marcum that was considered by the Company in reaching a decision as to any accounting, auditing, or financial reporting issue, (ii) any matter that was the subject of a disagreement within the meaning of Item 304(a)(1)(iv) of Regulation S-K, or (iii) any reportable event within the meaning of Item 304(a)(1)(v) of Regulation S-K.

SHARES AVAILABLE FOR FUTURE SALE

As of September 25, 2019, we had 18,277,807 shares of Common Stock outstanding, not including shares issuable upon the exercise of outstanding warrants, stock options and other convertible securities. All shares sold in this offering will be freely tradable without restriction or further registration under the Securities Act, unless they are purchased by our "affiliates," as that term is defined in Rule 144 promulgated under the Securities Act. The outstanding shares of our Common Stock not included in this prospectus will be available for sale in the public market as follows:

Public Float

Of our outstanding shares of Common Stock, 36,112 shares are beneficially owned by executive officers, directors and affiliates of the Company. The remaining 18,241,695 shares constitute our public float which, based on the last sale price of our Common Stock reported on the OTC QB on September 24, 2019, equaled approximately $1,970,103.66.

Rule 144

In general, under Rule 144, as currently in effect, a person who has beneficially owned shares of our Common Stock for at least six (6) months, including the holding period of prior owners other than affiliates, is entitled to sell his or her shares without any volume limitations; an affiliate, however, can sell such number of shares within any three-month period as does not exceed the greater of:

- 1% of the number of shares of our Common Stock then outstanding, which equaled 182,778 shares as of September 25, 2019, or
- the average weekly trading volume of our Common Stock, assuming our shares are then traded on a national securities exchange, during the four calendar weeks preceding the filing of a notice on Form 144 with respect to that sale.

Sales under Rule 144 are also subject to manner-of-sale provisions, notice requirements and the availability of current public information about us.

LEGAL MATTERS

Certain legal matters will be passed upon for us by McCarter & English LLP, Newark, New Jersey, including the validity of the Common Stock offered hereby.

EXPERTS

The consolidated financial statements as of December 31, 2018 and for the year then ended included in this prospectus and in the registration statement have been so included in reliance on the report of Marcum LLP, an independent registered public accounting firm, (the report on the financial statements contains an explanatory paragraph regarding the Company's ability to continue as a going concern) appearing elsewhere herein and in the registration statement, given on the authority of said firm as experts in auditing and accounting.

The consolidated financial statements as of December 31, 2017 and for the year then ended included in this prospectus and in the registration statement have been so included in reliance on the report of Grant Thornton LLP, an independent registered public accounting firm, (the report on the financial statements contains an explanatory paragraph regarding the Company's ability to continue as a going concern) appearing elsewhere herein and in the registration statement, given on the authority of said firm as experts in auditing and accounting.

INTEREST OF NAMED EXPERTS AND COUNSEL

No expert or counsel named in this prospectus as having prepared or certified any part of this prospectus or having given an opinion upon the validity of the securities being registered or upon other legal matters in connection with the registration or offering of the Common Stock was employed on a contingency basis, or had, or is to receive, in connection with the offering, a substantial interest, direct or indirect, in the registrant or any of its parents or subsidiaries. Nor was any such person connected with the registrant or any of its parents or subsidiaries as a promoter, managing or principal underwriter, voting trustee, director, officer, or employee.

WHERE TO FIND MORE INFORMATION

We have filed a registration statement on Form S-1 with the SEC to register resale of shares of our Common Stock being offered by this prospectus. For further information with respect to us and our Common Stock, please see the registration statement on Form S-1 and the exhibits thereto. In addition, we file annual, quarterly and current reports, proxy statements and other information with the SEC. The SEC maintains a website, http://www.sec.gov that contains reports, proxy statements and information statements and other information regarding registrants that file electronically with the SEC, including us. Our SEC filings are also available to the public from commercial document retrieval services. Information contained on our website should not be considered part of this prospectus.

You may also request a copy of our filings at no cost by writing or telephoning us at:

Delcath Systems, Inc.
1633 Broadway, Suite 22C
New York, New York 10019
Attn: Barbra C. Keck, Corporate Secretary
E-Mail: investorrelations@delcath.com
Telephone: (212) 489-2100

Our website address is http://www.delcath.com. Information contained in our website does not constitute any part of, and is not incorporated into, this prospectus.

Consolidated Financial Statements

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and Board of Directors of

Delcath Systems, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheet of Delcath Systems, Inc. (the "Company") as of December 31, 2018, the related consolidated statements of operations and comprehensive loss, stockholders' equity and cash flows for the year ended December 31, 2018, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018, and the results of its operations and its cash flows for the year ended December 31, 2018, in conformity with accounting principles generally accepted in the United States of America.

Explanatory Paragraph—Going Concern

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern. As more fully described in Note 1, the Company has a working capital deficiency, has incurred losses and needs to raise additional funds to meet its obligations and sustain its operations. These conditions raise substantial doubt about the Company's 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 financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audit. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

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

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

/s/ Marcum LLP

We have served as the Company's auditor since 2018.

New York, New York June 14, 2019

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Stockholders Delcath Systems, Inc.

Opinion on the financial statements

We have audited the accompanying consolidated balance sheet of Delcath Systems Inc. (a Delaware corporation) and subsidiaries (the "Company") as of December 31, 2017, the related consolidated statement of operations, changes in stockholders' equity, and cash flow for the year ended December 31, 2017, and the related notes (collectively referred to as the "financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2017, and the results of its operations and its cash flow for the year ended December 31, 2017, in conformity with accounting principles generally accepted in the United States of America.

Going concern

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 2017 consolidated financial statements, the Company has incurred recurring losses from operations and as of December 31, 2017 has an accumulated deficit of $324.8 million. These conditions, along with other matters as set forth in Note 1 to the 2017 consolidated financial statements, raise substantial doubt about the Company's ability to continue as a going concern. Management's plans in regard to these matters are also discussed in Note 1 to the 2017 consolidated financial statements. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Basis for opinion

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

We conducted our audit in accordance with the auditing standards of the PCAOB and in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud.

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

We served as the Company's auditor from 2015 to 2017.

/s/ Grant Thornton LLP

New York, New York March 16, 2018 (except for the matter described in Note 2, second paragraph, as to which the date is May 2, 2018)

DELCATH SYSTEMS, INC.
Consolidated Balance Sheets
(in thousands, except share and per share data)

	December 31, 2018	December 31, 2017
Assets		
Current assets		
Cash and cash equivalents	$ 2,516	$ 3,999
Restricted cash	1,062	1,325
Accounts receivables, net	585	317
Inventories	858	1,248
Prepaid expenses and other current assets	898	700
Total current assets	5,919	7,589
Property, plant and equipment, net	925	1,298
Total assets	$ 6,844	$ 8,887
Liabilities and Stockholders' Equity (Deficit)		
Current liabilities		
Accounts payable	$ 7,715	$ 3,846
Accrued expenses	7,964	3,408
Convertible notes payable, net of debt discount	2,038	—
Warrant liability	33	560
Total current liabilities	17,750	7,814
Deferred revenue	3,405	—
Other non-current liabilities	628	395
Total liabilities	21,783	8,209
Commitments and contingencies		
Stockholders' Equity (Deficit)		
Preferred stock, $.01 par value; 10,000,000 shares authorized; 101 and 0 shares issued and outstanding at December 31, 2018 and December 31, 2017, respectively	—	—
Common stock, $.01 par value; 1,000,000,000 shares authorized; 10,299,954 and 228,140 shares issued and 10,229,954 and 228,139 shares outstanding at December 31, 2018 and December 31, 2017, respectively*	103	2
Additional paid-in capital	328,962	325,517
Accumulated deficit	(344,054)	(324,832)
Treasury stock, at cost; 0 and 1 share at December 31, 2018 and December 31, 2017, respectively*	—	(51)
Accumulated other comprehensive loss	50	42
Total stockholders' equity (deficit)	(14,939)	678
Total liabilities and stockholders' equity (deficit)	$ 6,844	$ 8,887

* reflects a one-for-three hundred and fifty (1:350) reverse stock split effected on November 6, 2017 and a one-for-five hundred (1:500) reverse stock split effected on May 2, 2018.

See Accompanying Notes to these Consolidated Financial Statements.

DELCATH SYSTEMS, INC.
Consolidated Statements of Operations and Comprehensive Loss
(in thousands, except share and per share data)

	Year ended December 31, 2018	2017
Product revenue	$ 3,378	$ 2,715
Other revenue	29	—
Cost of goods sold	(1,009)	(701)
Gross profit	2,398	2,014
Operating expenses:		
Research and development expenses	19,650	10,495
Selling, general and administrative expenses	9,819	9,684
Total operating expenses	29,469	20,179
Operating loss	(27,071)	(18,165)
Change in fair value of the warrant liability, net	19,706	15,103
Gain on warrant extinguishment	—	9,613
Loss on debt extinguishment	(1,123)	(29,924)
Loss on issuance of financial instrument	(2,826)	—
Interest expense	(7,959)	(21,703)
Other income (expense)	51	(41)
Net loss	$ (19,222)	$ (45,117)
Other comprehensive loss:		
Foreign currency translation adjustments	$ 8	$ 83
Comprehensive loss	$ (19,214)	$ (45,034)
Common share data:		
Basic and diluted loss per share*	$ (0.72)	$ (3,250)
Weighted average number of basic and diluted shares outstanding*	26,705,375	14,039

* reflects a one-for-three hundred and fifty (1:350) reverse stock split effected on November 6, 2017 and a one-for-five hundred (1:500) reverse stock split effected on May 2, 2018.

See Accompanying Notes to these Consolidated Financial Statements.

DELCATH SYSTEMS, INC.
Consolidated Statements of Stockholders' Equity (Deficit)
for the Years Ended December 31, 2018 and 2017
(in thousands, except share data)

	Common Stock Issued $0.01 Par Value*		Preferred Stock Issued $0.01 Par Value*		In Treasury*					
	# of shares	Amount	# of shares	Amount	# of shares	Amount	Additional Paid-in Capital*	Accumulated Deficit	Accumulated Other Comprehensive (loss) income	Total Stockholders' Equity (Deficit)
Balance at January 1, 2017	24	—	—	—	(1)	$ (51)	$ 277,790	$ (279,188)	$ (41)	$ (1,490)
Compensation expense for issuance of stock options	—	—	—	—	—	—	50	—	—	50
Compensation expense for issuance of restricted stock	—	—	—	—	—	—	79	—	—	79
Issuance of Common Stock and rights for payments made in shares on convertible notes payable	262,462	2	—	—	—	—	40,119	—	—	40,121
Fair value of beneficial conversion feature of convertible note	—	—	—	—	—	—	4,908	—	—	4,908
Series B preferred stock dividend	—	—	—	—	—	—	—	(527)	—	(527)
Warrants exercised	736	—	—	—	—	—	19	—	—	19
Fair value of warrants exercised	—	—	—	—	—	—	2,552	—	—	2,552
Adjustment for rounding related to Nov 2017 reverse stock split	93	—	—	—	—	—	—	—	—	—
Net loss		—	—	—	—	—	—	(45,117)	—	(45,117)
Foreign currency translation	—	—	—	—	—	—	—	—	83	83
Balance at December 31, 2017	263,315	2	—	—	(1)	(51)	325,517	(324,832)	42	678
Compensation income related to cancellation of stock options	—	—	—	—	—	—	(40)	—	—	(40)
Compensation expense for issuance of restricted stock	164,989	2	—	—	—	—	96	—	—	98
Sale of Common Stock, net of expenses	5,336,665	54	—	—	—	—	10,862	—	—	10,916
Fair value of warrants issued in Feb 2018 public offering	—	—	—	—	—	—	(18,306)	—	—	(18,306)
Cashless exercise of warrants	34,467	—	—	—	—	—	—	—	—	—
Issuance of pre-funded warrants	—	—	—	—	—	—	520	—	—	520
Exercise of pre-funded warrants	3,675,516	37	—	—	—	—	(37)	—	—	—
Fair value of warrants issued with Convertible Notes	—	—	—	—	—	—	5,007	—	—	5,007
Fair value of warrants reclassified from liability to equity	—	—	—	—	—	—	4,210	—	—	4,210
Beneficial conversion feature of convertible note	—	—	—	—	—	—	44	—	—	44
Issuance of Series D Preferred Stock	—	—	101	—	—	—	1,004	—	—	1,004
Exchange of warrants for Common Stock	825,002	8	—	—	—	—	(8)	—	—	—
Fair value of warrants exchanged for Common Stock	—	—	—	—	—	—	144	—	—	144
Retirement of Treasury Stock	—	—	—	—	1	51	(51)	—	—	—
Net loss	—	—	—	—	—	—	—	(19,222)	—	(19,222)
Foreign currency translation	—	—	—	—	—	—	—	—	8	8
Balance at December 31, 2018	10,299,954	103	101	—	—	0	328,962	(344,054)	50	(14,939)

* reflects a one-for-three hundred and fifty (1:350) reverse stock split effected on November 6,2017 and a one-for-five hundred (1:500) reverse stock split effected on May 2, 2018.

See Accompanying Notes to these Consolidated Financial Statements.

DELCATH SYSTEMS, INC.
Consolidated Statements of Cash Flows
(in thousands)

	Year ended December 31, 2018	2017
Cash flows from operating activities:		
Net loss	$ (19,222)	$ (45,117)
Adjustments to reconcile net loss to net cash used in operating activities:		
Stock option compensation expense	(40)	50
Restricted stock compensation expense	98	79
Depreciation expense	444	310
Loss on disposal of equipment	—	18
Warrant liability fair value adjustment	(19,706)	(15,103)
Gain on warrant extinguishment	—	(9,613)
Non-cash interest income	(1)	(1)
Interest expense accrued related to convertible notes	402	—
Debt discount and deferred finance costs amortization	7,572	21,544
Loss on issuance of financial instrument	2,826	—
Loss on debt settlements and extinguishments	1,123	29,924
Changes in assets and liabilities:		
Prepaid expenses and other assets	(218)	7
Accounts receivable	(293)	108
Inventories	385	(543)
Accounts payable and accrued expenses	8,163	3,180
Deferred revenue	3,503	(32)
Other non-current liabilities	232	(209)
Net cash used in operating activities	(14,732)	(15,398)
Cash flows from investing activities:		
Purchase of property, plant and equipment	(76)	(524)
Net cash (used in) provided by investing activities	(76)	(524)
Cash flows from financing activities:		
Expenses from the release of restricted cash	—	(1,212)
Cash paid to extinguish of Series C Warrants	—	(7,876)
Net proceeds from sale of Series B and Series C preferred shares	—	2,310
Cash paid to redeem Series A and Series B preferred shares	—	(2,360)
Cash paid to redeem Series C preferred shares	—	(590)
Cash paid pursuant to Exchange Agreement	—	(804)
Net proceeds from convertible note debt financing	5,664	—
Net proceeds from sale of stock	10,917	15
Net proceeds from exercise of warrants	520	—
Net proceeds from the sale of Series D preferred shares	1,005	—
Repayment of convertible note debt	(4,870)	—
Net cash provided by (used in) financing activities	13,236	(10,517)
Foreign currency effects on cash, cash equivalents and restricted cash	(174)	67
Net decrease in cash, cash equivalents and restricted cash	(1,746)	(26,372)
Cash, cash equivalents and restricted cash:		
Beginning of period	5,324	31,696
End of period	$ 3,578	$ 5,324
Supplemental non-cash activities:		
Conversion of convertible notes	$ —	$ 40,121
Fair value of warrants issued	$ 28,539	$ 16,953
Cashless exercise of warrants	$ —	$ 2,537
Deemed dividend	$ —	$ 527
Fair value of warrants exercised for cash	$ —	$ 19

See Accompanying Notes to these Consolidated Financial Statements.

DELCATH SYSTEMS, INC.
Notes to Consolidated Financial Statements
for the Years Ended December 31, 2018 and 2017

(1) DESCRIPTION OF BUSINESS

Delcath Systems, Inc. is an interventional oncology company focused on the treatment of primary and metastatic liver cancers. Our investigational product, "Melphalan Hydrochloride for Injection for use with the Delcath Hepatic Delivery System" ("Melphalan/HDS"), is designed to administer high-dose chemotherapy to the liver while controlling systemic exposure and associated side effects.

Our primary research focus is on ocular melanoma liver metastases ("mOM") and intrahepatic cholangiocarcinoma ("ICC") and certain other cancers that are metastatic to the liver. Currently there are few effective treatment options for certain cancers in the liver. Traditional treatment options include surgery, systemic chemotherapy, liver transplant, radiation therapy, interventional radiology techniques, and isolated hepatic perfusion. We believe that Melphalan/HDS and CHEMOSAT represent a potentially important advancement in regional therapy for primary liver cancer and certain other cancers metastatic to the liver and are uniquely positioned to treat the entire liver either as a standalone therapy or as a complement to other therapies.

Our clinical development program for Melphalan/HDS is comprised of the FOCUS Clinical Trial for Patients with Hepatic Dominant Ocular Melanoma (the "FOCUS Trial"), a global registration clinical trial that is investigating objective response rate in mOM, and the ALIGN Trial, a global Phase 3 clinical trial for ICC (the "ALIGN Trial"). Our product also includes a registry for CHEMOSAT commercial cases performed in Europe and sponsorship of select Investigator Initiated Trials.

While we currently utilize third parties to manufacture some components of our product, we also have our own manufacturing operations for certain components of our product and assemble and package our products in Queensbury, New York. See the discussion in Part 1, Item 1 under the caption "Manufacturing and Quality Assurance" above.

We commercialize our product in Europe through alliances with third parties.

Liquidity

The accompanying financial statements have been prepared on a going concern basis, which contemplates the realization of assets and the satisfaction of liabilities in the normal course of business. As shown in the accompanying financial statements during the year ended December 31, 2018, the Company incurred net losses of $19.2 million and used $14.7 million of cash for its operating activities. These factors among others raise substantial doubt about the Company's ability to continue as a going concern for a reasonable period of time.

The Company's existence is dependent upon management's ability to obtain additional funding sources or to enter into strategic alliances. Adequate additional financing may not be available to us on acceptable terms, or at all. If the Company is unable to raise additional capital and/or enter into strategic alliances when needed or on attractive terms, it would be forced to delay, reduce or eliminate our research and development programs or any commercialization efforts. There can be no assurance that the Company's efforts will result in the resolution of the Company's liquidity needs. If Delcath is not able to continue as a going concern, it is likely that holders of its Common Stock will lose all of their investment. The accompanying consolidated financial statements do not include any adjustments that might result should the Company be unable to continue as a going concern.

The Company anticipates incurring additional losses until such time, if ever, that it can generate significant sales. At December 31, 2018, management believed that its capital resources were adequate to fund operations through March 2019. Additional working capital will be required to continue operations.

Operations of the Company are subject to certain risks and uncertainties, including, among others, uncertainty of product development and clinical trial results; uncertainty regarding regulatory approval; technological uncertainty; uncertainty regarding patents and proprietary rights; comprehensive government regulations; limited commercial manufacturing, marketing or sales experience; and dependence on key personnel. See Note 15 of these notes to the Company's audited consolidated financial statements relating to subsequent events.

(2) BASIS OF CONSOLIDATED FINANCIAL STATEMENT PRESENTATION

The accounting and financial reporting policies of the Company conform to generally accepted accounting principles in the United States of America ("GAAP"). The preparation of consolidated financial statements in conformity with GAAP requires management to make assumptions and estimates that impact the amounts reported in the Company's consolidated financial statements. The consolidated financial statements include the accounts of all entities controlled by Delcath. All significant inter-company accounts and transactions are eliminated.

Reverse Stock Splits

All share numbers presented in this footnote reflect a one-for-three hundred and fifty (1:350) reverse stock split effected on November 6, 2017 and a one-for-five hundred (1:500) reverse stock split effected on May 2, 2018.

(3) SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Use of Estimates

The Company bases its estimates and judgments on historical experience and on various other assumptions that it believes are reasonable under the circumstances. The amounts of assets and liabilities reported in the Company's consolidated balance sheets and the amount of revenues and expenses reported for each of the periods presented are affected by estimates and assumptions, which are used for, but not limited to, the accounting for derivative instrument liabilities, stock-based compensation, valuation of inventory, impairment of long-lived assets, income taxes and operating expense accruals. Such assumptions and estimates are subject to change in the future as additional information becomes available or as circumstances are modified. Actual results could differ from these estimates.

Cash Equivalents and Concentrations of Credit Risk

The Company considers investments with original maturities of three months or less at date of acquisition to be cash equivalents. The Company has deposits that exceed amounts insured by the Federal Deposit Insurance Corporation ("FDIC"), however, the Company does not consider this a significant concentration of credit risk based on the strength of the financial institution.

Restricted Cash

Cash and cash equivalents that are restricted as to withdrawal or use under the terms of certain contractual agreements are recorded as restricted cash on the accompanying consolidated balance sheets.

Accounts Receivable

Accounts receivable, principally trade, are generally due within 30 days and are stated at amounts due from customers. Collections and payments from customers are monitored and a provision for estimated credit losses may be created based upon historical experience and specific customer collection issues that may be identified.

Inventories

Inventories are valued at the lower of cost or market value using the first-in, first-out method. The reported net value of inventory includes finished saleable products, work-in-process, and raw materials that will be sold or used in future periods. The Company reserves for expired, obsolete, and slow-moving inventory.

Property, Plant and Equipment

Property, plant and equipment are recorded at cost, less accumulated depreciation. The Company provides for depreciation on a straight line basis over the estimated useful lives of the assets which range from three to seven years. Leasehold improvements will be amortized over the shorter of the lease term or the estimated useful life of the related assets when they are placed into service. The Company evaluates property, plant and equipment for impairment periodically to determine if changes in circumstances or the occurrence of events suggest the carrying value of the asset or asset group may not be recoverable. Maintenance and repairs are charged to operations as incurred. Expenditures which substantially increase the useful lives of the related assets are capitalized.

Derivative Instrument Liability

The Company accounts for derivative instruments in accordance with Accounting Standards Codification (“ASC”) 815, Derivatives and Hedging, which establishes accounting and reporting standards for derivative instruments and hedging activities, including certain derivative instruments embedded in other financial instruments or contracts and requires recognition of all derivatives on the balance sheet at fair value, regardless of the hedging relationship designation. Accounting for changes in the fair value of the derivative instruments depends on whether the derivatives qualify as hedge relationships and the types of relationships designated are based on the exposures hedged. At December 31, 2018 and 2017, the Company did not have any derivative instruments that were designated as hedges.

Fair Value Measurements

The Company adheres to ASC 820, Fair Value Measurement, which defines fair value, establishes a framework for measuring fair value, and expands disclosures about fair value measurements. ASC 820 applies to reported balances that are required or permitted to be measured at fair value under existing accounting pronouncements; accordingly, the standard does not require any new fair value measurements of reported balances.

ASC 820 emphasizes that fair value is a market-based measurement, not an entity-specific measurement. Therefore, a fair value measurement should be determined based on the assumptions that market participants would use in pricing the asset or liability. As a basis for considering market participant assumptions in fair value measurements, ASC 820 establishes a fair value hierarchy that distinguishes between market participant assumptions based on market data obtained from sources independent of the reporting entity (observable inputs that are classified within Levels 1 and 2 of the hierarchy) and the reporting entity’s own assumptions about market participant assumptions (unobservable inputs classified within Level 3 of the hierarchy).

- Level 1 inputs utilize quoted prices (unadjusted) in active markets for identical assets or liabilities that the Company has the ability to access.
- Level 2 inputs are inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly or indirectly. Level 2 inputs may include quoted prices for similar assets and liabilities in active markets, as well as inputs that are observable for the asset or liability (other than quoted prices), such as interest rates, foreign exchange rates, and yield curves that are observable at commonly quoted intervals.

- Level 3 inputs are unobservable inputs for the asset or liability, which is typically based on an entity's own assumptions, as there is little, if any, related market activity.

In instances where the determination of the fair value measurement is based on inputs from different levels of the fair value hierarchy, the level in the fair value hierarchy within which the entire fair value measurement falls is based on the lowest level input that is significant to the fair value measurement in its entirety. The Company's assessment of the significance of a particular input to the fair value measurement in its entirety requires judgment and considers factors specific to the asset or liability.

Revenue Recognition

Revenue is generated from proprietary and partnered product sales and license and royalty arrangements. Revenue is recognized when or as we transfer control of the promised goods or services to our customers in an amount that reflects the consideration to which we expect to be entitled to in exchange for those goods or services. When obligations or contingencies remain after the products are shipped, such as training and certifying the treatment centers, revenue is deferred until the obligations or contingencies are satisfied.

We may enter into contracts with partners that contain multiple elements such as licensing, development, manufacturing and commercialization components. These arrangements are often complex and we may receive various types of consideration over the life of the arrangement, including: up-front fees, reimbursements for research and development services, milestone payments, payments on product shipments, margin sharing arrangements, license fees and royalties.

Our results of operations for reporting periods beginning on or after January 1, 2018 are presented under ASC 606, Revenue from Contracts with Customers, while prior period amounts, as reported, are not adjusted. The effects of the adoption of the new standard in 2018 were not material to our consolidated financial statements. In assessing our revenue arrangements in accordance with ASC 606, Revenue from Contracts with Customers, we must identify the contract, determine the transaction price including an estimation of any variable consideration we expect to receive in connection with the contract, identify the promises of goods or services to the customer and each distinct performance obligation, allocate the transaction price to each of the performance obligations, and recognize revenue when or as the performance obligations are satisfied. Each of these steps in the revenue recognition process requires management to make judgements and/or estimates. The most significant judgements and estimates involve the determination of variable consideration to be included in the transaction price. Variable consideration is recognized at an amount we believe is not subject to significant reversal and is adjusted at each reporting period if the most likely amount of expected consideration changes or becomes fixed. We believe this provides a reasonable basis for recognizing revenue, however, actual results could differ from estimates and significant changes in estimates could impact our results of operations in future periods.

Deferred Revenue

License fees and milestones received in exchange for the grant of a license for the commercialization of CHEMOSAT are generally recognized over the development period, as the license is considered distinct from the delivery of product. Milestone payments that are contingent upon the occurrence of future events, are evaluated and recorded at the most likely amount, and to the extent that it is probable that a significant reversal will not occur when the associated uncertainty is resolved.

Selling, General and Administrative

Selling, general and administrative costs include personnel costs and related expenses for the Company's sales, marketing, general management and administrative staff, recruitment, costs related to the Company's commercialization efforts in Europe, professional service fees, professional license fees, business development and certain general legal activities. All such costs are charged to expense when incurred.

Research and Development

Research and development costs include the costs of materials used for clinical trials and R&D, personnel costs associated with device and pharmaceutical R&D, clinical affairs, medical affairs, medical science liaisons, and regulatory affairs, costs of outside services and applicable indirect costs incurred in the development of the Company's proprietary drug delivery system. All such costs are charged to expense when incurred.

Stock Based Compensation

The Company accounts for its share-based compensation in accordance with the provisions of ASC 718, Stock-Based Compensation, which establishes accounting for equity instruments exchanged for employee services and ASC 505-50, Equity-Based Payments to Non-Employees, which establishes accounting for equity-based payments to non-employees. Under the provisions of ASC 718, share-based compensation is measured at the grant date, based upon the fair value of the award, and is recognized as an expense over the option holders' requisite service period (generally the vesting period of the equity grant). The Company is required to record compensation cost for all share-based payments granted to employees based upon the grant date fair value, estimated in accordance with the provisions of ASC 718. Under the provisions of ASC 505-50, measurement of compensation cost related to common shares issued to non-employees for services is based on the value of the services provided or the fair value of the shares issued. The measurement of non-employee stock-based compensation is subject to periodic adjustment as the underlying equity instrument vests. The Company expenses its share-based compensation for share-based payments granted under the accelerated method, which treats each vesting tranche as if it were an individual grant.

The Company periodically grants stock options for a fixed number of shares of Common Stock to its employees, directors and non-employee contractors, with an exercise price greater than or equal to the fair market value of Delcath's Common Stock at the date of the grant. The Company estimates the fair value of stock options using an option pricing model. Key inputs used to estimate the fair value of stock options include the exercise price of the award, the expected post-vesting option life, the expected volatility of Delcath's stock over the option's expected term, the risk-free interest rate over the option's expected term, and Delcath's expected annual dividend yield. Estimates of fair value are not intended to predict actual future events or the value ultimately realized by persons who receive equity awards.

Income Taxes

The Company accounts for income taxes following the asset and liability method in accordance with the ASC 740, Income Taxes. Under such method, deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the consolidated financial statement carrying amounts of existing assets and liabilities and their respective tax bases. The Company applies the accounting guidance issued to address the accounting for uncertain tax positions. This guidance clarifies the accounting for income taxes, by prescribing a minimum recognition threshold a tax position is required to meet before being recognized in the financial statements as well as provides guidance on derecognition, measurement, classification, interest and penalties, accounting in interim periods, disclosure and transition. The Company classifies interest and penalty expense related to uncertain tax positions as a component of income tax expense. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years that the asset is expected to be recovered or the liability settled. A valuation allowance is provided when it is more likely than not that some portion or all of a deferred tax asset will not be realized. The ultimate realization of deferred tax assets depends on the generation of future taxable income during the period in which related temporary differences become deductible. The Company considers the scheduled reversal of deferred tax liabilities, projected future taxable income and tax planning strategies in its assessment of a valuation allowance. See Note 14 for additional information.

Net Loss per Common Share

Basic net loss per share is determined by dividing net loss by the weighted average shares of Common Stock outstanding during the period. Diluted net loss per share is determined by dividing net loss by diluted weighted average shares outstanding. Diluted weighted average shares reflects the dilutive effect, if any, of potentially dilutive common shares, such as stock options and warrants calculated using the treasury stock method. In periods with reported net operating losses, all stock options, unvested restricted stock and warrants are deemed anti-dilutive such that basic net loss per share and diluted net loss per share are equal.

The calculation of net loss and the number of shares used to compute basic and diluted earnings per share for the years ended December 31, 2018 and 2017:

(in thousands, except share data)	December 31, 2018	2017
Net loss—basic	$ (19,222)	$ (45,117)
Preferred stock dividends	—	(527)
Net loss—diluted	$ (19,222)	$ (45,644)
Weighted average shares outstanding—basic	26,705,375	14,039
Weighted average shares outstanding—diluted	26,705,375	14,039
Net loss per share—basic	$ (0.72)	$ (3,250)
Net loss per share—diluted	$ (0.72)	$ (3,250)

In the third quarter of 2017, the Company issued Series B Preferred Shares. A portion of the redemption price of the Series B Preferred Shares was accounted for as a deemed dividend.

At December 31, 2018, the Company has 61.3 million pre-funded warrants outstanding. The following table provides a reconciliation of the weighted average shares outstanding calculation at December 31, 2018:

	December 31, 2018
Weighted average shares issued	2,738,944
Weighted average pre-funded warrants	23,966,431
Weighted average shares outstanding	26,705,375

For the years ended December 31, 2018 and 2017 the following potentially dilutive securities were excluded from the computation of diluted earnings per share because their effects would be antidilutive.

Shares excluded from the computation of diluted earnings per share:

	2018	2017
Common stock warrants—equity	4,202,909	14,049
Common stock warrants—liability	189,029	—
Assumed conversion of convertible notes	2,576,203	—
Total	6,968,141	14,049

Segment Information

The Company currently operates in one business segment, which is the development and commercialization of Melphalan/HDS and CHEMOSAT. A single management team that reports to the CEO and President comprehensively manages the business. Accordingly, the Company does not have separately reportable segments.

Foreign Currency and Currency Translation

Transactions that are denominated in a foreign currency are remeasured into the functional currency at the current exchange rate on the date of the transaction. Any foreign currency-denominated monetary assets and liabilities are subsequently remeasured at current exchange rates, with gains or losses recognized as foreign exchange (losses)/gains in the statements of operations.

The assets and liabilities of the Company's international subsidiaries are translated from their functional currencies into United States dollars at exchange rates prevailing at the balance sheet date. The majority of the foreign subsidiaries revenues and operating expenses are denominated in Euros. The reporting currency for the Company is the United States Dollar ("USD"). Average rates of exchange during the period are used to translate the statement of operations, while historical rates of exchange are used to translate any equity transactions.

Translation adjustments arising on consolidation due to differences between average rates and balance sheet rates, as well as unrealized foreign exchange gains or losses arising from translation of intercompany loans that are of a long-term-investment nature, are recorded in other comprehensive income.

Recently Adopted Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2014-09, Revenue from Contracts with Customers, that updates the principles for recognizing revenue. The core principle of the guidance is that an entity should recognize revenue 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. ASU 2014-09 also amends the required disclosures of the nature, amount, timing and uncertainty of revenue and cash flows arising from contracts with customers. ASU 2014-09 is effective for the Company beginning in its fiscal year 2018, and may be applied retrospectively to all prior periods presented or through a cumulative adjustment to the opening retained earnings balance in the year of adoption. The Company has adopted this guidance.

In June 2016, the FASB issued ASU 2016-15, Statement of Cash Flows (Topic 230), which is intended to reduce diversity in practice in how certain transactions are classified in the statement of cash flows. The ASU is effective for public companies for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. Early adoption was permitted, including interim periods within those fiscal years provided that those electing early adoption must adopt all of the amendments in the same period. The guidance requires application using a retrospective transition method. The Company has adopted this guidance.

In October 2016, the FASB issues ASU 2016-16 which simplifies the income tax consequences of intra-entity transfers other than inventory. Prior to ASU 2016-16, GAAL prohibited the recognition of current and deferred income taxes for intra-entity asset transfers until the asset has been sold to an outside party. ASU 2016-16 eliminates this prohibition for intra-entity transfers of assets other than inventory but retains the prohibition for intra-entity transfers of inventory. This standard is effective go r public entities for fiscal years beginning after December 15, 2017. The Company has adopted this guidance. The adoption did not have a material impact on the Company's consolidated financial statements.

In November 2016, the FASB issued ASU 2016-18, Statement of Cash Flows (Topic 230): Restricted Cash, which requires that the statement of cash flows explain the change during the period in the total of cash, cash equivalents, and amounts generally described as restricted cash or restricted cash equivalents. Entities are also required to reconcile such total to amounts on the balance sheet and disclose the nature of the restrictions. ASU 2016-18 is effective for fiscal years beginning after December 15, 2017 and interim periods within those fiscal years, and early adoption was permitted. The Company adopted this standard.

SEC Disclosure Update and Simplification

In August 2018, the SEC adopted the final rule under SEC Release No. 33-10532, Disclosure Update and Simplification, amending certain disclosure requirements that were redundant, duplicative, overlapping, outdated or superseded. In addition, the amendments expanded the disclosure requirements on the analysis of stockholders' equity for interim financial statements. Under the amendments, an analysis of changes in each caption of stockholders' equity presented in the balance sheet must be provided in a note or separate statement. The analysis should present a reconciliation of the beginning balance to the ending balance of each period for which a statement of comprehensive income is required to be filed. This final rule was effective on November 5, 2018. The adoption did not have a material impact on the Company's consolidated financial statements.

Recent Accounting Standards to be Adopted

In February 2016, the FASB issued ASU No. 2016-02, Leases (Topic 842), superseding ASC Topic 840, Leases. ASU 2016-02 requires lessees to recognize a right-of-use asset and a lease liability on their balance sheets for all the leases with terms greater than twelve months. Based on certain criteria, leases will be classified as either financing or operating, with classification affecting the pattern of expense recognition in the income statement. For leases with a term of twelve months or less, a lessee is permitted to make an accounting policy election by class of underlying asset not to recognize lease assets and lease liabilities. If a lessee makes this election, it should recognize lease expense for such leases generally on a straight-line basis over the lease term. ASU 2016-02 is effective for fiscal years beginning after December 15, 2018, and interim periods within those years, with early adoption permitted. In transition, lessees and lessors are required to recognize and measure leases at the beginning of the earliest period presented using a modified retrospective approach. In July 2018, the FASB issued ASU No. 2018-11, Leases (Topic 842): Targeted Improvements that allows entities to apply the provisions of the new standard at the effective date (e.g. January 1, 2019), as opposed to the earliest period presented under the modified retrospective transition approach (January 1, 2017) and recognize a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption. The modified retrospective approach includes a number of optional practical expedients primarily focused on leases that commenced before the effective date of Topic 842, including continuing to account for leases that commence before the effective date in accordance with previous guidance, unless the lease is modified. The Company is currently evaluating the effect the guidance will have on our audited consolidated financial statements.

In July 2017, the FASB issued ASU 2017-11, Earnings Per Share (Topic 260) Distinguishing Liabilities from Equity (Topic 480) Derivatives and Hedging (Topic 815). This guidance was intended to reduce the complexity associated with the issuer's accounting for certain financial instruments with characteristics of liabilities and equity. Specifically, the Board determined that a down round feature would no longer cause a freestanding equity-linked financial instrument (or an embedded conversion option) to be accounted for as a derivative liability at fair value with changes in fair value recognized in current earnings. In addition, the Board re-characterized the indefinite deferral of certain provisions of Topic 480 to a scope exception. The re-characterization has no accounting effect. ASU 2017-11 is effective for public entities for fiscal years beginning after December 15, 2018. The Company intends to adopt this standard on January 1, 2019 and is evaluating the effects, if any, that the adoption of this guidance will have on the Company's consolidated financial statements.

(4) RESTRICTED CASH

Cash and cash equivalents that are restricted as to withdrawal or use under the terms of certain contractual agreements are recorded in *Restricted Cash* on the balance sheet. Restricted cash does not include required minimum balances.

(in thousands)	December 31, 2018	December 31, 2017
Cash and cash equivalents	$ 2,516	$ 3,999
Convertible Notes	—	238
Letters of credit	1,012	1,012
Security for credit cards	50	75
Total cash, cash equivalents and restricted cash shown in the statement of cash flows	$ 3,578	$ 5,324

(5) INVENTORIES

Inventories consist of:

(in thousands)	December 31, 2018	December 31, 2017
Raw materials	$ 358	$ 298
Work-in-process	500	721
Finished goods	—	229
Total Inventory	$ 858	$ 1,248

(6) PREPAID EXPENSES AND OTHER CURRENT ASSETS

Prepaid expenses and other current assets include the following:

(in thousands)	December 31, 2018	December 31, 2017
Insurance premiums	$ 140	$ 421
Financing costs	—	70
Security deposit	51	50
Income tax and VAT receivable	579	29
Other[1]	128	130
Total prepaid expenses and other current assets	$ 898	$ 700

1 Other consists of various prepaid expenses and other current assets, with no individual item accounting for more than 5% at December 31, 2018 and 2017.

(7) PROPERTY, PLANT, AND EQUIPMENT

Property, plant, and equipment consists of:

(in thousands)	December 31, 2018	December 31, 2017	Estimated Useful Life
Buildings and land	$ 589	$ 579	30 years-Buildings
Enterprise hardware and software	1,742	1,744	3 years
Leaseholds	1,701	1,705	Lesser of lease term or estimated useful life
Equipment	1,002	971	7 years
Furniture	198	175	5 years
Property, plant and equipment, gross	5,232	5,174	
Accumulated depreciation	(4,307)	(3,876)	
Property, plant and equipment, net	$ 925	$ 1,298	

Depreciation expense for the years ended December 31, 2018 and 2017 was $0.4 million, $0.3 million, respectively.

(8) CURRENT ACCRUED EXPENSES

Current accrued expenses include the following:

(in thousands)	December 31, 2018	December 31, 2017
Clinical trial expenses	$ 4,530	$ 869
Compensation, excluding taxes	1,785	1,124
Professional fees	190	221
Short-term portion of lease restructuring	184	209
Other[1]	1,275	985
Total accrued expenses	$ 7,964	$ 3,408

1 Other consists of various accrued expenses, with no individual item accounting for more than 5% of current liabilities at December 31, 2018 and 2017.

(9) RESTRUCTURING EXPENSES

In order to help reduce operating costs and more appropriately align its office space with the size of its workforce, the Company entered into two sub-leases for office space at its 810 Seventh Avenue office. On May 22, 2014, the Company entered into a sub-lease agreement (“Sub-lease #1”) for approximately one-half of the office space at this location (“Suite 3500”), resulting in a lease restructuring reserve of approximately $0.9 million. On August 18, 2014, the Company entered into a sub-lease agreement (“Sub-lease #2”) for the remaining one-half of office space at its 810 Seventh Avenue office (“Suite 3505”), resulting in a lease restructuring reserve of approximately $0.7 million. As of December 31, 2018, the total remaining lease restructuring liability for its leased office space was approximately $0.4 million, of which approximately $0.2 million and $0.2 million were included in Accrued expenses and Other non-current liabilities on the consolidated balance sheets, respectively.

The following table provides the year-to-date activity of the Company's restructuring reserves as of December 31, 2018:

(in thousands)	Lease Liability
Reserve balance at December 31, 2017	$ 604
Charges	—
Payments/Utilizations	(208)
Reserve balance at December 31, 2018	$ 396

(10) CONVERTIBLE NOTES PAYABLE (SECURED CONVERTIBLE NOTES AND RELATED COMMON STOCK PURCHASE WARRANTS)

On June 4, 2018, July 21, 2018, August 29, 2018, and September 21, 2018, the Company issued 8% senior secured convertible notes (collectively, "the Notes") to investors with aggregate principal of $9.4 million and maturity dates between December 2018 and March 2021. The Notes are secured pursuant to a Security Agreement which creates a first priority security interest in all of the personal property (other than Excluded Collateral (as defined in the Security Agreement) of the Company of every kind and description, tangible or intangible, whether currently owned and existing or created or acquired in the future. At December 31, 2018, the Notes were convertible at $1.75 per share subject to customary terms.

In April 2019, the Company received notices of default from the investors in the Notes.

In connection with the issuance of the Notes, the Company also issued 4.2 million Series D Warrants with exercise prices ranging from $1.75—$4.00 and 65.0 million Pre-Funded Series D Warrants with a purchase price of $0.01. The warrants expire 5 years from the date they could first be exercised. The provisions in the Series D Warrants and Pre-Funded Series D Warrants issued in June 2018 required the Company to initially account for the warrants as derivative liabilities. The warrants were valued at $5.1 million. As a result, the Company recognized a discount to debt of $2.3 million and a loss on issuance of a financial instrument of $2.8 million.

The Company valued the June 2018 Series D Warrants using the following inputs:

	June 2018 Series D Warrant	June 2018 Pre-Funded Series D Warrants
Contractual life	5.0	5.5 - 6.5
Expected volatility	194.10%	215.0% - 389.0%
Risk-free interest rates	2.78%	2.13% - 2.30%

First Amendment to June 2018 Series D Warrants

In July 2018, the Company and the investor from the June 2018 transaction amended the June 2018 Pre-Funded Series D Warrants so that they are exercisable as of July 20, 2018 and the Company may redeem them at any time the Notes are no longer outstanding and the Company is not in default. The Company and the investor from the June 2018 transaction also amended the definition of a Fundamental Transaction in the June 2018 Warrants. This amendment resulted in $4.2 million related to the fair value of the June 2018 Warrants being reclassified from a liability to equity.

Amendment to June 2018 and July 2018 Notes and Pre-Funded Warrants

In August 2018, the Company amended its June 2018 Notes and July 2018 Notes such that the conversion price was reduced to $1.75, interest shall accrue until maturity, and the first $2.5 million and 50% of any subsequent financings shall be used to satisfy the Company's obligations under the Notes. Effective the same date, the Company also amended its Pre-Funded Warrants such that the total number of June 2018

Pre-Funded Warrants was increased from 13.0 million to 22.2 million and the total number of July 2018 Pre-Funded Warrants was increased from 9.2 million to 15.8 million. This amendment was accounted for as an extinguishment of debt as the change in cash flows exceeded 10%. The original June 2018 and July 2018 notes were written off and the amended June 2018 and July 2018 Notes were recorded at fair value as of the date of this amendment. The Company recorded $1.1 million loss on debt extinguishment related to this amendment.

The following table provides a summary of the Notes by their maturity dates (absent provisions of default):

(in millions)	Interest rate	Conversion price	Principal	Unamortized Discount	Carrying value
December 4, 2018	8.0%	$ 1.75	$ 1.7	$ —	$ 1.7
March 1, 2019	8.0%	1.75	0.6	(0.5)	0.1
March 21, 2019	8.0%	1.75	0.4	(0.2)	0.2
December 4, 2019	8.0%	1.75	0.9	(0.9)	—
March 1, 2020	8.0%	1.75	0.8	(0.8)	—
March 21, 2020	8.0%	1.75	0.1	(0.1)	—
Total Convertible Notes Payable, net			$ 4.5	$ (2.5)	$ 2.0

(11) STOCKHOLDERS' EQUITY

Preferred Stock Issuances

Series D Preferred Stock

On November 5, 2018, the Company's Board authorized the establishment of a new series of preferred stock designated as Series D Preferred Stock, $0.01 par value, the terms of which are set forth in the certificate of designations for such series of Preferred Stock which was filed with the State of Delaware on November 5, 2018. On November 6, 2018 and November 30, 2018, the Company entered into a securities purchase agreements with an institutional investor which had purchased 101 shares of Series D Preferred Stock. At issuance, the Series D Preferred Stock would convert to 1,655,738 common shares.

On March 29, 2019, the Company exchanged all of its Series D Preferred Stock (with a stated value of $1,160,000) and received $400,000 in proceeds and issued a senior secured promissory note to an investor with a principal amount of $1,560,000. As a result, the Series D Preferred Stock is no longer outstanding.

Stock and Warrant Issuances

February 2018 Financing

In February 2018, the Company completed the sale of 424,000 shares of its Common Stock, 76,000 pre-funded warrants and the issuance of warrants to purchase 1.0 million common shares (the "February 2018 Warrants") pursuant to a placement agent agreement, with net proceeds after expenses of $4.3 million. The February 2018 Warrants are exercisable one year after the anniversary date of their issuance. At December 31, 2018, the February 2018 Warrants were exercisable at $10.00 per share with 0.2 million warrants outstanding. The Company allocated an estimated fair value of $18.3 million to the February 2018 Warrants. The Company valued the February 2018 Warrants using the following inputs: exercise price of $10.00; contractual term of six years; volatility of 122.68% and risk-free rate of approximately one percent. Due to certain price protection features in the agreement, the February 2018 Warrants were accounted for as a derivative liability at issuance and will be subsequently marked to market through the statement of operations.

September 2018 Rights Offering

In September 2018, the Company completed the sale of 4,667,811 shares of its Common Stock, with net proceeds after expenses of approximately $7.0 million. The rights offering was made pursuant to a Registration Statement on Form S-1 that was made effective on August 3, 2018.

December 2018 Warrant Exchange

In December 2018, the Company entered into exchange agreements with several institutional investors with respect to their November 2017 Warrants and February 2018 Warrants. The Company issued to the investors 0.8 million shares of Common Stock (the "Exchange Shares") in exchange for the Existing Warrants (the "Exchange"). The Exchange was made in reliance upon the exemption from registration provided by Section 3(a)(9) of the Securities Act of 1933, as amended.

Pre-Funded Series D Warrant Exercises

3.7 million Pre-Funded Series D Warrants were exercised during 2018.

In October 2018, the Company filed a registration statement on Form S-3 with the SEC, which was declared effective on December 21, 2018 and allows the Company to offer and sell, from time to time in one or more offerings, up to $100.0 million shares of Common Stock, preferred stock, warrants, debt securities and stock purchase contracts as it deems prudent or necessary to raise capital at a later date. The Company has lost its eligibility to use Form S-3 due to the late filing of its Annual Report on Form 10-K for the fiscal year ended December 31, 2018 and its late filing of its Quarterly Report on Form 10-Q for the fiscal quarter ended March 31, 2019.

Stock Incentive Plans

As a result of the May 2, 2018 reverse stock split, the Company's Stock Incentive Plan has no active grants and no further shares available to be granted.

As previously reported, on February 1, 2019 the Board of Directors of the Company adopted the Company's 2019 Equity Incentive Plan (the "2019 Plan"), pursuant to which 1,500,000 shares of Common Stock of the Company are available for grants through February 1, 2029 to the Company's employees, directors and consultants. On February 1, 2019, options to purchase 1,250,000 shares of Common Stock, at an exercise price of $0.281 per share, were granted under the 2019 Plan to certain executive officers and employees of the Company. The stock options are vesting over a period of one year commencing from the date of grant in twelve equal monthly increments commencing on the one month anniversary of the grant date. The stock options carry a ten year term and expire on February 1, 2029.

For the years ended December 31, 2018 and December 31, 2017, the Company recognized compensation income of $0.04 million and $0.05 million, respectively, related to stock options granted to employees.

For the years ended December 31, 2018 and December 31, 2017, the Company recognized compensation expense of approximately $0.1 million and $0.1 million, respectively, related to restricted stock granted to employees and consultants.

Warrants

The Company issued warrants as part of its offerings in 2013, 2015, 2016 and 2018 as well as part of its issuance of convertible notes in 2016 and 2018 and an exchange agreement in 2017. A summary of warrant activity is as follows:

	Warrants	Exercise Price per Share	Weighted Average Exercise Price	Weighted Average Remaining Life (Years)
Outstanding at January 1, 2017	78	$281,750 - $19,712,000	$ 910,000	5.59
Warrants issued	14,256		2,299	
Warrants exercised	(246)		4,221	
Warrants expired	(39)		845,250	
Outstanding at December 31, 2017	14,049	$1,225 - $19,712,000	$ 1,569	4.88
Warrants issued in Feb 2018 registered direct offering	1,076,002		9.33	
Warrants issued with convertible notes	69,169,756		0.18	
Exercised	(4,574,529)		1.79	
Expired	(9)		19,712,000	
Outstanding at December 31, 2018	65,685,269	$0.01 - $10.00	$ 0.22	5.75

(12) DERIVATIVE FINANCIAL INSTRUMENTS

Management expects that the Warrants will either be exercised or expire worthless. The fair value of the Warrants at December 31, 2018 was determined by using option pricing models assuming the following:

	December 31, 2018	December 31, 2017
Expected life (in years)	1.13 - 5.11	0.82 - 4.88
Expected volatility	145.7% - 265.3%	130.9% - 266.9%
Risk-free interest rates	2.5% - 2.6%	1.7% - 2.1%

The table below presents the Company's assets and liabilities measured at fair value on a recurring basis as of December 31, 2018 and 2017, aggregated by the level in the fair value hierarchy within which those measurements fall.

Assets and Liabilities Measured at Fair Value on a Recurring Basis

	Assets and Liabilities Measured at Fair Value on a Recurring Basis							
	Level 1		Level 2		Level 3		Balance at December 31,	
(in thousands)	2018	2017	2018	2017	2018	2017	2018	2017
Liabilities								
Derivative instrument liabilities	$—	$—	$—	$—	$ 33	$560	$ 33	$ 560

For the twelve months ended December 31, 2018 and December 31, 2017 there were no transfers in or out of Level 1, 2 or 3 inputs.

The table below presents the activity within Level 3 of the fair value hierarchy for the twelve months ended December 31, 2018:

Fair Value Measurements Using Significant Unobservable Inputs (Level 3)

(in thousands)	Warrant Liability
Balance at January 1, 2017	$ 18,751
Total change in the liability included in earnings	(15,103)
Extinguishment of convertible note warrant	(17,489)
Fair value of warrants issued	16,953
Fair value of warrants exercised	(2,552)
Balance at December 31, 2017	560
Fair value of warrants issued	23,533
Total change in the liability included in earnings	(19,706)
Reclass from liability to equity	(4,210)
Fair value of warrants exchanged	(144)
Balance at December 31, 2018	$ 33

(13) COMMITMENTS

Operating Leases

In February 2010, the Company entered into an agreement to lease (Initial Lease) 8,629 square feet of office space at 810 Seventh Avenue, New York, NY with an option to expand an additional 8,629 square feet. The term of the Initial Lease began in March, 2010. In September 2010, the Company exercised its option right under the Initial Lease and entered into an agreement to lease (Lease Amendment) an additional 8,629 square feet of office space. The term of the Lease Amendment began in January 2011 and will expire in March 2021. In addition, the Lease Amendment extends the term of the Initial Lease to March 2021. The Initial Lease and the Lease Amendment provide for annual rent of $1.0 million in 2015, $1.0 million in 2016, and $1.2 million in 2017-2020. As discussed in Note 9, the Company has sub-leased this office space.

In August 2011, Delcath Systems Ltd. entered into an agreement of lease for an office and manufacturing facility located in the city of Galway, Ireland. This facility is approximately 19,200 square feet and is intended to be the location of Delcath's European headquarters. The Lease is for a term of ten years, commencing August, 2011. The Lease provides for fixed annual lease amounts payable in advance in equal quarterly installments. The remaining annual lease amount is $0.2 million. Delcath Systems Ltd. is also required to pay for customary building operating expenses. Delcath Systems Ltd.'s payment obligations and performance of the Lease are guaranteed by Delcath. The Company has sub-leased a portion of this facility.

In September 2018, the Company entered into an amendment (the "1633 Sublease Amendment") to a sub-lease agreement executed in March 2016 (the "1633 Sublease) for approximately 6,877 square feet of office space at 1633 Broadway, New York, NY. The term began in April 2016 and under the terms of the 1633 Sublease Amendment is extended through February 2021 and provides for total annual base rent of $0.5 million.

In January 2019, the Company entered into an amendment (the "Park Road Lease Amendment") to a lease agreement entered into in October 2018 (the "Park Road Lease") for approximately 6,000 square feet of space located at 95-97 Park Road in Queensbury, New York. Under the terms of the Park Road Lease Amendment, the original two year term which began on October 31, 2018 was extended through November 2020 and provides for total annual base rent of $50,000 per year.

Future minimum lease payments, net of receipts due under the terms of subleases, under all operating leases at December 31, 2018 are as follows:

(in thousands)	Future Lease Payment
2019	885
2020	916
2021	348
	$ 2,149

For the years ended December 31, 2018 and 2017 rent expense, net of receipts under the terms of subleases, totaled approximately $0.6 million and $0.6 million, respectively.

Litigation

As previously reported, on March 26, 2019, the Company commenced an action (the "Action") in the Commercial Division of the Supreme Court for the State of New York, County of New York, styled as Delcath Systems, Inc., v. Iroquois Capital Investment Group LLC, Iroquois Master Fund Ltd., L1 Capital Global Opportunities Master Fund and First Fire Global Opportunities Fund LLC (Index No. 651749/2019). The Action seeks expedited equitable relief in the form of reformation and a declaratory judgement to remedy a scrivener's error in the Series D Warrants issued in the Company's February 2018 public offering such that those warrants do not contain a price and quantity ratchet upon a sale of Company securities at a price lower than the offering price in the February 2018 offering. The defendant, L1 Capital Global Opportunities Master Fund, settled with the Company by exchanging its Series D Warrants for Company Common Stock on a one-for-one basis, which is the same ratio for which other investors in the February 2018 round exchanged their Series D Warrants in December 2018. The Company and the remaining defendants in the Action, Iroquois Capital Investment Group LLC, Iroquois Master Fund Ltd. and First Fire Global Opportunities Fund LLC, entered into a settlement agreement on April 18, 2019, the full text of which is annexed as Exhibit 10.42 to our Annual Report on Form 10-K, pursuant to which such defendants surrendered the Series D Warrants and waived all rights granted to them by or in connection with the Series D Warrants and all rights afforded to them to participate in the Company's future Common Stock offerings. In consideration therefor, pursuant to the settlement agreement, (i) the Company paid one-fifth of the reasonable fees and expenses of defendants' counsel incurred in connection with the Action and negotiation of the settlement agreement, the total of which shall not exceed $50,000 (the "Settlement Fees") and (ii) subject to the Company securing and closing certain contemplated financing, the Company agreed to pay to the defendants $400,000 and the remaining Settlement Fees.

As previously reported, on July 27, 2018, Hudson Bay Master Fund Ltd. filed a summons and complaint against the Company in the New York State Supreme Court, New York County alleging breaches by the Company of Hudson Bay's rights of participation in future Company offerings granted in the September 2017 Securities Purchase Agreement between the Company and Hudson Bay and in the February 2018 Securities Purchase Agreement among, inter alia, the Company and Hudson Bay. In terms of relief sought, Hudson Bay claimed both monetary damages (which it claims to be in excess of $1 million) and specific performance. The Company denied any liability with respect to the claims set forth in the lawsuit. As previously reported, on January 4, 2019, the Company was notified by its litigation counsel that on December 28, 2018, the Suit was dismissed with prejudice by the filing of a Stipulation for Discontinuance in the New York State Supreme Court, New York County.

On May 9, 2018, the Company received a Demand Letter from a vendor for an outstanding balance owed at that time of $2.1 million. The Company has worked with the vendor since that time to establish a payment plan for the balance owed.

Letters of Credit

Under the terms of the lease agreement for office space at 810 Seventh Avenue, New York, NY, the Company is required to maintain a letter of credit in the amount of $0.9 million which will expire in February 2021 if not renewed by the Company. Under the terms of a sub-lease agreement for office space at 1633 Broadway, New York, NY, the Company is required to maintain a letter of credit in the amount of $0.1 million which will expire with the sublease in February 2021.

(14) INCOME TAXES

Income (loss) before income taxes consists of:

(in thousands)	Year Ended December 31, 2018	2017
Domestic	$ (12,961)	$ (41,313)
Foreign	(6,261)	(3,804)
Income (loss) before taxes	$ (19,222)	$ (45,117)

The provision for income taxes differs from the amount computed by applying the statutory rate as follows:

(in thousands)	Year Ended December 31, 2018	2017
Income taxes using U.S federal statutory rate	$ (4,037)	$ (15,340)
Tax Cuts and Jobs Act	—	143
Nondeductible interest	2,273	6,912
Loss on extinguishment of debt	236	10,174
Loss of tax benefit of federal net operating loss carryforwards	(588)	5,067
Loss of tax benefit of state net operating loss carryforwards	1,040	1,373
Loss of tax benefit of federal tax credit carryforwards	495	324
Amortization of gain on IP migration	—	767
State income taxes, net of federal benefit	(2,355)	(1,339)
Foreign rate differential	1,166	1,196
Valuation allowance	6,323	(1,423)
Derivative charge	(4,138)	(8,403)
Stock option exercises and cancellations	215	841
Research and development costs	(636)	(295)
Other	6	3
	$ —	$ —

Significant components of the Company's deferred tax assets are as follows:

(in thousands)	Year Ended December 31, 2018	2017
Deferred tax assets:		
Employee compensation accruals	$ —	$ 292
Accrued liabilities	519	353
Research tax credits	161	17
Other	60	34
Net operating losses	10,624	5,289
Total deferred tax assets	11,364	5,985
Deferred tax liabilities:		
Beneficial conversion feature	—	—
Other	—	13
Total deferred tax liabilities		13
Valuation allowance	11,364	5,972
Net deferred tax assets	$ —	$ —

As of December 31, 2018 and 2017 the Company had net operating loss carryforwards for U.S. federal income tax purposes of approximately $230.0 million and $211.3 million respectively. A significant portion of the federal amount is subject to an annual limitation as low as $27,500 as a result of changes in the Company's ownership in May 2003, November 2016, and multiple dates throughout 2017 and 2018, as defined by Federal Internal Revenue Code Section 382 and the related income tax regulations. As a result of the limitations caused by the May 2003, November 2016 and multiple 2017 and 2018 ownership changes, approximately $208.1 million of the total net operating loss carryforwards is expected to expire unutilized and will be unavailable to offset future federal taxable income. Approximately $21.9 million of net operating loss carryforwards remains available to offset future federal taxable income, of which $1.7 million will expire between 2019 and 2037 and $20.2 million will have an unlimited carryforward period as a result of the Tax Cuts and Jobs Act.

In addition, the Company's state net operating losses are also subject to annual limitations that generally follow the federal Section 382 provisions (with the exception of Connecticut), adjusted for each state's respective income apportionment percentages. As of December 31, 2018 and 2017, the Company had net operating loss carryforwards for state and city income tax purposes between approximately $27.3 million and $167.3 million and between approximately $27.3 million and $150.3 million, respectively, which expire through 2038. As a result of the 382 limitations, approximately $157.2 million and $141.5 million of New York State and New York City net operating losses are expected to expire unutilized and will be unavailable to offset future taxable income. Approximately $10.1 million and $10.1 million of net operating loss carryforwards, respectively, will be available to offset future state and city taxable income. As of December 31, 2018 and 2017 the Company had a net operating loss carryforward for foreign income tax purposes of $25.2 million and $25.0 million, respectively, which have indefinite carryforward periods. As of December 31, 2018 and 2017, the Company had federal research and development tax credit carryforwards of approximately $5.0 million and $4.3 million respectively, which expire through 2038. As a result of the section 382 limitations, all but $0.2 million of the tax credit carryforwards is expected to expire unutilized.

Management has established a 100% valuation allowance against the deferred tax assets as management does not believe it is more likely than not that these assets will be realized. The Company's valuation allowance decreased by approximately $5.4 million and decreased by $1.1 million in 2018 and 2017, respectively. The change in valuation allowance is as follows:

(in thousands)	December 31, 2018	December 31, 2017
Beginning balance	$ 5,972	$ 7,094
Charged to costs and expenses	6,323	(1,423)
Charged to additional paid-in capital	—	—
Charged to retained earnings	(834)	—
Charged to other comprehensive income	(97)	301
Ending balance	$ 11,364	$ 5,972

On December 22, 2017, the United States enacted the Tax Cuts and Jobs Act (the "Act"). The Act, which is also commonly referred to as "U.S. tax reform", significantly changes U.S. corporate income tax laws by, among other provisions, reducing the maximum U.S. corporate income tax rate from 35% to 21% starting in 2018. During the year ended December 31, 2017, the Company reduced deferred tax assets by a provisional amount of $143,500, offset by a corresponding reduction to its valuation allowance, as a result of the re-measurement of deferred tax assets and liabilities from its 34% effective rate under existing law to the new lower statutory rate of 21%. The Company finalized its accounting of the effects of tax reform in 2018, which resulted in insignificant adjustments.

The Act also requires a mandatory one-time inclusion of the deferred foreign income of controlled foreign corporations. The one-time transition tax is based on Delcath's total post-1986 earnings and profits (E&P) for which the Company has previously deferred from U.S. income taxes. During the year ended December 31, 2017, the Company's reasonable estimate resulted in no provisional amount for the one-time transition tax liability, as the Company's international subsidiaries are expected to have a cumulative deficit in E&P. As the Company's international subsidiaries have a cumulative deficit in earnings and profits, the Company did not anticipate being affected by the mandatory inclusion provisions of the Act. The Company finalized its calculation of the total post-1986 foreign E&P (including deficits) for these foreign subsidiaries during 2018 and was not impacted by the mandatory inclusion provisions of the Act.

On December, 22, 2017, Staff Accounting Bulletin 118 was issued due to the complexities involved in accounting for the recently enacted Act. SAB 118 requires the Company to include in its financial statements a reasonable estimate of the impact of the Act on earnings to the extent such estimate has been determined. Accordingly, the U.S. provision for income tax for December 31, 2017 was based on the reasonable estimate guidance provided by SAB 118. The Company finalized the impact from the Act and recorded insignificant adjustments.

The Company complies with the provisions of ASC 740-10, Income Taxes, in accounting for its uncertain tax positions. ASC 740-10 addresses the determination of whether tax benefits claimed or expected to be claimed on a tax return should be recorded in the financial statements. Under ASC 740-10, the Company may recognize the tax benefit from an uncertain tax position only if it is more likely than not that the tax position will be sustained on examination by the taxing authorities, based on the technical merits of the position. The Company has determined that the Company has no significant uncertain tax positions requiring recognition under ASC 740-10 and therefore has not included a tabular rollforward of unrecognized tax benefits. As there are no uncertain tax positions recognized, interest and penalties have not been accrued.

The Company is subject to income tax in the U.S., as well as various state and international jurisdictions. The Company has not been audited by any state tax authorities in connection with income taxes. The Company has not been audited by international tax authorities or any states in connection with income taxes. The Company's New York State tax returns have been subject to annual desk reviews which have resulted

in insignificant adjustments to the related franchise tax liabilities and credits. The Company is no longer subject to federal and state examination for tax years ending prior to December 31, 2015; tax years ending December 31, 2015 through December 31, 2018 remain open to examination. The Republic of Ireland is the Company's only significant foreign jurisdiction. The Company is no longer subject to Ireland tax examination for tax years ending prior to December 31, 2014 (as Ireland has not initiated an audit of 2013 as of December 31, 2018); tax years ending December 31, 2014 through December 31, 2018 remain open to examination. However, the Company's tax years December 31, 1998 through December 31, 2018 generally remain open to adjustment for all federal, state and foreign tax matters until its net operating loss and tax credit carryforwards are utilized or expire prior to utilization, and the applicable statutes of limitation have expired in the utilization year. The federal and state tax authorities can generally reduce a net operating loss (but not create taxable income) for a period outside the statute of limitations in order to determine the correct amount of net operating loss which may be allowed as a deduction against income for a period within the statute of limitations.

Delcath recognizes interest accrued related to unrecognized tax benefits and penalties, if incurred, as a component of income tax expense.

(15) SUBSEQUENT EVENTS

Since January 1, 2019, the Company has issued 7.9 million shares pursuant to exercises of Pre-Funded Series D Warrants.

As previously reported, in January 2019, the Company terminated Backstop Commitment Purchase Agreements with four institutional investors, by their mutual agreement. The Company and such institutional investors entered into Backstop Commitment Purchase Agreements in connection with a rights offering conducted by the Company that closed in September 2018 in which the Company proposed to raise up to $50 million by distributing, at no charge, to holders of its Common Stock non-transferable rights to subscribe for and purchase shares of the Company's Common Stock at a price of $1.75 per share (the "Subscription Price"). Pursuant to the Backstop Commitment Purchase Agreements, such institutional investors agreed to purchase, at the Subscription Price, shares not issued in the rights offering following the expiration of the rights offering subscription period, subject to certain conditions, including the requirement that the closing price of a share of the Company's Common Stock as reported by the OTCQB or higher market for each of the five business days immediately preceding a purchase exceeded the Subscription Price. The Backstop Commitment Purchase Agreements were terminated by mutual agreement of the parties thereto due to the fact that the closing price of the Company's Common Stock had not exceeded the Subscription Price since October 1, 2018 and, thus, the institutional investors had no obligation to purchase shares.

On March 29, 2019, the Company exchanged all of its Series D Preferred Stock (with a stated value of $1,160,000) and received $400,000 in proceeds and issued a senior secured promissory note to an investor with a principal amount of $1,560,000. The note is due on April 1, 2020, bears interest at 8% per annum and is nonconvertible.

On April 19, 2019, April 26, 2019, May 9, 2019 and May 23, 2019, the Company borrowed an aggregate $3.3 million from two institutional investors and issued promissory notes to the investors. The promissory notes have an aggregate principal amount of $3.3 million, bear interest at the rate of 8% per annum and are due six months from the issuance of each note. The promissory notes are nonconvertible. The notes contain standard events of default and remedies therefor. The Company's obligations under the promissory notes to the institutional investor are secured by a lien on the Company's assets.

On June 6, 2019, the Company entered into an agreement with two institutional investors, pursuant to which the investors agreed to transfer and surrender to the Company for cancellation of 3.9 million Series D Warrants and 53.4 million Pre-Funded Series D Warrants. Under the terms of the Purchase Agreement, the investors agreed to defer the payment of the purchase price for the Series D Warrants and Pre-Funded Series D Warrants and, accordingly, the Company agreed to sell and issue to the investors 8% Senior Secured Promissory Notes in an aggregate principal amount of $2 million in full payment and satisfaction of the purchase price for the Series D Warrants and Pre-Funded Series D Warrants.

DELCATH SYSTEMS, INC.
Condensed Consolidated Balance Sheets
(Unaudited)
(in thousands, except share and per share data)

	June 30, 2019	December 31, 2018
Assets		
Current assets		
Cash and cash equivalents	$ 352	$ 2,516
Restricted cash	1,062	1,062
Accounts receivables, net	180	585
Inventories	687	858
Prepaid expenses and other current assets	664	898
Total current assets	2,945	5,919
Property, plant and equipment, net	805	925
Right-of-use assets	1,886	—
Total assets	$ 5,636	$ 6,844
Liabilities and Stockholders' Deficit		
Current liabilities		
Accounts payable	$ 10,713	$ 7,715
Accrued expenses	9,119	7,964
Notes payable, net of debt discount	9,838	—
Convertible notes payable, net of debt discount	523	2,038
Lease liabilities, current portion	1,050	—
Warrant liability	9	33
Total current liabilities	31,252	17,750
Deferred revenue	3,143	3,405
Lease liabilities, long-term portion	848	—
Other non-current liabilities	122	628
Total liabilities	35,365	21,783
Commitments and contingencies	—	—
Stockholders' deficit		
Preferred stock, $.01 par value; 10,000,000 shares authorized; no shares and 101 shares issued and outstanding at June 30, 2019 and December 31, 2018, respectively	—	—
Common stock, $.01 par value; 1,000,000,000 shares authorized; 18,277,807 and 10,299,954 shares issued and outstanding at June 30, 2019 and December 31, 2018, respectively*	183	103
Additional paid-in capital	328,018	328,962
Accumulated deficit	(357,907)	(344,054)
Accumulated other comprehensive income	(23)	50
Total stockholders' deficit	(29,729)	(14,939)
Total liabilities and stockholders' deficit	$ 5,636	$ 6,844

* reflects a one-for-five hundred (1:500) reverse stock split effected on May 2, 2018.

See accompanying Notes to Condensed Consolidated Financial Statements.

DELCATH SYSTEMS, INC.
Condensed Consolidated Statements of Operations and Comprehensive Loss
(Unaudited)
(in thousands, except share and per share data)

	Three months ended June 30,		Six months ended June 30,	
	2019	2018	2019	2018
Product revenue	$ 221	$ 858	$ 311	$ 1,560
Other revenue	191	—	371	—
Cost of goods sold	(172)	(220)	(268)	(367)
Gross profit	240	638	414	1,193
Operating expenses:				
Selling, general and administrative	2,653	2,641	5,203	5,007
Research and development	1,714	4,089	5,011	9,781
Total operating expenses	4,367	6,730	10,214	14,788
Operating loss	(4,127)	(6,092)	(9,800)	(13,595)
Change in fair value of the warrant liability, net	10	2,513	17	17,209
Loss on issuance of financial instrument	(6)	(2,826)	(6)	(2,826)
Interest expense	(1,837)	(248)	(4,064)	(251)
Other income (expense)	1	(5)	—	(10)
Net (loss) income	$ (5,959)	$ (6,658)	$ (13,853)	$ 527
Other comprehensive (loss) income:				
Foreign currency translation adjustments	(23)	(36)	(74)	(78)
Other comprehensive (loss) income	$ (5,982)	$ (6,694)	$ (13,927)	$ 449
Common share data:				
Basic (loss) income per common share*	$ (0.08)	$ (7.26)	$ (0.19)	$ 0.67
Diluted loss per common share*	$ (0.08)	$ (7.26)	$ (0.19)	$ (0.12)
Weighted average number of basic shares outstanding*	71,303,364	916,706	72,069,390	788,512
Weighted average number of diluted shares outstanding*	71,303,364	916,706	72,069,390	799,430

* reflects a one-for-five hundred (1:500) reverse stock split effected on May 2, 2018.

See accompanying Notes to Condensed Consolidated Financial Statements.

DELCATH SYSTEMS, INC.
Condensed Consolidated Statements of Stockholders' Deficit
(Unaudited)
(in thousands, except share data)

	Common Stock $0.01 Par Value		Preferred Stock $0.01 Par Value					
	No. of Shares	Amount	No. of Shares	Amount	Additional Paid in Capital	Accumulated Deficit	Accumulated Other Comprehensive Income	Total
Balance at January 1, 2019	10,299,954	$ 103	101	$ —	$ 328,962	$ (344,054)	$ 50	$(14,939)
Compensation expense for issuance of stock options	—	—	—	—	54	—	—	54
Compensation expense for issuance of restricted stock	15,000	—	—	—	4	—	—	4
Issuance of Series D Preferred Stock	—	—	15	—	150	—	—	150
Retirement of Series D Preferred Stock	—	—	(116)	—	(1,160)	—	—	(1,160)
Exercise of Pre-Funded Series D Warrants	4,119,500	41	—	—	(41)	—	—	—
Net loss	—	—	—	—	—	(7,894)	—	(7,894)
Total comprehensive loss	—	—	—	—	—	—	7	7
Balance at March 31, 2019	14,434,454	$ 144	—	$ —	$ 327,969	$ (351,948)	$ 57	$(23,778)
Compensation expense for issuance of stock options	—	—	—	—	75	—	—	75
Exercise of Pre-Funded Series D Warrants	3,779,353	38	—	—	(39)	—	—	(1)
Exchange of warrants	64,000	1	—	—	13	—	—	14
Net loss	—	—	—	—	—	(5,959)	—	(5,959)
Total comprehensive loss	—	—	—	—	—	—	(80)	(80)
Balance at June 30, 2019	**18,277,807**	**$ 183**	**—**	$ —	**$ 328,018**	**$ (357,907)**	**$ (23)**	**$(29,729)**

	Common Stock Issued $0.01 Par Value		Treasury Stock					
	No. of Shares	Amount	No. of Shares	Amount	Additional Paid in Capital	Accumulated Deficit	Accumulated Other Comprehensive Income (Loss)	Total
Balance at January 1, 2018	263,305	$ 3	(1)	$ (51)	$ 325,516	$ (324,832)	$ 42	$ 678
Compensation expense for issuance of stock options	—	—	—	—	7	—	—	7
Compensation expense for issuance of restricted stock	—	—	—	—	14	—	—	14
Sale of common stock, net of expenses	668,854	6	—	—	4,245	—	—	4,251
Fair value of warrants issued	—	—	—	—	(18,306)	—	—	(18,306)
Net income	—	—	—	—	—	7,185	—	7,185
Total comprehensive loss	—	—	—	—	—	—	(34)	(34)
Balance at March 31, 2018	932,159	$ 9	(1)	$ (51)	$ 311,476	$ (317,647)	$ 8	$ (6,205)
Compensation expense for issuance of stock options	—	—	—	—	(47)	—	—	(47)
Compensation expense for issuance of restricted stock	—	—	—	—	(95)	—	—	(95)
Sale of common stock, net of expenses	—	—	—	—	(41)	—	—	(41)
Net income	—	—	—	—	—	(6,658)	—	(6,658)
Total comprehensive loss	—	—	—	—	—	—	(44)	(44)
Balance at June 30, 2018	**932,159**	**$ 9**	**(1)**	**$ (51)**	**$ 311,293**	**$ (324,305)**	**$ (36)**	**$(13,090)**

See accompanying Notes to Condensed Consolidated Financial Statements.

DELCATH SYSTEMS, INC.
Condensed Consolidated Statements of Cash Flows
(Unaudited)
(in thousands)

	Six months ended June 30, 2019	2018
Cash flows from operating activities:		
Net (loss) income	$ (13,853)	$ 527
Adjustments to reconcile net loss to net cash used in operating activities:		
Stock option compensation expense	129	(40)
Restricted stock compensation expense	4	(81)
Depreciation expense	122	236
Amortization of right of use assets	552	—
Warrant liability fair value adjustment	(17)	(17,209)
Non-cash interest income	—	(1)
Loss on issuance of financial instrument	6	2,826
Interest expense accrued related to convertible notes	329	—
Debt discount amortization	3,444	238
Changes in assets and liabilities:		
Prepaid expenses and other assets	232	318
Accounts receivable	404	(163)
Inventories	143	43
Accounts payable and accrued expenses	3,827	3,985
Deferred revenue	(240)	—
Other non-current liabilities	(504)	44
Principal payments on leases	(540)	—
Net cash used in operating activities	(5,962)	(9,277)
Cash flows from investing activities:		
Purchase of property, plant and equipment	(2)	(39)
Net cash used in investing activities	(2)	(39)
Cash flows from financing activities:		
Net proceeds from the issuance of debt	3,719	—
Net proceeds from sale of Series D Preferred Stock	150	—
Net proceeds from sale of common stock and warrants	—	4,210
Net proceeds from convertible debt financing	—	2,172
Net cash provided by financing activities	3,869	6,382
Foreign currency effects on cash, cash equivalents and restricted cash	(69)	(45)
Net decrease in cash, cash equivalents and restricted cash	(2,164)	(2,979)
Cash, cash equivalents and restricted cash:		
Beginning of period	3,578	5,324
End of period	$ 1,414	$ 2,345
Supplemental non-cash financing activities:		
Fair value of warrants issued	$ —	$ 23,532

See accompanying Notes to Condensed Consolidated Financial Statements.

DELCATH SYSTEMS, INC.
Notes to the Condensed Consolidated Financial Statements

(1) GENERAL

The unaudited interim condensed consolidated financial statements of Delcath Systems, Inc. ("Delcath" or the "Company") as of and for the three and six months ended June 30, 2019 and 2018 should be read in conjunction with the consolidated financial statements included in the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2018 (the "Annual Report"), which was filed with the Securities Exchange Commission (the "SEC") on June 14, 2019 and may also be found on the Company's website (www.delcath.com). In these notes to the condensed consolidated financial statements the terms "us", "we" or "our" refer to Delcath and its consolidated subsidiaries.

Description of Business

Delcath Systems, Inc. is an interventional oncology company focused on the treatment of primary and metastatic liver cancers. Our investigational product—Melphalan Hydrochloride for Injection for use with the Delcath Hepatic Delivery System ("Melphalan/HDS")—is designed to administer high-dose chemotherapy to the liver while controlling systemic exposure and associated side effects. In Europe, our system is commercially available under the trade name Delcath Hepatic CHEMOSAT ® Delivery System for Melphalan ("CHEMOSAT"), where it has been used at major medical centers to treat a wide range of cancers of the liver.

Our primary research focus is on ocular melanoma liver metastases ("mOM") and intrahepatic cholangiocarcinoma ("ICC"), a type of primary liver cancer, and certain other cancers that are metastatic to the liver. We believe the disease states we are investigating represent a multi-billion dollar global market opportunity and a clear unmet medical need.

Our clinical development program ("CDP") for Melphalan/HDS is comprised of The FOCUS Clinical Trial for Patients with Hepatic Dominant Ocular Melanoma (the "FOCUS Trial"), a global registration clinical trial that is investigating objective response rate in mOM, and the ALIGN Trial, a global Phase 3 clinical trial for ICC (the "ALIGN Trial"). Our CDP also includes a registry for CHEMOSAT commercial cases performed in Europe and sponsorship of select investigator-initiated trials ("IITs").

Liquidity and Operating Matters

The accompanying interim condensed consolidated financial statements have been prepared on a going concern basis, which contemplates the realization of assets and the satisfaction of liabilities in the normal course of business. The Company has incurred losses since inception and expects to continue incurring losses for the next several years. These losses, among other factors, raise substantial doubt about the Company's ability to continue as a going concern.

The Company's existence is dependent upon management's ability to obtain additional funding sources or to enter into strategic alliances. There can be no assurance that the Company's efforts will result in the resolution of the Company's liquidity needs. The accompanying statements do not include any adjustments that might result should the Company be unable to continue as a going concern.

Basis of Presentation

These interim condensed consolidated financial statements are unaudited and were prepared by the Company in accordance with generally accepted accounting principles in the United States of America (GAAP) and with the SEC's instructions to Form 10-Q and Article 10 of Regulation S-X. They include the accounts of all entities controlled by Delcath and all significant inter-company accounts and transactions have been eliminated in consolidation.

The preparation of interim condensed consolidated financial statements requires management to make assumptions and estimates that impact the amounts reported. These interim condensed consolidated financial statements, in the opinion of management, reflect all adjustments, consisting of normal recurring accruals, necessary for a fair presentation of the Company's results of operations, financial position and cash flows for the interim periods ended June 30, 2019 and 2018; however, certain information and footnote disclosures normally included in our Annual Report have been condensed or omitted as permitted by GAAP. It is important to note that the Company's results of operations and cash flows for interim periods are not necessarily indicative of the results of operations and cash flows to be expected for a full fiscal year or any interim period.

Significant Accounting Policies

A description of our significant accounting policies has been provided in Note 3 *Summary of Significant Accounting Policies* to the Consolidated Financial Statements included in the Company's Annual Report filed for the fiscal year ended December 31, 2018.

Recently Adopted Accounting Pronouncements

In February 2018, the Financial Accounting Standards Board (the "FASB") issued Accounting Standards Update ("ASU") 2018-02, Income Statement—Reporting Comprehensive Income (Topic 220). ASU 2018-02 allows a company to elect a reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the Tax Cuts and Jobs Act. ASU 2018-02 is effective for periods beginning after December 15, 2018. Upon adoption of ASU 2018-02, the Company did not elect to reclassify the tax effects of the Tax Cuts and Jobs Act from accumulated other comprehensive income to retained earnings, as the stranded tax effects were insignificant.

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842) effective January 1, 2019, electing the practical expedients and applying the transition provisions as of the effective date. Reporting periods beginning on or after January 1, 2019 are presented under Topic 842, while prior period amounts, as reported under previous GAAP, were not adjusted. The adoption of Topic 842 on January 1, 2019 did not have a significant impact on the Company's consolidated results of operations or cash flows.

(2) RESTRICTED CASH

Cash and cash equivalents that are restricted as to withdrawal or use under the terms of certain contractual agreements are recorded in *Restricted Cash* on the balance sheets. Restricted cash does not include required minimum balances.

Cash, cash equivalents, and restricted cash balances were as follows:

(in thousands)	June 30, 2019	December 31, 2018
Cash and cash equivalents	$ 352	$ 2,516
Letters of credit	1,012	1,012
Security for credit cards	50	50
Total cash, cash equivalents and restricted cash shown in the statements of cash flows	$1,414	$ 3,578

(3) INVENTORIES

Inventories consist of the following:

(in thousands)	June 30, 2019	December 31, 2018
Raw materials	$ 307	$ 358
Work-in-process	380	500
Total inventories	$ 687	$ 858

(4) PREPAID EXPENSES AND OTHER CURRENT ASSETS

Prepaid expenses and other current assets consist of the following:

(in thousands)	June 30, 2019	December 31, 2018
Insurance premiums	$ 175	$ 140
Sublease income	127	—
Financing costs	80	—
Security deposit	50	51
Income tax and VAT receivable	31	579
Other[1]	201	128
Total prepaid expenses and other current assets	$ 664	$ 898

1 Other consists of various prepaid expenses and other current assets, with no individual item accounting for more than 5% of prepaid expenses and other current assets at June 30, 2019 and December 31, 2018.

(5) PROPERTY, PLANT, AND EQUIPMENT

Property, plant, and equipment consist of the following:

(in thousands)	June 30, 2019	December 31, 2018	Estimated Useful Life
Buildings and land	$ 589	$ 589	30 years - Buildings
Enterprise hardware and software	1,742	1,742	3 years
Leaseholds	1,700	1,701	Lesser of lease term or estimated useful life
Equipment	1,003	1,002	7 years
Furniture	198	198	5 years
Property, plant and equipment, gross	5,232	5,232	
Accumulated depreciation	(4,427)	(4,307)	
Property, plant and equipment, net	$ 805	$ 925	

Depreciation expense for the three and six months ended June 30, 2019 was approximately $0.1 million and $0.1 million, respectively as compared to approximately $0.1 million and $0.2 million, respectively, for the same periods in 2018.

(6) ACCRUED EXPENSES

Accrued expenses consist of the following:

(in thousands)	June 30, 2019	December 31, 2018
Compensation, excluding taxes	$3,469	$ 1,785
Clinical trial expenses	4,289	4,530
Interest payable	731	402
Other[1]	630	1,247
Total accrued expenses	$9,119	$ 7,964

1 Other consists of various accrued expenses, with no individual item accounting for more than 5% of current liabilities at June 30, 2019 and December 31, 2018.

(7) LEASES

The Company recognizes right-of-use ("ROU") assets and lease liabilities when it obtains the right to control an asset under a leasing arrangement with an initial term greater than twelve months. The Company leases its facilities under non-cancellable operating and financing leases.

The Company evaluates the nature of each lease at the inception of an arrangement to determine whether it is an operating or financing lease and recognizes the ROU asset and lease liabilities based on the present value of future minimum lease payments over the expected lease term. The Company's leases do not generally contain an implicit interest rate and therefore the Company uses the incremental borrowing rate it would expect to pay to borrow on a similar collateralized basis over a similar term in order to determine the present value of its lease payments.

The following table summarizes the Company's operating and financing leases as of and for the six months ended June 30, 2019:

(in thousands)	U.S.	Ireland	Total
Lease cost			
Operating lease cost	$ 475	$ 112	$ 587
Financing lease cost	19	—	19
Sublease income	(215)	(93)	(308)
Total	$ 279	$ 19	298
Other information			
Operating cash flows out from operating leases	(516)	(112)	(628)
Operating cash flows in from operating leases	215	93	308
Operating cash flows from financing leases	(24)	—	(24)
Right-of-use assets exchanged for new operating lease liabilities	874	—	874
Weighted average remaining lease term	1.7	2.1	
Weighted average discount rate—operating leases	8%	8%	

Maturities of the Company's operating leases, excluding short-term leases, are as follows:

(in thousands)	U.S.	Ireland	Total
Six months ended December 31, 2019	$ 472	$ 107	$ 579
Year ended December 31, 2020	936	213	1,149
Year ended December 31, 2021	190	124	314
Total	1,598	444	2,042
Less present value discount	(108)	(36)	(144)
Operating lease liabilities included in the condensed consolidated balance sheets at June 30, 2019	$1,490	$ 408	$1,898

(8) OUTSTANDING DEBT

On April 19, 2019, April 26, 2019, May 9, 2019 and May 23, 2019, the Company issued 8% senior secured notes (collectively, the "2019 Notes") in the aggregate principal amount of $3.3 million, to two institutional investors. The 2019 Notes bore interest at the rate of 8% per annum and were to mature on the six month anniversary of issuance in each case. The 2019 Notes were not convertible. The 2019 Notes contained standard events of default and remedies and are secured by a lien on the Company's assets. The 2019 Notes were exchanged as part of the recent equity financing discussed further in Note 14 and are no longer outstanding.

In March 2019, the Company exchanged all issued and outstanding shares of its Series D Preferred Stock (having an aggregate stated value of $1,160,000) and received $400,000 in cash proceeds in exchange for a senior secured promissory note (the "March 2019 Note") in the principal amount of $1,560,000. The March 2019 Note bore interest at the rate of 8% per annum, and were to mature on April 1, 2020, and was not convertible. The principal is recognized in notes payable on the Condensed Consolidated Balance Sheet. The March 2019 Note was exchanged as part of the recent equity financing discussed further in Note 14 and is no longer outstanding.

On June 4, 2018, July 21, 2018, August 29, 2018, and September 21, 2018, the Company issued 8% senior secured convertible notes (collectively, "the 2018 Notes") in the aggregate principal amount of $9.4 million to several institutional investors. The 2018 Notes bore interest at the rate of 8% per annum and had maturity dates between December 2018 and March 2021. The 2018 Notes were initially convertible and secured pursuant to a Security Agreement which created a first priority security interest in all of the personal property (other than Excluded Collateral as defined in the Security Agreement) of the Company of every kind and description, tangible or intangible, whether currently owned and existing or created or acquired in the future. In March 2019, the Company amended the June 2018, July 2018 and August 2018 Notes to make them non-convertible. There was no impact to the financial statements. In April 2019, the Company received notices of default from the investors in the 2018 Notes which resulted in a 25%, or $1.1 million, increase in principal and an increase in the interest rates from 8% to 18%. The 2018 Notes were exchanged as part of the recent equity financing discussed further in Note 14 and are no longer outstanding.

The following tables provide a summary of the various notes issued at June 30, 2019 and December 31, 2018:

(in millions)	Conversion price	Current interest rate	Principal	Unamortized discount	Carrying value
Short term convertible notes payable					
8.0% 2018 Notes	$ 1.75	18%	$ 0.6	(0.1)	$ 0.5
Short term notes payable					
8.0% 2018 Notes	—	18%	5.0	(0.1)	4.9
8.0% 2019 Notes	—	8%	4.9	—	4.9
			9.9	(0.1)	9.8
Balance at June 30, 2019			**$ 10.5**	**$ (0.2)**	**$ 10.3**

(in millions)	Interest rate	Conversion price	Principal	Unamortized discount	Carrying value
December 4, 2018	8.0%	$ 1.75	$ 1.7	$ —	$ 1.7
March 1, 2019	8.0%	$ 1.75	0.6	(0.5)	0.1
March 21, 2019	8.0%	$ 1.75	0.4	(0.2)	0.2
December 4, 2019	8.0%	$ 1.75	0.9	(0.9)	—
March 1, 2020	8.0%	$ 1.75	0.8	(0.8)	—
March 21, 2020	8.0%	$ 1.75	0.1	(0.1)	—
Balance at December 31, 2018			**$ 4.5**	**$ (2.5)**	**$ 2.0**

(9) STOCKHOLDERS' EQUITY

Preferred Stock Issuances

Series D Preferred Stock

On November 5, 2018, the Company's Board authorized the establishment of a new series of preferred stock designated as Series D Preferred Stock, $0.01 par value, the terms of which are set forth in the certificate of designations for such series of Preferred Stock. On March 29, 2019, the Company exchanged all issued and outstanding shares of its Series D Preferred Stock (having an aggregate stated value of $1,160,000) and received $400,000 in cash proceeds in exchange for the issuance of the March 2019 Notes. Please see the discussion under Note 8 above.

Common Stock Issuances

During the six months ended June 30, 2019 the Company issued 7.9 million shares of the Company's common stock pursuant to the exercise of Pre-Funded Series D Warrants that were issued in connection with the 2018 Notes discussed in Note 8 above.

Warrant Exchange

In April 2019, the Company entered into an exchange agreement with an institutional investor with respect to warrants held by such investor (the "February 2018 Warrants"). The February 2018 Warrants were issued to several institutional investors as part of the Company's February 2018 sale of the Company's common stock and the issuance of warrants to purchase common shares. Pursuant to the exchange agreement, the Company issued 64,000 shares of the Company's common stock (the "Exchange Shares") in exchange for the February 2018 Warrants. The exchange resulted in a loss of approximately $6,000 which is recognized in the statement of operations.

Share-Based Compensation

The Company's 2019 Equity Incentive Plan (the "Plan") allows for grants in the form of incentive stock options, nonqualified stock options, stock units, stock awards, stock appreciation rights, and other stock-based awards. All of the Company's officers, directors, employees, consultants and advisors are eligible to receive grants under the Plan. The maximum number of shares reserved for issuance under the Plan is 1,500,000. Options to purchase shares of common stock are granted at exercise prices not less than 100% of fair value on the dates of grant. As of June 30, 2019, the Plan had approximately 333,333 shares available for grant.

The following is a summary of stock option activity under the Plan for the six months ended June 30, 2019:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Outstanding at December 31, 2018	—			
Granted	1,250,000	0.28		
Exercised	—			
Cancelled/Forfeited	(83,333)	0.28		
Outstanding at June 30, 2019	1,166,667	$ 0.28	8.8	$ —
Exercisable at June 30, 2019	399,998	$ 0.28	9.2	$ —

The following weighted average assumptions were used to compute the fair value of stock options granted during the six months ended June 30, 2019:

	Six months ended June 30, 2019
Dividend yield	N/A
Expected volatility	147.6%
Weighted average risk-free interest rate	2.6%
Weighted average expected life (in years)	5.5
Weighted average grant date fair value	$ 0.259

At June 30, 2019, there was approximately $0.2 million of total unrecognized compensation expense related to non-vested share-based compensation awards under the plans for employee and board stock option grants. The cost is expected to be recognized over a weighted average period of 0.6 years. For the three and six months ended June 30, 2019, the Company recognized share-based compensation expense of approximately $75,000 and $133,000 in the statement of operations, respectively. For the same periods in 2018, the Company recognized share-based compensation income of approximately $140,000 and $121,000 in the statement of operations, respectively.

	Three months ended June 30,		Six months ended June 30,	
(in thousands)	2019	2018	2019	2018
Selling, general and administrative	$ 58	$ (71)	$ 106	$ (58)
Research and development	17	(69)	27	(63)
Total	$ 75	$ (140)	$ 133	$ (121)

Warrants

The following is a summary of warrant activity for the six months ended June 30, 2019:

	Warrants	Exercise Price per Share	Weighted Average Exercise Price	Weighted Average Remaining Life (Years)
Outstanding at December 31, 2018	65,685,269	$ 0.01 - $10.00	$ 0.22	5.75
Exercised	(7,898,853)		0.01	
Exchanged	(64,000)			
Outstanding at June 30, 2019	57,722,416	$ 0.01 - $10.00	$ 0.23	5.24

(10) FAIR VALUE MEASUREMENTS

The table below presents the activity within Level 3 of the fair value hierarchy for the six months ended June 30, 2019:

Fair Value Measurements Using Significant Unobservable Inputs (Level 3)

(in thousands)	Warrant Liability
Balance at December 31, 2018	$ 33
Total change in the liability included in earnings	(17)
Reclass from liability to equity	(7)
Balance at June 30, 2019	$ 9

At June 30, 2019, the Company had a total of 125,000 February 2018 Warrants outstanding. As discussed in Part II—Item 1 “Legal Proceedings” and in Note 12 to the Company’s condensed consolidated financial statements contained in this Quarterly Report on Form 10-Q, the February 2018 Warrants were surrendered pursuant to a settlement agreement entered into between the Company and the remaining holders of the February 2018 Warrants on April 18, 2019 and final payment under the settlement was made on July 16, 2019. The fair value of the February 2018 Warrants at June 30, 2019 and December 31, 2018 was determined by using option pricing models with the following assumptions:

	June 30, 2019	December 31, 2018
Expected life (in years)	4.50	1.13 - 5.11
Expected volatility	163.6%	145.7% - 265.3%
Risk-free interest rates	1.8%	2.5% - 2.6%

The table below presents the Company’s assets and liabilities measured at fair value on a recurring basis as of June 30, 2019, aggregated by the level in the fair value hierarchy within which those measurements fall in accordance with ASC 820.

(in thousands)	Assets and Liabilities Measured at Fair Value on a Recurring Basis							
	Level 1		Level 2		Level 3		Total	
	June 30, 2019	December 31, 2018	June 30, 2019	December 31, 2018	June 30, 2019	December 31, 2018	June 30, 2019	December 31, 2018
Liabilities								
Derivative instrument liabilities	$ —	$ —	$ —	$ —	$ 9	$ 33	$ 9	$ 33

For the periods ended June 30, 2019 and December 31, 2018, there were no transfers in or out of Level 1, 2 or 3 inputs.

(11) NET LOSS PER COMMON SHARE

Basic net loss per share is determined by dividing net loss by the weighted average shares of common stock outstanding during the period, without consideration of potentially dilutive securities except for those shares that are issuable for little or no cash consideration. Diluted net loss per share is determined by dividing net loss by diluted weighted average shares outstanding. Diluted weighted average shares reflects the dilutive effect, if any, of potentially dilutive common shares, such as stock options and warrants calculated using the treasury stock method. In periods with reported net operating losses, all common stock options and warrants are generally deemed anti-dilutive such that basic net loss per share and diluted net loss per share are equal. However, in certain periods in which the exercise price of the warrants was less than the last reported sales price of Delcath's common stock on the final trading day of the period and there is a gain recorded pursuant to the change in fair value of the warrant derivative liability, the impact of gains related to the mark-to-market adjustment of the warrants outstanding at the end of the period is reversed and the treasury stock method is used to determine diluted earnings per share.

(in thousands, except share data)	June 30, 2019	2018
Net (loss) income—basic	$ (13,853)	$ 527
Adjustment for gain on warrant income	—	(619)
Net loss—diluted	$ (13,853)	$ (92)
Weighted average shares outstanding—basic*	72,069,390	788,512
Weighted average shares outstanding—diluted*	72,069,390	799,430
Net loss per share—basic*	$ (0.19)	$ 0.67
Net loss per share—diluted*	$ (0.19)	$ (0.12)

* reflects a one-for-five hundred (1:500) reverse stock split effected on May 2, 2018.

At June 30, 2019, the Company had 53.4 million pre-funded warrants outstanding. The following table provides a reconciliation of the weighted average shares outstanding calculation for the three and six months ended June 30, 2019:

	Three months ended June 30, 2019	Six months ended June 30, 2019
Weighted average shares issued	17,910,886	18,676,912
Weighted average pre-funded warrants	53,392,478	53,392,478
Weighted average shares outstanding	71,303,364	72,069,390

The following potentially dilutive securities were excluded from the computation of earnings per share as of June 30, 2019 and 2018 because their effects would be anti-dilutive:

	June 30, 2019	2018
Stock options	1,166,667	—
Common stock warrants—equity	4,202,909	—
Common stock warrants—liability	125,029	2,116,296
Assumed conversion of convertible notes	335,697	1,116,255
Total	5,830,302	3,232,551

(12) TAXES

As discussed in Note 14 *Income Taxes* to the Consolidated Financial Statements included in the Company's Annual Report filed for the fiscal year ended December 31, 2018, the Company has a valuation allowance against the full amount of its net deferred tax assets. The Company currently provides a valuation allowance against deferred tax assets when it is more likely than not that some portion or all of its deferred tax assets will not be realized. The Company has not recognized any unrecognized tax benefits in its balance sheet.

The Company is subject to income tax in the U.S., as well as various state and international jurisdictions. The federal and state tax authorities can generally reduce a net operating loss (but not create taxable income) for a period outside the statute of limitations in order to determine the correct amount of net operating loss which may be allowed as a deduction against income for a period within the statute of limitations. Additional information regarding the statutes of limitations can be found in Note 14 *Income Taxes* to the Consolidated Financial Statements included in the Company's Annual Report filed for the fiscal year ended December 31, 2018.

(13) COMMITMENT AND CONTINGENCIES

As previously reported, on March 26, 2019, the Company commenced an action (the "Action") in the Commercial Division of the Supreme Court for the State of New York, County of New York, captioned Delcath Systems, Inc., v. Iroquois Capital Investment Group LLC, Iroquois Master Fund Ltd., L1 Capital Global Opportunities Master Fund and First Fire Global Opportunities Fund LLC (Index No. 651749/2019). The Action sought expedited equitable relief in the form of reformation and a declaratory judgement to remedy a scrivener's error made in connection with the Series D Warrants issued in the Company's February 2018 public offering such that those warrants did not contain a price and quantity ratchet upon a sale of Company securities at a price lower than the offering price in the offering. The defendant, L1 Capital Global Opportunities Master Fund, settled with the Company by exchanging its Series D Warrants for the Company's common stock on a one-for-one basis, which is the same ratio for which other investors in the February 2018 round exchanged their Series D Warrants in December 2018. The Company and the remaining defendants in the Action, Iroquois Capital Investment Group LLC, Iroquois Master Fund Ltd. and First Fire Global Opportunities Fund LLC, entered into a settlement agreement on April 18, 2019 pursuant to which such defendants surrendered their Series D Warrants and waived all rights granted to them by or in connection with the Series D Warrants and all rights afforded to them to participate in the Company's future common stock offerings. In consideration therefor, pursuant to the settlement agreement, (i) the Company paid one-fifth of the reasonable fees and expenses of defendants' counsel incurred in connection with the Action and negotiation of the settlement agreement, the total of which shall not exceed $50,000 (the "Settlement Fees") and (ii) subject to the Company securing and closing certain contemplated financing, the Company agreed to pay to the defendants $400,000 and the remaining Settlement Fees. On July 17, 2019, the Company paid the amount of $440,000 to the defendants pursuant to the settlement agreement from the net proceeds received by the Company in the closing of a private placement transaction discussed in Note 14 below. No amounts remain payable under the settlement and the Action is now fully settled.

On May 9, 2018, the Company received a Demand Letter from UBC for an outstanding balance owed at that time by the Company to UBC of $2.1 million. The Company has worked with UBC since that time to establish a payment plan for the balance owed.

(14) SUBSEQUENT EVENTS

Debt Issuances

On June 6, 2019, the Company entered into an agreement with two institutional investors, pursuant to which the investors agreed to transfer and surrender to the Company for cancellation of warrants to purchase 3.9 million shares of the Company's common stock (the "Series D Warrants") and warrants to purchase 53.4 million shares of the Company's common stock (the "Pre-Funded Series D Warrants"). Under the

terms of the Purchase Agreement, the investors agreed to defer the payment of the purchase price for the Series D Warrants and Pre-Funded Series D Warrants and, accordingly, the Company agreed to sell and issue to the investors 8% Senior Secured Promissory Notes in an aggregate principal amount of $2 million in full payment and satisfaction of the purchase price for the Series D Warrants and Pre-Funded Series D Warrants. This agreement was effective upon the closing of the Company's Private Placement discussed below.

Equity Financing

On July 11, 2019 and August 15, 2019, the Company and certain accredited investors entered into securities purchase agreements (the "Securities Purchase Agreements") pursuant to which the Company sold to investors an aggregate of 20,000 shares of Series E Convertible Preferred Stock, par value $0.01 per share and 9,510 shares of Series E-1 Convertible Preferred Stock, par value $0.01 per share, having the rights and privileges described in the Company's certificate of designations for such Series E Convertible Preferred Stock and Series E-1 Convertible Preferred Stock, at a price of $1,000 per share . Pursuant to the Securities Purchase Agreements, the Company also issued to each Investor a warrant (a "2019 Warrant") to purchase a number of shares of common stock of the Company equal to the number of shares of common stock issuable upon conversion of the Series E Preferred Stock purchased by the investor. Each 2019 Warrant has an exercise price of $0.06, subject to adjustment in accordance with the terms of the 2019 Warrants (the "Exercise Price"), and is exercisable at any time beginning on the date that the Company effects a reverse stock split until 5:00 p.m. (NYC time) on the fifth anniversary of the date of the reverse stock split. The Company received gross proceeds from the private placements of $29.5 million, before deducting cash fees in the amount of $2.2 million payable to Roth Capital Partners, LLC ("Roth") for serving as placement agent and cash fees in the amount of $0.6 million payable to Roth for serving as placement agent for certain prior securities offerings by the Company, and other transaction costs, fees and expenses payable by the Company.

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Delcath Systems, Inc.

PRELIMINARY PROSPECTUS

September 25, 2019

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 13. Other Expenses of Issuance and Distribution.

The following table sets forth the costs and expenses, other than placement agent fees to be paid by us in connection with the sale of Common Stock shares being registered hereby. All amounts are estimates except for the SEC registration fee and the FINRA filing fee. All such expenses will be borne by the Company; none shall be borne by the Selling Stockholders.

SEC registration fee	$ 14,261.23
FINRA filing fee	200.00
Legal fees and expenses	125,000.00
Accounting fees and expenses	150,000.00
Printing and engraving expenses	125,000.00
Transfer agent and registrar fees and expenses	10,000.00
Other expenses	20,000.00
Total	$ 444,461.23

Item 14. Indemnification of Directors and Officers.

Section 102(b)(7) of Delaware's General Corporation Law ("DGCL") allows a corporation to provide in its certificate of incorporation that a director of the corporation will not be personally liable to the corporation or its stockholders for monetary damages for breach of fiduciary duty as a director, except where the director breached the duty of loyalty, failed to act in good faith, engaged in intentional misconduct or knowingly violated a law, authorized the payment of a dividend or approved a stock repurchase in violation of Delaware corporate law or obtained an improper personal benefit. Our amended and restated certificate of incorporation provides for this limitation of liability.

Section 145 of the DGCL, or Section 145, provides that a Delaware corporation may indemnify any person who was, is or is threatened to be made, party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of such corporation), by reason of the fact that such person is or was an officer, director, employee or agent of such corporation or is or was serving at the request of such corporation as a director, officer, employee or agent of another corporation or enterprise. The indemnity may include expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with such action, suit or proceeding, provided such person acted in good faith and in a manner he reasonably believed to be in or not opposed to the corporation's best interests and, with respect to any criminal action or proceeding, had no reasonable cause to believe that his or her conduct was illegal. A Delaware corporation may indemnify any persons who are, were or are a party to any threatened, pending or completed action or suit by or in the right of the corporation by reason of the fact that such person is or was a director, officer, employee or agent of another corporation or enterprise. The indemnity may include expenses (including attorneys' fees) actually and reasonably incurred by such person in connection with the defense or settlement of such action or suit, provided such person acted in good faith and in a manner he reasonably believed to be in or not opposed to the corporation's best interests, provided that no indemnification is permitted without judicial approval if the officer, director, employee or agent is adjudged to be liable to the corporation. Where an officer or director is successful on the merits or otherwise in the defense of any action referred to above, the corporation must indemnify him against the expenses which such officer or director has actually and reasonably incurred.

Section 145 further authorizes a corporation to purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the corporation or is or was serving at the request of the

corporation as a director, officer, employee or agent of another corporation or enterprise, against any liability asserted against him and incurred by him in any such capacity, or arising out of his or her status as such, whether or not the corporation would otherwise have the power to indemnify him under Section 145.

Our amended and restated bylaws provides that we must indemnify our directors and officers to the fullest extent permitted by the DGCL and must also pay expenses incurred in defending any such proceeding in advance of its final disposition upon delivery of an undertaking, by or on behalf of an indemnified person, to repay all amounts so advanced if it should be determined ultimately that such person is not entitled to be indemnified.

We have entered into indemnification agreements with certain of our executive officers and directors pursuant to which have agreed to indemnify such persons against all expenses and liabilities incurred or paid by such person in connection with any proceeding arising from the fact that such person is or was an officer or director of our company, and to advance expenses as incurred by or on behalf of such person in connection therewith.

The indemnification rights set forth above shall not be exclusive of any other right which an indemnified person may have or hereafter acquire under any statute, provision of our certificate of incorporation, our bylaws, agreement, vote of stockholders or disinterested directors or otherwise.

We maintain standard policies of insurance that provide coverage (1) to our directors and officers against loss rising from claims made by reason of breach of duty or other wrongful act and (2) to us with respect to indemnification payments that we may make to such directors and officers.

Item 15. Recent Sales of Unregistered Securities

In connection with each of the following unregistered sales and issuances of securities, except as otherwise provided below, the Company relied upon the exemption from registration provided by Section 4(a)(2) of the Securities Act of 1933, as amended, and Rule 506 of Regulation D promulgated thereunder for transactions not involving a public offering.

On June 6, 2016, the Company completed a private placement, exempt for registration purposes under Section 4(a)(2) of the Securities Act, of $35 million aggregate principal amount of senior secured convertible notes (the “Notes”) pursuant to a Securities Purchase Agreement dated June 6, 2016 (the “SPA”) between the Company and certain institutional investors as set forth in the Schedule of Buyers attached to the SPA, as described in the Company’s Form 8-K filed with the Securities and Exchange Commission on June 7, 2016.

The Notes were issued at an 8 percent original issue discount to the principal amount of Notes (a purchase price of $920 for each $1,000 principal amount of Notes and related warrants) for aggregate proceeds of $32.2 million. The Notes did not bear any ordinary interest and provided that the Company repay the principal amount of the Notes in equal monthly installments beginning seven months after the original date of issuance.

The Company also issued warrants to purchase 6.8 million additional shares of common stock to such institutional investors concurrently with the issuance of the Notes. The Company repurchased all of such warrants for cash, effective as of March 31, 2017.

On June 29, 2017, our Board authorized the establishment of a new series of preferred stock designated as Series A Preferred Stock, $0.01 par value, the terms of which are set forth in the certificate of designations for such series of Preferred Stock (the “Series A Certificate of Designations”) which were filed with the State of Delaware on June 30, 2017 (together with any preferred shares issued in replacement thereof in accordance with the terms thereof, the “Series A Preferred Stock”). On July 2, 2017, we entered into an exchange agreement (the “Exchange”) with one of our investors which had purchased certain senior secured convertible notes (the “Notes”), convertible into shares of our common stock pursuant to a certain June 6, 2016 securities purchase agreement, of $4.2 million aggregate principal amount of such Notes for 4,200 shares of Series A Preferred Stock

(the “Series A Preferred Shares”). The Exchange was made in reliance upon the exemption from registration provided by Rule 3(a)(9) of the Securities Act of 1933, as amended. The Series A Preferred Shares were entitled to the whole number of votes equal to $4.2 million divided by $1,288.00 (the closing bid price on June 13, 2016, the date of issuance of the Notes as adjusted for the reverse stock split effected in July 2016,) or 3,261 votes. The Series A Preferred Stock had no dividend, liquidation or other preferential rights to our common stock, and each share of Series A Preferred Stock was redeemed for the amount of $0.01 on August 28, 2017.

On July 11, 2017, we entered into an Amended and Restated Securities Purchase Agreement (the “Amended Purchase Agreement”) with certain institutional investors for the sale by the Company of 2,360 shares of Series B Preferred Stock (the “Series B Preferred Stock”) at a purchase price of $1,000 per share, in a private placement. The aggregate gross proceeds for the sale of the Series B Preferred Stock was $2.0 million. The Company used the proceeds from the transaction for general corporate purposes. The restricted shares of Series B Preferred Stock had no registration rights and were not be eligible for legend removal for a period of at least six months from the date of closing. This Amended Purchase Agreement amends the July 5, 2017 Securities Purchase Agreement (the “Purchase Agreement”) into which we entered with certain institutional investors (the “Investors”) for the sale by the Company of 2,360 shares of Series B Preferred Stock in a registered direct offering. The Series B Preferred Stock was entitled to the whole number of votes equal to $2.0 million divided by $65.35 (the closing bid price on July 5, 2017, the date of sale of the Series B Preferred Stock), or 30,607 votes. The Series B Preferred Stock had no liquidation or other rights which are preferential to our common stock. The Series B Preferred Stock was redeemed for $2,360,000 in August 2017.

On August 28, 2017, the Company entered into a Restructuring Agreement (the “Agreement”) with one of the institutional investors (the “Investor”) who was a party to the SPA. As of the date the Agreement was entered into, the Investor held $11,444,637 aggregate principal amount of Notes of which there was $10,092,857 aggregate Restricted Principal, (as defined in the Notes) of Notes (the “Restricted Notes”), secured by such aggregate cash amount held in a collateral account of the Company in the same amount (the “Restricted Cash”) and (y) $1,351,780 principal of Notes (the “Unrestricted Notes”), (ii) 4,200 shares of Series A Preferred Stock and (iii) 2,006 shares of Series B Convertible Preferred Stock.

Pursuant to the Agreement, (a) on the date thereof the Company and the Investor took the following actions (the “Initial Restructuring”): (i) the Investor released restrictions on $1,650,000 of Restricted Cash (the “Initial Release”), (ii) the Investor consented to the use of additional Restricted Cash to effect redemptions of the Series A Preferred Shares and the Series B Preferred Shares, (iii) the Investor cancelled $1,200,000 aggregate principal of the Notes (such portion of the Notes, the “Cancellation Note”), (iv) the Company redeemed all the Series A Preferred Shares outstanding for a cash payment to the Investor of $4.20 and (v) the Company redeemed the Series B Preferred Shares for a cash payment to the Investor of $2,006,000 and (b) upon the consummation of a reverse stock split of our Common Stock of at least twenty to one (the “Reverse Stock Split Event”, and such date, the “Reverse Stock Split Date”) by September 15, 2017, the Company and the Investor shall have taken the following actions (the “Additional Restructuring”, and together with the Initial Restructuring, the “Restructuring”): (i) the Investor shall consent to the use of Restricted Cash to effect redemptions of $4,000,000 aggregate Restricted Principal of the Restricted Notes (such portion of the Restricted Notes, the “Redemption Notes”), (ii) the Company shall redeem the Redemption Notes for a redemption price of $6,436,852.80 (the “Redemption Price”) and (iii) the Company shall exchange (the “Exchange”), pursuant to Section 4(a)(2) of the Securities Act of 1933, as amended, $2,436,852.80 aggregate Restricted Principal of the Restricted Notes (such portion of the Restricted Notes, the “Exchange Notes”, and together with the Redemption Notes, the “Restructured Notes”) for new warrants to purchase 114,286 shares of its Common Stock (the “New Warrants”, as exercised, the “New Warrant Shares”). The New Warrants expire on the 42 month anniversary of the date of issuance and bear an exercise price of $122.50 per share (which shall be adjusted to the new lower purchase price per share if there is a subsequent “down round” financing). The Investor, in lieu of an exercise of the New Warrants pursuant to a cash payment of the aggregate exercise price of the number of New Warrants being exercised, may exercise the New Warrants, in whole or in part, by electing instead to receive upon such exercise two shares and one hundred and twenty-five thousandths of a share of the Company’s Common Stock for each

Warrant Share exercised pursuant to this provision. The transactions set forth herein were being made in reliance upon the exemption from registration provided by Rule 4(a)(2) of the Securities Act of 1933, as amended (the "1933 Act") and Rule 144(d)(3)(ii) of the 1933 Act. As a result of not having effected a reverse stock split by September 15, 2017, the Additional Restructuring did not occur.

Amendment to Restructuring Agreement

As a result of the lack of requisite approval by Delcath stockholders for the Company's proposed reverse stock split, the parties and the two investors in the Notes entered into an amendment to the August restructuring agreement on October 10, 2017 as follows: (i) on the date that the Company effects a reverse split of its common stock, (x) the Company will exchange, pursuant to Section 4(a)(2) of the Securities Act of 1933, as amended, an aggregate principal amount of those notes equal to $279,015 for new warrants to purchase an aggregate of 127,551 shares of Common Stock, and the Company shall redeem all the Series C Preferred Shares then outstanding for a cash payment of $590,000 and (ii) upon the initial consummation, on or prior to December 15, 2017, by the Company of the offering contemplated by the registration statement on Form S-1 that was filed with the SEC on October 11, 2017 the following shall occur: (i) pursuant to Section 3(b) of the Restricted Notes, the Company shall be deemed (as adjusted downward by the Black-Scholes value of the warrants being issued in this offering) to have automatically, and irrevocably, adjusted the conversion price of the Notes to 200% of the purchase price of a share of our common stock in the offering contemplated by the registration statement, (ii) the maturity date (as defined in the notes) shall automatically be extended to the earlier to occur of (x) the first anniversary of the date of consummation of the offering contemplated by the registration statement and (y) December 30, 2018, (iii) until the earlier of (x) this maturity date and (y) the 75th calendar day after the date of consummation of the offering contemplated by the registration statement, all installments to be made under the notes shall be deemed automatically deferred with no conversions during that 75 day period, (iv) the Company agreed to redeem any portion of the outstanding notes at any time requested by either investor thereto with $7.3 million in cash to be reduced by $0.6 million to redeem the Series C Preferred Stock remaining in the restricted accounts with respect to the 2016 convertible notes and (v) the conversion floor price on the notes is $0.05 and not subject to adjustments.

On September 21, 2017, we entered into a securities purchase agreement (the "SPA") with two of our investors which had purchased certain senior secured convertible notes (the "Notes"), convertible into shares of our common stock pursuant to a certain June 6, 2016 securities purchase agreement, of $0.5 million aggregate purchase price for 590 shares of Series C Preferred Stock (the "Series C Preferred Shares"). The purchase of the Series C Preferred Stock was made in reliance upon the exemption from registration provided by Rule 4(a)(2) of the Securities Act of 1933, as amended. The Series C Preferred Shares was entitled to 1,484,061 votes and could only vote on approval of a reverse split of our outstanding common stock. The Series C Preferred Stock had no dividend, liquidation or other preferential rights to our common stock, and each share of Series C Preferred Stock was redeemable for the amount of $1,000.00, payable in cash, per share at our written election, and had to be redeemed by us no later than December 21, 2017. The Series C Preferred Stock was redeemed for $590,000 in November 2017.

On November 15, 2017, Delcath Systems, Inc. (the "Company") entered into exchange agreements ("Exchange Agreements") with each of the two investors from its June 2016 private placement of senior secured convertible notes as contemplated by that certain Securities Purchase Agreement, dated June 6, 2016, by and among the Company and such investors. As of November 15, 2017, those investors held $11,157,970 aggregate principal amount of investor notes (the "Investor Notes"), including (a) such aggregate principal amount of the Investor Notes as set forth on the signature page of the Investor hereto that does not include Restricted Principal as of the date hereof and all accrued and unpaid interest under the Investor Notes (such portion of the Investor Notes, the "Unrestricted Investor Notes") and such aggregate principal amount of the Investor Notes as set forth on the signature page of the investors hereto that solely consists of Restricted Principal as of the date hereof (such portion of the Investor Notes, the "Restricted Investor Notes").

On November 15, 2017, the Company authorized a new series of senior secured convertible notes of the Company, in the aggregate original principal amount as set forth above (the "Exchange Notes"), which Exchange

Notes shall be convertible into shares of Common Stock in accordance with the terms of the Exchange Notes. Subject to the terms and conditions of the Exchange Agreements, the Company and the investors exchanged (the "Exchange") the Unrestricted Investor Notes for (a) $10,562,425 aggregate principal amount of the Exchange Notes (the "New Notes", and the shares of Common Stock issuable pursuant to the terms of the New Notes, including, without limitation, upon conversion or otherwise, collectively, the "New Conversion Shares") and (b) warrants to purchase an aggregate of 7,000,000 shares of Common Stock (the "New Warrants", as exercised, the "New Warrant Shares").

The New Conversion Shares and the New Warrant Shares are collectively referred to herein as the "New Underlying Securities" and, together with the New Notes and the New Warrants, the "New Securities".

The New Notes, which were satisfied in full on December 28, 2017, bore the following terms:

- The New Notes did not bear interest except upon the occurrence of an event of default upon which the interest rate is 15% per annum.
- The initial conversion price was $1.50 per share for an optional conversion and at any time, an investor could have instead engaged in an alternate conversion for which the conversion price is 82% (75% if an event of default) of the lowest volume weighted average price for the Company's common stock on the three trading days prior to and including the date of the conversion. All conversions attributable to the Restricted Notes could have been converted at the lower of the optional conversion price and the alternate conversion price, then in effect.
- The obligation to prepay the Notes was extended to March 31, 2018, except in the case of an event of default or change in control.
- Assuming equity conditions as stated in the New Notes are met, the investors would consent to release cash to the Company from the existing controlled accounts upon conversion of the New Notes.
- The New Notes contained provisions waiving Section 8 of the Restricted Investor Notes, including, without limitation, any requirements for the Company to effect installment conversions or redemptions.
- The New Notes contained customary and usual terms including but not limited to, events of default upon failure to trade on an eligible market, failure to timely deliver shares upon conversion, failure to maintain converted share reserve, for conversions, failure to make payments thereunder when due, failure to remove legends, cross defaults to other indebtedness, bankruptcy and the like, and any material adverse effect in the Company's financial condition, as well as remedies and negative covenants substantially similar to those in the Investor Notes.

The New Warrants bear the following terms:

- The Warrants will be exercisable for five years from the date of issuance.
- The initial exercise price of the warrants is 115% of the closing bid price of the Company's common stock as of the trading day ended immediately prior to the time of execution of the Exchange Agreement.
- The Warrants contain full antidilution ratchet protection from lowered price securities issuances subsequent to the date of issuance for six months from the date of issuance and most favored nations protection for a year from the date of issuance.
- The Warrants are exercisable on a cashless basis to the extent at any time commencing on the one year anniversary of the date of issuance the issuance of underlying securities is not covered by an effective registration statement.
- To the extent the investors elect to apply any amounts in their controlled accounts to the balances of the New Notes, the number of shares into which the applicable New Warrant is exercisable shall be reduced by a formula set forth in the New Warrants.

On December 28, 2017, we entered into exchange agreements (collectively, "Exchange Agreements"), each by and between us and an investor from its June 2016 private placement of senior secured convertible notes (as further exchanged, the "Notes") originally issued pursuant to that certain Securities Purchase Agreement, dated June 6, 2016, by and among us and such investors. Pursuant to the Exchange Agreements, we (i) extinguished our remaining $3,027,408 in outstanding obligations under the Notes in full, (ii) obtained a release of restrictions on $2,046,897.66 in restricted cash held in our control accounts, (iii) issued to the investors shares (the "Shares") of our common stock (or rights ("Rights") to receive common stock to the extent such issuance of Shares would otherwise result in the beneficial ownership by any such investor of more than 4.9% or 9.9% of our issued and outstanding stock), as applicable, of an aggregate of 123,708,735 shares of our common stock (in each case, subject to trading restrictions set forth in leak out agreements we separately entered into with each investor (collectively, the "Leak-Out Agreements")) and (iv) a cash payment to the investors of $829,830.54 from the restricted cash held in our control accounts. The number of shares of our issued and outstanding common stock immediately following issuance of the initial Shares to the investors is 114,054,852.

The Rights could be exercised in whole or in part by an investor, without payment of additional consideration, at any time an investor would not beneficially own more than 4.9% or 9.9% (as set forth in the applicable Exchange Agreement) of our common stock (along with any shares of our common stock owned by any Attribution Parties) outstanding immediately after giving effect to such exercise. The Shares and Rights were issued in transactions exempt from registration under Section 4(a)(2) of the Securities Act of 1933, as amended, and the Shares and Rights were also issued in compliance with Section 3(a)(9) thereunder such that for Rule 144 purposes the holding period for the Shares and Rights and shares of our common stock underlying the Rights may be tacked onto the holding period of the Notes.

June 2018, July 2018 and August 2018 Notes

In June 2018, the Company entered into a Securities Purchase Agreement (the "June 2018 SPA") with an institutional investor pursuant to which the Company issued $3.3 million in principal face amount of senior secured convertible notes of the Company (the "June 2018 Notes") and related June 2018 Series D Warrant and June 2018 Pre-Funded Series D Warrants (the "June 2018 Series D Warrants") to purchase additional shares of the Company's common stock. June 2018 Notes in the amount of $3.3 million and June 2018 Pre-Funded Warrants in the amount of $0.2 million were issued for cash proceeds of $2.4 million with an original issue discount in the amount of $1.1 million. The June 2018 Notes bear 8% interest payable upon maturity. Of the $3.3 million in issued June 2018 Notes, $2.5 million matures in six months; the balance of $0.8 million is payable in twelve installments beginning seven months after the original issuance date. Each payment shall be paid in cash or, provided that the Market Price (as defined in the June 2018 SPA) is at least the conversion price of $3.00, at the option of the Company, upon ten Trading Days' written notice to the Holder, in free trading common stock at the conversion price. The transaction was exempt from registration under Regulation S, as amended promulgated under the Securities Act of 1933.

On July 20, 2018, pursuant to another Securities Purchase Agreement between the Company and a domestic institutional investor, the Company sold two 8% Senior Secured Convertible Promissory Notes for a total face amount of $2,223,525 and a purchase price of $1,507,557 to this institutional investor upon the same terms and conditions as the transaction consummated under the Securities Purchase Agreement in a transaction exempt from registration under Section 4(a)(2) and Regulation D, as amended promulgated under the Securities Act of 1933.

Effective August 31, 2018, the Company entered into an agreement to sell up to $6.0 million purchase price of its 8% Senior Secured Convertible Promissory Notes ("Notes") and warrants and prepaid warrants ("Warrants") pursuant to a Securities Purchase Agreement ("Agreement") with one or more institutional investors in transactions exempt from registration pursuant to Section 4(a)(2) of the Securities Act of 1933, as amended (the "Securities Act"), Regulation S and Rule 506(b) promulgated thereunder. The Agreement provided for an aggregate subscription amount for all securities to all purchasers of up to $6.0 million and has substantially the

same terms as the July 20, 2018 Securities Purchase Agreement with Discover Growth Fund, LLC, except that the conversion price under the Notes and exercise price of the Warrants is $1.75, and interest on the Notes shall accrue and be payable at maturity. On August 31, 2018, the Company sold $3,336,617 face amount of Notes and 2,021,410 Warrants and 23,777,381 Pre-funded Warrants to Discover Growth Fund, LLC with gross proceeds to the Company of $2,500,000.

In March 2019, the Company amended the June 2018, July 2018 and August 2018 Notes to make them non-convertible.

On April 19, 2019, April 26, 2019, May 9, 2019 and May 23, 2019, the Company borrowed an aggregate $3.3 million from two institutional investors and issued promissory notes to the investors. The promissory notes have an aggregate principal amount of $3.3 million, bear interest at the rate of 8% per annum and are due six months from the issuance of each note. The promissory notes are nonconvertible. The notes contain standard events of default and remedies therefor. The Company's obligations under the promissory notes to the institutional investor are secured by a lien on the Company's assets.

On June 6, 2019, the Company entered into an agreement with two institutional investors, pursuant to which the investors agreed to transfer and surrender to the Company for cancellation of 3.9 million Series D Warrants and 53.4 million Pre-Funded Series D Warrants. Under the terms of the Purchase Agreement, the investors agreed to defer the payment of the purchase price for the Series D Warrants and Pre-Funded Series D Warrants and, accordingly, the Company agreed to sell and issue to the investors 8% Senior Secured Promissory Notes in an aggregate principal amount of $2 million in full payment and satisfaction of the purchase price for the Series D Warrants and Pre-Funded Series D Warrants.

July 2019 Private Placement

On July 11, 2019, the Company and certain accredited investors (each an "Investor" and, collectively, the "Investors") entered into a securities purchase agreement (the "Securities Purchase Agreement") pursuant to which the Company expects to sell and issue to the Investors an aggregate of 20,000 shares of Series E Convertible Preferred Stock, par value $0.01 per share, at a price of $1,000 per share (the "Private Placement"). Pursuant to the Securities Purchase Agreement, the Company will issue to each Investor a warrant (a "Warrant") to purchase a number of shares of common stock of the Company, par value $0.01 per share ("Common Stock"), equal to the number of shares of Common Stock issuable upon conversion of the Series E Preferred Stock purchased by the Investor. Each Warrant will have an exercise price equal to $0.06, subject to adjustment in accordance with the terms of the Warrants (the "Exercise Price"), and be exercisable at any time beginning on the date that the Company effects a reverse stock split until 5:00 p.m. (NYC time) on the date that is five years following the date that the Company effects a reverse stock split. The Company expects to receive gross proceeds from the Private Placement of approximately $20.0 million, before deducting cash fees in the amount of $1.4 million payable to Roth Capital Partners, LLC ("Roth") for serving as placement agent for the Private Placement and cash fees in the amount of $552,000 payable to Roth for serving as placement agent for certain prior securities offerings by the Company, and other transaction costs, fees and expenses payable by the Company.

Pursuant to certain Waiver Agreements, certain holders of Common Stock (the "MFN Common Stockholders") were issued 923 shares of Series E Preferred Stock, in the aggregate, and Warrants to purchase up to 15,382,992 shares of Common Stock, in the aggregate, in exchange for the MFN Common Stockholders' waiver of certain most favored nations rights granted to them pursuant to exchange agreements between the Company and the MFN Common Stockholders, which exchange agreements were previously reported by the Company.

Following the closing of the July 2019 Private Placement, the Company entered into agreements (the "Exchange Agreements") with the holders of (i) its 8% Senior Secured Promissory Notes in an aggregate amount (principal plus accrued interest) of approximately $10.8 million (the "Bridge Notes"), and (ii) its 8% Senior Secured

Promissory Notes in an aggregate principal amount of $2 million ("Surviving Notes") pursuant to which the Bridge Notes were converted into shares of Series E Preferred Stock and Warrants at the same $1,000 price per Unit as applied to the Private Placement and the Surviving Notes became convertible into shares of Series E Preferred Stock and Warrants at the price of $1,500 per Unit.

The sale and issuance of the Series E Preferred Stock and Warrants to the Investors, MFN Common Stockholders and holders of Bridge Notes have been determined to be exempt from registration under the United States Securities Act of 1933, as amended (the "Act"), in reliance on Section 4(a)(2) thereof and Rule 506 of Regulation D promulgated thereunder.

The transactions set forth herein were being made in reliance upon the exemption from registration provided by Rule 4(a)(2) of the Securities Act of 1933, as amended (the "1933 Act"). As of the date of this Prospectus, all of the Rights have been exercised, and neither investor owns more than 4.9% of the issued and outstanding shares of our common stock.

August 2019 Private Placement

On August 19, 2019, the Company closed on its securities purchase agreement, dated August 15, 2019 (the "Securities Purchase Agreement"), entered into with certain accredited investors (each an "Investor" and, collectively, the "Investors") pursuant to which the Company issued to the Investors an aggregate of 9,510 shares of Series E-1 Convertible Preferred Stock, par value $0.01 per share (the "Series E-1 Preferred Stock"), at a price of $1,000 per share (the "Private Placement"). Pursuant to the Securities Purchase Agreement, the Company also issued to each Investor a warrant (a "Warrant") to purchase a number of shares of common stock of the Company, par value $0.01 per share ("Common Stock"), equal to the number of shares of Common Stock issuable upon conversion of the Series E-1 Preferred Stock purchased by the Investor. Each Warrant has an exercise price equal to $0.06, subject to adjustment in accordance with the terms of the Warrants (the "Exercise Price"), and are exercisable at any time beginning on the date that the Company effects a reverse stock split until 5:00 p.m. (NYC time) on the date that is five years following the date that the Company effects a reverse stock split. The Company received gross proceeds from the Private Placement of approximately $9.5 million, before deducting cash fees in the amount of $738,285 payable to Roth Capital Partners, LLC for serving as placement agent for the Private Placement, and other transaction costs, fees and expenses payable by the Company.

The sale and issuance of the Series E-1 Preferred Stock and Warrants to the Investors have been determined to be exempt from registration under the United States Securities Act of 1933, as amended (the "Act"), in reliance on Section 4(a)(2) thereof and Rule 506 of Regulation D promulgated thereunder.

Item 16. Exhibits and Financial Statement Schedules

Exhibit	Description
3.1	Amended and Restated Certificate of Incorporation of Company.*
3.2	Amended and Restated By-Laws of the Company (incorporated by reference to Exhibit 3.2 to Amendment No. 1 to Company's Registration Statement on Form SB-2).
4.1	Certificate of Designation of Preferences, Rights and Limitations of Series E Convertible Preferred Stock of Company (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed July 11, 2019).
4.2	Certificate of Designation of Preferences, Rights and Limitations of Series E-1 Convertible Preferred Stock of Company (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed August 16, 2019).
4.3	Form of Series E Warrant to Purchase Shares of Common Stock (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed July 11, 2019).
4.4	Form of Series E-1 Warrant to Purchase Shares of Common Stock (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed August 16, 2019).
4.5	Form of Registration Rights Agreement between the Company and each other party a signatory thereto (incorporated by reference to Exhibit 4.2 to the Company's Current Report on Form 8-K filed July 11, 2019).
4.6	Form of Registration Rights Agreement between the Company and each other party a signatory thereto (incorporated by reference to Exhibit 4.2 to the Company's Current Report on Form 8-K filed August 16, 2019).
5.1	Opinion of McCarter & English LLP.**
10.1	2009 Stock Incentive Plan (incorporated by reference to Appendix B to the Company's definitive Proxy Statement dated April 30, 2009).
10.2	Form of Indemnification Agreement dated April 8, 2009 between the Company and members of the Company's Board of Directors (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed April 10, 2009).
10.3	Lease between SLG 810 Seventh Lessee LLC and the Company dated as of February 5, 2010 (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2010).
10.4	Amended and Restated Supply Agreement between B. Braun Medical Inc and the Company dated as of May 4, 2010 (incorporated by reference to Exhibit 10.7 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2010).
10.5	Lease Modification, Extension and Additional Space Agreement between SLG 810 Seventh Lessee LLC and the Company dated as of September 27, 2010 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed September 30, 2010).
10.6†	License, Supply and Contract Manufacturing Agreement between Synerx Pharma, LLC and Bioniche Teoranta and the Company dated as of October 13, 2010 (incorporated by reference to Exhibit 10.32 to the Company's Annual Report on Form 10-K for the year ended December 31, 2010).
10.7	Form of Employee Confidentiality and Restrictive Covenant Agreement (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed September 26, 2011).
10.8	Lease Agreement, dated August 2, 2011 (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2011).
10.9	Sublease between Delcath Systems, Inc. and SLG 810 Seventh Lessee LLC, dated May 22, 2014. (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed May 28, 2014).
10.10	Sublease Agreement between Delcath Systems, Inc. and ICV Partners, LLC dated August 18, 2014 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed September 30, 2014).

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Exhibit	Description
10.11	Form of Warrant Repurchase Agreement (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed April 3, 2017).
10.12	Exchange Agreement dated July 2, 2017 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on July 2, 2017).
10.13	Securities Purchase Agreement dated July 5, 2017 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on July 6, 2017).
10.14	Form of Leak-Out Agreement (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed on July 2, 2017).
10.15	Amended and Restated Securities Purchase Agreement dated July 5, 2017 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K/A filed on July 12, 2017).
10.16	Form of Restructuring Agreement and Warrant (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on August 28, 2017).
10.17	Securities Purchase Agreement dated September 19, 2017 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on September 21, 2017).
10.18	Exchange Agreement, dated November 15, 2017 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on November 16, 2017).
10.19	Form of Exchange Note (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed on November 16, 2017).
10.20	Form of Exchange Warrant (incorporated by reference to Exhibit 10.3 to the Company's Current Report on Form 8-K filed on November 16, 2017).
10.21	Exchange Agreement, dated December 28, 2017 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on December 29, 2017).
10.22	Form of Leak-Out Agreement (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed on December 29, 2017).
10.23	Executive Agreement between the Company and Jennifer Simpson (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on March 26, 2018).
10.24	Executive Agreement between the Company and Barbra Keck (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed on March 26, 2018).
10.25	Executive Agreement between the Company and John Purpura (incorporated by reference to Exhibit 10.3 to the Company's Current Report on Form 8-K filed on March 26, 2018).
10.26	Securities Purchase Agreement dated as of June 4, 2018 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on June 8, 2018).
10.27	First Amendment to Securities Purchase Agreement dated as of July 20, 2018 to Securities Purchase Agreement dated as of June 4, 2018 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on July 26, 2018).
10.28	First Amendment to Warrants to Purchase Common Stock dated July 20, 2018 (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed on July 26, 2018).
10.29	Form of Securities Purchase Agreement dated August 31, 2018 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on September 7, 2018).
10.30	Form of Backstop Commitment Purchase Agreement (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed on September 7, 2018).
10.31	Form of 8% Senior Secured Convertible Promissory Note (incorporated by reference to Exhibit 10.3 to the Company's Current Report on Form 8-K filed on September 7, 2018).
10.32	Form of Warrant to Purchase Common Stock (incorporated by reference to Exhibit 10.4 to the Company's Current Report on Form 8-K filed on September 7, 2018).
10.33	Form of Pre-Funded Warrant to Purchase Common Stock (incorporated by reference to Exhibit 10.5 to the Company's Current Report on Form 8-K filed on September 7, 2018)

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Exhibit	Description
10.34	Form of First Amendment to 8% Senior Secured Convertible Promissory Notes issued June 4, 2018 (incorporated by reference to Exhibit 10.6 to the Company's Current Report on Form 8-K filed on September 7, 2018).
10.35	Form of Second Amendment to Warrants to Purchase Common Stock issued June 4, 2018 and July 20, 2018 (incorporated by reference to Exhibit 10.7 to the Company's Current Report on Form 8-K filed on September 7, 2018).
10.36	Form of Pre-Funded Warrant to Purchase Common Stock (incorporated by reference to Exhibit 10.5 to the Company's Current Report on Form 8-K filed on September 7, 2018).
10.37	Form of Second Amendment to Warrants to Purchase Common Stock issued June 4, 2018 and July 20, 2018 (incorporated by reference to Exhibit 10.7 to the Company's Current Report on Form 8-K filed on September 7, 2018).
10.38	Form of Stock Purchase Agreement dated as of November 16, 2018 (incorporated by reference to Exhibit 10.1 to the Form 8-K filed November 7, 2018).
10.39	License, Supply and Marketing Agreement for CHEMOSAT® dated as of December 10, 2018 between the Company and medac Gesellschaft für klinische Spezialpräparate mbH (incorporated by reference to Exhibit 10.38 to the Company's Form 10-K filed on June 14, 2019).†
10.40	Form of Exchange Agreement dated December 2018 (incorporated by reference to Exhibit 10.39 to the Company's Form 10-K filed on June 14, 2019).
10.41	Form of Leak-Out Agreement dated December 2018 (incorporated by reference to Exhibit 10.40 to the Company's Form 10-K filed on June 14, 2019).
10.42	2019 Equity Incentive Plan (incorporated by reference to Exhibit 4.01 to the Company's Current Report on Form 8-K filed on February 7, 2019).
10.43	Global Settlement Agreement dated as of April 18, 2019 by and among the Company, Iroquois Capital Investment Group, LLC, Iroquois Master Fund Ltd. and FirstFire Global Opportunities Fund LLC (incorporated by reference to Exhibit 10.42 to the Company's Form 10-K filed on June 14, 2019).
10.44	Securities Purchase Agreement dated as of April 19, 2019 (incorporated by reference to Exhibit 10.43 to the Company's Form 10-K filed on June 14, 2019).
10.45	Securities Purchase Agreement dated as of April 26, 2019 (incorporated by reference to Exhibit 10.44 to the Company's Form 10-K filed on June 14, 2019).
10.46	Securities Purchase Agreement dated as of May 9, 2019 (incorporated by reference to Exhibit 10.45 to the Company's Form 10-K filed on June 14, 2019).
10.47	Securities Purchase Agreement dated as of May 23, 2019 (incorporated by reference to Exhibit 10.46 to the Company's Form 10-K filed on June 14, 2019).
10.48	Note Purchase Agreement dated as of June 6, 2019 by and among Delcath Systems, Inc., Rosalind Master Fund LP and Rosalind Opportunities Fund I (incorporated by reference to Exhibit 10.47 to the Company's Form 10-K filed on June 14, 2019).
10.49	Form of 8% Secured Promissory Note Due June 6, 2021 (incorporated by reference to Exhibit 10.48 to the Company's Form 10-K filed on June 14, 2019).
10.50	Securities Purchase Agreement dated as of July 11, 2019 between the Company and Roth Capital Partners, LLC (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed July 11, 2019).
10.51	Engagement Letter dated as of May 20, 2019 between the Company and Roth Capital Partners, LLC (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed July 11, 2019).
10.52	Securities Purchase Agreement dated as of August 15, 2019 between the Company and Roth Capital Partners, LLC (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed August 16, 2019).

Exhibit	Description
10.53	Engagement Letter dated as of August 14, 2019 between the Company and Roth Capital Partners, LLC (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed August 16, 2019).
10.54	Amendment dated as of August 15, 2019 between the Company and each purchaser a signatory thereto to Securities Purchase Agreement dated as of July 11, 2019 between the Company and the purchasers signatories thereto (incorporated by reference to Exhibit 10.3 to the Company's Current Report on Form 8-K filed August 16, 2019).
23.1	Consent of Grant Thornton, LLP*
23.2	Consent of Marcum LLP*
23.3	Consent of McCarter & English LLP (included as part of Exhibit 5.1)**
24.1	Powers of Attorney (included on signature page to this Registration Statement)*
101.INS	XBRL Instance Document**
101.SCH	XBRL Taxonomy Extension Schema Document**
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document**
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document**
101.LAB	XBRL Taxonomy Extension Label Linkbase Document**
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document**

* Filed herewith.
** To be filed by amendment.
† Portions of this exhibit have been omitted.

Item 17. Undertakings

The undersigned registrant hereby undertakes:

1. To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

i. To include any prospectus required by section 10(a)(3) of the Securities Act;

ii. To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Securities and Exchange Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement.

iii. To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement, *provided*, *however*, that paragraphs (1)(i), (1)(ii) and (1)(iii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to Section 13 or 15(d) of the Exchange Act that are incorporated by reference in the registration statement.

2. That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

3. To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

4. That, for the purpose of determining liability under the Securities Act to any purchaser:

i. If the registrant is relying on Rule 430B (Section 430B of this chapter):

A. Each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and

B. Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by section 10(a) of the Securities Act shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof. Provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date; or

ii. If the registrant is subject to Rule 430C, each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A, shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness. Provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.

5. That, for the purpose of determining liability of the registrant under the Securities Act to any purchaser in the initial distribution of the securities: The undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

i. Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

ii. Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;

iii. The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and

iv. Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

6. Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

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SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, Delcath Systems, Inc., a Delaware corporation, has duly caused this Registration Statement on Form S-1 to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of New York, State of New York, on September 25, 2019.

DELCATH SYSTEMS, INC.

By: /s/ Jennifer K. Simpson
Name: Jennifer K. Simpson, Ph.D.
Title: President and Chief Executive Officer

Each person whose signature appears below constitutes and appoints Jennifer K. Simpson and Barbra C. Keck and each of them singly, his or her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments (including post-effective amendments) to this registration statement and any and all additional registration statements pursuant to Rule 462(b) of the Securities Act and to file the same, with all exhibits thereto and all other documents in connection therewith, with the SEC, granting unto each said attorney-in-fact and agents full power and authority to do and perform each and every act in person, hereby ratifying and confirming all that said attorneys-in-fact and agents or either of them or their, his or her substitute or substitutes may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this Registration Statement on Form S-1 has been signed by the following persons in the capacities indicated.

SIGNATURE	TITLE	DATE
/s/ Jennifer K. Simpson, Ph.D. Jennifer K. Simpson, Ph.D.	President and Chief Executive Officer and Director (Principal Executive Officer)	September 25, 2019.
/s/ Barbra C. Keck, M.B.A. Barbra C. Keck, M.B.A.	Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	September 25, 2019.
/s/ Roger G. Stoll, Ph.D. Roger G. Stoll, Ph.D.	Chairman of the Board	September 25, 2019.
/s/ William D. Rueckert William D. Rueckert	Director	September 25, 2019.
/s/ John R. Sylvester John R. Sylvester	Director	September 25, 2019.
/s/ Marco Taglietti, M.D. Marco Taglietti, M.D.	Director	September 25, 2019.

Exhibit 3.1

AMENDED AND RESTATED
CERTIFICATE OF INCORPORATION
OF
DELCATH SYSTEMS, INC.

Under Sections 242 and 245 of the

Delaware General Corporation Law

The undersigned, Delcath Systems, Inc., a corporation organized and existing under the laws of the State of Delaware, originally incorporated as BGH Medical Products, Inc. on August 5, 1988 (the "Corporation"), hereby certifies that:

FIRST: The name of the Corporation is Delcath Systems, Inc.

SECOND: The Certificate of Incorporation of the Corporation was filed with the Secretary of the State of Delaware on August 5, 1988.

THIRD: Amendments to the Certificate of Incorporation of the Corporation were filed with the Secretary of the State of Delaware as follows: August 22, 1988, May 7, 1990, January 23, 1991, February 2, 1994 and November 21, 1996.

FOURTH: This Amended and Restated Certificate of Incorporation was duly adopted by stockholders representing a majority of the Corporation's issued and outstanding stock by written consent in lieu of a meeting and by a unanimous written consent of Directors in lieu of a meeting in accordance with Sections 242 and 245 of the General Corporation Law of the State of Delaware.

FIFTH: The text of the Certificate of Incorporation of the Corporation is hereby amended and restated to integrate the various amendments thereto and shall read as set forth in full in Exhibit A annexed hereto.

IN WITNESS WHEREOF, the Corporation, has caused its corporate seal to be hereunto affixed and to be signed by its President and CEO who does hereby acknowledge that the foregoing is the free act and deed of the Corporation and that the facts state therein are true, as of this 28th day of September, 2000.

DELCATH SYSTEMS, INC.

(SEAL)

By: /s/ M.S. Koly
M.S. Koly, President and CEO

EXHIBIT A

AMENDED AND RESTATED
CERTIFICATE OF INCORPORATION
OF
DELCATH SYSTEMS, INC.

FIRST: The name of the corporation is Delcath Systems, Inc.

SECOND: The address, including street, number, city and county of the registered office of the Corporation in the State of Delaware is 2711 Centerville Road, Suite 400, Wilmington, DE 19808 in the county of New Castle; and the name of the registered agent of the Corporation in the State of Delaware at such address is the Corporation Service Company.

THIRD: The nature of the business and the purposes to be conducted and promoted by the Corporation shall be to conduct any lawful business, to promote any lawful purpose, and to engage in any lawful act or activity for which corporations may be organized under the General Corporation Law of the State of Delaware.

FOURTH: The total number of all classes of shares of stock which the corporation shall have authority to issue is twenty-five million (25,000,000) shares, consisting of ten million (10,000,000) shares of Preferred Stock with a par value of $.01 per share, and fifteen million (15,000,000) shares of Common Stock with a par value of $.01 **per** share, amounting in the aggregate to Two Hundred and Fifty Thousand Dollars ($250,000,00).

The designation and powers, rights and preferences, and the qualifications, limitations, or restrictions with respect to each class or series of such class of the stock of the Corporation shall be as determined by resolution of the Board of Directors from time to time.

Each 2.28810175 shares of the Corporation's Common Stock, par value $.01 per share, issued and outstanding as of the close of business on September 28, 2000 shall be converted and reclassified into one (1) share of the Corporation's Common Stock, par value $.01 per share, so that each share of the Corporation's Common Stock $.01 par value per share, issued and outstanding is hereby converted and reclassified. No fractional interests resulting from such conversion shall be issued, but in lieu thereof, the Corporation will pay cash for each currently issued and outstanding share of Common Stock, par value $.01 per share, representing such fractional interest at a price equal to the per share price of the Corporation's Common Stock on September 28, 2000.

FIFTH: The corporation is to have perpetual existence.

SIXTH: For the management of the business and for the conduct of the affairs of the Corporation, and in further definition, limitation, and regulation of the powers of the Corporation and of its directors and of its stockholders or any class thereof, as the case may be, it is further provided:

1. The management of the business and the conduct of the affairs of the Corporation shall be vested in the Corporation's Board of Directors. The number of directors shall be determined by affirmative vote of a majority of the Board of Directors, but shall be not less than three (3).

2. The directors shall be divided into three classes, designated Class I, Class II and Class III. Each class shall consist, as nearly as may be possible, of one-third of the total number of directors constituting the entire Board of Directors. The term of the initial Class I directors shall terminate on the date of the 2001 annual meeting of stockholders; the term of the initial Class II directors shall terminate on the date of the 2002 annual meeting of stockholders and the term of the Class III directors shall terminate on the date of the 2003 annual meeting of stockholders. At each annual meeting of stockholders beginning in 2001, successors to the class of directors whose term expires at that annual meeting shall be elected for a three-year term. If the number of directors is changed, any increase or decrease in directorships shall be apportioned among the classes so as to maintain the number of directors in each class as nearly equal as possible, and any additional directors of any class elected to fill a vacancy resulting from an increase in such class shall hold office for a term that shall coincide with the remaining term of that class, but in no case will a decrease in the number of directors shorten the term of any incumbent director. Directors shall hold office until the annual meeting for the year in which their terms expire and until their successors shall be elected and shall qualify, subject, however, to prior death, resignation, retirement, disqualification or removal from office. A majority of the Board of Directors shall constitute a quorum for the transaction of business. Except as otherwise required by law, any vacancy on the Board of Directors, however resulting, may be filled only by the affirmative vote of two-thirds of the remaining directors then in office even if less than a quorum. Any director elected to fill a vacancy shall hold office for a term that shall coincide with the remaining term of that class.

3. Notwithstanding the foregoing, whenever the holders of any one or more classes or series of Preferred Stock issued by the Corporation shall have the right, voting separately by class or series, to elect directors at an annual or special meeting of stockholders, the election, term of office, filling of vacancies and features of such directorships shall be governed by the terms of this Certificate of Incorporation or the resolution or resolutions adopted by the Board of Directors applicable thereto, and such directors so elected shall not be divided into classes pursuant to this Article unless expressly provided by such terms.

4. Subject to the rights, if any, of the holders of shares of Preferred Stock then outstanding, any or all of the directors of the Corporation may be removed from office at any time, with or without cause, by the affirmative vote of two-thirds of the directors then in office or by the affirmative vote of the holders of at least a majority of the outstanding stock of the Corporation then entitled to vote generally for the election of directors, considered for purposes of this Article as one class.

5. The power to adopt, amend, or repeal the By-Laws of the Corporation may be exercised by the affirmative vote of two-thirds of the Board of Directors of the Corporation. In addition, the stockholders may amend the By-Laws by the affirmative vote of a majority of the outstanding stock of the Corporation entitled to vote thereon.

6. The Board of Directors shall have the power, when considering a tender offer or merger or acquisition proposal, to take into account any and all factors that the Board of Directors determines to be relevant, including, but not limited to the following:

(a) the interests of the Corporation's stockholders, including the possibility that these interests might be best served by the continued independence of the Corporation;

(b) whether the proposed transaction might violate federal or state laws;

(c) not only the consideration being offered in the proposed transaction, in relation to the then current market price for the outstanding capital stock of the Corporation, but also to the market price for the capital stock of the Corporation over a period of years, the estimated price that might be achieved in a negotiated sale of the Corporation as a whole or in part or through orderly liquidation, the premiums over market price for the securities of other corporations in similar transactions, current political, economic and other factors bearing on securities prices and the Corporation's financial condition and future prospects; and

(d) the social, legal and economic effects upon employees, suppliers, customers, creditors and others having similar relationships with the Corporation, upon the communities in which the Corporation conducts its business and upon the economy of the state, region and nation.

SEVENTH: No person serving as a director of the Corporation shall be personally liable to the Corporation or its stockholders for breach of his or her fiduciary duty as a director; *provided, however,* that the foregoing shall not eliminate or limit the liability of a director of the Corporation (i) for any breach of the director's duty of loyalty to the Corporation or its stockholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) under Section 174 of the Delaware General Corporation Law, or (iv) for any transaction from which the director derived an improper personal benefit.

EIGHTH: The Corporation shall, to the fullest extent permitted by Section 145 of the General Corporation Law of the State of Delaware, as the same may be amended and supplemented, indemnify (and advance expenses to) any and all persons who it shall have power to indemnify (and advance expenses to) under said section from and against any and all of the expenses, liabilities, or other matters referred to in or covered by said section, and the indemnification and advancement provided for herein shall not be deemed exclusive of any other rights to which those indemnified may be entitled under any By-law, agreement, vote of stockholders or disinterested directors or otherwise, both as to action in his or her official capacity and as to action in another capacity while holding such office, and shall continue as to a person who has ceased to be a director, officer, employee, or agent and shall inure to the benefit of the heirs, executors, and administrators of such a person.

NINTH: Pursuant to Section 203(b)(iii) of the Delaware General Corporation Law, the Corporation hereby elects not to be governed by the provisions of Delaware General Corporation Law Section 203.

TENTH: Annual meetings of the stockholders shall be held on the date set in the Corporation's By-Laws. Any stockholder who desires to present a proposal or other matter or to nominate any person for election to the Board of Directors at an annual meeting of stockholders shah be entitled to present such proposal, matter or nomination at the annual meeting only if such stockholder notifies the Corporation, in writing, signed by the stockholder or stockholders submitting the notice, addressed to the Secretary of the Corporation, describing in detail the proposal or other matter to be presented and, in the case of nomination of a director, specifically identifying the person or persons such stockholder is nominating, sent by and delivery, overnight delivery or certified mail, return receipt requested, and such notice is received by the Secretary or President of the Corporation not less than one hundred and twenty (120) calendar days before the date of the Corporation's proxy statement released to the stockholders in connection with the previous year's annual meeting. In the event the Corporation did not hold an annual meeting the previous year, or if the date of the current year's annual meeting has been changed by more than thirty (30) calendar days from the date of the previous year's meeting, such notice must be received by the Secretary or President not less than sixty (60) days before the date set for the current year's meeting.

ELEVENTH: From time to time any of the provisions of this certificate of incorporation may be amended, altered, or repealed, and other provisions authorized by the laws of the State of Delaware at the time in force may be added or inserted in the manner and at the time prescribed by said laws, and all rights at any time conferred upon the stockholders of the Corporation by this certificate of incorporation are granted subject to the provision of this Article ELEVENTH.

CERTIFICATE OF AMENDMENT

TO

AMENDED AND RESTATED CERTIFICATE OF INCORPORATION

OF

DELCATH SYSTEMS, INC.

Delcath Systems, Inc., a corporation organized and existing under and by virtue of the General Corporation Law of the State of Delaware, DOES HEREBY CERTIFY:

FIRST: That, by written consent of all the Directors and the holders of a majority of the issued and outstanding capital stock of the Corporation, the following resolution proposing an amendment to the Amended and Restated Certificate of Incorporation of said Corporation was duly adopted. The resolution setting forth the amendment is as follows:

RESOLVED: That Article FOURTH of the Amended and Restated Certificate of Incorporation be amended by adding the following paragraph of Article FOURTH thereof so that, as amended, said article FOURTH shall be and read as follows:

"Each 1.26661011 shares of the Corporation's Common Stock, par value $.01 per share, issued and outstanding as of the close of business on October 11, 2000 shall be converted and reclassified into one (1) share of the Corporation's Common Stock, par value $.01 per share, so that each share of the Corporation's Common Stock $.01 par value per share, issued and outstanding is hereby converted and reclassified. No fractional interests resulting from such conversion shall be issued, but in lieu thereof, the Corporation will pay cash for each currently issued and outstanding share of Common Stock, par value $.01 per share, representing such fractional interest at a price equal to the per share price of the Corporation's Common Stock on October 11, 2000."

SECOND: That said amendment was duly adopted in accordance with the provisions of Section 242 of the General Corporation Law of the State of Delaware.

IN WITNESS WHEREOF, said Delcath Systems, Inc. has caused this certificate to be signed by M.S. Koly, its President and Chief Executive Officer, this 11th day of October, 2000.

DELCATH SYSTEMS, INC.

By: /s/ M.S. Koly
M.S. Koly, President and Chief Executive Officer

CERTIFICATE OF CORRECTION

OF

AMENDED AND RESTATED

CERTIFICATE OF INCORPORATION

OF

DELCATH SYSTEMS, INC.

Pursuant to the provisions of Section 103(f) of the General Corporation Laws of the State of Delaware, the undersigned, being the President and the Secretary of Delcath Systems, Inc., a Delaware corporation (the Corporation"), DO HEREBY CERTIFY:

FIRST: That the Amended and Restated Certificate of Incorporation of the Corporation, filed with the office of the Secretary of State of Delaware contained an error, to wit:

The second paragraph of Article 6 of said Amended and Restated Certificate of Incorporation misstated the dates upon which the term of each Class of Directors shall terminate. Said paragraph should be, and is hereby, corrected to read as follows:

"2. The directors shall be divided into three classes, designated Class I, Class II and Class III. Each class shall consist, as nearly as may be possible, of one-third of the total number of directors constituting the entire Board of Directors. The term of the initial Class I directors shall terminate on the date of the 2003 annual meeting of stockholders; the term of the initial Class II directors shall terminate on the date of the 2001 annual meeting of stockholders and the term of the Class III directors shall terminate on the date of the 2002 annual meeting of stockholders. At each annual meeting of stockholders beginning in 2001, successors to the class of directors whose term expires at that annual meeting shall be elected for a three-year term. If the number of directors is changed, any increase or decrease in directorships shall be apportioned among the classes so as to maintain the number of directors in each class as nearly equal as possible, and any additional directors of any class elected to fill a vacancy resulting from an increase in such class shall hold office for a term that shall coincide with the remaining term of that class, but in no case will a decrease in the number of directors shorten the term of any incumbent director. Directors shall hold office until the annual meeting for the year in which their terms expire and until their successors shall be elected and shall qualify, subject, however, to prior death, resignation, retirement, disqualification or removal from office. A majority of the Board of Directors shall constitute a quorum for the transaction of business. Except as otherwise required by law, any vacancy on the Board of Directors, however resulting, may be filled only by the affirmative vote of two-thirds of the remaining directors then in office even if less than a quorum. Any director elected to fill a vacancy shall hold office for a term that shall coincide with the remaining term of that class."

SECOND: That all other provisions contained in said Amended and Restated Certificate of Incorporation are ratified, confirmed and approved in all respects as of the date hereof.

IN WITNESS WHEREOF, the undersigned hereby make this certificate, hereby declaring and certifying that this is their act and deed and that the facts stated herein are true, and accordingly have hereunto set their hands this 21st day of August, 2001.

DELCATH SYSTEMS, INC.

By: /s/ M.S. Koly
M.S. Koly, President

CERTIFICATE OF AMENDMENT
OF
AMENDED AND RESTATED
CERTIFICATE OF INCORPORATION
OF
DELCATH SYSTEMS, INC.

DELCATH SYSTEMS, INC. (the "**Corporation**"), a corporation organized and existing under the laws of the State of Delaware, does hereby certify as follows:

FIRST: .The name of the Corporation is "Delcath Systems, Inc." and the Corporation was incorporated upon the filing of its original certificate of incorporation on August 5, 1988.

SECOND: The Amended and Restated Certificate of Incorporation of the Corporation is hereby amended by deleting the first paragraph of Article FOURTH in its entirety and replacing it with the following:

> "FOURTH: The total number of all classes of shares of stock which the Corporation shall have authority to issue is forty-five million (45,000,000) shares, consisting of ten million (10,000,000) shares of Preferred Stock with a par value of $.01 per share, and thirty-five million (35,000,000) shares of Common Stock with a par value of $.01 per share."

THIRD: This Amendment to the Amended and Restated Certificate of Incorporation of the Corporation has been duly adopted in accordance with the provisions of Sections 141 and 242 of the General Corporation Law of the State of Delaware by the unanimous vote of the Board ·of Directors of the Corporation and by a majority of the outstanding stock entitled to vote, and a majority of the outstanding stock of each class entitled to vote as a class, voted in favor of the amendment at a special meeting held on January 31 2003 for that purpose.

[Signature Page Follows]

IN WITNESS WHEREOF, the Corporation has caused this Certificate to be signed by M. S. Koly, its President and Chief Executive Officer, as of January 31, 2003. The undersigned acknowledges pursuant to Section 103 of the General Corporation Law of the State of Delaware that he executes this Certificate as the free act and deed of the Corporation and that all facts stated herein are true.

DELCATH SYSTEMS, INC.

By: /s/ M.S. Koly
M.S. Koly
President and Chief Executive Officer

CERTIFICATE OF AMENDMENT
OF
AMENDED AND RESTATED
CERTIFICATE OF INCORPORATION
OF
DELCATH SYSTEMS, INC.

DELCATH SYSTEMS, INC. (the "*Corporation*"), a corporation organized and existing under the laws of the State of Delaware, does hereby certify as follows:

FIRST: The name of the Corporation is "Delcath Systems, Inc." and the Corporation was incorporated upon the filing of its original certificate of incorporation on August 5, 1988.

SECOND: The Amended and Restated Certificate of Incorporation of the Corporation is hereby amended by deleting the first paragraph of Article FOURTH in its entirety and replacing it with the following:

> "FOURTH: The total number of all classes of shares of stock which the Corporation shall have authority to issue is forty-five million (80,000,000) shares, consisting of ten million (10,000,000) shares of Preferred Stock with a par value of $.01 per share, and seventy million (70,000,000) shares of Common Stock with a par value of $0.01 per share."

THIRD: This Amendment to the Amended and Restated Certificate of Incorporation of the Corporation has been duly adopted in accordance with the provisions of Sections 141 and 242 of the General Corporation Law of the State of Delaware by the unanimous vote of the Board of Directors of the Corporation and by a majority of the outstanding stock entitled to vote, and a majority of the outstanding stock of each class entitled to vote as a class, voted in favor of the amendment at the annual meeting of stockholders of the Corporation held on June 15, 2004.

[Signature Page Follows)

IN WITNESS WHEREOF, the Corporation has caused this Certificate to be signed by M. S. Koly, its President and Chief Executive Officer, as of June 15, 2004. The undersigned acknowledges pursuant to Section 103 of the General Corporation Law of the State of Delaware that he executed this Certificate as the free act and deed of the Corporation and that all facts stated herein are true.

DELCATH SYSTEMS, INC.

By: /s/ M.S. Koly
M.S. Koly
President and Chief Executive Officer

STATE OF DELAWARE
CERTIFICATE OF CORRECTION

The corporation organized and existing under and by virtue of the General Corporation Law of the State of Delaware:

DOES HEREBY CERTIFY:

1. The name of the corporation is: Delcath Systems, Inc.

2. That a Certificate of Amendment of Amended and Restated Certificate of Incorporation (the "Certificate of Amendment") was filed by the Secretary of State Delaware on June 16, 2004 and that said Certificate of Amendment requires correction as permitted by Section 103 of the General Corporation Law of the State of Delaware.

3. The inaccuracy or defect of said Certificate of Amendment to be corrected is a follows: Paragraph SECOND indicated that the first paragraph of Article FOURTH of the Amended and Restated Certificate of Incorporation of the Corporation was to be deleted and a new first paragraph of Article FOURTH increasing the total number of authorized shares from forty-five million to eighty million was to be substituted in lieu thereof. The number of authorized shares was incorrectly spelled out as forty-five million but was correctly set forth in numerals as (80,000,000),

4. Article SECOND of the Certificate is corrected to read as follows:

SECOND. The Amended and Restated Certificate of Incorporation of the Corporation is hereby amended by deleting the first paragraph of Article FOURTH in its entirety and replacing it with the following:

> "FOURTH. The total number of all classes of shares of stock which the Corporation shall have authority to issue is eighty million (80,000,000) shares, consisting of ten million (10,000,000) shares of Preferred Stock with a par value of $.01 per share, and seventy million (70,000,000) shares of Common Stock with a par value of $0.01 per share."

IN WITNESS WHEREOF, said Corporation has caused this certificate to be signed by M. S. Koly, an Authorized Officer, this 25th day of May, A.D. 2005.

By: /s/ M.S. Koly
Authorized Officer

Name: M.S. KOLY
Print or Type

Title: President and Chief Executive Officer

CERTIFICATE OF AMENDMENT
TO THE
AMENDED AND RESTATED CERTIFICATE OF INCORPORATION
OF
DELCATH SYSTEMS, INC.

Pursuant to Section 242 of the General
Corporation Law of the State of Delaware

DELCATH SYSTEMS, INC., a Delaware corporation (hereinafter called the "Corporation"), does hereby certify as follows:

FIRST: The Amended and Restated Certificate of Incorporation of the Corporation is hereby amended by deleting the first paragraph of Article FOURTH in its entirety and replacing it with the following:

"FOURTH: The total number of all classes of shares of stock which the Corporation shall have authority to issue is one hundred and eighty million (180,000,000) shares, consisting of ten million (10,000,000) shares of Preferred Stock with a par value of $.01 per share, and one hundred and seventy million (170,000,000) shares of Common Stock with a par value of $.01 per share."

SECOND: The foregoing amendment was duly adopted in accordance with Section 242 of the General Corporation Law of the State of Delaware.

IN WITNESS WHEREOF, DELCATH SYSTEMS, INC. has caused this Certificate to be duly executed in its corporate name this 23rd Day of May, 2012,

DELCATH SYSTEMS, INC.

By: /s/ Peter J. Graham
Name: Peter J. Graham
Title: Executive Vice President, General Counsel

CERTIFICATE OF AMENDMENT
TO THE
AMENDED AND RESTATED CERTIFICATE OF INCORPORATION
OF
DELCATH SYSTEMS, INC.

Pursuant to Section 242 of the General
Corporation Law of the State of Delaware

DELCATH SYSTEMS, INC., a Delaware corporation (hereinafter called the "Corporation"), does hereby certify as follows:

FIRST: Upon the filing and effectiveness (the "Effective Time") pursuant to the General Corporation Law of the State of Delaware (the "DGCL") of this Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Corporation, each sixteen (16) shares of the Corporation's common stock, par value $0.01 per share ("Common Stock"), issued and outstanding or held by the Corporation in treasury stock immediately prior to the Effective Time shall automatically be combined into one (1) validly issued, fully paid and non-assessable share of Common Stock without any further action by the Corporation or the holder thereof, subject to the treatment of fractional interests as described below. Notwithstanding the immediately preceding sentence, no fractional shares will be issued in connection with the reverse stock split. Stockholders of record who otherwise would be entitled to receive fractional shares, will be entitled to rounding up of their fractional share to the nearest whole share. No stockholders will receive cash in lieu of fractional shares. Each certificate that immediately prior to the Effective Time represented shares of Common Stock ("Old Certificates") shall thereafter represent that number of shares of Common Stock into which the shares of Common Stock represented by the Old Certificate shall have been combined, subject to the adjustment for fractional shares as described above.

SECOND: The foregoing amendment was duly adopted in accordance with Section 242 of the General Corporation Law of the State of Delaware.

THIRD: This Certificate of Amendment shall become effective as of April 8**,** 2014 at 5:00 p.m., New York City time.

IN WITNESS WHEREOF, DELCATH SYSTEMS, INC., has caused this certificate to be duly executed in its corporate name this 8th Day of April, 2014.

DELCATH SYSTEMS, INC.

By: /s/ Peter J. Graham
Name: Peter J. Graham
Title: Executive Vice President, General Counsel

STATE OF DELAWARE
CERTIFICATE OF AMENDMENT
OF CERTIFICATE OF INCORPORATION

The corporation organized and existing under and by virtue of the General Corporation Law of the State of Delaware does hereby certify:

FIRST: That at a meeting of the Board of Directors of Delcath Systems, Inc.

resolutions were duly adopted setting forth a proposed amendment of the Certificate of Incorporation of said corporation, declaring said amendment to be advisable and calling a meeting of the stockholders of said corporation for consideration thereof. The resolution setting forth the proposed amendment is as follows:

RESOLVED, that the Certificate of Incorporation of this corporation be amended by changing the first paragraph of Article thereof numbered "Fourth" so that, as amended, said first paragraph of such Article shall be and read as follows:

FOURTH: The total number of all classes of shares of stock which the Corporation shall have authority to issue is five hundred million (500,000,000) shares of Common Stock with a par value of $0.01 per share.

SECOND: That thereafter, pursuant to resolution of its Board of Directors, a special meeting of the stockholders of said corporation was duly called and held upon notice in accordance with Section 222 of the General Corporation Law of the State of Delaware at which meeting the necessary number of shares as required by statute were voted in favor of the amendment.

THIRD: That said amendment was duly adopted in accordance with the provisions of Section 242 of the General Corporation Law of the State of Delaware.

IN WITNESS WHEREOF, said corporation has caused this certificate to be signed this 20th day of July, 2016.

By: /s/ Jennifer K. Simpson, Ph.D.
Title: President and Chief Executive Officer
Name: Jennifer K. Simpson, Ph.D.

Amendment to Amended and Restated Certificate of Incorporation to Effectuate Reverse Stock Split

Pursuant to Section 242 of the General
Corporation Law of the State of Delaware

DELCATH SYSTEMS, INC., a Delaware corporation (hereinafter called the "Corporation"), does hereby certify as follows:

FIRST: Upon the filing and effectiveness (the "Effective Time") pursuant to the General Corporation Law of the State of Delaware (the "DGCL") of this Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Corporation, the Amended and Restated Certificate of Incorporation of the Corporation is hereby amended by adding the following paragraph at the end of Article FOURTH:

"Each 16 shares of the Corporation's common stock, par value $0.01 per share ("Common Stock"), issued and outstanding or held by the Corporation in treasury stock immediately prior to the Effective Time shall automatically be combined into one (1) validly issued, fully paid and non-assessable share of Common Stock without any further action by the Corporation or the holder thereof, subject to the treatment of fractional interests as described below. Notwithstanding the immediately preceding sentence, no fractional shares will be issued in connection with the reverse stock split. Stockholders of record who otherwise would be entitled to receive fractional shares, will be entitled to rounding up of their fractional share to the nearest whole share. No stockholders will receive cash in lieu of fractional shares. Each certificate that immediately prior to the Effective Time represented shares of Common Stock ("Old Certificates") shall thereafter represent that number of shares of Common Stock into which the shares of Common Stock represented by the Old Certificate shall have been combined, subject to the adjustment for fractional shares as described above."

SECOND: The foregoing amendment was duly adopted in accordance with Section 242 of the General Corporation Law of the State of Delaware.

THIRD: This Certificate of Amendment shall become effective as of July 21, 2016 at 9:00 a.m., New York City time.

IN WITNESS WHEREOF, DELCATH SYSTEMS, INC., has caused this certificate to be duly executed in its corporate name this 20th Day of July, 2016.

By: /s/ Jennifer K. Simpson, Ph.D.
Title: President and Chief Executive Officer
Name: Jennifer K. Simpson, Ph.D

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STATE OF DELAWARE
CERTIFICATE OF CORRECTION

The corporation organized and existing under and by virtue of the General Corporation Law of the State of Delaware does hereby certify:

1. The name of the corporation is: Delcath Systems, Inc.

2. That a Certificate of Amendment of the Amended and Restated Certificate of Incorporation (the "Certificate of Amendment") was filed by the Secretary of the State of Delaware on July 20, 2016 and that said Certificate of Amendment requires correction as permitted by Section 103(f) of the General Corporation Law of the State of Delaware.

3. The inaccuracy or defect of said Certificate of Amendment to be corrected is as follows: Article FIRST of the Certificate of Amendment indicated that the first paragraph of Article FOURTH of the Amended and Restated Certificate of Incorporation was to be deleted and a new first paragraph of Article FOURTH increasing the number of authorized shares of common stock was to be substituted in lieu thereof. The number of authorized shares of common stock of five hundred million (500,000,000) was incorrectly stated as the total number of authorized shares of all classes of shares of stock and the portion of such paragraph referring to ten million (10,000,000) authorized shares of preferred stock, which was present in the Amended and Restated Certificate of Incorporation prior to the Certificate of Amendment, was incorrectly deleted.

4. The second paragraph of Article FIRST of the Certificate of Amendment is corrected to read as follows:

FOURTH: The total number of all classes of shares of stock which the Corporation shall have authority to issue is five hundred ten million (510,000,000), consisting of ten million (10,000,000) shares of Preferred Stock, with a par value of $.01 per share, and five hundred million (500,000,000) shares of Common Stock, with a par value of $.01 per share.

IN WITNESS WHEREOF, said corporation has caused this certificate to be signed this 23rd day of June, 2017.

By: /s/ Jennifer K. Simpson
Title: President and Chief Executive Officer
Name: Jennifer K. Simpson, Ph.D.

CERTIFICATE OF DESIGNATIONS,

PREFERENCES AND RIGHTS OF THE

SERIES A

PREFERRED STOCK

OF

DELCATH SYSTEMS, INC.

Pursuant to Section 151 of the
General Corporation Law of the State of Delaware

Delcath Systems, Inc., a corporation organized and existing under the General Corporation Law of the State of Delaware (the **"Corporation"),** hereby certifies that the following resolution was adopted by the Board of Directors of the Corporation (the **"Board")** as required by Section 151 of the General Corporation Law of the State of Delaware at a meeting duly called and held on June 29, 2017:

RESOLVED, that pursuant to the provisions of Section 151 of the General Corporation Law of the State of Delaware (the **"DGCL")** and the authority vested in the Board by the Certificate of Incorporation of the Corporation filed with the Secretary of State of the State of Delaware on June 30, 2017 (the **"Certificate of Incorporation"),** the Board hereby fixes and determines the designation of, the number of shares constituting, and the rights, preferences, privileges, and qualifications, limitations and restrictions thereof, relating to, a series of the preferred stock, par value $0.01 per share, of the Corporation (the **"Preferred Stock"),** pursuant to this certificate of designations (this **"Certificate of Designations")** as follows:

1. Designation and Number of Shares. There shall hereby be created and established a series of Preferred Stock of the Corporation designated as "Series A Preferred Stock" (the **"Series A Preferred Stock").** The authorized number of shares of Series A Preferred Stock shall be 4,200 shares;

Each share of Series A Preferred Stock shall have a par value of $0.01, a stated value of $1,000.00 and a liquidation preference of $0.001 per share, as described herein.

2. Fractional Shares. The Corporation shall not issue any fractional shares of the Series A Preferred Stock.

3. Dividends. The Series A Preferred Stock shall not be entitled to receive any dividends from the Corporation.

4. Liquidation Preferences. Upon the dissolution, liquidation or winding up of the Corporation (a **"Liquidation Event"),** each holder of Series A Preferred Stock (each, a **"Holder",** and collectively, the **"Holders")** shall be entitled to receive and to be paid out of the assets of the Corporation available for distribution to its stockholders on a *pari passu* basis with one another and before any payment or distribution shall be made on the Common Stock or on any other class of capital stock of the Corporation ranking junior to the Series A Preferred Stock upon a Liquidation Event, the amount of $0.001 per share, payable in cash per share of Series A Preferred Stock. Neither the sale of all or substantially all of the assets or capital stock of the Corporation, nor the merger or consolidation of the Corporation into or with any Person or the merger or consolidation of any Person into or with the Corporation, shall be deemed to be a Liquidation Event for the purposes of this Section 4. After the payment to each Holder of the full preferential amount provided for in this Section 4, each such Holder, as such, shall have no right or claim to any of the remaining assets of the Corporation.

5. Voting Rights.

(a) Each Holder, as such, shall be entitled to the whole number of votes equal to the number of shares of Common Stock equal to the Stated Value of the Series A Preferred Stock divided by $3.68 (the closing bid price on June 13, 2016, the date of issuance of the Notes), but without regard to the Maximum Percentage and the Exchange Cap or any other limitations or restrictions on conversions set forth in the Notes and without regard to whether or not there are then a sufficient number of shares of Common Stock authorized for issuance upon conversion of the Remaining Note (as defined in the Exchange Agreement) or any other Notes then outstanding; provided, however, that such amount of votes with respect to the Series A Preferred Stock shall not exceed 19.9% (or such greater percentage allowed by The NASDAQ Capital Market without any stockholder approval requirements) of the voting power of the Corporation.

(b) Each Holder shall be entitled to receive the same prior notice of any stockholders' meeting as is provided to the holders of Common Stock as well as prior notice of all stockholder actions to be taken by legally available means in lieu of a meeting (and copies of proxy materials, consent solicitation statements and other information sent to stockholders in connection therewith), all in accordance with the Bylaws and the DGCL, and shall be entitled to vote or, if applicable, provide consent, together with the holders of Common Stock as if they were a single class of securities upon any matter submitted to a vote of stockholders, except as otherwise expressly required by law and except as required by the terms hereof to be submitted to a series vote of the applicable Holders, in which case each Holder only shall vote as a separate series.

6. Covenants. In addition to any other rights provided by law, except where the vote or, if applicable, written consent of the holders of a greater number of shares is required by law, without first obtaining the affirmative vote at a meeting duly called for such purpose or, if applicable, the written consent without a meeting of the holders in the aggregate of a majority in voting power of all of the Series A Preferred Stock, voting together as if they were a single class of securities, the Corporation shall not (and the Corporation shall cause its Subsidiaries (as defined in the Exchange Agreement) not to), directly or indirectly, whether by merger, consolidation, reorganization or otherwise:

(i) alter, amend or repeal any provision of, or add any provision to, the Certificate of Incorporation, this Certificate of Designations, the Bylaws or any other organizational documents of the Corporation, or file any certificate of amendment of the Certificate of Incorporation (including any certificate of designations of, or certificate of amendment or other instrument with respect to, any series of preferred stock), if such action would adversely affect the preferences, rights, privileges or powers, or restrictions provided for the benefit of the Series A Preferred Stock or would adversely affect the rights, powers and preferences of any Holder in its capacity as such (in each case as determined by a majority of the aggregate voting power of the Holders in their sole and absolute discretion), regardless of whether any such action shall be by means of amendment to the Certificate of Incorporation, this Certificate of Designations, the Bylaws or other organizational documents of the Corporation or by merger, consolidation, reorganization or otherwise or, without limitation of the foregoing, authorize, approve, consent to, take or effect any transaction or series of transactions, whether by amendment to the Certificate of Incorporation, this Certificate of Designations, the Bylaws or other organizational documents of the Corporation, or by merger, consolidation, reorganization or otherwise, to cancel the outstanding shares of any series of Series A Preferred Stock or to reclassify, convert or exchange such share into cash or other property (including securities) of the Corporation, or to otherwise adversely affect the rights, powers and preferences of any series of Series A Preferred Stock or the rights of any Holder as such (in each case as determined by the majority of the aggregate voting power of the Holders in their sole discretion);

(ii) increase or decrease, or authorize the increase or decrease of, the authorized number of shares of any series of Series A Preferred Stock; or

(iii) authorize, approve, consent to, or enter into any agreement with respect to, any of the foregoing, directly or indirectly, or authorize, approve, consent to, cause or permit any Subsidiary of the Corporation, directly or indirectly, to take any actions described in clauses (i) through (ii) above.

Notwithstanding the foregoing, if any of the actions contemplated in Section 6(b) above would comply with the foregoing but disproportionately, materially and adversely affects the rights, powers and preferences of any Holder relative to the comparable rights, powers and preferences of the other Holders, such action shall also require the prior written consent of such adversely affected Holder.

7. Transfer. A Holder may transfer its shares of Series A Preferred Stock in whole, or in part, and the accompanying rights hereunder held by such Holder without the consent of the Corporation; provided, that a share of Series A Preferred Stock shall only be transferable in conjunction with, and in proportion to, a transfer of Notes then held by such Holder provided, further, that such transfer is in compliance with applicable securities laws. If a Holder transfers Series A Preferred Stock in whole or in part, the Corporation agrees, upon the request of such transferor, to authorize a new series of Preferred Stock with rights, preferences, privileges, and

restrictions substantially identical to those of the Series A Preferred Stock being transferred, and, upon the request of such transferor, to exchange the Series A Preferred Stock being transferred for the same number of shares or fractional shares of such newly authorized Series A Preferred Stock. The Corporation shall do and perform, or cause to be done and performed, all such further acts and things, and shall execute and deliver all such other agreements, certificates, instruments and documents, as any Holder may reasonably request in order to carry out the intent and accomplish the purposes of this Section 7.

8. Lost or Stolen Certificates. Upon receipt by the Corporation of evidence reasonably satisfactory to the Corporation of the loss, theft, destruction or mutilation of any certificate representing a share of Series A Preferred Stock (as to which a written certification and the indemnification contemplated below shall suffice as such evidence), and, in the case of loss, theft or destruction, of an indemnification undertaking by the applicable Holder to the Corporation in customary and reasonable form and, in the case of mutilation, upon surrender and cancellation of the certificate(s), the Corporation shall execute and deliver new certificate(s) of like tenor and date.

9. Remedies. The remedies provided in this Certificate of Designations shall be cumulative and in addition to all other remedies available under the Certificate of Incorporation, the Bylaws, any other organizational documents of the Corporation and any of the other Transaction Documents (as defined in the Exchange Agreement) or Exchange Documents (as defined in the Exchange Agreement), at law or in equity (including a decree of specific performance and/or other injunctive relief), and no remedy contained herein shall be deemed a waiver of compliance with the provisions giving rise to such remedy. Nothing herein shall limit any Holder's right to pursue actual and consequential damages for any failure by the Corporation to comply with the terms of this Certificate of Designations. The Corporation covenants to each Holder that there shall be no characterization concerning this instrument other than as expressly provided herein. The Corporation acknowledges that a breach by it of its obligations hereunder will cause irreparable harm to the Holders and that the remedy at law for any such breach may be inadequate. The Corporation therefore acknowledges and agrees that, in the event of any such breach or threatened breach, the Holders shall be entitled, in addition to all other available remedies, to an injunction restraining any breach, without the necessity of showing economic loss and without any bond or other security being required. Upon any request made by a Holder to the Corporation, the Corporation shall promptly (and in any event within 48 hours) provide all requested information and documentation to such Holder to enable such Holder to confirm the Corporation's compliance with the terms and conditions of this Certificate of Designations or to assert or exercise the rights, powers or privileges of a Holder hereunder.

10. Noncircumvention. The Corporation hereby covenants and agrees that the Corporation will not, by amendment of its Certificate of Incorporation, Bylaws or through any reorganization, transfer of assets, consolidation, merger, scheme of arrangement, dissolution, issue or sale of securities, or any other voluntary action (in each case, whether directly by the Corporation or indirectly through any Subsidiary of the Corporation), avoid or seek to avoid the observance or performance of any of the terms of this Certificate of Designations, and will at all times in good faith carry out all the provisions of this Certificate of Designations and take all actions as may be required to protect the rights of the Holders.

11. Failure or Indulgence Not Waiver. No failure or delay on the part of any Holder in the exercise of any power, right or privilege hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any such power, right or privilege preclude other or further exercise thereof or of any other right, power or privilege. No waiver shall be effective unless it is in writing and signed by an authorized representative of the waiving party. This Certificate of Designations shall be deemed to be jointly drafted by the Corporation and the Holders and shall not be construed against any Person as the drafter hereof.

12. Notices. The Corporation shall provide the Holders with prompt written notice of all actions taken pursuant to the terms of this Certificate of Designations, including in reasonable detail a description of such action and the reason therefor. Whenever notice is required to be given to a Holder under this Certificate of Designations, unless otherwise provided herein, such notice must be to such Holder in writing and shall be given in accordance with the Exchange Agreement.

13. Series A Preferred Stock Register. The Corporation shall maintain at its principal executive offices (or such other office or agency of the Corporation as it may designate by notice to the Series A), a register for the Series A Preferred Stock, in which the Corporation shall record the name, address, electronic mail address and facsimile number of the Person in whose name the shares of Series A Preferred Stock has been issued, as well as the name, address, electronic mail address and facsimile number of each transferee. The Corporation may treat the Person in whose name any share of Series A Preferred Stock is registered on the register as the owner and holder thereof for all purposes, notwithstanding any notice to the contrary, but in all events recognizing any properly made transfers. The Corporation shall keep the register open and available at all times during business hours for inspection by any Holder or its legal representatives

14. Redemption and Conversion Rights.

(a) Each share of Series A Preferred Stock shall be redeemable for the amount of $0.001, payable in cash, per share at the written election of the Corporation.

(b) No shares of Series A Preferred Stock shall be convertible either at the Corporation’s option or at the option of the Holder into shares of capital stock or other securities of the Corporation.

15. Actions Prohibited by Law. To the extent the Corporation is prohibited by law from taking any action specified in this Certificate of Designations to give effect to the rights, powers or privileges of any Holder, the Corporation shall, upon the request of such Holder, in addition to any other requirements of this Certificate of Designations, take such actions as may be reasonably requested by such Holder to implement a valid and enforceable provision that is a reasonable substitute for the prohibited provision in order to give the maximum effect to the intent of the Corporation and such Holder to observe the rights, powers and privileges of such Holder (the **“Amended Provision”).** The Corporation shall take any action necessary or appropriate, to the extent reasonably within its control, to cause this Certificate of Designations to be amended to include the Amended Provision.

16. Certain Defined Terms. For purposes of this Certificate of Designations, the following terms shall have the following meanings:

(a) "Closing Date" shall have the meaning ascribed to such term in the Exchange Agreement.

(b) "Common Stock" means (i) the Corporation's shares of common stock, $0.01 par value per share, and (ii) any capital stock into which such common stock shall have been changed or any share capital resulting from a reclassification or conversion of such common stock.

(c) "Exchange Agreement" means that certain securities purchase agreement by and among the Corporation and the other parties listed thereto, dated as of the Subscription Date, as may be amended from time in accordance with the terms thereof.

(d) "Notes" shall have the meaning as set forth in the Exchange Agreement.

(e) "Person" means an individual, a limited liability company, a partnership, a joint venture, a corporation, a trust, an unincorporated organization, any other entity or a government or any department or agency thereof.

(f) "Subscription Date" means June 30, 2017.

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IN WITNESS WHEREOF, Delcath Systems, Inc. has caused this Certificate of Designations to be signed by its President and Chief Executive Officer this 30 day of June, 2017.

DELCATH SYSTEMS, INC.

By: /s/ Jennifer K. Simpson
Name: Jennifer K. Simpson
Title: President and Chief Executive Officer

CERTIFICATE OF DESIGNATIONS, PREFERENCES AND RIGHTS OF THE SERIES B CONVERTIBLE PREFERRED STOCK OF DELCATH SYSTEMS, INC.

1, Jennifer Simpson, hereby certify that 1 am the Chief Executive Officer of Delcath Systems, Inc. (the **"Corporation"),** a corporation incorporated and existing under the Delaware General Corporation Law (the **"DGCL")** and further do hereby certify:

That pursuant to the authority expressly conferred upon the Board of Directors of the Corporation (the **"Board")** by the Corporation's Certificate of Incorporation, as amended (the **"Certificate of Incorporation"),** and Section 151(g) of the DGCL, the Board on June 29, 2017 adopted the following resolution determining it desirable and in the best interests of the Corporation and its stockholders for the Corporation to create a series of shares of preferred stock designated as **"Series B Convertible Preferred Stock",** none of which shares have been issued:

RESOLVED, that pursuant to the authority vested in the Board, in accordance with the provisions of the Certificate of Incorporation, a series of preferred stock, par value $0.01 per share, of the Corporation be and hereby is created, and that the designation and number of shares thereof and the voting and other powers, preferences and relative, participating, optional or other rights of the shares of such series and the qualifications, limitations and restrictions thereof are as follows:

TERMS OF SERIES B CONVERTIBLE PREFERRED STOCK

1. Designation and Number of Shares. There shall hereby be created and established a series of preferred stock of the Corporation designated as "Series B Convertible Preferred Stock" (the **"Preferred Shares").** The authorized number of Preferred Shares shall be 2,360 shares. Each Preferred Share shall have a par value of $0.01. Capitalized terms not defined herein shall have the meaning as set forth in Section 29 below.

2. Ranking. Except to the extent that the holders of at least a majority of the outstanding Preferred Shares (the **"Required Holders")** expressly consent to the creation of Parity Stock (as defined below) or Senior Preferred Stock (as defined below) in accordance with Section 14**,** all shares of capital stock of the Corporation shall be junior in rank to all Preferred Shares with respect to the preferences as to dividends, distributions and payments upon the liquidation, dissolution and winding up of the Corporation (such junior stock is referred to herein collectively as **"Junior Stock"**). The rights of all such shares of capital stock of the Corporation shall be subject to the rights, powers, preferences and privileges of the Preferred Shares. Without limiting any other provision of this Certificate of Designations, without the prior express consent of the Required Holders, voting separate as a single class, the Corporation shall not hereafter authorize or issue any additional or other shares of capital stock that is (i) of senior rank to the Preferred Shares in respect of the preferences as to dividends, distributions and payments upon the liquidation, dissolution and winding up of the Corporation (collectively, the **"Senior Preferred Stock"),** (ii) of pari passu rank to the Preferred Shares in respect of the preferences as to dividends, distributions and payments upon the liquidation, dissolution and winding up of the Corporation (collectively, the **"Parity Stock")** or (iii) any Junior Stock having a maturity date (or any other date requiring redemption or repayment of such shares of Junior Stock) that is prior to the Maturity Date. In the event of the merger or consolidation of the Corporation with or into another corporation, the Preferred Shares shall maintain their relative rights, powers, designations, privileges and preferences provided for herein and no such merger or consolidation shall result inconsistent therewith.

3. Dividends. From and after the first date of issuance of any Preferred Shares (the **"Initial Issuance Date"**), no holder of a Preferred Share (each, a **"Holder"** and collectively, the **"Holders"**) shall be entitled to receive any dividends (**"Dividends"**) except in accordance with Section 6 or Section 13 below or, otherwise, to the extent, if any, as may be declared by the Board on the Preferred Shares, from time to time, in its sole and absolute discretion, which Dividends, if any, shall be paid by the Corporation out of funds legally available therefor, payable, subject to the conditions and other terms hereof, in cash on the Stated Value of such Preferred Share.

4. Conversion. At any time after (x) solely with respect to any Reallocation Conversion (as defined in the Securities Purchase Agreement), the Initial Issuance Date or (y) with respect to any other conversion hereunder, the earlier of (A) the third (3rd) Trading Day after the Company obtains the Stockholder Approval (as defined in the Securities Purchase Agreement) and (B) the forty-fifth (45th) calendar day after the Initial Issuance Date, each Preferred Share shall be convertible into validly issued, fully paid and non-assessable shares of Common Stock (as defined below), on the terms and conditions set forth in this Section 4.

(a) Holder's Conversion Right. Subject to the provisions of Section 4(d), at any time or times on or after the Initial Issuance Date, each Holder shall be entitled to convert any portion of the outstanding Preferred Shares held by such Holder into validly issued, fully paid and non-assessable shares of Common Stock in accordance with Section 4(c) at the Conversion Rate (as defined below). The Corporation shall not issue any fraction of a share of Common Stock upon any conversion. If the issuance would result in the issuance of a fraction of a share of Common Stock, the Corporation shall round such fraction of a share of Common Stock up to the nearest whole share. The Corporation shall pay any and all transfer, stamp, issuance and similar taxes, costs and expenses (including, without limitation, fees and expenses of the Transfer Agent (as defined below)) that may be payable with respect to the issuance and delivery of Common Stock upon conversion of any Preferred Shares.

(b) Conversion Rate. The number of shares of Common Stock issuable upon conversion of any Preferred Share pursuant to Section 4(a) shall be determined by dividing (x) the Conversion Amount of such Preferred Share by (y) the Conversion Price (the **"Conversion Rate"**):

(i) **"Conversion Amount"** means, with respect to each Preferred Share, as of the applicable date of determination, the sum of (1) the Stated Value thereof plus (2) the Additional Amount thereon and any accrued and unpaid Late Charges (as defined below in Section 22(c)) with respect to such Stated Value and Additional Amount as of such date of determination.

(ii) **"Conversion Price"** means, with respect to each Preferred Share, as of any Conversion Date or other date of determination, $0.1530, subject to adjustment as provided herein.

(c) Mechanics of Conversion. The conversion of each Preferred Share shall be conducted in the following manner:

(i) Optional Conversion. To convert a Preferred Share into shares of Common Stock on any date (a **"Conversion Date"**), a Holder shall deliver (via facsimile, electronic mail or otherwise), for receipt on or prior to 11:59 p.m., New York time, on such date, a copy of an executed notice of conversion of the share(s) of Preferred Shares subject to such conversion in the form attached hereto as **Exhibit I** (the **"Conversion Notice"**) to the Corporation. If required by Section 4(c)(iii), within three (3) Trading Days following a conversion of any such Preferred Shares as aforesaid, such Holder shall surrender to a nationally recognized overnight delivery service for delivery to the Corporation the original certificates, if any, representing the Preferred Shares (the **"Preferred Share Certificates"**) so converted as aforesaid (or an indemnification undertaking with respect to the Preferred Shares in the case of its loss, theft or destruction as contemplated by Section 16(b)). On or before the first (1st) Trading Day following the date of receipt of a Conversion Notice, the Corporation shall transmit by facsimile or electronic mail an acknowledgment of confirmation, in the form attached hereto as **Exhibit II,** of receipt of such Conversion Notice to such Holder and the Corporation's transfer agent (the **"Transfer Agent"),** which confirmation shall constitute an instruction to the Transfer Agent to process such Conversion Notice in accordance with the terms herein. On or before the third (3rd) Trading Day following the date of receipt of a Conversion Notice (or such earlier date as required pursuant to the 1934 Act or other applicable law, rule or regulation for the settlement of a trade initiated on the applicable Conversion Date of such shares of Common Stock issuable pursuant to such Conversion Notice) (the **"Share Delivery Deadline"**), the Corporation shall (1) provided that the Transfer Agent is participating in The Depository Trust Company's (**"DTC"**) Fast Automated Securities Transfer Program, credit such aggregate number of shares of Common Stock to which such Holder shall be entitled to such Holder's or its designee's balance account with DTC through its Deposit/Withdrawal at Custodian system, or (2) if the Transfer Agent is not participating in the DTC Fast Automated Securities Transfer Program, issue and deliver (via reputable overnight courier) to the address as specified in such Conversion Notice, a certificate, registered in the name of such Holder or its designee, for the number of shares of Common Stock to which such Holder shall be entitled. If the number of Preferred Shares represented by the Preferred Share Certificate(s) submitted for conversion pursuant to Section 4(c)(iii) is greater than the number of Preferred Shares being converted, then the Corporation shall, as soon as practicable and in no event later than three (3) Trading Days after receipt of the Preferred Share Certificate(s) and at its own expense, issue and deliver to such Holder (or its designee) a new Preferred Share Certificate (in accordance with Section 16(d)) representing the

number of Preferred Shares not converted. The Person or Persons entitled to receive the shares of Common Stock issuable upon a conversion of Preferred Shares shall be treated for all purposes as the record holder or holders of such shares of Common Stock on the Conversion Date.

(ii) Corporation's Failure to Timely Convert. If the Corporation shall fail, for any reason or for no reason, on or prior to the applicable Share Delivery Deadline, to issue to such Holder a certificate for the number of shares of Common Stock to which such Holder is entitled and register such shares of Common Stock on the Corporation's share register or to credit such Holder's or its designee's balance account with DTC for such number of shares of Common Stock to which such Holder is entitled upon such Holder's conversion of any Conversion Amount (as the case may be) (a **"Conversion Failure"**), and if on or after such Share Delivery Deadline such Holder purchases (in an open market transaction or otherwise) shares of Common Stock to deliver in satisfaction of a sale by such Holder of all or any portion of the number of shares of Common Stock, or a sale of a number of shares of Common Stock equal to all or any portion of the number of shares of Common Stock, issuable upon such conversion that such Holder so anticipated receiving from the Corporation, then, in addition to all other remedies available to such Holder, the Corporation shall, within three (3) Business Days after receipt of such Holder's request and in such Holder's discretion, either: (1) pay cash to such Holder in an amount equal to such Holder's total purchase price (including brokerage commissions and other out-of-pocket expenses, if any) for the shares of Common Stock so purchased (including, without limitation, by any other Person in respect, or on behalf, of such Holder) (the **"Buy-In Price"**), at which point the Corporation's obligation to so issue and deliver such certificate or credit such Holder's balance account with DTC for the number of shares of Common Stock to which such Holder is entitled upon such Holder's conversion hereunder (as the case may be) (and to issue such shares of Common Stock) shall terminate, or (II) promptly honor its obligation to so issue and deliver to such Holder a certificate or certificates representing such shares of Common Stock or credit such Holder's balance account with DTC for the number of shares of Common Stock to which such Holder is entitled upon such Holder's conversion hereunder (as the case may be) and pay cash to such Holder in an amount equal to the excess (if any) of the Buy-In Price over the product of (x) such number of shares of Common Stock multiplied by (y) the lowest Closing Sale Price of the Common Stock on any Trading Day during the period commencing on the date of the applicable Conversion Notice and ending on the date of such issuance and payment under this clause (II).

(iii) Registration; Book-Entry. At the time of issuance of any Preferred Shares hereunder, the applicable Holder may, by written request (including by electronic-mail) to the Corporation, elect to receive such Preferred Shares in the form of one or more Preferred Share Certificates or in Book-Entry form. The Corporation (or the Transfer Agent, as custodian for the Preferred Shares) shall maintain a register (the **"Register"**) for the recordation of the names and

addresses of the Holders of each Preferred Share and the Stated Value of the Preferred Shares and whether the Preferred Shares are held by such Holder in Preferred Share Certificates or in Book-Entry form (the "**Registered Preferred Shares**"). The entries in the Register shall be conclusive and binding for all purposes absent manifest error. The Corporation and each Holder of the Preferred Shares shall treat each Person whose name is recorded in the Register as the owner of a Preferred Share for all purposes (including, without limitation, the right to receive payments and Dividends hereunder) notwithstanding notice to the contrary. A Registered Preferred Share may be assigned, transferred or sold only by registration of such assignment or sale on the Register. Upon its receipt of a written request to assign, transfer or sell one or more Registered Preferred Shares by such Holder thereof, the Corporation shall record the information contained therein in the Register and issue one or more new Registered Preferred Shares in the same aggregate Stated Value as the Stated Value of the surrendered Registered Preferred Shares to the designated assignee or transferee pursuant to Section 16, provided that if the Corporation does not so record an assignment, transfer or sale (as the case may be) of such Registered Preferred Shares within two (2) Business Days of such a request, then the Register shall be automatically deemed updated to reflect such assignment, transfer or sale (as the case may be). Notwithstanding anything to the contrary set forth in this Section 4, following conversion of any Preferred Shares in accordance with the terms hereof, the applicable Holder shall not be required to physically surrender such Preferred Shares held in the form of a Preferred Share Certificate to the Corporation unless (A) the full or remaining number of Preferred Shares represented by the applicable Preferred Share Certificate are being converted (in which event such certificate(s) shall be delivered to the Corporation as contemplated by this Section 4(c)(iii)) or (B) such Holder has provided the Corporation with prior written notice (which notice may be included in a Conversion Notice) requesting reissuance of Preferred Shares upon physical surrender of the applicable Preferred Share Certificate. Each Holder and the Corporation shall maintain records showing the Stated Value, Dividends and Late Charges converted and/or paid (as the case may be) and the dates of such conversions and/or payments (as the case may be) or shall use such other method, reasonably satisfactory to such Holder and the Corporation, so as not to require physical surrender of a Preferred Share Certificate upon conversion. If the Corporation does not update the Register to record such Stated Value, Dividends and Late Charges converted and/or paid (as the case may be) and the dates of such conversions and/or payments (as the case may be) within two (2) Business Days of such occurrence, then the Register shall be automatically deemed updated to reflect such occurrence. In the event of any dispute or discrepancy, such records of the Corporation establishing the number of Preferred Shares to which the record holder is entitled shall be controlling and determinative in the absence of manifest error. Notwithstanding the foregoing, if the number of Preferred Shares set forth on the face of a Preferred Share Certificate is greater than the number of Preferred Shares then outstanding under such Preferred Share Certificate, the applicable Holder may not transfer such Preferred Share Certificate into the name of any other Person (other than an Affiliate of such

Holder) unless such Holder first physically surrenders such Preferred Share Certificate to the Corporation pursuant to Section 16 below (or delivers a lost certificate affidavit to the Corporation, if applicable, pursuant to Section 16(b) below), whereupon the Corporation will forthwith issue and deliver to such Holder (or to such other Person as designated by such Holder to the Corporation in writing) a new Preferred Share Certificate of like tenor, representing, in the aggregate, the remaining number of Preferred Shares outstanding under such Preferred Share Certificate. A Holder and any transferee or assignee, by acceptance of a certificate, acknowledge and agree that, by reason of the provisions of this paragraph, following conversion of any Preferred Shares, the number of Preferred Shares represented by such certificate may be less than the number of Preferred Shares stated on the face thereof. Each Preferred Share Certificate shall bear the following legend:

ANY TRANSFEREE OR ASSIGNEE OF THIS CERTIFICATE SHOULD CAREFULLY REVIEW THE TERMS OF THE CORPORATION'S CERTIFICATE OF DESIGNATIONS RELATING TO THE SHARES OF SERIES B PREFERRED STOCK REPRESENTED BY THIS CERTIFICATE, INCLUDING SECTION 4(c)(iii) THEREOF. THE NUMBER OF SHARES OF SERIES B PREFERRED STOCK REPRESENTED BY THIS CERTIFICATE MAY BE LESS THAN THE NUMBER OF SHARES OF SERIES B PREFERRED STOCK STATED ON THE FACE HEREOF PURSUANT TO SECTION 4(c)(iii) OF THE CERTIFICATE OF DESIGNATIONS RELATING TO THE SHARES OF SERIES B PREFERRED STOCK REPRESENTED BY THIS CERTIFICATE.

(iv) Pro Rata Conversion; Disputes. In the event that the Corporation receives a Conversion Notice from more than one Holder for the same Conversion Date and the Corporation can convert some, but not all, of such Preferred Shares submitted for conversion, the Corporation shall convert from each Holder electing to have Preferred Shares converted on such date a pro rata amount of such Holder's Preferred Shares submitted for conversion on such date based on the number of Preferred Shares submitted for conversion on such date by such Holder relative to the aggregate number of Preferred Shares submitted for conversion on such date. In the event of a dispute as to the number of shares of Common Stock issuable to a Holder in connection with a conversion of Preferred Shares, the Corporation shall issue to such Holder the number of shares of Common Stock not in dispute and resolve such dispute in accordance with Section 21.

(d) Limitation on Beneficial Ownership. The Corporation shall not effect the conversion of any of the Preferred Shares held by a Holder, and such Holder shall not have the right to convert any of the Preferred Shares held by such Holder pursuant to the terms and conditions of this Certificate of Designations and any such conversion shall be null and void and treated as if never made, to the extent that after giving effect to such conversion, such Holder together with the other Attribution Parties collectively would beneficially own in excess of 9.99% (the "**Maximum Percentage"**) of the shares of Common Stock outstanding immediately after giving effect to such conversion. For purposes of the foregoing sentence, the aggregate number of shares of Common Stock beneficially owned by such Holder and the other Attribution Parties shall include the number of shares of Common Stock held by such Holder and all other Attribution Parties plus the number of shares of Common Stock issuable upon conversion of the Preferred Shares with respect to which the determination of such sentence is being made, but shall exclude shares of Common Stock which would be issuable upon (A) conversion of the remaining, nonconverted Preferred Shares beneficially owned by such Holder or any of the other Attribution Parties and (B) exercise or conversion of the unexercised or nonconverted portion of any other securities of the Corporation (including, without limitation, any convertible notes, convertible preferred stock or warrants) beneficially owned by such Holder or any other Attribution Party subject to a limitation on conversion or exercise analogous to the limitation contained in this Section 4(d). For purposes of this Section 4(d), beneficial ownership shall be calculated in accordance with Section 13(d) of the 1934 Act. For purposes of determining the number of outstanding shares of Common Stock a Holder may acquire upon the conversion of such Preferred Shares without exceeding the Maximum Percentage, such Holder may rely on the number of outstanding shares of Common Stock as reflected in (x) the Corporation's most recent Annual Report on Form 10-K, Quarterly Report on Form 10-Q, Current Report on Form 8-K or other public filing with the SEC, as the case may be, (y) a more recent public announcement by the Corporation or (z) any other written notice by the Corporation or the Transfer Agent, if any, setting forth the number of shares of Common Stock outstanding (the **"Reported Outstanding Share Number"**). If the Corporation receives a Conversion Notice from a Holder at a time when the actual number of outstanding shares of Common Stock is less than the Reported Outstanding Share Number, the Corporation shall notify such Holder in writing of the number of shares of Common Stock then outstanding and, to the extent that such Conversion Notice would otherwise cause such Holder's beneficial ownership, as determined pursuant to this Section 4(d), to exceed the Maximum Percentage, such Holder must notify the Corporation of a reduced number of shares of Common Stock to be purchased pursuant to such Conversion Notice. For any reason at any time, upon the written or oral request of any Holder, the Corporation shall within one (1) Business Day confirm orally and in writing or by electronic mail to such Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Corporation, including such Preferred Shares, by such Holder and any other Attribution Party since the date as of which the Reported Outstanding Share Number was reported. In the event that the issuance of shares of Common Stock to a Holder upon conversion of such Preferred Shares results in such Holder and the other Attribution Parties being deemed to beneficially own, in the aggregate, more than the Maximum Percentage of the number of outstanding shares of Common Stock (as determined under Section 13(d) of the 1934 Act), the number of shares so issued by which such Holder's and the other Attribution Parties' aggregate beneficial ownership

exceeds the Maximum Percentage (the **"Excess Shares")** shall be deemed null and void and shall be cancelled ab initio, and such Holder shall not have the power to vote or to transfer the Excess Shares. Upon delivery of a written notice to the Corporation, any Holder may from time to time increase (with such increase not effective until the sixty-first (61st) day after delivery of such notice) or decrease the Maximum Percentage of such Holder to any other percentage not in excess of 9.99% as specified in such notice; provided that (i) any such increase in the Maximum Percentage will not be effective until the sixty-first (61st) day after such notice is delivered to the Corporation and (ii) any such increase or decrease will apply only to such Holder and the other Attribution Parties and not to any other Holder. For purposes of clarity, the shares of Common Stock issuable to a Holder pursuant to the terms of this Certificate of Designations in excess of the Maximum Percentage shall not be deemed to be beneficially owned by such Holder for any purpose including for purposes of Section 13(d) or Rule 16a-1(a)(1) of the 1934 Act. No prior inability to convert such Preferred Shares pursuant to this paragraph shall have any effect on the applicability of the provisions of this paragraph with respect to any subsequent determination of convertibility. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 4(d) to the extent necessary to correct this paragraph (or any portion of this paragraph) which may be defective or inconsistent with the intended beneficial ownership limitation contained in this Section 4(d) or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitation contained in this paragraph may not be waived and shall apply to a successor holder of such Preferred Shares.

5. Rights Upon Fundamental Transactions. The Corporation shall not enter into or be party to a Fundamental Transaction unless the Successor Entity assumes in writing all of the obligations of the Corporation under this Certificate of Designations and the other Transaction Documents in accordance with the provisions of this Section 55 pursuant to written agreements in form and substance reasonably satisfactory to the Required Holders and approved by the Required Holders prior to such Fundamental Transaction, including agreements to deliver to each holder of Preferred Shares in exchange for such Preferred Shares a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Certificate of Designations, including, without limitation, having a stated value and dividend rate equal to the stated value and dividend rate of the Preferred Shares held by the Holders and having similar ranking to the Preferred Shares, and satisfactory to the Required Holders. Upon the occurrence of any Fundamental Transaction, the Successor Entity shall succeed to, and be substituted for (so that from and after the date of such Fundamental Transaction, the provisions of this Certificate of Designations and the other Transaction Documents referring to the "Corporation" shall refer instead to the Successor Entity), and may exercise every right and power of the Corporation and shall assume all of the obligations of the Corporation under this Certificate of Designations and the other Transaction Documents with the same effect as if such Successor Entity had been named as the Corporation herein and therein. In addition to the foregoing, upon consummation of a Fundamental Transaction, the Successor Entity shall deliver to each Holder confirmation that there shall be issued upon conversion or redemption of the Preferred Shares at any time after the consummation of such Fundamental Transaction, in lieu of the shares of Common Stock (or other securities, cash, assets or other property (except such

items still issuable under Sections 6(a) and 13, which shall continue to be receivable thereafter)) issuable upon the conversion or redemption of the Preferred Shares prior to such Fundamental Transaction, such shares of the publicly traded common stock (or their equivalent) of the Successor Entity (including its Parent Entity) which each Holder would have been entitled to receive upon the happening of such Fundamental Transaction had all the Preferred Shares held by each Holder been converted immediately prior to such Fundamental Transaction (without regard to any limitations on the conversion of the Preferred Shares contained in this Certificate of Designations), as adjusted in accordance with the provisions of this Certificate of Designations. Notwithstanding the foregoing, such Holder may elect, at its sole option, by delivery of written notice to the Corporation to waive this Section 5 to permit the Fundamental Transaction without the assumption of the Preferred Shares. The provisions of this Section 5 shall apply similarly and equally to successive Fundamental Transactions and shall be applied without regard to any limitations on the conversion or redemption of the Preferred Shares.

6. Rights Upon Issuance of Purchase Rights and Other Corporate Events.

(a) Purchase Rights. In addition to any adjustments pursuant to Section 7 below, if at any time the Corporation grants, issues or sells any Options, Convertible Securities or rights to purchase stock, warrants, securities or other property pro rata to all or substantially all of the record holders of any class of Common Stock (the **"Purchase Rights"),** then each Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which such Holder could have acquired if such Holder had held the number of shares of Common Stock acquirable upon complete conversion of all the Preferred Shares (without taking into account any limitations or restrictions on the convertibility of the Preferred Shares) held by such Holder immediately prior to the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights (provided, however, to the extent that such Holder's right to participate in any such Purchase Right would result in such Holder and the other Attribution Parties exceeding the Maximum Percentage, then such Holder shall not be entitled to participate in such Purchase Right to such extent (and shall not be entitled to beneficial ownership of such shares of Common Stock as a result of such Purchase Right (and beneficial ownership) to such extent) and such Purchase Right to such extent shall be held in abeyance for such Holder until such time or times , if ever, as its right thereto would not result in such Holder and the other Attribution Parties exceeding the Maximum Percentage), at which time or times such Holder shall be granted such right (and any Purchase Right granted, issued or sold on such initial Purchase Right or on any subsequent Purchase Right to be held similarly in abeyance) to the same extent as if there had been no such limitation.

(b) Other Corporate Events. In addition to and not in substitution for any other rights hereunder, prior to the consummation of any Fundamental Transaction pursuant to which holders of shares of Common Stock are entitled to receive securities or other assets with respect to or in exchange for shares of Common Stock (a **"Corporate Event"**), the Corporation shall make appropriate provision to insure that each Holder will

thereafter have the right to receive upon a conversion of all the Preferred Shares held by such Holder (i) in addition to the shares of Common Stock receivable upon such conversion, such securities or other assets to which such Holder would have been entitled with respect to such shares of Common Stock had such shares of Common Stock been held by such Holder upon the consummation of such Corporate Event (without taking into account any limitations or restrictions on the convertibility of the Preferred Shares contained in this Certificate of Designations) or (ii) in lieu of the shares of Common Stock otherwise receivable upon such conversion, such securities or other assets received by the holders of shares of Common Stock in connection with the consummation of such Corporate Event in such amounts as such Holder would have been entitled to receive had the Preferred Shares held by such Holder initially been issued with conversion rights for the form of such consideration (as opposed to shares of Common Stock) at a conversion rate for such consideration commensurate with the Conversion Rate. Provision made pursuant the proceeding sentence shall be in a form and substance satisfactory to the Holder. The provisions of this Section 6 shall apply similarly and equally to successive Corporate Events and shall be applied without regard to any limitations on the conversion or redemption of the Preferred Shares contained in this Certificate of Designations.

7. Rights Upon Issuance of Other Securities.

(a) Adjustment of Conversion Price upon Subdivision or Combination of Common Stock. Without limiting any provision of Section 6 or Section 13, if the Corporation at any time on or after the Subscription Date subdivides (by any stock split, stock dividend, stock combination, recapitalization or other similar transaction) one or more classes of its outstanding shares of Common Stock into a greater number of shares, the Conversion Price in effect immediately prior to such subdivision will be proportionately reduced. Without limiting any provision of Section 6 or Section 13, if the Corporation at any time on or after the Subscription Date combines (by any stock split, stock dividend, stock combination, recapitalization or other similar transaction) one or more classes of its outstanding shares of Common Stock into a smaller number of shares, the Conversion Price in effect immediately prior to such combination will be proportionately increased. Any adjustment pursuant to this Section 7(a) shall become effective immediately after the effective date of such subdivision or combination. If any event requiring an adjustment under this Section 7(a) occurs during the period that a Conversion Price is calculated hereunder, then the calculation of such Conversion Price shall be adjusted appropriately to reflect such event.

(b) Calculations. All calculations under this Section 7 shall be made by rounding to the nearest cent or the nearest 1/100th of a share, as applicable. The number of shares of Common Stock outstanding at any given time shall not include shares owned or held by or for the account of the Corporation, and the disposition of any such shares shall be considered an issue or sale of Common Stock.

8. Redemptions.

(a) Corporation Optional Redemption. At any time after the Initial Issuance Date, the Corporation shall have the right to redeem all, or any part, of the Preferred Shares then outstanding (the **"Corporation Optional Redemption Amount")** on the applicable Corporation Optional Redemption Date (each as defined below) (a **"Corporation Optional Redemption"**). The Preferred Shares subject to redemption pursuant to this Section 8(a) shall be redeemed by the Corporation in cash at a price (the **"Corporation Optional Redemption Price"**) equal to the Conversion Amount being redeemed as of the Corporation Optional Redemption Date. The Corporation may exercise its right to require redemption under this Section 8(a) by delivering a written notice thereof by facsimile or electronic mail and overnight courier to all, but not less than all, of the Holders (the **"Corporation Optional Redemption Notice"** and the date all of the Holders received such notice is referred to as the **"Corporation Optional Redemption Notice Date"**). Each Corporation Optional Redemption Notice shall be irrevocable. The Corporation Optional Redemption Notice shall (x) state the ,date on which the Corporation Optional Redemption shall occur (the **"Corporation Optional Redemption Date")** which date shall not be less than five (5) Trading Days nor more than twenty (20) Trading Days following the Corporation Optional Redemption Notice Date, and (y) state the aggregate Conversion Amount of the Preferred Shares which is being redeemed in such Corporation Optional Redemption from such Holder and all of the other Holders of the Preferred Shares pursuant to this Section 8(a) on the Corporation Optional Redemption Date. Notwithstanding anything herein to the contrary, at any time prior to the date the Corporation Optional Redemption Price is paid, in full, the Corporation Optional Redemption Amount may be converted, in whole or in part, by any Holder into shares of Common Stock pursuant to Section 4. All Conversion Amounts converted by a Holder after the Corporation Optional Redemption Notice Date shall reduce the Corporation Optional Redemption Amount of the Preferred Shares of such Holder required to be redeemed on the Corporation Optional Redemption Date.

(b) Financing Redemption. Upon the occurrence of any Financing, the Corporation shall be required to redeem from each Holder (unless waived, in whole or in part, by such Holder in an e-mail or other writing to the Corporation) such aggregate number of Preferred Shares equal to the lesser of (x) the aggregate number of preferred shares then held by such Holder and (y) the quotient (rounded down to the nearest whole number) of (A) the applicable Financing Amount, divided by (B) the Stated Value then in effect (the **"Financing Redemption Amount"**) concurrently with such related Financing by instructing the Control Account Bank, purchaser of securities, placement agent or underwriter, as applicable, to wire or release the applicable Financing Amount to such corresponding Holder (or, if such Financing Amount is delivered to the Company for any reason, to promptly thereafter wire each Financing Amount to the applicable Holder) (each, a **"Financing Redemption Date"**, and such redemption, a **"Financing Redemption"**). The Preferred Shares subject to redemption pursuant to this Section 8(b) shall be redeemed by the Corporation in cash at a price (each, a **"Financing Redemption Price"**) equal to the Conversion Amount being redeemed as of the Financing Redemption Date. Notwithstanding anything herein to the contrary, at any time prior to the date the

Financing Redemption Price is paid, in full, the Financing Redemption Amount may be converted, in whole or in part, by any Holder into shares of Common Stock pursuant to Section 4. All Conversion Amounts converted by a Holder after the occurrence of any Controlled Account Release Event and prior to the applicable Financing Redemption Date shall reduce the Financing Redemption Amount of the Preferred Shares of such Holder required to be redeemed on the applicable Financing Redemption Date.

(c) Mandatory Redemption upon Bankruptcy Event of Default. Notwithstanding anything to the contrary herein, and notwithstanding any conversion that is then required or in process, upon any Bankruptcy Event of Default (as defined in the Notes) (each, a **"Bankruptcy Redemption Date"**), whether occurring prior to or following the Maturity Date, the Corporation shall immediately redeem, in cash, each of the Preferred Shares then outstanding at a redemption price equal to the Conversion Amount of such Preferred Shares (each, a **"Bankruptcy Redemption Price**"**),** without the requirement for any notice or demand or other action by any Holder or any other person or entity, provided that a Holder may, in its sole discretion, waive such right to receive payment upon a Bankruptcy Event of Default, in whole or in part, and any such waiver shall not affect any other rights of such Holder or any other Holder hereunder, including any other rights in respect of such Bankruptcy Event of Default, any right to conversion, and any right to payment of such Bankruptcy Redemption Price or any other Redemption Price, as applicable.

(d) Holder Optional Redemption after Maturity Date. At any time from and after the tenth (10th) Business Day prior to the Maturity Date, any Holder may require the Corporation to redeem (a **"Maturity Redemption**") all or any number of Preferred Shares held by such Holder at a purchase price equal to 100% of the Conversion Amount of such Preferred Shares (the **"Maturity Redemption Price"**) by delivery of written notice thereof (the **"Maturity Redemption Notice"**) to the Corporation. The Maturity Redemption Notice shall state the date the Corporation is required to pay to such Holder such Maturity Redemption Price (the **"Maturity Redemption Date"),** which date shall be no earlier than ten (10) Business Days following the date of delivery of such Maturity Redemption Notice.

(e) Mechanics of Redemptions. If a Holder has submitted a Maturity Redemption Notice, the Corporation shall deliver the applicable Maturity Redemption Price to such Holder in cash on the applicable Maturity Redemption Date. The Corporation shall deliver the applicable Corporation Optional Redemption Price to each Holder in cash on the applicable Corporation Optional Redemption Date. The Corporation shall deliver the applicable Bankruptcy Redemption Price to each Holder in cash on the applicable Bankruptcy Redemption Date. The Corporation shall deliver the applicable Financing Redemption Price to each Holder in cash on the applicable Financing Redemption Date. Notwithstanding anything herein to the contrary, in connection with any redemption hereunder at a time a Holder is entitled to receive a cash payment under any of the other Transaction Documents, at the option of such Holder delivered in writing to the Corporation, the applicable Redemption Price hereunder shall be increased by the amount of such cash payment owed to such Holder under such other

Transaction Document and, upon payment in full or conversion in accordance herewith, shall satisfy the Corporation's payment obligation under such other Transaction Document. In the event of a redemption of less than all of the Preferred Shares, the Corporation shall promptly cause to be issued and delivered to such Holder a new Preferred Share Certificate (in accordance with Section 16) (or evidence of the creation of a new Book-Entry) representing the number of Preferred Shares which have not been redeemed. In the event that the Corporation does not pay the applicable Redemption Price to a Holder within the time period required for any reason (including, without limitation, to the extent such payment is prohibited pursuant to the DGCL), at any time thereafter and until the Corporation pays such unpaid Redemption Price in full, such Holder shall have the option, in lieu of redemption, to require the Corporation to promptly return to such Holder all or any of the Preferred Shares that were submitted for redemption and for which the applicable Redemption Price (together with any Late Charges thereon) has not been paid. Upon the Corporation's receipt of such notice, (x) the applicable Redemption Notice shall be null and void with respect to such Preferred Shares, (y) the Corporation shall immediately return the applicable Preferred Share Certificate, or issue a new Preferred Share Certificate (in accordance with Section 16(d)), to such Holder (unless the Preferred Shares are held in Book-Entry form, in which case the Corporation shall deliver evidence to such Holder that a Book-Entry for such Preferred Shares then exists). A Holder's delivery of a notice voiding a Redemption Notice and exercise of its rights following such notice shall not affect the Corporation's obligations to make any payments of Late Charges which have accrued prior to the date of such notice with respect to the Preferred Shares subject to such notice.

(f) Redemption by Multiple Holders. Upon the Corporation's receipt of a Redemption Notice from any Holder, the Corporation shall immediately, but no later than one (1) Business Day of its receipt thereof, forward to each other Holder by facsimile or electronic mail a copy of such notice. If the Corporation receives one or more Redemption Notices, during the seven (7) Business Day period beginning on and including the date which is three (3) Business Days prior to the Corporation's receipt of the initial Redemption Notice and ending on and including the date which is three (3) Business Days after the Corporation's receipt of the initial Redemption Notice and the Corporation is unable to redeem all principal, interest and other amounts designated in such initial Redemption Notice and such other Redemption Notices received during such seven (7) Business Day period, then the Corporation shall redeem a pro rata amount from each Holder based on the principal amount of the Preferred Shares submitted for redemption pursuant to such Redemption Notices received by the Corporation during such seven (7) Business Day period.

9. Noncircumvention. The Corporation hereby covenants and agrees that the Corporation will not, by amendment of its Certificate of Incorporation (as defined in the Securities Purchase Agreement), Bylaws (as defined in the Securities Purchase Agreement) or through any reorganization, transfer of assets, consolidation, merger, scheme of arrangement, dissolution, issue or sale of securities, or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Certificate of Designations, and will at all times in good faith carry out all the provisions of this Certificate of Designations and take all

action as may be required to protect the rights of the Holders hereunder. Without limiting the generality of the foregoing or any other provision of this Certificate of Designations or the other Transaction Documents, the Corporation (a) shall not increase the par value of any shares of Common Stock receivable upon the conversion of any Preferred Shares above the Conversion Price then in effect, (b) shall take all such actions as may be necessary or appropriate in order that the Corporation may validly and legally issue fully paid and non-assessable shares of Common Stock upon the conversion of Preferred Shares and (c) shall, so long as any Preferred Shares are outstanding, take all action necessary to reserve and keep available out of its authorized and unissued shares of Common Stock, solely for the purpose of effecting the conversion of the Preferred Shares, the maximum number of shares of Common Stock as shall from time to time be necessary to effect the conversion of the Preferred Shares then outstanding (without regard to any limitations on conversion contained herein).

10. Authorized Shares.

(a) Reservation. So long as any Preferred Shares remain outstanding, from and after the date of the Stockholder Approval (as defined in the Securities Purchase Agreement), the Corporation shall at all times reserve at least 125% of the number of shares of Common Stock as shall from time to time be necessary to effect the conversion of all of the Preferred Shares then outstanding (without regard to any limitations on conversions and assuming the Preferred Shares remain outstanding until the Maturity Date) (the **"Required Reserve Amount**")**.** The Required Reserve Amount (including, without limitation, each increase in the number of shares so reserved) shall be allocated pro rata among the Holders based on the number of the Preferred Shares held by each Holder on the Initial Issuance Date or increase in the number of reserved shares, as the case may be (the **"Authorized Share Allocation"**). In the event that a Holder shall sell or otherwise transfer any of such Holder's Preferred Shares, each transferee shall be allocated a pro rata portion of such Holder's Authorized Share Allocation. Any shares of Common Stock reserved and allocated to any Person which ceases to hold any Preferred Shares shall be allocated to the remaining Holders of Preferred Shares, pro rata based on the number of the Preferred Shares then held by the Holders.

(b) Insufficient Authorized Shares. If, notwithstanding Section 10(a) and not in limitation thereof, after the date of the Stockholder Approval, while any of the Preferred Shares remain outstanding, the Corporation does not have a sufficient number of authorized and unreserved shares of Common Stock to satisfy its obligation to reserve for issuance upon conversion of the Preferred Shares at least a number of shares of Common Stock equal to the Required Reserve Amount (an **"Authorized Share Failure**")**,** then the Corporation shall immediately take all action necessary to increase the Corporation's authorized shares of Common Stock to an amount sufficient to allow the Corporation to reserve the Required Reserve Amount for the Preferred Shares then outstanding. Without limiting the generality of the foregoing sentence, as soon as practicable after the date of the occurrence of an Authorized Share Failure, but in no event later than sixty (60) days after the occurrence of such Authorized Share Failure, the Corporation shall hold a meeting of its stockholders for the approval of an increase in the number of authorized shares of Common Stock. In connection with such meeting, the

Corporation shall provide each stockholder with a proxy statement and shall use its best efforts to solicit its stockholders' approval of such increase in authorized shares of Common Stock and to cause its board of directors to recommend to the stockholders that they approve such proposal. In the event that the Corporation is prohibited from issuing shares of Common Stock to a Holder upon any conversion due to the failure by the Corporation to have sufficient shares of Common Stock available out of the authorized but unissued shares of Common Stock (such unavailable number of shares of Common Stock, the **"Authorized Failure Shares"**), in lieu of delivering such Authorized Failure Shares to such Holder, the Corporation shall pay cash in exchange for the redemption of such portion of the Conversion Amount convertible into such Authorized Failure Shares at a price equal to the sum of (i) the product of (x) such number of Authorized Failure Shares and (y) the greatest Closing Sale Price of the Common Stock on any Trading Day during the period commencing on the date such Holder delivers the applicable Conversion Notice with respect to such Authorized Failure Shares to the Corporation and ending on the date of such issuance and payment under this Section 10(b); and (ii) to the extent such Holder purchases (in an open market transaction or otherwise) shares of Common Stock to deliver in satisfaction of a sale by such Holder of Authorized Failure Shares, any brokerage commissions and other out-of-pocket expenses, if any, of such Holder incurred in connection therewith. Nothing contained in Section 10(a) or this Section 10(b) shall limit any obligations of the Corporation under any provision of the Securities Purchase Agreement.

11. Voting Rights.

(a) Each Holder, as such, shall be entitled to the whole number of votes equal to the number of shares of Common Stock equal to the purchase price of the Preferred Shares then held by such Holder (calculated as the portion of the aggregate $2,000,000 purchase price for all of the Preferred Shares attributable to the Preferred Shares then held by such Holder); divided by $0.1867 (the closing bid price on the Initial Issuance Date), provided, however, that such amount of votes with respect to the Series B Preferred Stock shall not exceed 19.9% (or such greater percentage allowed by The NASDAQ Capital Market without any stockholder approval requirements) of the voting power of the Corporation.

(b) Each Holder shall be entitled to receive the same prior notice of any stockholders' meeting as is provided to the holders of Common Stock as well as prior notice of all stockholder actions to be taken by legally available means in lieu of a meeting (and copies of proxy materials, consent solicitation statements and other information sent to stockholders in connection therewith), all in accordance with the Bylaws and the DGCL, and shall be entitled to vote or, if applicable, provide consent, together with the holders of Common Stock as if they were a single class of securities upon any matter submitted to a vote of stockholders, except as otherwise expressly required by law and except as required by the terms hereof to be submitted to a series vote of the applicable Holders, in which case each Holder only shall vote as a separate series.

12. Liquidation, Dissolution, Winding-Up. In the event of a Liquidation Event, the Holders shall be entitled to receive in cash out of the assets of the Corporation, whether from capital or from earnings available for distribution to its stockholders (the **"Liquidation Funds"),** before any amount shall be paid to the holders of any of shares of Junior Stock, but pari passu with any Parity Stock then outstanding, an amount per Preferred Share equal to the Conversion Amount thereof on the date of such payment, provided that if the Liquidation Funds are insufficient to pay the full amount due to the Holders and holders of shares of Parity Stock, then each Holder and each holder of Parity Stock shall receive a percentage of the Liquidation Funds equal to the full amount of Liquidation Funds payable to such Holder and such holder of Parity Stock as a liquidation preference, in accordance with their respective certificate of designations (or equivalent), as a percentage of the full amount of Liquidation Funds payable to all holders of Preferred Shares and all holders of shares of Parity Stock. To the extent necessary, the Corporation shall cause such actions to be taken by each of its Subsidiaries so as to enable, to the maximum extent permitted by law, the proceeds of a Liquidation Event to be distributed to the Holders in accordance with this Section 12. All the preferential amounts to be paid to the Holders under this Section 12 shall be paid or set apart for payment before the payment or setting apart for payment of any amount for, or the distribution of any Liquidation Funds of the Corporation to the holders of shares of Junior Stock in connection with a Liquidation Event as to which this Section 12 applies.

13. Distribution of Assets. In addition to any adjustments pursuant to Section 7, if the Corporation shall declare or make any dividend or other distributions of its assets (or rights to acquire its assets) to any or all holders of shares of Common Stock, by way of return of capital or otherwise (including without limitation, any distribution of cash, stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (the **"Distributions"),** then each Holder, as holders of Preferred Shares, will be entitled to such Distributions as if such Holder had held the number of shares of Common Stock acquirable upon complete conversion of the Preferred Shares (without taking into account any limitations or restrictions on the convertibility of the Preferred Shares) immediately prior to the date on which a record is taken for such Distribution or, if no such record is taken, the date as of which the record holders of Common Stock are to be determined for such Distributions (provided, however that to the extent that such Holder's right to participate in any such Distribution would result in such Holder and the other Attribution Parties exceeding the Maximum Percentage, then such Holder shall not be entitled to participate in such Distribution to the extent of the Maximum Percentage (and shall not be entitled to beneficial ownership of such shares of Common Stock as a result of such Distribution (and beneficial ownership) to the extent of any such excess) and the portion of such Distribution shall be held in abeyance for such Holder until such time or times as its right thereto would not result in such Holder and the other Attribution Parties exceeding the Maximum Percentage, at which time or times, if any, such Holder shall be granted such rights (and any rights under this Section 13 on such initial rights or on any subsequent such rights to be held similarly in abeyance) to the same extent as if there had been no such limitation).

14. Vote to Change the Terms of or Issue Preferred Shares. In addition to any other rights provided by law, except where the vote or written consent of the holders of a greater number of shares is required by law or by another provision of the Certificate of Incorporation, without first obtaining the affirmative vote at a meeting duly called for such purpose or the written consent without a meeting of the Required Holders, voting together as a single class, the Corporation shall not: (a) amend or repeal any provision of, or add any provision to, its Certificate of Incorporation or bylaws, or file any certificate of designations or articles of amendment of any series of shares of preferred stock, if such action would adversely alter or change in any respect the preferences, rights, privileges or powers, or restrictions provided for the benefit of the Preferred Shares hereunder, regardless of whether any such action shall be by means of amendment to the Certificate of Incorporation or by merger, consolidation or otherwise; (b) increase or decrease (other than by conversion) the authorized number of Preferred Shares; (c) without limiting any provision of Section 2, create or authorize (by reclassification or otherwise) any new class or series of Senior Preferred Stock or Parity Stock; (d) purchase, repurchase or redeem any shares of Junior Stock (other than pursuant to the terms of the Corporation's equity incentive plans and options and other equity awards granted under such plans (that have in good faith been approved by the Board)); (e) without limiting any provision of Section 2, pay dividends or make any other distribution on any shares of any Junior Stock; (f) issue any Preferred Shares other than as contemplated hereby or pursuant to the Securities Purchase Agreement ; or (g) without limiting any provision of Section 8(e), whether or not prohibited by the terms of the Preferred Shares, circumvent a right of the Preferred Shares hereunder.

15. Transfer of Preferred Shares. A Holder may transfer some or all of its Preferred Shares without the consent of the Corporation.

16. Reissuance of Preferred Share Certificates and Book Entries.

(a) Transfer. If any Preferred Shares are to be transferred, the applicable Holder shall surrender the applicable Preferred Share Certificate to the Corporation (or, if the Preferred Shares are held in Book-Entry form, a written instruction letter to the Corporation), whereupon the Corporation will forthwith issue and deliver upon the order of such Holder a new Preferred Share Certificate (in accordance with Section 16(d)) (or evidence of the transfer of such Book-Entry), registered as such Holder may request, representing the outstanding number of Preferred Shares being transferred by such Holder and, if less than the entire outstanding number of Preferred Shares is being transferred, a new Preferred Share Certificate (in accordance with Section 16(d)) to such Holder representing the outstanding number of Preferred Shares not being transferred (or evidence of such remaining Preferred Shares in a Book-Entry for such Holder). Such Holder and any assignee, by acceptance of the Preferred Share Certificate or evidence of Book-Entry issuance, as applicable, acknowledge and agree that, by reason of the provisions of Section 4(c)(i) following conversion or redemption of any of the Preferred Shares, the outstanding number of Preferred Shares represented by the Preferred Shares may be less than the number of Preferred Shares stated on the face of the Preferred Shares.

(b) Lost, Stolen or Mutilated Preferred Share Certificate. Upon receipt by the Corporation of evidence reasonably satisfactory to the Corporation of the loss, theft, destruction or mutilation of a Preferred Share Certificate (as to which a written certification and the indemnification contemplated below shall suffice as such evidence),

and, in the case of loss, theft or destruction, of any indemnification undertaking by the applicable Holder to the Corporation in customary and reasonable form and, in the case of mutilation, upon surrender and cancellation of such Preferred Share Certificate, the Corporation shall execute and deliver to such Holder a new Preferred Share Certificate (in accordance with Section 16(d)) representing the applicable outstanding number of Preferred Shares.

(c) Preferred Share Certificate and Book-Entries Exchangeable for Different Denominations and Forms. Each Preferred Share Certificate is exchangeable, upon the surrender hereof by the applicable Holder at the principal office of the Corporation, for a new Preferred Share Certificate or Preferred Share Certificate(s) or new Book-Entry (in accordance with Section 16(d)) representing, in the aggregate, the outstanding number of the Preferred Shares in the original Preferred Share Certificate, and each such new Preferred Share Certificate and/or new Book-Entry, as applicable, will represent such portion of such outstanding number of Preferred Shares from the original Preferred Share Certificate as is designated in writing by such Holder at the time of such surrender. Each Book-Entry may be exchanged into one or more new Preferred Share Certificates or split by the applicable Holder by delivery of a written notice to the Corporation into two or more new Book-Entries (in accordance with Section 16(d)) representing, in the aggregate, the outstanding number of the Preferred Shares in the original Book-Entry, and each such new Book-Entry and/or new Preferred Share Certificate, as applicable, will represent such portion of such outstanding number of Preferred Shares from the original Book-Entry as is designated in writing by such Holder at the time of such surrender.

(d) Issuance of New Preferred Share Certificate or Book-Entry. Whenever the Corporation is required to issue a new Preferred Share Certificate or a new Book-Entry pursuant to the terms of this Certificate of Designations, such new Preferred Share Certificate or new Book-Entry (i) shall represent, as indicated on the face of such Preferred Share Certificate or in such Book-Entry, as applicable, the number of Preferred Shares remaining outstanding (or in the case of a new Preferred Share Certificate or new Book-Entry being issued pursuant to Section 16(a) or Section 16(c), the number of Preferred Shares designated by such Holder) which, when added to the number of Preferred Shares represented by the other new Preferred Share Certificates or other new Book-Entry, as applicable, issued in connection with such issuance, does not exceed the number of Preferred Shares remaining outstanding under the original Preferred Share Certificate or original Book-Entry, as applicable, immediately prior to such issuance of new Preferred Share Certificate or new Book-Entry, as applicable, and (ii) shall have an issuance date, as indicated on the face of such new Preferred Share Certificate or in such new Book-Entry, as applicable, which is the same as the issuance date of the original Preferred Share Certificate or in such original Book-Entry, as applicable.

17. Remedies, Characterizations, Other Obligations, Breaches and Injunctive Relief. The remedies provided in this Certificate of Designations shall be cumulative and in addition to all other remedies available under this Certificate of Designations and any of the other Transaction Documents, at law or in equity (including a decree of specific performance and/or other injunctive relief), and nothing herein shall limit any Holder’s right to pursue actual and

consequential damages for any failure by the Corporation to comply with the terms of this Certificate of Designations. The Corporation covenants to each Holder that there shall be no characterization concerning this instrument other than as expressly provided herein. Amounts set forth or provided for herein with respect to payments, conversion and the like (and the computation thereof) shall be the amounts to be received by a Holder and shall not, except as expressly provided herein, be subject to any other obligation of the Corporation (or the performance thereof). The Corporation acknowledges that a breach by it of its obligations hereunder will cause irreparable harm to the Holders and that the remedy at law for any such breach may be inadequate. The Corporation therefore agrees that, in the event of any such breach or threatened breach, each Holder shall be entitled, in addition to all other available remedies, to specific performance and/or temporary, preliminary and permanent injunctive or other equitable relief from any court of competent jurisdiction in any such case without the necessity of proving actual damages and without posting a bond or other security. The Corporation shall provide all information and documentation to a Holder that is requested by such Holder to enable such Holder to confirm the Corporation's compliance with the terms and conditions of this Certificate of Designations.

18. Payment of Collection, Enforcement and Other Costs. If (a) any Preferred Shares are placed in the hands of an attorney for collection or enforcement or is collected or enforced through any legal proceeding or a Holder otherwise takes action to collect amounts due under this Certificate of Designations with respect to the Preferred Shares or to enforce the provisions of this Certificate of Designations or (b) there occurs any bankruptcy, reorganization, receivership of the Corporation or other proceedings affecting Corporation creditors' rights and involving a claim under this Certificate of Designations, then the Corporation shall pay the costs incurred by such Holder for such collection, enforcement or action or in connection with such bankruptcy, reorganization, receivership or other proceeding, including, without limitation, attorneys' fees and disbursements.

19. Construction; Headings. This Certificate of Designations shall be deemed to be jointly drafted by the Corporation and the Holders and shall not be construed against any such Person as the drafter hereof. The headings of this Certificate of Designations are for convenience of reference and shall not form part of, or affect the interpretation of, this Certificate of Designations. Unless the context clearly indicates otherwise, each pronoun herein shall be deemed to include the masculine, feminine, neuter, singular and plural forms thereof. The terms "including," "includes," "include" and words of like import shall be construed broadly as if followed by the words "without limitation." The terms "herein," "hereunder," "hereof" and words of like import refer to this entire Certificate of Designations instead of just the provision in which they are found. Unless expressly indicated otherwise, all section references are to sections of this Certificate of Designations. Terms used in this Certificate of Designations and not otherwise defined herein, but defined in the other Transaction Documents, shall have the meanings ascribed to such terms on the Initial Issuance Date in such other Transaction Documents unless otherwise consented to in writing by the Required Holders.

20. Failure or Indulgence Not Waiver. No failure or delay on the part of a Holder in the exercise of any power, right or privilege hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any such power, right or privilege preclude other or further exercise thereof or of any other right, power or privilege. No waiver shall be effective unless it is in writing and signed by an authorized representative of the waiving party. This Certificate of Designations shall be deemed to be jointly drafted by the Corporation and all Holders and shall not be construed against any Person as the drafter hereof. Notwithstanding the foregoing, nothing contained in this Section 20 shall permit any waiver of any provision of Section 4(d).

21. Dispute Resolution.

(a) Submission to Dispute Resolution.

(i) In the case of a dispute relating to a Closing Bid Price, a Closing Sale Price, a Conversion Price, a VWAP or a fair market value or the arithmetic calculation of a Conversion Rate, or the applicable Redemption Price (as the case may be) (including, without limitation, a dispute relating to the determination of any of the foregoing), the Corporation or the applicable Holder (as the case may be) shall submit the dispute to the other party via facsimile or electronic mail (A) if by the Corporation, within two (2) Business Days after the occurrence of the circumstances giving rise to such dispute or (B) if by such Holder at any time after such Holder learned of the circumstances giving rise to such dispute. If such Holder and the Corporation are unable to promptly resolve such dispute relating to such Closing Bid Price, such Closing Sale Price, such Conversion Price, such VWAP or such fair market value, or the arithmetic calculation of such Conversion Rate or such applicable Redemption Price (as the case may be), at any time after the second (2nd) Business Day following such initial notice by the Corporation or such Holder (as the case may be) of such dispute to the Corporation or such Holder (as the case may be), then such Holder and the Corporation may jointly select an independent, reputable investment bank to resolve such dispute.

(ii) Such Holder and the Corporation shall each deliver to such investment bank (A) a copy of the initial dispute submission so delivered in accordance with the first sentence of this Section 21 and (B) written documentation supporting its position with respect to such dispute, in each case, no later than 5:00 p.m. (New York time) by the fifth (5th) Business Day immediately following the date on which such Holder selected such investment bank (the **"Dispute Submission Deadline"**) (the documents referred to in the immediately preceding clauses (A) and (B) are collectively referred to herein as the **"Required Dispute Documentation**") (it being understood and agreed that if either such Holder or the Corporation fails to so deliver all of the Required Dispute Documentation by the Dispute Submission Deadline, then the party who fails to so submit all of the Required Dispute Documentation shall no longer be entitled to (and hereby waives its right to) deliver or submit any written documentation or other support to such investment bank with respect to such dispute and such investment bank shall resolve such dispute based solely on the Required Dispute Documentation that was delivered to such investment bank prior to the Dispute Submission Deadline). Unless otherwise agreed to in writing by both the Corporation and such Holder or otherwise requested by such investment bank, neither the Corporation nor such Holder shall be entitled to deliver or submit any written documentation or other support to such investment bank in connection with such dispute (other than the Required Dispute Documentation).

(iii) The Corporation and such Holder shall cause such investment bank to determine the resolution of such dispute and notify the Corporation and such Holder of such resolution no later than ten (10) Business Days immediately following the Dispute Submission Deadline. The fees and expenses of such investment bank shall be borne solely by the Corporation, and such investment bank's resolution of such dispute shall be final and binding upon all parties absent manifest error.

(b) Miscellaneous. The Corporation and each Holder each, severally and not jointly, expressly acknowledges and agrees that (i) this Section 21 constitutes an agreement to arbitrate between the Corporation and such Holder (and constitutes an arbitration agreement) under § 7501, et seq. of the New York Civil Practice Law and Rules (**"CPLR"**) and that any Holder is authorized to apply for an order to compel arbitration pursuant to CPLR § 7503(a) in order to compel compliance with this Section 21, (ii) the terms of this Certificate of Designations and each other applicable Transaction Document shall serve as the basis for the selected investment bank's resolution of the applicable dispute, such investment bank shall be entitled (and is hereby expressly authorized) to make all findings, determinations and the like that such investment bank determines are required to be made by such investment bank in connection with its resolution of such dispute and in resolving such dispute such investment bank shall apply such findings, determinations and the like to the terms of this Certificate of Designations and any other applicable Transaction Documents, (iii) the Corporation and such applicable Holder (but only such Holder with respect to disputes solely relating to such Holder) shall each have the right to submit any dispute described in this Section 21 to any state or federal court sitting in The City of New York, Borough of Manhattan in lieu of utilizing the procedures set forth in this Section 21 and (iv) nothing in this Section 21 shall limit such Holder from obtaining any injunctive relief or other equitable remedies (including, without limitation, with respect to any matters described in this Section 21).

22. Notices; Currency; Payments.

(a) Notices. The Corporation shall provide each Holder of Preferred Shares with prompt written notice of all actions taken pursuant to the terms of this Certificate of Designations, including in reasonable detail a description of such action and the reason therefor. Any notices, consents, waivers or other communications required or permitted to be given under the terms hereof must be in writing and will be deemed to have been delivered: (i) upon receipt, when delivered personally; (ii) upon receipt, when sent by facsimile (provided confirmation of transmission is mechanically or electronically generated and kept on file by the sending party) or by electronic mail; or (iii) one Business Day after deposit with an overnight courier service, in each case properly addressed to the party to receive the same as determined in accordance with the Securities

Purchase Agreement. Written confirmation of receipt (A) given by the recipient of such notice, consent, waiver or other communication, (B) mechanically or electronically generated by the sender's facsimile machine or e-mail containing the time, date, recipient facsimile number and an image of the first page of such transmission or (C) provided by an overnight courier service shall be rebuttable evidence of personal service, receipt by facsimile or receipt from an overnight courier service in accordance with clause (i), (ii) or (iii) above, respectively. The Corporation shall provide each Holder with prompt written notice of all actions taken pursuant to this Certificate of Designations, including in reasonable detail a description of such action and the reason therefore. Without limiting the generality of the foregoing, the Corporation shall give written notice to each Holder (i) immediately upon any adjustment of the Conversion Price, setting forth in reasonable detail, and certifying, the calculation of such adjustment and (ii) at least fifteen (15) days prior to the date on which the Corporation closes its books or takes a record (A) with respect to any dividend or distribution upon the Common Stock, (B) with respect to any grant, issuances, or sales of any Options, Convertible Securities or rights to purchase stock, warrants, securities or other property to holders of shares of Common Stock or (C) for determining rights to vote with respect to any Fundamental Transaction, dissolution or liquidation, provided in each case that such information shall be made known to the public prior to or in conjunction with such notice being provided to such Holder.

(b) Currency. An dollar amounts referred to in this Certificate of Designations are in United States Dollars (**"U.S. Dollars"**), and all amounts owing under this Certificate of Designations shall be paid in U.S. Dollars. All amounts denominated in other currencies (if any) shall be converted into the U.S. Dollar equivalent amount in accordance with the Exchange Rate on the date of calculation. **"Exchange Rate"** means, in relation to any amount of currency to be converted into U.S. Dollars pursuant to this Certificate of Designations, the U.S. Dollar exchange rate as published in the Wall Street Journal on the relevant date of calculation (it being understood and agreed that where an amount is calculated with reference to, or over, a period of time, the date of calculation shall be the final date of such period of time).

(c) Payments. Whenever any payment of cash is to be made by the Corporation to any Person pursuant to this Certificate of Designations, unless otherwise expressly set forth herein, such payment shall be made in lawful money of the United States of America by a certified check drawn on the account of the Corporation and sent via overnight courier service to such Person at such address as previously provided to the Corporation in writing (which address, in the case of each of the Buyers (as defined in the Securities Purchase Agreement, shall initially be as set forth on the Schedule of Buyers attached to the Securities Purchase Agreement), provided that such Holder may elect to receive a payment of cash via wire transfer of immediately available funds by providing the Corporation with prior written notice setting out such request and such Holder's wire transfer instructions. Whenever any amount expressed to be due by the terms of this Certificate of Designations is due on any day which is not a Business Day, the same shall instead be due on the next succeeding day which is a Business Day. Any amount due under the Transaction Documents which is not paid when due shall result in a late charge being incurred and payable by the Corporation in an amount equal to interest on such amount at the rate of fifteen percent (15%) per annum from the date such amount was due until the same is paid in full ("**Late Charge**").

23. Waiver of Notice. To the extent permitted by law, the Corporation hereby irrevocably waives demand, notice, presentment, protest and all other demands and notices in connection with the delivery, acceptance, performance, default or enforcement of this Certificate of Designations and the Securities Purchase Agreement.

24. Governing Law. This Certificate of Designations shall be construed and enforced in accordance with, and all questions concerning the construction, validity, interpretation and performance of this Certificate of Designations shall be governed by, the internal laws of the State of Delaware, without giving effect to any choice of law or conflict of law provision or rule (whether of the State of Delaware or any other jurisdictions) that would cause the application of the laws of any jurisdictions other than the State of Delaware. Except as otherwise required by Section 21 above, the Corporation hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in The City of New York, Borough of Manhattan, for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is brought in an inconvenient forum or that the venue of such suit, action or proceeding is improper. Nothing contained herein shall be deemed to limit in any way any right to serve process in any manner permitted by law. Nothing contained herein shall be deemed to limit in any way any right to serve process in any manner permitted by law. Nothing contained herein (i) shall be deemed or operate to preclude any Holder from bringing suit or taking other legal action against the Corporation in any other jurisdiction to collect on the Corporation's obligations to such Holder, to realize on any collateral or any other security for such obligations, or to enforce a judgment or other court ruling in favor of such Holder or (ii) shall limit, or shall be deemed or construed to limit, any provision of Section 21. **THE CORPORATION HEREBY IRREVOCABLY WAIVES ANY RIGHT IT MAY HAVE TO, AND AGREES NOT TO REQUEST, A JURY TRIAL FOR THE ADJUDICATION OF ANY DISPUTE HEREUNDER OR IN CONNECTION WITH OR ARISING OUT OF THIS CERTIFICATE OF DESIGNATIONS OR ANY TRANSACTION CONTEMPLATED HEREBY.**

25. Judgment Currency.

(a) If for the purpose of obtaining or enforcing judgment against the Corporation in any court in any jurisdiction it becomes necessary to convert into any other currency (such other currency being hereinafter in this Section 29 referred to as the "**Judgment Currency**") an amount due in U.S. dollars under this Certificate of Designations, the conversion shall be made at the Exchange Rate prevailing on the Trading Day immediately preceding:

(i) the date actual payment of the amount due, in the case of any proceeding in the courts of New York or in the courts of any other jurisdiction that will give effect to such conversion being made on such date: or

(ii) the date on which the foreign court determines, in the case of any proceeding in the courts of any other jurisdiction (the date as of which such conversion is made pursuant to this Section 25(a)(ii) being hereinafter referred to as the **"Judgment Conversion Date"**).

(b) If in the case of any proceeding in the court of any jurisdiction referred to in Section 25(a) above, there is a change in the Exchange Rate prevailing between the Judgment Conversion Date and the date of actual payment of the amount due, the applicable party shall pay such adjusted amount as may be necessary to ensure that the amount paid in the Judgment Currency, when converted at the Exchange Rate prevailing on the date of payment, will produce the amount of US dollars which could have been purchased with the amount of Judgment Currency stipulated in the judgment or judicial order at the Exchange Rate prevailing on the Judgment Conversion Date.

(c) Any amount due from the Corporation under this provision shall be due as a separate debt and shall not be affected by judgment being obtained for any other amounts due under or in respect of this Certificate of Designations.

26. Severability. If any provision of this Certificate of Designations is prohibited by law or otherwise determined to be invalid or unenforceable by a court of competent jurisdiction, the provision that would otherwise be prohibited, invalid or unenforceable shall be deemed amended to apply to the broadest extent that it would be valid and enforceable, and the invalidity or unenforceability of such provision shall not affect the validity of the remaining provisions of this Certificate of Designations so long as this Certificate of Designations as so modified continues to express, without material change, the original intentions of the parties as to the subject matter hereof and the prohibited nature, invalidity or unenforceability of the provision(s) in question does not substantially impair the respective expectations or reciprocal obligations of the parties or the practical realization of the benefits that would otherwise be conferred upon the parties. The parties will endeavor in good faith negotiations to replace the prohibited, invalid or unenforceable provision(s) with a valid provision(s), the effect of which comes as close as possible to that of the prohibited, invalid or unenforceable provision(s).

27. Maximum Payments. Nothing contained herein shall be deemed to establish or require the payment of a rate of interest or other charges in excess of the maximum permitted by applicable law. In the event that the rate of interest required to be paid or other charges hereunder exceed the maximum permitted by such law, any payments in excess of such maximum shall be credited against amounts owed by the Corporation to the applicable Holder and thus refunded to the Corporation.

28. Stockholder Matters; Amendment.

(a) Stockholder Matters. Any stockholder action, approval or consent required, desired or otherwise sought by the Corporation pursuant to the DGCL, the Certificate of Incorporation, this Certificate of Designations or otherwise with respect to the issuance of Preferred Shares may be effected by written consent of the Corporation's stockholders or at a duly called meeting of the Corporation's stockholders, all in

accordance with the applicable rules and regulations of the DGCL. This provision is intended to comply with the applicable sections of the DGCL permitting stockholder action, approval and consent affected by written consent in lieu of a meeting.

(b) Amendment. This Certificate of Designations or any provision hereof may be amended by obtaining the affirmative vote at a meeting duly called for such purpose, or written consent without a meeting in accordance with the DGCL, of the Required Holders, voting separate as a single class, and with such other stockholder approval, if any, as may then be required pursuant to the DGCL and the Certificate of Incorporation.

29. Certain Defined Terms. For purposes of this Certificate of Designations, the following terms shall have the following meanings:

(a) **"1933 Act"** means the Securities Act of 1933, as amended, and the rules and regulations thereunder.

(b) **"1934 Act"** means the Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder.

(c) **"Additional Amount"** means, as of the applicable date of determination, with respect to each Preferred Share, all declared and unpaid Dividends on such Preferred Share.

(d) **"Affiliate"** or **"Affiliated"** means, with respect to any Person, any other Person that directly or indirectly controls, is controlled by, or is under common control with, such Person, it being understood for purposes of this definition that "control" of a Person means the power directly or indirectly either to vote 10% or more of the stock having ordinary voting power for the election of directors of such Person or direct or cause the direction of the management and policies of such Person whether by contract or otherwise.

(e) **"Attribution Parties"** means, collectively, the following Persons and entities: (i) any investment vehicle, including, any funds, feeder funds or managed accounts, currently, or from time to time after the Initial Issuance Date, directly or indirectly managed or advised by a Holder's investment manager or any of its Affiliates or principals, (ii) any direct or indirect Affiliates of such Holder or any of the foregoing, (iii) any Person acting or who could be deemed to be acting as a Group together with such Holder or any of the foregoing and (iv) any other Persons whose beneficial ownership of the Corporation's Common Stock would or could be aggregated with such Holder's and the other Attribution Parties for purposes of Section 13(d) of the 1934 Act. For clarity, the purpose of the foregoing is to subject collectively such Holder and all other Attribution Parties to the Maximum Percentage.

(f) **"Bloomberg"** means Bloomberg, L.P.

(g) **"Book-Entry"** means each entry on the Register evidencing one or more Preferred Shares held by a Holder in lieu of a Preferred Share Certificate issuable hereunder.

(h) **"Business Day"** means any day other than Saturday, Sunday or other day on which commercial banks in The City of New York are authorized or required by law to remain closed.

(i) **"Closing Bid Price"** and **"Closing Sale Price"** means, for any security as of any date, the last closing bid price and last closing trade price, respectively, for such security on the Principal Market, as reported by Bloomberg, or, if the Principal Market begins to operate on an extended hours basis and does not designate the closing bid price or the closing trade price (as the case may be) then the last bid price or last trade price, respectively, of such security prior to 4:00:00 p.m., New York time, as reported by Bloomberg, or, if the Principal Market is not the principal securities exchange or trading market for such security, the last closing bid price or last trade price, respectively, of such security on the principal securities exchange or trading market where such security is listed or traded as reported by Bloomberg, or if the foregoing do not apply, the last closing bid price or last trade price, respectively, of such security in the over-the-counter market on the electronic bulletin board for such security as reported by Bloomberg, or, if no closing bid price or last trade price, respectively, is reported for such security by Bloomberg, the average of the bid prices, or the ask prices, respectively, of any market makers for such security as reported in the "pink sheets" by OTC Markets Group Inc. (formerly Pink Sheets LLC). If the Closing Bid Price or the Closing Sale Price cannot be calculated for a security on a particular date on any of the foregoing bases, the Closing Bid Price or the Closing Sale Price (as the case may be) of such security on such date shall be the fair market value as mutually determined by the Corporation and the Required Holder. If the Corporation and the Required Holders are unable to agree upon the fair market value of such security, then such dispute shall be resolved in accordance with the procedures in Section 21. All such determinations shall be appropriately adjusted for any stock splits, stock dividends, stock combinations, recapitalizations or other similar transactions during such period.

(j) **"Common Stock"** means (i) the Corporation's shares of common stock, $0.01 par value per share, and (ii) any capital stock into which such common stock shall have been changed or any share capital resulting from a reclassification of such common stock.

(k) **"Convertible Securities"** means any stock or other security (other than Options) that is at any time and under any circumstances, directly or indirectly, convertible into, exercisable or exchangeable for, or which otherwise entitles the holder thereof to acquire, any shares of Common Stock.

(l) **"Current Subsidiary"** means any Person in which the Corporation on the Subscription Date, directly or indirectly, (i) owns any of the outstanding capital stock or holds any equity or similar interest of such Person or (ii) controls or operates all or any part of the business, operations or administration of such Person, and all of the foregoing, collectively, **"Current Subsidiaries".**

(m) **“Eligible Market”** means The New York Stock Exchange, the NYSE MKT, the Nasdaq Global Select Market, the Nasdaq Global Market or the Principal Market.

(n) **“Financing”** means (x) the occurrence of any Control Account Release Event (as defined in the Notes) or (y) the occurrence of any Subsequent Placement (as defined in the Securities Purchase Agreement.

(o) **“Financing Amount”** means (x) with respect to the occurrence of any Control Account Release Event with respect to a Note held by a given Holder, the applicable Controlled Account Release Amount (as defined in the Notes) of the Note of such Holder (provided, that no portion of such Controlled Account Release Amount shall be used to redeem any other Preferred Shares of any other Holder as long as the Holder (or any of its Affiliates) holds any Preferred Shares) or (y) with respect to any Subsequent Placement, the Holder Pro Rata Amount of the net cash proceeds of such Subsequent Placement.

(p) **“Fundamental Transaction”** means (A) that the Corporation shall, directly or indirectly, including through subsidiaries, Affiliates or otherwise, in one or more related transactions, (i) consolidate or merge with or into (whether or not the Corporation is the surviving corporation) another Subject Entity, or (ii) sell, assign, transfer, convey or otherwise dispose of all or substantially all of the properties or assets of the Corporation or any of its “significant subsidiaries “ (as defined in Rule 1-02 of Regulation S-X) to one or more Subject Entities, or (iii) make, or allow one or more Subject Entities to make, or allow the Corporation to be subject to or have its Common Stock be subject to or party to one or more Subject Entities making, a purchase, tender or exchange offer that is accepted by the holders of at least either (x) 50% of the outstanding shares of Common Stock, (y) 50% of the outstanding shares of Common Stock calculated as if any shares of Common Stock held by all Subject Entities making or party to, or Affiliated with any Subject Entities making or party to, such purchase, tender or exchange offer were not outstanding; or (z) such number of shares of Common Stock such that all Subject Entities making or party to, or Affiliated with any Subject Entity making or party to, such purchase, tender or exchange offer, become collectively the beneficial owners (as defined in Rule 13d-3 under the 1934 Act) of at least 50% of the outstanding shares of Common Stock, or (iv) consummate a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off or scheme of arrangement) with one or more Subject Entities whereby all such Subject Entities, individually or in the aggregate, acquire, either (x) at least 50% of the outstanding shares of Common Stock, (y) at least 50% of the outstanding shares of Common Stock calculated as if any shares of Common Stock held by all the Subject Entities making or party to, or Affiliated with any Subject Entity making or party to, such stock purchase agreement or other business combination were not outstanding; or (z) such number of shares of Common Stock such that the Subject Entities become collectively the

beneficial owners (as defined in Rule 13d-3 under the 1934 Act) of at least 50% of the outstanding shares of Common Stock, or (v) reorganize, recapitalize or reclassify its Common Stock, (B) that the Corporation shall, directly or indirectly, including through subsidiaries, Affiliates or otherwise, in one or more related transactions, allow any Subject Entity individually or the Subject Entities in the aggregate to be or become the "beneficial owner" (as defined in Rule 13d-3 under the 1934 Act), directly or indirectly, whether through acquisition, purchase, assignment, conveyance, tender, tender offer, exchange, reduction in outstanding shares of Common Stock, merger, consolidation, business combination, reorganization, recapitalization, spin-off, scheme of arrangement, reorganization, recapitalization or reclassification or otherwise in any manner whatsoever, of either (x) at least 50% of the aggregate ordinary voting power represented by issued and outstanding Common Stock, (y) at least 50% of the aggregate ordinary voting power represented by issued and outstanding Common Stock not held by all such Subject Entities as of the date of this Certificate of Designations calculated as if any shares of Common Stock held by all such Subject Entities were not outstanding, or (z) a percentage of the aggregate ordinary voting power represented by issued and outstanding shares of Common Stock or other equity securities of the Corporation sufficient to allow such Subject Entities to effect a statutory short form merger or other transaction requiring other shareholders of the Corporation to surrender their shares of Common Stock without approval of the shareholders of the Corporation or (C) directly or indirectly, including through subsidiaries, Affiliates or otherwise, in one or more related transactions, the issuance of or the entering into any other instrument or transaction structured in a manner to circumvent, or that circumvents, the intent of this definition in which case this definition shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this definition to the extent necessary to correct this definition or any portion of this definition which may be defective or inconsistent with the intended treatment of such instrument or transaction.

(q) **"GAAP"** means United States generally accepted accounting principles, consistently applied.

(r) **"Group"** means a "group" as that term is used in Section 13(d) of the 1934 Act and as defined in Rule 13d-5 thereunder.

(s) **"Holder Pro Rata Amount"** means, with respect to any Holder, a fraction (i) the numerator of which is the number of Preferred Shares issued to such Holder on the Initial Issuance Date and (ii) the denominator of which is the number of Preferred Shares issued to all Holders on the Initial Issuance Date.

(t) **"Liquidation Event"** means, whether in a single transaction or series of transactions, the voluntary or involuntary liquidation, dissolution or winding up of the Corporation or such Subsidiaries the assets of which constitute all or substantially all of the assets of the business of the Corporation and its Subsidiaries, taken as a whole.

(u) **"Maturity Date"** shall mean October 5, 2017.

(v) **"Note"** means, with respect to a Holder, that certain senior secured convertible note issued by the Corporation to such Holder pursuant to that certain Securities Purchase Agreement, dated June 6, 2016, by and among the Corporation, such Holder and the other investors party thereto, as amended from time to time in accordance therewith.

(w) **"New Subsidiary"** means, as of any date of determination, any Person in which the Corporation after the Subscription Date, directly or indirectly, (i) owns or acquires any of the outstanding capital stock or holds any equity or similar interest of such Person or (ii) controls or operates all or any part of the business, operations or administration of such Person, and all of the foregoing, collectively, **"New Subsidiaries**.**"**

(x) **"Options"** means any rights, warrants or options to subscribe for or purchase shares of Common Stock or Convertible Securities.

(y) **"Parent Entity"** of a Person means an entity that, directly or indirectly, controls the applicable Person and whose common stock or equivalent equity security is quoted or listed on an Eligible Market, or, if there is more than one such Person or Parent Entity, the Person or Parent Entity with the largest public market capitalization as of the date of consummation of the Fundamental Transaction.

(z) **"Person"** means an individual, a limited liability Corporation, a partnership, a joint venture, a corporation, a trust, an unincorporated organization, any other entity or a government or any department or agency thereof.

(aa) **"Principal Market"** means the Nasdaq Capital Market.

(bb) **"Redemption Notices"** means, collectively, the Maturity Redemption Notice and the Corporation Optional Redemption Notice, and each of the foregoing, individually, a **"Redemption Notice."**

(cc) **"Redemption Prices"** means, collectively, Financing Redemption Prices, the Maturity Redemption Price, Bankruptcy Redemption Price and the Corporation Optional Redemption Prices, and each of the foregoing, individually, a **"Redemption Price."**

(dd) **"SEC"** means the Securities and Exchange Commission or the successor thereto.

(ee) **"Securities Purchase Agreement"** means that certain securities purchase agreement by and among the Corporation and the initial holders of Preferred Shares, dated as of the Subscription Date, as may be amended from time in accordance with the terms thereof,

(ff) **"Stated Value"** shall mean $1,000 per share, subject to adjustment for stock splits, stock dividends, recapitalizations, reorganizations, reclassifications, combinations, subdivisions or other similar events occurring after the Initial Issuance Date with respect to the Preferred Shares.

(gg) **"Subscription Date"** means July 5, 2017.

(hh) **"Subject Entity"** means any Person, Persons or Group or any Affiliate or associate of any such Person, Persons or Group.

(ii) **"Subsidiaries"** means, as of any date of determination, collectively, all Current Subsidiaries and all New Subsidiaries, and each of the foregoing, individually, a **"Subsidiary."**

(jj) **"Successor Entity"** means the Person (or, if so elected by the Required Holders, the Parent Entity) formed by, resulting from or surviving any Fundamental Transaction or the Person (or, if so elected by the Required Holders, the Parent Entity) with which such Fundamental Transaction shall have been entered into.

(kk) **"Trading Day"** means, as applicable, (x) with respect to all price or trading volume determinations relating to the Common Stock, any day on which the Common Stock is traded on the Principal Market, or, if the Principal Market is not the principal trading market for the Common Stock, then on the principal securities exchange or securities market on which the Common Stock is then traded, provided that "Trading Day" shall not include any day on which the Common Stock is scheduled to trade on such exchange or market for less than 4.5 hours or any day that the Common Stock is suspended from trading during the final hour of trading on such exchange or market (or if such exchange or market does not designate in advance the closing time of trading on such exchange or market, then during the hour ending at 4:00:00 p.m., New York time) unless such day is otherwise designated as a Trading Day in writing by the Holder or (y) with respect to all determinations other than price determinations relating to the Common Stock, any day on which The New York Stock Exchange (or any successor thereto) is open for trading of securities.

(ll) **"Transaction Documents"** means this Certificate of Designations, the Securities Purchase Agreement and each of the other agreements and instruments entered into or delivered by the Corporation or any of the Holders in connection with the transactions contemplated by the Securities Purchase Agreement, all as may be amended from time to time in accordance with the terms thereof.

(mm) **"VWAP"** means, for any security as of any date, the dollar volume-weighted average price for such security on the Principal Market (or, if the Principal Market is not the principal trading market for such security, then on the principal securities exchange or securities market on which such security is then traded) during the period beginning at 9:30:01 a.m., New York time, and ending at 4:00:00 p.m., New York time, as reported by Bloomberg through its "Volume at Price" function or, if the foregoing does not apply, the dollar volume-weighted average price of such security in the over-the-counter market on the electronic bulletin board for such security during the period beginning at 9:30:01 a.m., New York time, and ending at 4:00:00 p.m., New York

time, as reported by Bloomberg, or, if no dollar volume-weighted average price is reported for such security by Bloomberg for such hours, the average of the highest closing bid price and the lowest closing ask price of any of the market makers for such security as reported in the "pink sheets" by OTC Markets Group Inc. (formerly Pink Sheets LLC). If the VWAP cannot be calculated for such security on such date on any of the foregoing bases, the VWAP of such security on such date shall be the fair market value as mutually determined by the Corporation and the Required Holders. If the Corporation and the Required Holders are unable to agree upon the fair market value of such security, then such dispute shall be resolved in accordance with the procedures in Section 21. All such determinations shall be appropriately adjusted for any stock dividend, stock split, stock combination, recapitalization or other similar transaction during such period.

30. Disclosure. Upon receipt or delivery by the Corporation of any notice in accordance with the terms of this Certificate of Designations, unless the Corporation has in good faith determined that the matters relating to such notice do not constitute material, non-public information relating to the Corporation or any of its Subsidiaries, the Corporation shall within one (1) Business Day after any such receipt or delivery publicly disclose such material, nonpublic information on a Current Report on Form 8-K or otherwise. In the event that the Corporation believes that a notice contains material, non-public information relating to the Corporation or any of its Subsidiaries, the Corporation so shall indicate to such Holder contemporaneously with delivery of such notice, and in the absence of any such indication, such Holder shall be allowed to presume that all matters relating to such notice do not constitute material, non-public information relating to the Corporation or any of its Subsidiaries. If the Corporation or any of its Subsidiaries provides material non-public information to a Holder that is not simultaneously filed in a Current Report on Form 8-K and such Holder has not agreed to receive such material non-public information, the Corporation hereby covenants and agrees that such Holder shall not have any duty of confidentiality to the Corporation, any of its Subsidiaries or any of their respective officers, directors, employees, affiliates or agents with respect to, or a duty to any of the foregoing not to trade on the basis of, such material non-public information. Nothing contained in this Section 30 shall limit any obligations of the Corporation, or any rights of any Holder, under the Securities Purchase Agreement.

* * * * *

IN WITNESS WHEREOF, the Corporation has caused this Certificate of Designations of Series B Convertible Preferred Stock to be signed by its Chief Executive Officer on this 5th day of July, 2017.

DELCATH SYSTEMS, INC.

By: /s/ Jennifer K. Simpson
Name: Jennifer K. Simpson
Title: CEO

EXHIBIT I

DELCATH SYSTEMS, INC.
CONVERSION NOTICE

Reference is made to the Certificate of Designations, Preferences and Rights of the Series B Convertible Preferred Stock of Delcath Systems, Inc. (the **"Certificate of Designations").** In accordance with and pursuant to the Certificate of Designations, the undersigned hereby elects to convert the number of shares of Series B Convertible Preferred Stock, $0.01 par value per share (the **"Preferred Shares"),** of Delcath Systems, Inc., a Delaware corporation (the **"Corporation"),** indicated below into shares of common stock, $0.01 value per share (the **"Common Stock"),** of the Corporation, as of the date specified below.

Date of Conversion: _____

Aggregate number of Preferred Shares to be converted: _____

Aggregate Stated Value of such Preferred Shares to be converted: _____

Aggregate accrued and unpaid Dividends and accrued and unpaid Late Charges with respect to such Preferred Shares and such Aggregate Dividends to be converted: _____

AGGREGATE CONVERSION AMOUNT TO BE CONVERTED: _____

Please confirm the following information: _____

Conversion Price: _____

Number of shares of Common Stock to be issued: _____

Please issue the Common Stock into which the applicable Preferred Shares are being converted to Holder, or for its benefit, as follows:

☐ Check here if requesting delivery as a certificate to the following name and to the following address:

Issue to: _____

_____

_____

_____

☐ Check here if requesting delivery by Deposit/Withdrawal at Custodian as follows:

DTC Participant: _____

DTC Number: _____

Account Number: _____

Date: _____

_____

Name of Registered Holder By:

By: _____

Name:

Title:

Tax ID: _____

Facsimile: _____

E-mail Address:

EXHIBIT II

ACKNOWLEDGMENT

The Corporation hereby acknowledges this Conversion Notice and hereby directs _____ to issue the above indicated number of shares of Common Stock in accordance with the Transfer Agent Instructions dated _____, 20__ from the Corporation and acknowledged and agreed to by _____.

DELCATH SYSTEMS, INC.

By: _____
Name:
Title:

CERTIFICATE OF DESIGNATIONS, PREFERENCES AND RIGHTS OF THE SERIES C PREFERRED STOCK OF DELCATH SYSTEMS, INC.

I, Jennifer Simpson, hereby certify that I am the Chief Executive Officer of Delcath Systems, Inc. (the **"Corporation"),** a corporation incorporated and existing under the Delaware General Corporation Law (the **"DGCL"**) and further do hereby certify:

That pursuant to the authority expressly conferred upon the Board of Directors of the Corporation (the **"Board")** by the Corporation's Certificate of Incorporation, as amended (the **"Certificate of Incorporation"**), and Section 151(g) of the DGCL, the Board on September 12, 2017 adopted the following resolution determining it desirable and in the best interests of the Corporation and its stockholders for the Corporation to create a series of shares of preferred stock designated as **"Series C Convertible Preferred Stock",** none of which shares have been issued:

RESOLVED, that pursuant to the authority vested in the Board, in accordance with the provisions of the Certificate of Incorporation, a series of preferred stock, par value $0.01 per share, of the Corporation be and hereby is created, and that the designation and number of shares thereof and the voting and other powers, preferences and relative, participating, optional or other rights of the shares of such series and the qualifications, limitations and restrictions thereof are as follows:

TERMS OF SERIES C PREFERRED STOCK

1. Designation and Number of Shares. There shall hereby be created and established a series of preferred stock of the Corporation designated as "Series C Preferred Stock" (the **"Preferred Shares").** The authorized number of Preferred Shares shall be 590 shares. Each Preferred Share shall have a par value of $0.01. Capitalized terms not defined herein shall have the meaning as set forth in Section 27 below.

2. Ranking. Except to the extent that the holders of at least a majority of the outstanding Preferred Shares (the **"Required Holders"**) expressly consent to the creation of Parity Stock (as defined below) or Senior Preferred Stock (as defined below) in accordance with Section 12, all shares of capital stock of the Corporation shall be junior in rank to all Preferred Shares with respect to the preferences as to dividends, distributions and payments upon the liquidation, dissolution and winding up of the Corporation (such junior stock is referred to herein collectively as **"Junior Stock"**). The rights of all such shares of capital stock of the Corporation shall be subject to the rights, powers, preferences and privileges of the Preferred Shares. Without limiting any other provision of this Certificate of Designations, without the prior express consent of the Required Holders, voting separate as a single class, the Corporation shall not hereafter authorize or issue any additional or other shares of capital stock that is (i) of senior rank to the Preferred Shares in respect of the preferences as to dividends, distributions and payments upon the liquidation, dissolution and winding up of the Corporation (collectively, the **"Senior Preferred Stock"**), (ii) of pari passu rank to the Preferred Shares in respect of the preferences as to dividends, distributions and payments upon the liquidation, dissolution and winding up of the Corporation (collectively, the "**Parity Stock**") or (iii) any Junior Stock having a maturity date (or any other date requiring redemption or repayment of such shares of Junior Stock) that is prior to the Maturity Date. In the event of the merger or consolidation of the Corporation with or into another corporation, the Preferred Shares shall maintain their relative rights, powers, designations, privileges and preferences provided for herein and no such merger or consolidation shall result inconsistent therewith.

3. Dividends. From and after the first date of issuance of any Preferred Shares (the "**Initial Issuance Date**"), no holder of a Preferred Share (each, a "**Holder**" and collectively, the "**Holders**") shall be entitled to receive any dividends ("**Dividends**") except in accordance with Section 5 or Section 11 below or, otherwise, to the extent, if any, as may be declared by the Board on the Preferred Shares, from time to time, in its sole and absolute discretion, which Dividends, if any, shall be paid by the Corporation out of funds legally available therefor, payable, subject to the conditions and other terms hereof, in cash on the Stated Value of such Preferred Share.

4. Rights Upon Fundamental Transactions. The Corporation shall not enter into or be party to a Fundamental Transaction unless the Successor Entity assumes in writing all of the obligations of the Corporation under this Certificate of Designations and the other Transaction Documents in accordance with the provisions of this Section 4 pursuant to written agreements in form and substance reasonably satisfactory to the Required Holders and approved by the Required Holders prior to such Fundamental Transaction, including agreements to deliver to each holder of Preferred Shares in exchange for such Preferred Shares a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Certificate of Designations, including, without limitation, having a stated value and dividend rate equal to the stated value and dividend rate of the Preferred Shares held by the Holders and having similar ranking to the Preferred Shares, and satisfactory to the Required Holders. Upon the occurrence of any Fundamental Transaction, the Successor Entity shall succeed to, and be substituted for (so that from and after the date of such Fundamental Transaction, the provisions of this Certificate of Designations and the other Transaction Documents referring to the "Corporation" shall refer instead to the Successor Entity), and may exercise every right and power of the Corporation and shall assume all of the obligations of the Corporation under this Certificate of Designations and the other Transaction Documents with the same effect as if such Successor Entity had been named as the Corporation herein and therein. In addition to the foregoing, upon consummation of a Fundamental Transaction, the Successor Entity shall deliver to each Holder confirmation that there shall be issued upon conversion or redemption of the Preferred Shares at any time after the consummation of such Fundamental Transaction, in lieu of the shares of Common Stock (or other securities, cash, assets or other property (except such items still issuable under Sections 5(a) and 11, which shall continue to be receivable thereafter)) issuable upon the conversion or redemption of the Preferred Shares prior to such Fundamental Transaction, such shares of the publicly traded common stock (or their equivalent) of the Successor Entity (including its Parent Entity) which each Holder would have been entitled to receive upon the happening of such Fundamental Transaction had all the Preferred Shares held by each Holder been converted immediately prior to such Fundamental Transaction (without regard to any limitations on the conversion of the Preferred Shares contained in this Certificate of Designations), as adjusted in accordance with the provisions of this Certificate of Designations. Notwithstanding the foregoing, such Holder may elect, at its sole option, by delivery of written notice to the Corporation to waive this Section 4 to permit the Fundamental Transaction without the assumption of the Preferred Shares. The provisions of this Section 4 shall apply similarly and equally to successive Fundamental Transactions and shall be applied without regard to any limitations on the conversion or redemption of the Preferred Shares.

5. Rights Upon Issuance of Purchase Rights and Other Corporate Events.

(a) Purchase Rights. In addition to any adjustments pursuant to Section 6 below, if at any time the Corporation grants, issues or sells any Options, Convertible Securities or rights to purchase stock, warrants, securities or other property pro rata to all or substantially all of the record holders of any class of Common Stock (the "**Purchase Rights**"), then each Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which such Holder could have acquired if such Holder had held the number of shares of Common Stock acquirable upon complete conversion of all the Preferred Shares (without taking into account any limitations or restrictions on the convertibility of the Preferred Shares) held by such Holder immediately prior to the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights (provided, however, to the extent that such Holder's right to participate in any such Purchase Right would result in such Holder and the other Attribution Parties exceeding the Maximum Percentage, then such Holder shall not be entitled to participate in such Purchase Right to such extent (and shall not be entitled to beneficial ownership of such shares of Common Stock as a result of such Purchase Right (and beneficial ownership) to such extent) and such Purchase Right to such extent shall be held in abeyance for such Holder until such time or times , if ever, as its right thereto would not result in such Holder and the other Attribution Parties exceeding the Maximum Percentage), at which time or times such Holder shall be granted such right (and any Purchase Right granted, issued or sold on such initial Purchase Right or on any subsequent Purchase Right to be held similarly in abeyance) to the same extent as if there had been no such limitation.

(b) Other Corporate Events. In addition to and not in substitution for any other rights hereunder, prior to the consummation of any Fundamental Transaction pursuant to which holders of shares of Common Stock are entitled to receive securities or other assets with respect to or in exchange for shares of Common Stock (a "**Corporate Event**"), the Corporation shall make appropriate provision to insure that each Holder will thereafter have the right to receive upon a conversion of all the Preferred Shares held by such Holder (i) in addition to the shares of Common Stock receivable upon such conversion, such securities or other assets to which such Holder would have been entitled with respect to such shares of Common Stock had such shares of Common Stock been held by such Holder upon the consummation of such Corporate Event (without taking into account any limitations or restrictions on the convertibility of the Preferred Shares contained in this Certificate of Designations) or (ii) in lieu of the shares of Common Stock otherwise receivable upon such conversion, such securities or other assets received by the holders of shares of Common Stock in connection with the consummation of such Corporate Event in such amounts as such Holder would have been entitled to receive had the Preferred Shares held by such Holder initially been issued with conversion rights for

the form of such consideration (as opposed to shares of Common Stock) at a conversion rate for such consideration commensurate with the Conversion Rate. Provision made pursuant the proceeding sentence shall be in a form and substance satisfactory to the Holder. The provisions of this Section 5 shall apply similarly and equally to successive Corporate Events and shall be applied without regard to any limitations on the conversion or redemption of the Preferred Shares contained in this Certificate of Designations.

6. Rights Upon Issuance of Other Securities.

(a) Adjustment of Conversion Price upon Subdivision or Combination of Common Stock. Without limiting any provision of Section 5 or Section 111, if the Corporation at any time on or after the Subscription Date subdivides (by any stock split, stock dividend, stock combination, recapitalization or other similar transaction) one or more classes of its outstanding shares of Common Stock into a greater number of shares, the Conversion Price in effect immediately prior to such subdivision will be proportionately reduced. Without limiting any provision of Section 5 or Section 11, if the Corporation at any time on or after the Subscription Date combines (by any stock split, stock dividend, stock combination, recapitalization or other similar transaction) one or more classes of its outstanding shares of Common Stock into a smaller number of shares, the Conversion Price in effect immediately prior to such combination will be proportionately increased. Any adjustment pursuant to this Section 6(a) shall become effective immediately after the effective date of such subdivision or combination.

(b) Calculations. All calculations under this Section 6 shall be made by rounding to the nearest cent or the nearest 1/100th of a share, as applicable. The number of shares of Common Stock outstanding at any given time shall not include shares owned or held by or for the account of the Corporation, and the disposition of any such shares shall be considered an issue or sale of Common Stock.

7. Redemptions.

(a) Corporation Optional Redemption. At any time after the Initial Issuance Date, the Corporation shall have the right to redeem all, or any part, of the Preferred Shares then outstanding (the **"Corporation Optional Redemption Amount"**) on the applicable Corporation Optional Redemption Date (each as defined below) (a **"Corporation Optional Redemption").** The Preferred Shares subject to redemption pursuant to this Section 7(a) shall be redeemed by the Corporation in cash at a price (the **"Corporation Optional Redemption Price"**) equal to the Stated Value of the shares of Series C Preferred Stock being redeemed as of the Corporation Optional Redemption Date**.** The Corporation may exercise its right to require redemption under this Section 7(a) by delivering a written notice thereof by facsimile or electronic mail and overnight courier to all, but not less than all, of the Holders (the **"Corporation Optional Redemption Notice"** and the date all of the Holders received such notice is referred to as the **"Corporation Optional Redemption Notice Date"**). Each Corporation Optional Redemption Notice shall be irrevocable**.** The Corporation Optional Redemption Notice shall (x) state the date on which the Corporation Optional Redemption shall occur (the **"Corporation Optional Redemption Date")** which date shall not be less than five (5)

Trading Days nor more than twenty (20) Trading Days following the Corporation Optional Redemption Notice Date, and (y) state the aggregate Redemption Amount of the Preferred Shares which is being redeemed in such Corporation Optional Redemption from such Holder and all of the other Holders of the Preferred Shares pursuant to this Section 7(a) on the Corporation Optional Redemption Date.

(b) Financing Redemption. Upon the occurrence of any Financing, the Corporation shall be required to redeem from each Holder (unless waived, in whole or in part, by such Holder in an e-mail or other writing to the Corporation) such aggregate number of Preferred Shares equal to the lesser of (x) the aggregate number of preferred shares then held by such Holder and (y) the quotient (rounded down to the nearest whole number) of (A) the applicable Financing Amount, divided by (B) the Stated Value then in effect (the **"Financing Redemption Amount**") concurrently with such related Financing by instructing the Control Account Bank, purchaser of securities, placement agent or underwriter, as applicable, to wire or release the applicable Financing Amount to such corresponding Holder (or, if such Financing Amount is delivered to the Company for any reason, to promptly thereafter wire each Financing Amount to the applicable Holder) (each, a "**Financing Redemption Date",** and such redemption, a "**Financing Redemption**"). The Preferred Shares subject to redemption pursuant to this Section 7(b) shall be redeemed by the Corporation in cash at a price (each, a **"Financing Redemption Price**") equal to the Redemption Amount being redeemed as of the Financing Redemption Date. Notwithstanding anything herein to the contrary, at any time prior to the date the Financing Redemption Price is paid, in full, the Financing Redemption Amount may be converted, in whole or in part, by any Holder into shares of Common Stock pursuant to Section **Error! Reference source not found..** All Redemption Amounts converted by a Holder after the occurrence of any Controlled Account Release Event and prior to the applicable Financing Redemption Date shall reduce the Financing Redemption Amount of the Preferred Shares of such Holder required to be redeemed on the applicable Financing Redemption Date.

(c) Mandatory Redemption upon Bankruptcy Event of Default. Notwithstanding anything to the contrary herein, and notwithstanding any conversion that is then required or in process, upon any Bankruptcy Event of Default (as defined in the Notes) (each, a **"Bankruptcy Redemption Date"),** whether occurring prior to or following the Maturity Date, the Corporation shall immediately redeem, in cash, each of the Preferred Shares then outstanding at a redemption price equal to the Redemption Amount of such Preferred Shares (each, a **"Bankruptcy Redemption Price"),** without the requirement for any notice or demand or other action by any Holder or any other person or entity, provided that a Holder may, in its sole discretion, waive such right to receive payment upon a Bankruptcy Event of Default, in whole or in part, and any such waiver shall not affect any other rights of such Holder or any other Holder hereunder, including any other rights in respect of such Bankruptcy Event of Default, any right to conversion, and any right to payment of such Bankruptcy Redemption Price or any other Redemption Price, as applicable.

(d) Holder Optional Redemption after Maturity Date. At any time from and after the tenth (10th) Business Day prior to the Maturity Date, any Holder may require the Corporation to redeem (a "**Maturity Redemption**") all or any number of Preferred Shares held by such Holder at a purchase price equal to 100% of the Redemption Amount of such Preferred Shares (the "**Maturity Redemption Price**") by delivery of written notice thereof (the "**Maturity Redemption Notice**") to the Corporation. The Maturity Redemption Notice shall state the date the Corporation is required to pay to such Holder such Maturity Redemption Price (the "**Maturity Redemption Date**"), which date shall be no earlier than ten (10) Business Days following the date of delivery of such Maturity Redemption Notice.

(e) Mechanics of Redemptions. If a Holder has submitted a Maturity Redemption Notice, the Corporation shall deliver the applicable Maturity Redemption Price to such Holder in cash on the applicable Maturity Redemption Date. The Corporation shall deliver the applicable Corporation Optional Redemption Price to each Holder in cash on the applicable Corporation Optional Redemption Date. The Corporation shall deliver the applicable Bankruptcy Redemption Price to each Holder in cash on the applicable Bankruptcy Redemption Date. The Corporation shall deliver the applicable Financing Redemption Price to each Holder in cash on the applicable Financing Redemption Date. Notwithstanding anything herein to the contrary, in connection with any redemption hereunder at a time a Holder is entitled to receive a cash payment under any of the other Transaction Documents, at the option of such Holder delivered in writing to the Corporation, the applicable Redemption Price hereunder shall be increased by the amount of such cash payment owed to such Holder under such other Transaction Document and, upon payment in full or conversion in accordance herewith, shall satisfy the Corporation's payment obligation under such other Transaction Document. In the event of a redemption of less than all of the Preferred Shares, the Corporation shall promptly cause to be issued and delivered to such Holder a new Preferred Share Certificate (in accordance with Section 4) (or evidence of the creation of a new Book-Entry) representing the number of Preferred Shares which have not been redeemed. In the event that the Corporation does not pay the applicable Redemption Price to a Holder within the time period required for any reason (including, without limitation, to the extent such payment is prohibited pursuant to the DGCL), at any time thereafter and until the Corporation pays such unpaid Redemption Price in full, such Holder shall have the option, in lieu of redemption, to require the Corporation to promptly return to such Holder all or any of the Preferred Shares that were submitted for redemption and for which the applicable Redemption Price (together with any Late Charges thereon) has not been paid. Upon the Corporation's receipt of such notice, (x) the applicable Redemption Notice shall be null and void with respect to such Preferred Shares, (y) the Corporation shall immediately return the applicable Preferred Share Certificate, or issue a new Preferred Share Certificate (in accordance with Section 14(d)), to such Holder (unless the Preferred Shares are held in Book-Entry form, in which case the Corporation shall deliver evidence to such Holder that a Book-Entry for such Preferred Shares then exists). A Holder's delivery of a notice voiding a Redemption Notice and exercise of its rights following such notice shall not affect the Corporation's obligations to make any payments of Late Charges which have accrued prior to the date of such notice with respect to the Preferred Shares subject to such notice.

(f) Redemption by Multiple Holders. Upon the Corporation's receipt of a Redemption Notice from any Holder, the Corporation shall immediately, but no later than one (1) Business Day of its receipt thereof, forward to each other Holder by facsimile or electronic mail a copy of such notice. If the Corporation receives one or more Redemption Notices, during the seven (7) Business Day period beginning on and including the date which is three (3) Business Days prior to the Corporation's receipt of the initial Redemption Notice and ending on and including the date which is three (3) Business Days after the Corporation's receipt of the initial Redemption Notice and the Corporation is unable to redeem all principal, interest and other amounts designated in such initial Redemption Notice and such other Redemption Notices received during such seven (7) Business Day period, then the Corporation shall redeem a pro rata amount from each Holder based on the principal amount of the Preferred Shares submitted for redemption pursuant to such Redemption Notices received by the Corporation during such seven (7) Business Day period.

8. Noncircumvention. The Corporation hereby covenants and agrees that the Corporation will not, by amendment of its Certificate of Incorporation (as defined in the Securities Purchase Agreement), Bylaws (as defined in the Securities Purchase Agreement) or through any reorganization, transfer of assets, consolidation, merger, scheme of arrangement, dissolution, issue or sale of securities, or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Certificate of Designations, and will at all times in good faith carry out all the provisions of this Certificate of Designations and take all action as may be required to protect the rights of the Holders hereunder. Without limiting the generality of the foregoing or any other provision of this Certificate of Designations or the other Transaction Documents, the Corporation (a) shall not increase the par value of any shares of Common Stock receivable upon the conversion of any Preferred Shares above the Conversion Price then in effect, (b) shall take all such actions as may be necessary or appropriate in order that the Corporation may validly and legally issue fully paid and non-assessable shares of Common Stock upon the conversion of Preferred Shares and (c) shall, so long as any Preferred Shares are outstanding, take all action necessary to reserve and keep available out of its authorized and unissued shares of Common Stock, solely for the purpose of effecting the conversion of the Preferred Shares, the maximum number of shares of Common Stock as shall from time to time be necessary to effect the conversion of the Preferred Shares then outstanding (without regard to any limitations on conversion contained herein).

9. Voting Rights.

(a) With respect to a vote of shareholders to approve a reverse split of the Corporation's common stock no later than November 30, 2017 only, each share of Series C Preferred Stock held by a Holder, as such, shall be entitled to the whole number of votes equal to 880,375 shares of Common Stock.

(b) Each Holder shall be entitled to receive the same prior notice of any stockholders' meeting as is provided to the holders of Common Stock as well as prior notice of all stockholder actions to be taken by legally available means in lieu of a meeting (and copies of proxy materials, consent solicitation statements and other information sent to stockholders in connection therewith), all in accordance with the

Bylaws and the DGCL, and shall be entitled to vote or, if applicable, provide consent, together with the holders of Common Stock as if they were a single class of securities upon any matter submitted to a vote of stockholders, except as otherwise expressly required by law and except as required by the terms hereof to be submitted to a series vote of the applicable Holders, in which case each Holder only shall vote as a separate series.

10. Liquidation, Dissolution, Winding-Up. In the event of a Liquidation Event, the Holders shall be entitled to receive in cash out of the assets of the Corporation, whether from capital or from earnings available for distribution to its stockholders (the "**Liquidation Funds**"), before any amount shall be paid to the holders of any of shares of Junior Stock, but pari passu with any Parity Stock then outstanding, an amount per Preferred Share equal to the Redemption Amount thereof on the date of such payment, provided that if the Liquidation Funds are insufficient to pay the full amount due to the Holders and holders of shares of Parity Stock, then each Holder and each holder of Parity Stock shall receive a percentage of the Liquidation Funds equal to the full amount of Liquidation Funds payable to such Holder and such holder of Parity Stock as a liquidation preference, in accordance with their respective certificate of designations (or equivalent), as a percentage of the full amount of Liquidation Funds payable to all holders of Preferred Shares and all holders of shares of Parity Stock. To the extent necessary, the Corporation shall cause such actions to be taken by each of its Subsidiaries so as to enable, to the maximum extent permitted by law, the proceeds of a Liquidation Event to be distributed to the Holders in accordance with this Section 0. All the preferential amounts to be paid to the Holders under this Section 10 shall be paid or set apart for payment before the payment or setting apart for payment of any amount for, or the distribution of any Liquidation Funds of the Corporation to the holders of shares of Junior Stock in connection with a Liquidation Event as to which this Section 0 applies.

11. Distribution of Assets. In addition to any adjustments pursuant to Section 6, if the Corporation shall declare or make any dividend or other distributions of its assets (or rights to acquire its assets) to any or all holders of shares of Common Stock, by way of return of capital or otherwise (including without limitation, any distribution of cash, stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (the **"Distributions"),** then each Holder, as holders of Preferred Shares, will be entitled to such Distributions as if such Holder had held the number of shares of Common Stock acquirable upon complete conversion of the Preferred Shares (without taking into account any limitations or restrictions on the convertibility of the Preferred Shares) immediately prior to the date on which a record is taken for such Distribution or, if no such record is taken, the date as of which the record holders of Common Stock are to be determined for such Distributions (provided, however, that to the extent that such Holder's right to participate in any such Distribution would result in such Holder and the other Attribution Parties exceeding the Maximum Percentage, then such Holder shall not be entitled to participate in such Distribution to the extent of the Maximum Percentage (and shall not be entitled to beneficial ownership of such shares of Common Stock as a result of such Distribution (and beneficial ownership) to the extent of any such excess) and the portion of such Distribution shall be held in abeyance for such Holder until such time or times as its right thereto would not result in such Holder and the other Attribution Parties exceeding the Maximum Percentage, at which time or times, if any, such Holder shall be granted such rights (and any rights under this Section 11 on such initial rights or on any subsequent such rights to be held similarly in abeyance) to the same extent as if there had been no such limitation).

12. Vote to Change the Terms of or Issue Preferred Shares. In addition to any other rights provided by law, except where the vote or written consent of the holders of a greater number of shares is required by law or by another provision of the Certificate of Incorporation, without first obtaining the affirmative vote at a meeting duly called for such purpose or the written consent without a meeting of the Required Holders, voting together as a single class, the Corporation shall not: (a) amend or repeal any provision of, or add any provision to, its Certificate of Incorporation or bylaws, or file any certificate of designations or articles of amendment of any series of shares of preferred stock, if such action would adversely alter or change in any respect the preferences, rights, privileges or powers, or restrictions provided for the benefit of the Preferred Shares hereunder, regardless of whether any such action shall be by means of amendment to the Certificate of Incorporation or by merger, consolidation or otherwise; (b) increase or decrease (other than by conversion) the authorized number of Preferred Shares; (c) without limiting any provision of Section 2, create or authorize (by reclassification or otherwise) any new class or series of Senior Preferred Stock or Parity Stock; (d) purchase, repurchase or redeem any shares of Junior Stock (other than pursuant to the terms of the Corporation's equity incentive plans and options and other equity awards granted under such plans (that have in good faith been approved by the Board)); (e) without limiting any provision of Section 2, pay dividends or make any other distribution on any shares of any Junior Stock; (f) issue any Preferred Shares other than as contemplated hereby or pursuant to the Securities Purchase Agreement ; or (g) without limiting any provision of Section 7(e), whether or not prohibited by the terms of the Preferred Shares, circumvent a right of the Preferred Shares hereunder.

13. Transfer of Preferred Shares. A Holder may transfer some or all of its Preferred Shares without the consent of the Corporation.

14. Reissuance of Preferred Share Certificates and Book Entries.

(a) Transfer. If any Preferred Shares are to be transferred, the applicable Holder shall surrender the applicable Preferred Share Certificate to the Corporation (or, if the Preferred Shares are held in Book-Entry form, a written instruction letter to the Corporation), whereupon the Corporation will forthwith issue and deliver upon the order of such Holder a new Preferred Share Certificate (in accordance with Section 14(d)) (or evidence of the transfer of such Book-Entry), registered as such Holder may request, representing the outstanding number of Preferred Shares being transferred by such Holder and, if less than the entire outstanding number of Preferred Shares is being transferred, a new Preferred Share Certificate (in accordance with Section 14(d)) to such Holder representing the outstanding number of Preferred Shares not being transferred (or evidence of such remaining Preferred Shares in a Book-Entry for such Holder). Such Holder and any assignee, by acceptance of the Preferred Share Certificate or evidence of Book-Entry issuance, as applicable, acknowledge and agree that, by reason of the provisions of Section **Error! Reference source not found.** following conversion or redemption of any of the Preferred Shares, the outstanding number of Preferred Shares represented by the Preferred Shares may be less than the number of Preferred Shares stated on the face of the Preferred Shares.

(b) Lost, Stolen or Mutilated Preferred Share Certificate. Upon receipt by the Corporation of evidence reasonably satisfactory to the Corporation of the loss, theft, destruction or mutilation of a Preferred Share Certificate (as to which a written certification and the indemnification contemplated below shall suffice as such evidence), and, in the case of loss, theft or destruction, of any indemnification undertaking by the applicable Holder to the Corporation in customary and reasonable form and, in the case of mutilation, upon surrender and cancellation of such Preferred Share Certificate, the Corporation shall execute and deliver to such Holder a new Preferred Share Certificate (in accordance with Section 14(d)) representing the applicable outstanding number of Preferred Shares.

(c) Preferred Share Certificate and Book-Entries Exchangeable for Different Denominations and Forms. Each Preferred Share Certificate is exchangeable, upon the surrender hereof by the applicable Holder at the principal office of the Corporation, for a new Preferred Share Certificate or Preferred Share Certificate(s) or new Book-Entry (in accordance with Section 14(d)) representing, in the aggregate, the outstanding number of the Preferred Shares in the original Preferred Share Certificate, and each such new Preferred Share Certificate and/or new Book-Entry, as applicable, will represent such portion of such outstanding number of Preferred Shares from the original Preferred Share Certificate as is designated in writing by such Holder at the time of such surrender. Each Book-Entry may be exchanged into one or more new Preferred Share Certificates or split by the applicable Holder by delivery of a written notice to the Corporation into two or more new Book-Entries (in accordance with Section 14(d)) representing, in the aggregate, the outstanding number of the Preferred Shares in the original Book-Entry, and each such new Book-Entry and/or new Preferred Share Certificate, as applicable, will represent such portion of such outstanding number of Preferred Shares from the original Book-Entry as is designated in writing by such Holder at the time of such surrender.

(d) Issuance of New Preferred Share Certificate or Book-Entry. Whenever the Corporation is required to issue a new Preferred Share Certificate or a new Book-Entry pursuant to the terms of this Certificate of Designations, such new Preferred Share Certificate or new Book-Entry (i) shall represent, as indicated on the face of such Preferred Share Certificate or in such Book-Entry, as applicable, the number of Preferred Shares remaining outstanding (or in the case of a new Preferred Share Certificate or new Book-Entry being issued pursuant to Section 14(a) or Section 14(c), the number of Preferred Shares designated by such Holder) which, when added to the number of Preferred Shares represented by the other new Preferred Share Certificates or other new Book-Entry, as applicable, issued in connection with such issuance, does not exceed the number of Preferred Shares remaining outstanding under the original Preferred Share Certificate or original Book-Entry, as applicable, immediately prior to such issuance of new Preferred Share Certificate or new Book-Entry, as applicable, and (ii) shall have an issuance date, as indicated on the face of such new Preferred Share Certificate or in such new Book-Entry, as applicable, which is the same as the issuance date of the original Preferred Share Certificate or in such original Book-Entry, as applicable.

15. Remedies, Characterizations, Other Obligations, Breaches and Injunctive Relief. The remedies provided in this Certificate of Designations shall be cumulative and in addition to all other remedies available under this Certificate of Designations and any of the other Transaction Documents, at law or in equity (including a decree of specific performance and/or other injunctive relief), and nothing herein shall limit any Holder's right to pursue actual and consequential damages for any failure by the Corporation to comply with the terms of this Certificate of Designations. The Corporation covenants to each Holder that there shall be no characterization concerning this instrument other than as expressly provided herein. Amounts set forth or provided for herein with respect to payments, conversion and the like (and the computation thereof) shall be the amounts to be received by a Holder and shall not, except as expressly provided herein, be subject to any other obligation of the Corporation (or the performance thereof). The Corporation acknowledges that a breach by it of its obligations hereunder will cause irreparable harm to the Holders and that the remedy at law for any such breach may be inadequate. The Corporation therefore agrees that, in the event of any such breach or threatened breach, each Holder shall be entitled, in addition to all other available remedies, to specific performance and/or temporary, preliminary and permanent injunctive or other equitable relief from any court of competent jurisdiction in any such case without the necessity of proving actual damages and without posting a bond or other security. The Corporation shall provide all information and documentation to a Holder that is requested by such Holder to enable such Holder to confirm the Corporation's compliance with the terms and conditions of this Certificate of Designations.

16. Payment of Collection, Enforcement and Other Costs. If (a) any Preferred Shares are placed in the hands of an attorney for collection or enforcement or is collected or enforced through any legal proceeding or a Holder otherwise takes action to collect amounts due under this Certificate of Designations with respect to the Preferred Shares or to enforce the provisions of this Certificate of Designations or (b) there occurs any bankruptcy, reorganization, receivership of the Corporation or other proceedings affecting Corporation creditors' rights and involving a claim under this Certificate of Designations, then the Corporation shall pay the costs incurred by such Holder for such collection, enforcement or action or in connection with such bankruptcy, reorganization, receivership or other proceeding, including, without limitation, attorneys' fees and disbursements.

17. Construction; Headings. This Certificate of Designations shall be deemed to be jointly drafted by the Corporation and the Holders and shall not be construed against any such Person as the drafter hereof. The headings of this Certificate of Designations are for convenience of reference and shall not form part of, or affect the interpretation of, this Certificate of Designations. Unless the context clearly indicates otherwise, each pronoun herein shall be deemed to include the masculine, feminine, neuter, singular and plural forms thereof. The terms "including," "includes," "include" and words of like import shall be construed broadly as if followed by the words "without limitation." The terms "herein," "hereunder," "hereof' and words of like import refer to this entire Certificate of Designations instead of just the provision in which they are found. Unless expressly indicated otherwise, all section references are to sections of this Certificate of Designations. Terms used in this Certificate of Designations and not otherwise defined herein, but defined in the other Transaction Documents, shall have the meanings ascribed to such terms on the Initial Issuance Date in such other Transaction Documents unless otherwise consented to in writing by the Required Holders.

18. Failure or Indulgence Not Waiver. No failure or delay on the part of a Holder in the exercise of any power, right or privilege hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any such power, right or privilege preclude other or further exercise thereof or of any other right, power or privilege. No waiver shall be effective unless it is in writing and signed by an authorized representative of the waiving party. This Certificate of Designations shall be deemed to be jointly drafted by the Corporation and all Holders and shall not be construed against any Person as the drafter hereof. Notwithstanding the foregoing, nothing contained in this Section 18 shall permit any waiver of any provision of Section **Error! Reference source not found.**.

19. Dispute Resolution.

(a) Submission to Dispute Resolution.

(i) In the case of a dispute relating to a Closing Bid Price, a Closing Sale Price, a Conversion Price, a VWAP or a fair market value or the arithmetic calculation of a Conversion Rate, or the applicable Redemption Price (as the case may be) (including, without limitation, a dispute relating to the determination of any of the foregoing), the Corporation or the applicable Holder (as the case may be) shall submit the dispute to the other party via facsimile or electronic mail (A) if by the Corporation, within two (2) Business Days after the occurrence of the circumstances giving rise to such dispute or (B) if by such Holder at any time after such Holder learned of the circumstances giving rise to such dispute. If such Holder and the Corporation are unable to promptly resolve such dispute relating to such Closing Bid Price, such Closing Sale Price, such Conversion Price, such VWAP or such fair market value, or the arithmetic calculation of such Conversion Rate or such applicable Redemption Price (as the case may be), at any time after the second (2nd) Business Day following such initial notice by the Corporation or such Holder (as the case may be) of such dispute to the Corporation or such Holder (as the case may be), then such Holder and the Corporation may jointly select an independent, reputable investment bank to resolve such dispute.

(ii) Such Holder and the Corporation shall each deliver to such investment bank (A) a copy of the initial dispute submission so delivered in accordance with the first sentence of this Section 19 and (B) written documentation supporting its position with respect to such dispute, in each case, no later than 5:00 p.m. (New York time) by the fifth (5th) Business Day immediately following the date on which such Holder selected such investment bank (the "**Dispute Submission Deadline**") (the documents referred to in the immediately preceding clauses (A) and (B) are collectively referred to herein as the **"Required Dispute Documentation")** (it being understood and agreed that if either such Holder or the Corporation fails to so deliver all of the Required Dispute Documentation by the Dispute Submission Deadline, then the party who fails to so submit all of the Required Dispute Documentation shall no longer be entitled to (and hereby waives its right to) deliver or submit any written documentation or other support to such investment bank with respect to such dispute and such investment bank shall resolve such dispute based solely on the

Required Dispute Documentation that was delivered to such investment bank prior to the Dispute Submission Deadline). Unless otherwise agreed to in writing by both the Corporation and such Holder or otherwise requested by such investment bank, neither the Corporation nor such Holder shall be entitled to deliver or submit any written documentation or other support to such investment bank in connection with such dispute (other than the Required Dispute Documentation).

(iii) The Corporation and such Holder shall cause such investment bank to determine the resolution of such dispute and notify the Corporation and such Holder of such resolution no later than ten (10) Business Days immediately following the Dispute Submission Deadline. The fees and expenses of such investment bank shall be borne solely by the Corporation, and such investment bank's resolution of such dispute shall be final and binding upon all parties absent manifest error.

(b) Miscellaneous. The Corporation and each Holder each, severally and not jointly, expressly acknowledges and agrees that (i) this Section 19 constitutes an agreement to arbitrate between the Corporation and such Holder (and constitutes an arbitration agreement) under § 7501, et seq. of the New York Civil Practice Law and Rules ("**CPLR**") and that any Holder is authorized to apply for an order to compel arbitration pursuant to CPLR § 7503(a) in order to compel compliance with this Section 19, (ii) the terms of this Certificate of Designations and each other applicable Transaction Document shall serve as the basis for the selected investment bank's resolution of the applicable dispute, such investment bank shall be entitled (and is hereby expressly authorized) to make all findings, determinations and the like that such investment bank determines are required to be made by such investment bank in connection with its resolution of such dispute and in resolving such dispute such investment bank shall apply such findings, determinations and the like to the terms of this Certificate of Designations and any other applicable Transaction Documents, (iii) the Corporation and such applicable Holder (but only such Holder with respect to disputes solely relating to such Holder) shall each have the right to submit any dispute described in this Section 19 to any state or federal court sitting in The City of New York, Borough of Manhattan in lieu of utilizing the procedures set forth in this Section 19 and (iv) nothing in this Section 19 shall limit such Holder from obtaining any injunctive relief or other equitable remedies (including, without limitation, with respect to any matters described in this Section 19).

20. Notices: Currency: Payments.

(a) Notices. The Corporation shall provide each Holder of Preferred Shares with prompt written notice of all actions taken pursuant to the terms of this Certificate of Designations, including in reasonable detail a description of such action and the reason therefor. My notices, consents, waivers or other communications required or permitted to be given under the terms hereof must be in writing and will be deemed to have been delivered: (i) upon receipt, when delivered personally; (ii) upon receipt, when sent by facsimile (provided confirmation of transmission is mechanically or electronically generated and kept on file by the sending party) or by electronic mail; or (iii) one

Business Day after deposit with an overnight courier service, in each case properly addressed to the party to receive the same as determined in accordance with the Securities Purchase Agreement. Written confirmation of receipt (A) given by the recipient of such notice, consent, waiver or other communication, (B) mechanically or electronically generated by the sender's facsimile machine or e-mail containing the time, date, recipient facsimile number and an image of the first page of such transmission or (C) provided by an overnight courier service shall be rebuttable evidence of personal service, receipt by facsimile or receipt from an overnight courier service in accordance with clause (i), (ii) or (iii) above, respectively. The Corporation shall provide each Holder with prompt written notice of all actions taken pursuant to this Certificate of Designations, including in reasonable detail a description of such action and the reason therefore. Without limiting the generality of the foregoing, the Corporation shall give written notice to each Holder (i) immediately upon any adjustment of the Conversion Price, setting forth in reasonable detail, and certifying, the calculation of such adjustment and (ii) at least fifteen (15) days prior to the date on which the Corporation closes its books or takes a record (A) with respect to any dividend or distribution upon the Common Stock, (B) with respect to any grant, issuances, or sales of any Options, Convertible Securities or rights to purchase stock, warrants, securities or other property to holders of shares of Common Stock or (C) for determining rights to vote with respect to any Fundamental Transaction, dissolution or liquidation, provided in each case that such information shall be made known to the public prior to or in conjunction with such notice being provided to such Holder.

(b) Currency. All dollar amounts referred to in this Certificate of Designations are in United States Dollars **("U.S. Dollars"),** and all amounts owing under this Certificate of Designations shall be paid in U.S. Dollars. All amounts denominated in other currencies (if any) shall be converted into the U.S. Dollar equivalent amount in accordance with the Exchange Rate on the date of calculation. **"Exchange Rate"** means, in relation to any amount of currency to be converted into U.S. Dollars pursuant to this Certificate of Designations, the U.S. Dollar exchange rate as published in the Wall Street Journal on the relevant date of calculation (it being understood and agreed that where an amount is calculated with reference to, or over, a period of time, the date of calculation shall be the final date of such period of time).

(c) Payments. Whenever any payment of cash is to be made by the Corporation to any Person pursuant to this Certificate of Designations, unless otherwise expressly set forth herein, such payment shall be made in lawful money of the United States of America by a certified check drawn on the account of the Corporation and sent via overnight courier service to such Person at such address as previously provided to the Corporation in writing (which address, in the case of each of the Buyers (as defined in the Securities Purchase Agreement, shall initially be as set forth on the Schedule of Buyers attached to the Securities Purchase Agreement), provided that such Holder may elect to receive a payment of cash via wire transfer of immediately available funds by providing the Corporation with prior written notice setting out such request and such Holder's wire transfer instructions. Whenever any amount expressed to be due by the terms of this Certificate of Designations is due on any day which is not a Business Day, the same shall instead be due on the next succeeding day which is a Business Day. Any amount due under the Transaction Documents which is not paid when due shall result in a late charge being incurred and payable by the Corporation in an amount equal to interest on such amount at the rate of fifteen percent (15%) per annum from the date such amount was due until the same is paid in full **("Late Charge").**

21. Waiver of Notice. To the extent permitted by law, the Corporation hereby irrevocably waives demand, notice, presentment, protest and all other demands and notices in connection with the delivery, acceptance, performance, default or enforcement of this Certificate of Designations and the Securities Purchase Agreement.

22. Governing Law. This Certificate of Designations shall be construed and enforced in accordance with, and all questions concerning the construction, validity, interpretation and performance of this Certificate of Designations shall be governed by, the internal laws of the State of Delaware, without giving effect to any choice of law or conflict of law provision or rule (whether of the State of Delaware or any other jurisdictions) that would cause the application of the laws of any jurisdictions other than the State of Delaware. Except as otherwise required by Section 19 above, the Corporation hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in The City of New York, Borough of Manhattan, for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is brought in an inconvenient forum or that the venue of such suit, action or proceeding is improper. Nothing contained herein shall be deemed to limit in any way any right to serve process in any manner permitted by law. Nothing contained herein shall be deemed to limit in any way any right to serve process in any manner permitted by law. Nothing contained herein (i) shall be deemed or operate to preclude any Holder from bringing suit or taking other legal action against the Corporation in any other jurisdiction to collect on the Corporation's obligations to such Holder, to realize on any collateral or any other security for such obligations, or to enforce a judgment or other court ruling in favor of such Holder or (ii) shall limit, or shall be deemed or construed to limit, any provision of Section 19. **THE CORPORATION HEREBY IRREVOCABLY WAIVES ANY RIGHT IT MAY HAVE TO, AND AGREES NOT TO REQUEST, A JURY TRIAL FOR THE ADJUDICATION OF ANY DISPUTE HEREUNDER OR IN CONNECTION WITH OR ARISING OUT OF THIS CERTIFICATE OF DESIGNATIONS OR ANY TRANSACTION CONTEMPLATED HEREBY.**

23. Judgment Currency.

(a) If for the purpose of obtaining or enforcing judgment against the Corporation in any court in any jurisdiction it becomes necessary to convert into any other currency (such other currency being hereinafter in this Section 29 referred to as the "**Judgment Currency**") an amount due in U.S. dollars under this Certificate of Designations, the conversion shall be made at the Exchange Rate prevailing on the Trading Day immediately preceding:

(i) the date actual payment of the amount due, in the case of any proceeding in the courts of New York or in the courts of any other jurisdiction that will give effect to such conversion being made on such date: or

(ii) the date on which the foreign court determines, in the case of any proceeding in the courts of any other jurisdiction (the date as of which such conversion is made pursuant to this Section 23(a)(ii) being hereinafter referred to as the **"Judgment Conversion Date").**

(b) If in the case of any proceeding in the court of any jurisdiction referred to in Section 23(a) above, there is a change in the Exchange Rate prevailing between the Judgment Conversion Date and the date of actual payment of the amount due, the applicable party shall pay such adjusted amount as may be necessary to ensure that the amount paid in the Judgment Currency, when converted at the Exchange Rate prevailing on the date of payment, will produce the amount of US dollars which could have been purchased with the amount of Judgment Currency stipulated in the judgment or judicial order at the Exchange Rate prevailing on the Judgment Conversion Date.

(c) Any amount due from the Corporation under this provision shall be due as a separate debt and shall not be affected by judgment being obtained for any other amounts due under or in respect of this Certificate of Designations.

24. Severability. If any provision of this Certificate of Designations is prohibited by law or otherwise determined to be invalid or unenforceable by a court of competent jurisdiction, the provision that would otherwise be prohibited, invalid or unenforceable shall be deemed amended to apply to the broadest extent that it would be valid and enforceable, and the invalidity or unenforceability of such provision shall not affect the validity of the remaining provisions of this Certificate of Designations so long as this Certificate of Designations as so modified continues to express, without material change, the original intentions of the parties as to the subject matter hereof and the prohibited nature, invalidity or unenforceability of the provision(s) in question does not substantially impair the respective expectations or reciprocal obligations of the parties or the practical realization of the benefits that would otherwise be conferred upon the parties. The parties will endeavor in good faith negotiations to replace the prohibited, invalid or unenforceable provision(s) with a valid provision(s), the effect of which comes as close as possible to that of the prohibited, invalid or unenforceable provision(s).

25. Maximum Payments. Nothing contained herein shall be deemed to establish or require the payment of a rate of interest or other charges in excess of the maximum permitted by applicable law. In the event that the rate of interest required to be paid or other charges hereunder exceed the maximum permitted by such law, any payments in excess of such maximum shall be credited against amounts owed by the Corporation to the applicable Holder and thus refunded to the Corporation.

26. Stockholder Matters; Amendment.

(a) Stockholder Matters. Any stockholder action, approval or consent required, desired or otherwise sought by the Corporation pursuant to the DGCL, the Certificate of Incorporation, this Certificate of Designations or otherwise with respect to the issuance of Preferred Shares may be effected by written consent of the Corporation's stockholders or at a duly called meeting of the Corporation's stockholders, all in accordance with the applicable rules and regulations of the DGCL. This provision is intended to comply with the applicable sections of the DGCL permitting stockholder action, approval and consent affected by written consent in lieu of a meeting.

(b) Amendment. This Certificate of Designations or any provision hereof may be amended by obtaining the affirmative vote at a meeting duly called for such purpose, or written consent without a meeting in accordance with the DGCL, of the Required Holders, voting separate as a single class, and with such other stockholder approval, if any, as may then be required pursuant to the DGCL and the Certificate of Incorporation.

27. Certain Defined Terms. For purposes of this Certificate of Designations, the following terms shall have the following meanings:

(a) "**1933 Act**" means the Securities Act of 1933, as amended, and the rules and regulations thereunder.

(b) "**1934 Act**" means the Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder.

(c) "**Additional Amount**" means, as of the applicable date of determination, with respect to each Preferred Share, all declared and unpaid Dividends on such Preferred Share.

(d) **"Affiliate"** or **"Affiliated"** means, with respect to any Person, any other Person that directly or indirectly controls, is controlled by, or is under common control with, such Person, it being understood for purposes of this definition that "control" of a Person means the power directly or indirectly either to vote 10% or more of the stock having ordinary voting power for the election of directors of such Person or direct or cause the direction of the management and policies of such Person whether by contract or otherwise.

(e) **"Attribution Parties"** means, collectively, the following Persons and entities: (i) any investment vehicle, including, any funds, feeder funds or managed accounts, currently, or from time to time after the Initial Issuance Date, directly or indirectly managed or advised by a Holder's investment manager or any of its Affiliates or principals, (ii) any direct or indirect Affiliates of such Holder or any of the foregoing, (iii) any Person acting or who could be deemed to be acting as a Group together with such Holder or any of the foregoing and (iv) any other Persons whose beneficial ownership of the Corporation's Common Stock would or could be aggregated with such Holder's and the other Attribution Parties for purposes of Section 13(d) of the 1934 Act. For clarity, the purpose of the foregoing is to subject collectively such Holder and all other Attribution Parties to the Maximum Percentage.

(f) **"Bloomberg"** means Bloomberg, L.P.

(g) **"Book-Entry"** means each entry on the Register evidencing one or more Preferred Shares held by a Holder in lieu of a Preferred Share Certificate issuable hereunder.

(h) **"Business Day"** means any day other than Saturday, Sunday or other day on which commercial banks in The City of New York are authorized or required by law to remain closed.

(i) **"Closing Bid Price"** and **"Closing Sale Price"** means, for any security as of any date, the last closing bid price and last closing trade price, respectively, for such security on the Principal Market, as reported by Bloomberg, or, if the Principal Market begins to operate on an extended hours basis and does not designate the closing bid price or the closing trade price (as the case may be) then the last bid price or last trade price, respectively, of such security prior to 4:00:00 p.m., New York time, as reported by Bloomberg, or, if the Principal Market is not the principal securities exchange or trading market for such security, the last closing bid price or last trade price, respectively, of such security on the principal securities exchange or trading market where such security is listed or traded as reported by Bloomberg, or if the foregoing do not apply, the last closing bid price or last trade price, respectively, of such security in the over-the-counter market on the electronic bulletin board for such security as reported by Bloomberg, or, if no closing bid price or last trade price, respectively, is reported for such security by Bloomberg, the average of the bid prices, or the ask prices, respectively, of any market makers for such security as reported in the "pink sheets" by OTC Markets Group Inc. (formerly Pink Sheets LLC). If the Closing Bid Price or the Closing Sale Price cannot be calculated for a security on a particular date on any of the foregoing bases, the Closing Bid Price or the Closing Sale Price (as the case may be) of such security on such date shall be the fair market value as mutually determined by the Corporation and the Required Holder. If the Corporation and the Required Holders are unable to agree upon the fair market value of such security, then such dispute shall be resolved in accordance with the procedures in Section 19. All such determinations shall be appropriately adjusted for any stock splits, stock dividends, stock combinations, recapitalizations or other similar transactions during such period.

(j) **"Common Stock"** means (i) the Corporation's shares of common stock, $0.01 par value per share, and (ii) any capital stock into which such common stock shall have been changed or any share capital resulting from a reclassification of such common stock.

(k) **"Convertible Securities"** means any stock or other security (other than Options) that is at any time and under any circumstances, directly or indirectly, convertible into, exercisable or exchangeable for, or which otherwise entitles the holder thereof to acquire, any shares of Common Stock.

(l) "**Current Subsidiary**" means any Person in which the Corporation on the Subscription Date, directly or indirectly, (i) owns any of the outstanding capital stock or holds any equity or similar interest of such Person or (ii) controls or operates all or any part of the business, operations or administration of such Person, and all of the foregoing, collectively, **"Current Subsidiaries".**

(m) **"Eligible Market"** means The New York Stock Exchange, the NYSE MKT, the Nasdaq Global Select Market, the Nasdaq Global Market or the Principal Market.

(n) **"Financing"** means (x) the occurrence of any Control Account Release Event (as defined in the Notes) or (y) the occurrence of any Subsequent Placement (as defined in the Securities Purchase Agreement.

(o) **"Financing Amount"** means (x) with respect to the occurrence of any Control Account Release Event with respect to a Note held by a given Holder, the applicable Controlled Account Release Amount (as defined in the Notes) of the Note of such Holder (provided, that no portion of such Controlled Account Release Amount shall be used to redeem any other Preferred Shares of any other Holder as long as the Holder (or any of its Affiliates) holds any Preferred Shares) or (y) with respect to any Subsequent Placement, the Holder Pro Rata Amount of the net cash proceeds of such Subsequent Placement.

(p) **"Fundamental Transaction"** means (A) that the Corporation shall, directly or indirectly, including through subsidiaries, Affiliates or otherwise, in one or more related transactions, (i) consolidate or merge with or into (whether or not the Corporation is the surviving corporation) another Subject Entity, or (ii) sell, assign, transfer, convey or otherwise dispose of all or substantially all of the properties or assets of the Corporation or any of its "significant subsidiaries " (as defined in Rule 1-02 of Regulation S-X) to one or more Subject Entities, or (iii) make, or allow one or more Subject Entities to make, or allow the Corporation to be subject to or have its Common Stock be subject to or party to one or more Subject Entities making, a purchase, tender or exchange offer that is accepted by the holders of at least either (x) 50% of the outstanding shares of Common Stock, (y) 50% of the outstanding shares of Common Stock calculated as if any shares of Common Stock held by all Subject Entities making or party to, or Affiliated with any Subject Entities making or party to, such purchase, tender or exchange offer were not outstanding; or (z) such number of shares of Common Stock such that all Subject Entities making or party to, or Affiliated with any Subject Entity making or party to, such purchase, tender or exchange offer, become collectively the beneficial owners (as defined in Rule 13d-3 under the 1934 Act) of at least 50% of the outstanding shares of Common Stock, or (iv) consummate a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off or scheme of arrangement) with one or more Subject Entities whereby all such Subject Entities, individually or in the aggregate, acquire, either (x) at least 50% of the outstanding shares of Common Stock, (y) at least 50% of the outstanding shares of Common Stock calculated as if any shares of Common Stock held by all the Subject Entities making or party to, or Affiliated with any Subject Entity making or party to, such stock purchase agreement or other business combination were not outstanding; or (z) such number of shares of Common Stock such that the Subject Entities become collectively the beneficial owners (as defined in Rule 13d-3 under the 1934 Act) of at least 50% of the outstanding shares of Common Stock, or (v) reorganize, recapitalize or reclassify its Common Stock, (B) that the Corporation shall, directly or indirectly, including through subsidiaries, Affiliates or otherwise, in one or more related transactions,

allow any Subject Entity individually or the Subject Entities in the aggregate to be or become the "beneficial owner" (as defined in Rule 13d-3 under the 1934 Act), directly or indirectly, whether through acquisition, purchase, assignment, conveyance, tender, tender offer, exchange, reduction in outstanding shares of Common Stock, merger, consolidation, business combination, reorganization, recapitalization, spin-off, scheme of arrangement, reorganization, recapitalization or reclassification or otherwise in any manner whatsoever, of either (x) at least 50% of the aggregate ordinary voting power represented by issued and outstanding Common Stock, (y) at least 50% of the aggregate ordinary voting power represented by issued and outstanding Common Stock not held by all such Subject Entities as of the date of this Certificate of Designations calculated as if any shares of Common Stock held by all such Subject Entities were not outstanding, or (z) a percentage of the aggregate ordinary voting power represented by issued and outstanding shares of Common Stock or other equity securities of the Corporation sufficient to allow such Subject Entities to effect a statutory short form merger or other transaction requiring other shareholders of the Corporation to surrender their shares of Common Stock without approval of the shareholders of the Corporation or (C) directly or indirectly, including through subsidiaries, Affiliates or otherwise, in one or more related transactions, the issuance of or the entering into any other instrument or transaction structured in a manner to circumvent, or that circumvents, the intent of this definition in which case this definition shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this definition to the extent necessary to correct this definition or any portion of this definition which may be defective or inconsistent with the intended treatment of such instrument or transaction.

(q) "**GAAP**" means United States generally accepted accounting principles, consistently applied.

(r) **"Group"** means a "group" as that term is used in Section 13(d) of the 1934 Act and as defined in Rule 13d-5 thereunder.

(s) **"Holder Pro Rata Amount"** means, with respect to any Holder, a fraction (i) the numerator of which is the number of Preferred Shares issued to such Holder on the Initial Issuance Date and (ii) the denominator of which is the number of Preferred Shares issued to all Holders on the Initial Issuance Date.

(t) **"Liquidation Event"** means, whether in a single transaction or series of transactions, the voluntary or involuntary liquidation, dissolution or winding up of the Corporation or such Subsidiaries the assets of which constitute all or substantially all of the assets of the business of the Corporation and its Subsidiaries, taken as a whole.

(u) **"Maturity Date"** shall mean December 21**,** 2017.

(v) **"Note"** means, with respect to a Holder, that certain senior secured convertible note issued by the Corporation to such Holder pursuant to that certain Securities Purchase Agreement, dated June 6, 2016, by and among the Corporation, such Holder and the other investors party thereto, as amended from time to time in accordance therewith.

(w) **"New Subsidiary"** means, as of any date of determination, any Person in which the Corporation after the Subscription Date, directly or indirectly, (i) owns or acquires any of the outstanding capital stock or holds any equity or similar interest of such Person or (ii) controls or operates all or any part of the business, operations or administration of such Person, and all of the foregoing, collectively, "**New Subsidiaries**."

(x) **"Options"** means any rights, warrants or options to subscribe for or purchase shares of Common Stock or Convertible Securities.

(y) **"Parent Entity"** of a Person means an entity that, directly or indirectly, controls the applicable Person and whose common stock or equivalent equity security is quoted or listed on an Eligible Market, or, if there is more than one such Person or Parent Entity, the Person or Parent Entity with the largest public market capitalization as of the date of consummation of the Fundamental Transaction.

(z) **"Person"** means an individual, a limited liability Corporation, a partnership, a joint venture, a corporation, a trust, an unincorporated organization, any other entity or a government or any department or agency thereof.

(aa) **"Principal Market"** means the Nasdaq Capital Market.

(bb) "**Redemption Notices**" means, collectively, the Maturity Redemption Notice and the Corporation Optional Redemption Notice, and each of the foregoing, individually, a "**Redemption Notice**."

(cc) "**Redemption Prices**" means, collectively, Financing Redemption Prices, the Maturity Redemption Price, Bankruptcy Redemption Price and the Corporation Optional Redemption Prices, and each **of** the foregoing, individually, a **"Redemption Price."**

(dd) "**SEC**" means the Securities and Exchange Commission or the successor thereto.

(ee) **"Securities Purchase Agreement"** means that certain securities purchase agreement by and among the Corporation and the initial holders of Preferred Shares, dated as of the Subscription Date, as may be amended from time in accordance with the terms thereof,

(ff) **"Stated Value"** shall mean $1,000 per share, subject to adjustment for stock splits, stock dividends**,** recapitalizations, reorganizations, reclassifications, combinations, subdivisions or other similar events occurring after the Initial Issuance Date with respect to the Preferred Shares.

(gg) "**Subscription Date**" means September 20, 2017.

(hh) "**Subject Entity**" means any Person, Persons or Group or any Affiliate or associate of any such Person, Persons or Group.

(ii) "**Subsidiaries**" means, as of any date of determination, collectively, all Current Subsidiaries and all New Subsidiaries, and each of the foregoing, individually, a **"Subsidiary."**

(jj) **"Successor Entity"** means the Person (or, if so elected by the Required Holders, the Parent Entity) formed by, resulting from or surviving any Fundamental Transaction or the Person (or, if so elected by the Required Holders, the Parent Entity) with which such Fundamental Transaction shall have been entered into.

(kk) **"Trading Day"** means, as applicable, (x) with respect to all price or trading volume determinations relating to the Common Stock, any day on which the Common Stock is traded on the Principal Market, or, if the Principal Market is not the principal trading market for the Common Stock, then on the principal securities exchange or securities market on which the Common Stock is then traded, provided that "Trading Day" shall not include any day on which the Common Stock is scheduled to trade on such exchange or market for less than 4.5 hours or any day that the Common Stock is suspended from trading during the final hour of trading on such exchange or market (or if such exchange or market does not designate in advance the closing time of trading on such exchange or market, then during the hour ending at 4:00:00 p.m., New York time) unless such day is otherwise designated as a Trading Day in writing by the Holder or (y) with respect to all determinations other than price determinations relating to the Common Stock, any day on which The New York Stock Exchange (or any successor thereto) is open for trading of securities.

(ll) **"Transaction Documents"** means this Certificate of Designations, the Securities Purchase Agreement and each of the other agreements and instruments entered into or delivered by the Corporation or any of the Holders in connection with the transactions contemplated by the Securities Purchase Agreement, all as may be amended from time to time in accordance with the terms thereof

(mm) **"VWAP"** means, for any security as of any date, the dollar volume-weighted average price for such security on the Principal Market (or, if the Principal Market is not the principal trading market for such security, then on the principal securities exchange or securities market on which such security is then traded) during the period beginning at 9:30:01 a.m., New York time, and ending at 4:00:00 p.m., New York time, as reported by Bloomberg through its "Volume at Price" function or, if the foregoing does not apply, the dollar volume-weighted average price of such security in the over-the-counter market on the electronic bulletin board for such security during the period beginning at 9:30:01 a.m., New York time, and ending at 4:00:00 p.m., New York time, as reported by Bloomberg, or, if no dollar volume-weighted average price is reported for such security by Bloomberg for such hours, the average of the highest closing bid price and the lowest closing ask price of any of the market makers for such security as reported in the "pink sheets" by OTC Markets Group Inc. (formerly Pink Sheets LLC). If the VWAP cannot be calculated for such security on such date on any of the foregoing bases, the VWAP of such security on such date shall be the fair market value as mutually determined by the Corporation and the Required Holders. If the Corporation and the Required Holders are unable to agree upon the fair market value of such security, then such dispute shall be resolved in accordance with the procedures in Section19. All such determinations shall be appropriately adjusted for any stock dividend, stock split, stock combination, recapitalization or other similar transaction during such period.

28. Disclosure. Upon receipt or delivery by the Corporation of any notice in accordance with the terms of this Certificate of Designations, unless the Corporation has in good faith determined that the matters relating to such notice do not constitute material, non-public information relating to the Corporation or any of its Subsidiaries, the Corporation shall within one (1) Business Day after any such receipt or delivery publicly disclose such material, nonpublic information on a Current Report on Form 8-K or otherwise. In the event that the Corporation believes that a notice contains material, non-public information relating to the Corporation or any of its Subsidiaries, the Corporation so shall indicate to such Holder contemporaneously with delivery of such notice, and in the absence of any such indication, such Holder shall be allowed to presume that all matters relating to such notice do not constitute material, non-public information relating to the Corporation or any of its Subsidiaries. If the Corporation or any of its Subsidiaries provides material non-public information to a Holder that is not simultaneously filed in a Current Report on Form 8-K and such Holder has not agreed to receive such material non-public information, the Corporation hereby covenants and agrees that such Holder shall not have any duty of confidentiality to the Corporation, any of its Subsidiaries or any of their respective officers, directors, employees, affiliates or agents with respect to, or a duty to any of the foregoing not to trade on the basis of, such material non-public information. Nothing contained in this Section 28 shall limit any obligations of the Corporation, or any rights of any Holder, under the Securities Purchase Agreement.

* * * * *

IN WITNESS WHEREOF, the Corporation has caused this Certificate of Designations of Series C Convertible Preferred Stock to be signed by its Chief Executive Officer on this 20th day of September, 2017.

DELCATH SYSTEMS, INC.

By: /s/Jennifer K. Simpson
Name: Jennifer K. Simpson
Title: CEO

Amendments to Amended and Restated Certificate of Incorporation of Delcath Systems, Inc.

Pursuant to Section 242 of the General
Corporation Law of the State of Delaware

DELCATH SYSTEMS, INC., a Delaware corporation (hereinafter called the "Corporation"), does hereby certify as follows:

FIRST: Upon the filing and effectiveness, which shall be effective at 7:30 AM. Eastern Time on November 6, 2017 (the "Effective Time") pursuant to the General Corporation Law of the State of Delaware (the "DGCL") of this Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Corporation, each number of shares of the Corporation's common stock, par value $0.01 per share ("Common Stock") as determined by the Corporation's Board of Directors in a number of at 1:350, and to be announced by the Corporation via press release upon determination by the Board of Directors,"), issued and outstanding or held by the Corporation in treasury stock immediately prior to the Effective Time shall automatically be combined into one (1) validly issued, fully paid and non-assessable share of Common Stock without any further action by the Corporation or the holder thereof, subject to the treatment of fractional interests as described below. Notwithstanding the immediately preceding sentence, no fractional shares will be issued in connection with the reverse stock split. Stockholders of record who otherwise would be entitled to receive fractional shares, will be entitled to rounding up of their fractional share to the nearest whole share. No stockholders will receive cash in lieu of fractional shares. Each certificate that immediately prior to the Effective Time represented shares of Common Stock ("Old Certificates") shall thereafter represent that number of shares of Common Stock into which the shares of Common Stock represented by the Old Certificate shall have been combined, subject to the adjustment for fractional shares as described above.

SECOND: The foregoing amendment was duly adopted in accordance with Section 242 of the General Corporation Law of the State of Delaware.

THIRD: This Certificate of Amendment shall become effective as of November 6, 2017 at 7:30 AM, New York City time.

IN WITNESS WHEREOF, DELCATH SYSTEMS, INC., has caused this certificate to be duly executed in its corporate name this 26th day of October, 2017.

DELCATH SYSTEMS, INC.

By: /s/ Barbra Keck
Barbra Keck
Chief Financial Officer

Amendment to Amended and Restated Certificate of Incorporation of Delcath Systems, Inc.

Pursuant to Section 242 of the General
Corporation Law of the State of Delaware

DELCATH SYSTEMS, INC., a Delaware corporation (hereinafter called the "Corporation"), does hereby certify as follows:

FIRST: upon the filing and effectiveness (the "Effective Time") pursuant to the General Corporation Law of the State of Delaware (the "DGCL") of this Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Corporation, the first paragraph of Article FOURTH of the Corporation's amended and restate certificate of Incorporation is amended so that the number of shares of common stock, par value $.01 per share which the Corporation shall be authorized to issue is 1,000,000,000.

SECOND: The foregoing amendment was duly adopted in accordance with Section 242 of the General Corporation Law of the State of Delaware.

THIRD: This Certificate of Amendment shall become effective as of April 21, 2018 at 4:30 PM, New York City time.

IN WITNESS WHEREOF, DELCATH SYSTEMS, INC., has caused this certificate to be duly executed in its corporate name this 17th Day of April, 2018.

DELCATH SYSTEMS, INC.

/s/ Barbra Keck
Barbra Keck
CFO

Amendment to Amended and Restated Certificate of Incorporation

Pursuant to Section 242 of the General
Corporation Law of the State of Delaware

DELCATH SYSTEMS, INC., a Delaware corporation (hereinafter called the "Corporation"), does hereby certify as follows:

FIRST: Upon the filing and effectiveness (the "Effective Time") pursuant to the General Corporation Law of the State of Delaware (the "DGCL") of this Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Corporation, the Corporation's Amended and Restated Certificate of Incorporation shall be amended by adding the following paragraph at the end of Article FOURTH:

each 500 shares of the Corporation's common stock, par value $0.01 per share ("Common Stock"), issued and outstanding or held by the Corporation in treasury stock immediately prior to the Effective Time shall automatically be combined into one (1) validly issued, fully paid and non-assessable share of Common Stock without any further action by the Corporation or the holder thereof, subject to the treatment of fractional interests as described below. Notwithstanding the immediately preceding sentence, no fractional shares will be issued in connection with the reverse stock split. Stockholders of record who otherwise would be entitled to receive fractional shares, will be entitled to rounding up of their fractional share to the nearest whole share. No stockholders will receive cash in lieu of fractional shares. Each certificate that immediately prior to the Effective Time represented shares of Common Stock ("Old Certificates") shall thereafter represent that number of shares of Common Stock into which the shares of Common Stock represented by the Old Certificate shall have been combined, subject to the adjustment for fractional shares as described above.

SECOND: The foregoing amendment was duly adopted in accordance with Section 242 of the General Corporation Law of the State of Delaware.

THIRD: This Certificate of Amendment shall become effective as of April 21, 2018 at 4:30 PM, New York City time.

IN WITNESS WHEREOF, DELCATH SYSTEMS, INC., has caused this certificate to be duly executed in its corporate name this 17th Day of April, 2018.

DELCATH SYSTEMS, INC.

/s/ Barbra Keck
Barbra Keck
CFO

STATE OF DELAWARE

CERTIFICATE OF CORRECTION

The corporation organized and existing under and by virtue of the General Corporation Law of the State of Delaware:

DOES HEREBY CERTIFY:

1. The name of the corporation is: Delcath Systems, Inc.

2. That a Certificate of Amendment of Amended and Restated Certificate of Incorporation (the "Certificate of Amendment") was filed by the Secretary of State Delaware on April 17, 2018 and that said Certificate of Amendment requires correction as permitted by Section 103 of the General Corporation Law of the State of Delaware.

3. The inaccuracy or defect of said Certificate of Amendment to be corrected is a follows: Paragraph SECOND indicated that the first paragraph of Article FOURTH of the Amended and Restated Certificate of Incorporation of the Corporation was to be amended by increasing the number of shares of authorized common stock from 500,000,000 to 1,000,000,000 shares but the remainder of the paragraph was to remain as stated, including maintaining 10,000,000 shares of Preferred Stock with a par value of $.01 per share. The amendment was misconstrued as increasing the authorized shares of common stock but not maintaining the shares of Preferred Stock, and as a result, the shares of Preferred Stock were mistakenly omitted in the records of the Secretary of State.

4. Article SECOND of the Certificate is corrected to read as follows:

SECOND. The Amended and Restated Certificate of Incorporation of the Corporation is hereby amended by deleting the first paragraph of Article FOURTH in its entirety and replacing it with the following:

> "FOURTH. The total number of all classes of shares of stock which the Corporation shall have authority to issue is one billion ten million (1,010,000,000) shares, consisting of ten million (10,000,000) shares of Preferred Stock with a par value of $.01 per share, and one billion (1,000,000,000) shares of Common Stock with a par value of $0.01 per share."

IN WITNESS WHEREOF, said Corporation has caused this certificate to be signed by Barbara Keck, an Authorized Officer, this 5 day of November, 2018.

By: /s/ Barbra Keck
Authorized Officer

Name: Barbra Keck
Print or Type

DELCATH SYSTEMS, INC.

CERTIFICATE OF DESIGNATIONS OF PREFERENCES, POWERS,
RIGHTS AND LIMITATIONS
OF
SERIES D REDEEMABLE CONVERTIBLE PREFERRED STOCK

The undersigned, Jennifer K. Simpson and Barbra C. Keck, hereby certify that:

1. The undersigned are the Chief Executive Officer and Chief Financial Officer, respectively, of Delcath Systems, Inc., a Delaware corporation (the **"Corporation");**

2. The Corporation is authorized to issue 10,000,000 shares of preferred stock, $0.01 par value, of which none are issued and outstanding; and

3. The following resolutions were duly adopted by the Board of Directors:

WHEREAS, the Certificate of Incorporation of the Corporation provides for a class of its authorized stock known as preferred stock, comprised of 10,000,000 shares, $0.01 par value per share (the **"Preferred Stock"),** issuable from time to time in one or more series;

WHEREAS, the Board of Directors of the Corporation is authorized to fix the dividend rights, dividend rate, powers, voting rights, conversion rights, rights and terms of redemption and liquidation preferences of any wholly unissued series of Preferred Stock and the number of shares constituting any series and the designation thereof, of any of them;

WHEREAS, it is the desire of the Board of Directors of the Corporation, pursuant to its authority as aforesaid and as set forth in this Certificate of Designations of Preferences, Powers, Rights and Limitations of Series D Redeemable Convertible Preferred Stock, to designate the rights, preferences, restrictions and other matters relating to the Series D Redeemable Convertible Preferred Stock, which will consist of up to 10,000 shares of the Preferred Stock which the Corporation has the authority to issue, as follows:

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors does hereby provide for the issuance of a series of Preferred Stock for cash, notes or exchange of other securities, rights or property and does hereby fix and determine the powers, rights, preferences, restrictions and other matters relating to such series of Preferred Stock as follows:

I. Terms of Preferred Stock.

A. Designation and Amount. A series of Preferred Stock is hereby designated as the Corporation's Series D Redeemable Convertible Preferred Stock, par value of $0.01 per share (the "**Series D Preferred Stock**"), the number of shares of which so designated are 10,000 shares of Series D Preferred Stock, each with a face value of $10,000 per share ("**Face Value**"); which Series D Preferred Stock will not be subject to increase without any consent of the holders of the Series D Preferred Stock (each a "**Holder**" and collectively, the "**Holders**") that may be required by applicable law.

B. Ranking and Voting.

1. Ranking. The Series D Preferred Stock will, with respect to dividend rights and rights upon liquidation, winding-up or dissolution, rank: (a) senior to the Corporation's Common Stock, $0.01 par value per share **("Common Stock");** (b) senior, pari passu or junior with respect to any other series of Preferred Stock, as set forth in the Certificate of Designations of Preferences, Powers, Rights and Limitations with respect to such Preferred Stock; and (d) junior to all existing and future indebtedness of the Corporation**.** Without the prior written consent of the Holders of a majority of the outstanding shares of Series D Preferred Stock (voting separately as a single class), the Corporation may not issue any additional shares of Series D Preferred Stock or any other Preferred Stock that is pari passu or senior to the Series D Preferred Stock with respect to any rights.

2. Voting. Except as required by applicable law or as set forth herein, the holders of shares of Series D Preferred Stock will have no right to vote on any matters, questions or proceedings of this Corporation including, without limitation, the election of directors.

C. Protective Provision.

1. So long as any shares of Series D Preferred Stock are outstanding, the Corporation will not, without the affirmative approval of the Holders of a majority of the shares of the Series D Preferred Stock then outstanding (voting separately as one class), (i) alter or change adversely the powers, preferences or rights given to the Series D Preferred Stock or alter or amend this Certificate of Designations, (ii) authorize or create any class of stock ranking as to distribution of dividends senior to the Series D Preferred Stock, (iii) amend its certificate of incorporation or other charter documents in breach of any of the provisions hereof, (iv) increase the authorized number of shares of Series D Preferred Stock or (v) enter into any agreement with respect to the foregoing.

2. A **"Deemed Liquidation Event"** will mean: (a) a merger or consolidation in which the Corporation is a constituent party or a subsidiary of the Corporation is a constituent party and the Corporation issues shares of its capital stock pursuant to such merger or consolidation, except (i) any such merger or consolidation involving the Corporation or a subsidiary in which the Corporation is the surviving or resulting corporation, (ii) any merger effected exclusively to change the domicile of the Corporation, or (iii) any transaction or series of transactions in which the holders of the voting securities of the Company outstanding immediately prior to such transaction continue to retain more than 50% of the total voting power of such surviving entity; (b) Corporation issues convertible or equity securities that are senior to the Series D Preferred Stock in any respect, (c) Holder does not receive the number of Conversion Shares stated in a Delivery Notice with 5 Trading Days of the Notice Time; (d) trading of the Common Stock is halted or suspended by the Trading Market or any U.S**.** governmental agency for 10 or more consecutive trading days; (e) the sale, lease, transfer, exclusive license or other disposition, in a single transaction or series of related transactions, by

the Corporation or any subsidiary of the Corporation of all or substantially all the assets of the Corporation and its subsidiaries taken as a whole, or the sale or disposition (whether by merger or otherwise) of one or more subsidiaries of the Corporation if substantially all of the assets of the Corporation and its subsidiaries taken as a whole are held by such subsidiary or subsidiaries, except where such sale, lease, transfer, exclusive license or other disposition is to a wholly owned subsidiary of the Corporation.

3. The Corporation will not have the power to close or effect a voluntary Deemed Liquidation Event unless the agreement or plan of merger or consolidation for such transaction provides that the consideration payable to the stockholders of the Corporation will be allocated among the holders of capital stock of the Corporation in accordance with Section I.E, and the required amount is paid to Holder prior to or upon closing, effectuation or occurrence of the Deemed Liquidation Event.

D. Liquidation.

1. Upon any liquidation, dissolution or winding up of the Corporation, whether voluntary or involuntary, after payment or provision for payment of debts and other liabilities of the Corporation, prior to any distribution or payment made to the holders of Preferred Stock or Common Stock by reason of their ownership thereof, the Holders of Series D Preferred Stock will be entitled to be paid out of the assets of the Corporation available for distribution to its stockholders an amount with respect to each share of Series D Preferred Stock equal to $10,000.00 ("**Liquidation Value**").

2. If, upon any liquidation, dissolution or winding up of the Corporation, whether voluntary or involuntary, the amounts payable with respect to the shares of Series D Preferred Stock are not paid in full, the holders of shares of Series D Preferred Stock will share equally and ratably with the holders of shares of Preferred Stock and Common Stock in any distribution of assets of the Corporation in proportion to the liquidation preference and an amount equal to all accumulated and unpaid Dividends, if any, to which each such holder is entitled.

3. If, upon any liquidation, dissolution or winding up of the Corporation, the assets of the Corporation will be insufficient to make payment in full to all Holders, then the assets distributable to the Holders will be distributed among the Holders at the time outstanding, ratably in proportion to the full amounts to which they would otherwise be respectively entitled.

E. Conversion.

1. Mechanics of Conversion.

a. One or more shares of the Series D Preferred Stock may be converted, in part or in whole, into shares of Common Stock, at any time or times after the Issuance Date, in the sole and absolute discretion of Holder or, subject to the terms and conditions hereof, the Corporation; (i) if at the option of Holder, by delivery of one or more written notices to the Corporation or its transfer agent (each, a "**Holder Conversion Notice**"), of the Holder's election to convert any or all of its Series D Preferred Stock; or (ii) if at the option of the Corporation, if the Equity Conditions are met, delivery of written notice to Holder (each, a "**Corporation Conversion Notice**," with the Holder Conversion Notice, each a "Conversion Notice," and with the Redemption Notice, each a "**Delivery Notice**"), of the Corporation's election to convert the Series D Preferred Stock.

b. Each Delivery Notice will set forth the number of shares of Series D Preferred Stock being converted and the minimum number of Conversion Shares due as of the time the Delivery Notice is given (the "**Notice Time**"), and the calculation thereof.

c. As soon as practicable, and in any event within **1** Trading Day of the Notice Time, time being of the essence, the Corporation will do all of the following: (i) transmit the Delivery Notice by facsimile or electronic mail to the Holder, and to the Corporation's transfer agent (the "**Transfer Agent**") with instructions to comply with the Delivery Notice; (ii) either (A) if the Corporation is approved through The Depository Trust Corporation ("**DTC**"), authorize and instruct the credit by the Transfer Agent the aggregate number of Conversion Shares set forth in the Delivery Notice, to Holder's or its designee's balance account with the DTC Fast Automated Securities Transfer (FAST) Program, through its Deposit/Withdrawal at Custodian (DWAC) system, or (B) only if the Corporation is not approved through DTC, issue and surrender to a common carrier for overnight delivery to the address as specified in the Delivery Notice a certificate registered in the name of Holder or its designee, for the number of Conversion Shares set forth in the Delivery Notice, bearing no restrictive legend unless a registration statement covering the Conversion Shares is not effective and neither Company nor Investor provides an opinion of counsel to the effect that Conversion Shares may be issued without restrictive legend; and (iii) if it contends that the Delivery Notice is in any way incorrect, a through explanation of why and its own calculation, or the Delivery Notice will conclusively be deemed correct for all purposes**.** The Corporation will at all times diligently take or cause to be taken all actions reasonably necessary to cause the Conversion Shares to be issued as soon as practicable.

d. If the Corporation for any reason does not issue or cause to be issued to the Holder within 3 Trading Days after the date of a Delivery Notice, the number of Conversion Shares stated in the Delivery Notice, then, in addition to all other remedies available to the Holder, as liquidated damages and not as a penalty, the Corporation will pay in cash to the Holder on each day after such 3rd Trading Day that the issuance of such Conversion Shares is not timely effected an amount equal to 1% of the product of (i) the aggregate number of Conversion Shares not issued to the Holder on a timely basis and to which the Holder is entitled and (ii) the highest Closing Price of the Common Stock between the date on which the Corporation should have issued such shares to the Holder and the actual date of receipt of Conversion Shares by Holder**.** It is intended that the foregoing will serve to reasonably compensate Holder for any delay in delivery of Conversion Shares, and not as punishment for any breach by the Corporation**.** The Corporation acknowledges that the actual damages likely to result from delay in delivery are difficult to estimate and would be difficult for Holder to prove.

e. Notwithstanding any other provision: all of the requirements of this **Section I.E** are each independent covenants; the Corporation's obligations to issue and deliver Conversion Shares upon any Delivery Notice are absolute, unconditional and irrevocable; any breach or alleged breach of any representation or agreement, or any violation or alleged violation of any law or regulation, by any party or any other person will not excuse full and timely performance of any of the Corporation's obligations under these sections; and under no circumstances may the Corporation seek or obtain any temporary, interim or preliminary injunctive or equitable relief to prevent or interfere with any issuance of Conversion Shares to Holder.

f. If for any reason whatsoever Holder does not timely receive the number of Conversion Shares stated in any Delivery Notice, Holder will be entitled to a compulsory remedy of immediate specific performance, temporary, interim and, preliminary and final injunctive relief requiring Corporation and its transfer agent, attorneys, officers and directors to immediately issue and deliver the number of Conversion Shares stated by Holder, which requirement will not be stayed for any reason, without the necessity of posting any bond, and which Corporation may not seek to stay or appeal.

g. No fractional shares of Common Stock are to be issued upon conversion of Series D Preferred Stock, but rather the Corporation will round up to the nearest whole share of Common Stock**.** The Holder will not be required to deliver the original certificates for the Series D Preferred Stock in order to effect a conversion hereunder**.** The Corporation will pay any and all taxes which may be payable with respect to the issuance and delivery of any Conversion Shares.

2. Holder Conversion. In the event of a conversion of any Series D Preferred Stock pursuant to a Holder Conversion Notice, the Corporation will issue to the Holder of such Series D Preferred Stock a number of Conversion Shares equal to (i) the Face Value multiplied by (ii) the number of such Series D Preferred Stock subject to the Holder Conversion Notice divided by (iii) the Conversion Price; all in accordance with the procedures set forth in **Section I.E.1.**

3. Corporation Conversion. The Corporation will have the right to send the Holder a Corporation Conversion Notice at any time in its sole and absolute discretion, if the Equity Conditions are met as of the time such Corporation Conversion Notice is given. Upon any conversion of any Series D Preferred Stock pursuant to a Corporation Conversion Notice, the Corporation will on the date of such notice issue to the Holder of such Series D Preferred Stock a number of Conversion Shares equal to (i) the Face Value multiplied by (ii) the number of such Series D Preferred Stock subject to the Holder Conversion Notice divided by (iii) the Conversion Price; all in accordance with the procedures set forth in **Section I.E.1.**

4. Stock Splits. If the Corporation at any time on or after the filing of this Certificate of Designations subdivides (by any stock split, stock dividend, recapitalization or otherwise) one or more classes of its outstanding shares of Common Stock into a greater number of shares, the applicable Conversion Price and other share based metrics in effect immediately prior to such subdivision will be proportionately reduced and the number of shares of Common Stock issuable will be proportionately increased. If the Corporation at any time on or after such Issuance Date combines (by combination, reverse stock split or otherwise) one or more classes of its outstanding shares of Common Stock into a smaller number of shares, the applicable Conversion Price and other share based metrics in effect immediately prior to such combination will be proportionately increased and the number of Conversion Shares will be proportionately decreased. Any adjustment under this Section will become effective at the close of business on the date the subdivision or combination becomes effective.

5. Rights. In addition to any adjustments pursuant to **Section I.E.4,** if at any time the Corporation grants, issues or sells any options, convertible securities or rights to purchase stock, Certificate of Designations, securities or other property pro rata to the record holders of any class of shares of Common Stock (the **"Purchase Rights"),** then Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which Holder could have acquired if Holder had held the number of shares of Common Stock acquirable upon conversion of all Preferred Stock held by Holder immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights.

6. Notices. The holders of shares of Series D Preferred Stock are entitled to the same rights as the holders of Common Stock with respect to rights to receive notices, reports and audited accounts from the Company and with respect to attending stockholder meetings.

7. Definitions. The following terms will have the following meanings:

a. "Closing Price" means, for any security as of any date, the last closing price for such security on the Trading Market, or, if the Trading Market begins to operate on an extended hours basis and does not designate the closing price, then the last bid price of such security prior to 4:00 p.m., Eastern time, or, if the Trading Market is not the principal securities exchange or trading market for such security, the last closing price of such security on the principal securities exchange or trading market where such security is listed or traded, or if the foregoing do not apply, the last closing price of such security in the over-the-counter market on the electronic bulletin board for such security, or, if no closing price is reported for such security, the average of the bid prices of any market makers for such security as reported on OTCMarkets.com.

b. "Conversion Price" means, with respect to a share of Series D Preferred Stock, a price per share of Common Stock specified in the Stock Purchase Agreement, subject to adjustment as otherwise provided herein.

c. "Conversion Shares" means all shares of Common Stock that are required to be or may be issued upon conversion of Series D Preferred Stock.

d. "Maturity Date" means the date that is 5 years after the Issuance Date.

e. "Equity Conditions" mean that (i) the Common Stock is not under chill or freeze from DTC, the Common Stock is designated for trading on OTCQB or higher market and will not have been suspended from trading on such market, and delisting or suspension by the Trading Market has not been threatened or pending, either in writing by such market or because Company has fallen below the then effective minimum listing maintenance requirements of such market; (ii) the Corporation has delivered Conversion Shares upon all conversions or redemptions of the Series D Preferred Stock in accordance with their terms to the

Holder on a timely basis; (iii) the Corporation will have no knowledge of any fact that would cause both of the following (A) a registration statement not to be effective and available for the resale of all Conversion Shares, and (B) Section 3(a)(9) under the Securities Act of 1933, as amended, not to be available for the issuance of all Conversion Shares, or Regulation S or Securities Act Rule 144 not to be available for the resale of all the Conversion Shares underlying the Series D Preferred Stock without restriction; (iv) there has been a minimum of $1 million in aggregate trading volume over the last 20 consecutive Trading Days; (v) all shares of Common Stock to which Holder is entitled have been timely received into Holder's designated account in electronic form fully cleared for trading; (vi) the Corporation otherwise will have been in compliance with and will not have breached any provision, covenant, representation or warranty of any Transaction Document; the Closing Price is at least $1.00; and (vii) no Trigger Event will have occurred.

f. "Stock Purchase Agreement" means the Stock Purchase Agreement or other agreement pursuant to which any share of Series D Preferred Stock is issued, including all exhibits thereto and all related Transaction Documents as defined therein.

g. "Trading Day" means any day on which the Common Stock is traded on the Trading Market.

h. "Trading Market" means whatever is at the applicable time, the principal U.S. trading exchange or market for the Common Stock. All Trading Market data will be measured as provided by the appropriate function of the Bloomberg Professional service of Bloomberg Financial Markets or its successor performing similar functions.

8. Beneficial Ownership Limitation. Notwithstanding any other provision, at no time may the Corporation issue shares of Common Stock to Holder which, when aggregated with all other shares of Common Stock then deemed beneficially owned by Holder, would result in Holder owning more than 4.99% of all Common Stock outstanding immediately after giving effect to such issuance, as determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder; provided, however, that Holder may increase such amount to 9.99% upon not less than 61 days' prior notice to the Corporation.. To the extent that any conversion would otherwise result in exceeding the beneficial ownership limitation set forth in the preceding sentence, the Delivery Notice will specify the number of shares that may be delivered without exceeding the limitation, and any issuance beyond such extent will be held in abeyance until such time as it would not result in Holder exceeding the beneficial ownership limitation. No provision of this paragraph may be waived by Holder or the Corporation.

9. Conversion at Maturity. Subject to the beneficial ownership limitation above, on the Maturity Date, all remaining outstanding Series D Preferred Stock will automatically be converted into shares of Common Stock at the Conversion Price.

F. Trigger Event.

1. Any occurrence of any one or more of the following will constitute a **"Trigger Event":**

(a) Holder does not timely receive the number of Conversion Shares stated in any Conversion Notice pursuant to this Certificate of Designations or any other agreement with Holder for any reason whatsoever, time being of the essence, including without limitation the issuance of restricted shares if counsel for Corporation or Holder provides a legal opinion that shares may be issued without restrictive legend;

(b) Any violation of or failure to timely perform any covenant or provision of this Certificate of Designations, the Stock Purchase Agreement, any Transaction Document or any other agreement with Holder, related to payment of cash, registration or delivery of Conversion Shares, time being of the essence;

(c) Any violation of or failure to perform any covenant or provision of this Certificate of Designations, the Stock Purchase Agreement, any Transaction Document or any other agreement with Holder, which in the case of a default that is curable, is not related to payment of cash, registration or delivery of Conversion Shares, and has not occurred before, is not cured within 5 Trading Days of written notice thereof;

(d) Any representation or warranty made in the Securities Purchase Agreement, any Transaction Document or any other agreement with Holder will be untrue, incorrect, or misleading in any material respect as of the date when made or deemed made;

(e) The occurrence of any default or event of default under any material agreement, lease, document or instrument to which the Corporation or any subsidiary is obligated, including without limitation of an aggregate of at least $2,000,000 of indebtedness, not existing on the date hereof;

(f) While any Registration Statement is required to be maintained effective, the effectiveness of the Registration Statement lapses for any reason, including, without limitation, the issuance of a stop order, or the Registration Statement, or the prospectus contained therein, is unavailable to Holder sale of all Conversion Shares for any 5 or more Trading Days, which may be non-consecutive;

(g) The suspension from trading or the failure of the Common Stock to be trading or listed on the Trading Market;

(h) The Corporation notifies Holder, including without limitation, by way of public announcement or through any of its attorneys, agents or representatives, of its intention not to comply, as required, with a Conversion Notice pursuant to this Certificate of Designations or any other agreement with Holder, at any time, including without limitation any objection or instruction to its transfer agent not to comply with any notice from Holder;

(i) Bankruptcy, insolvency, reorganization or liquidation proceedings or other proceedings for the relief of debtors will be instituted by or against the Corporation or any subsidiary and, if instituted against the Corporation or any subsidiary by a third party, an order for relief is entered or the proceedings are not dismissed within 30 days of their initiation;

(j) The appointment of or taking possession by a custodian, receiver, liquidator, assignee, trustee, or other similar official of the Corporation or any subsidiary or of any substantial part of its property, or the making by it of an assignment for the benefit of creditors, or the execution of a composition of debts, or the occurrence of any other similar federal, state or foreign proceeding, or the admission by it in writing of its inability to pay its debts generally as they become due, the taking of corporate action by the Corporation or any subsidiary in furtherance of any such action or the taking of any action by any person to commence a foreclosure sale or any other similar action under any applicable law;

(k) A final judgment or judgments for the payment of money aggregating in excess of $500,000 are rendered against the Corporation or any of its subsidiaries and are not stayed or satisfied within 30 days of entry;

(l) The Corporation does not for any reason timely comply with the reporting requirements of the Securities Exchange Act of 1934, as amended, and the regulations promulgated thereunder, including without limitation timely filing when first due all periodic reports;

(m) Any regulatory, administrative or enforcement proceeding is initiated against Corporation or any subsidiary (except to the extent an adverse determination would not have a material adverse effect on the Company's business, properties, assets, financial condition or results of operations or prevent the performance by the Company of any material obligation under the Transaction Documents); or

(n) Any material provision of this Certificate of Designations shall at any time for any reason, other than pursuant to the express terms thereof, cease to be valid and binding on or enforceable against the parties thereto, or the validity or enforceability thereof will be contested by any party thereto, or a proceeding will be commenced by the Corporation or any subsidiary or any governmental authority having jurisdiction over any of them, seeking to establish the invalidity or unenforceability thereof, or the Corporation or any subsidiary denies that it has any liability or obligation purported to be created under this Certificate of Designations.

2. It is intended that all adjustments made following a Trigger Event will serve to reasonably compensate Holder for the consequences and increased risk following a Trigger Event, and not as a penalty or punishment for any breach by the Corporation. The Corporation acknowledges that the actual damages likely to result from a Trigger Event are difficult to estimate and would be difficult for Holder to prove.

II. General.

A. Notices. Any and all notices to the Corporation will be addressed to the Corporation's Chief Executive Officer at the Corporation's principal place of business on file with the Secretary of State of the State of Delaware. Any and all notices or other communications or deliveries to be provided by the Corporation to any Holder hereunder will be in writing and delivered personally, by electronic mail or facsimile, sent by a nationally recognized overnight courier service addressed to each Holder at the electronic mail, facsimile telephone number or address of such Holder appearing on the books of the Corporation, or if no such electronic mail, facsimile telephone number or address appears, at the principal place of

business of the Holder. Any notice or other communication or deliveries hereunder will be deemed given and effective on the earliest of (1) the date of transmission, if such notice or communication is delivered via facsimile or electronic mail prior to 5:30 p.m. Eastern time, (2) the date after the date of transmission, if such notice or communication is delivered via facsimile or electronic mail later than 5:30 p.m. but prior to 11:59 p.m. Eastern time on such date, (3) the second business day following the date of mailing, if sent by nationally recognized overnight courier service, or (4) upon actual receipt by the party to whom such notice is required to be given, regardless of how sent.

B. Lost or Mutilated Preferred Stock Certificate. Upon receipt of evidence reasonably satisfactory to the Corporation (an affidavit of the registered Holder will be satisfactory) of the ownership and the loss, theft, destruction or mutilation of any certificate evidencing shares of Series D Preferred Stock, and in the case of any such loss, theft or destruction upon receipt of indemnity reasonably satisfactory to the Corporation (provided that if the Holder is a financial institution or other institutional investor its own agreement will be satisfactory) or in the case of any such mutilation upon surrender of such certificate, the Corporation will, at its expense, execute and deliver in lieu of such certificate a new certificate of like kind representing the number of shares of such class represented by such lost, stolen, destroyed or mutilated certificate and dated the date of such lost, stolen, destroyed or mutilated certificate.

C. Headings. The headings contained herein are for convenience only, do not constitute a part of this Certificate of Designations and will not be deemed to limit or affect any of the provisions hereof.

RESOLVED, FURTHER, that the chairman, chief executive officer, chief financial officer, president or any vice-president, and the secretary or any assistant secretary, of the Corporation be and they hereby are authorized and directed to prepare and file a Designation of Preferences, Rights and Limitations of Series D Preferred Stock in accordance with the foregoing resolution and the provisions of Delaware law.

IN WITNESS WHEREOF, the undersigned have executed this Certificate this 5th day of November 2018.

Signed: /s/ Jennifer Simpson
Name: Jennifer K. Simpson
Title: Chief Executive Officer

Signed: /s/ Barbra Keck
Name: Barbra C. Keck
Title: Chief Financial Officer

DELCATH SYSTEMS, INC.

**CERTIFICATE OF DESIGNATION OF PREFERENCES,
RIGHTS AND LIMITATIONS
OF
SERIES E CONVERTIBLE PREFERRED STOCK**

PURSUANT TO SECTION 151 OF THE
DELAWARE GENERAL CORPORATION LAW

The undersigned, Jennifer K. Simpson and Barbra C. Keck, do hereby certify that:

1. They are the Chief Executive Officer and Secretary, respectively, of Delcath Systems, Inc., a Delaware corporation (the "Corporation").

2. The Corporation is authorized to issue 10,000,000 shares of preferred stock, none of which are issued and outstanding on the date hereof

3. The following resolutions were duly adopted by the board of directors of the Corporation (the "Board of Directors"):

WHEREAS, the certificate of incorporation of the Corporation provides for a class of its authorized stock known as preferred stock, consisting of 10,000,000 shares, $0.01 par value per share, issuable from time to time in one or more series;

WHEREAS, the Board of Directors is authorized to fix the dividend rights, dividend rate, voting rights, conversion rights, rights and terms of redemption and liquidation preferences of any wholly unissued series of preferred stock and the number of shares constituting any series and the designation thereof, of any of them; and

WHEREAS, it is the desire of the Board of Directors, pursuant to its authority as aforesaid, to fix the rights, preferences, restrictions and other matters relating to a series of the preferred stock, which shall consist of, except as otherwise set forth in the Purchase Agreement, up to 40,000 shares of the preferred stock which the Corporation has the authority to issue, as follows:

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors does hereby provide for the issuance of a series of preferred stock for cash or exchange of other securities, rights or property and does hereby fix and determine the rights, preferences, restrictions and other matters relating to such series of preferred stock as follows:

TERMS OF PREFERRED STOCK

Section 1. Definitions. For the purposes hereof, the following terms shall have the following meanings:

"Affiliate" means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 of the Securities Act.

"Alternate Consideration" shall have the meaning set forth in Section 7(e).

"Attribution Parties" shall have the meaning set forth in Section 6(d).

"Beneficial Ownership Limitation" shall have the meaning set forth in Section 6(d).

"Board of Directors" shall have the meaning set forth on the cover page hereto.

"Business Day" means any day except any Saturday, any Sunday, any day which is a federal legal holiday in the United States or any day on which banking institutions in the State of New York are authorized or required by law or other governmental action to close.

"Buy-In" shall have the meaning set forth in Section 6(c)(iv).

"Closing" means the closing of the purchase and sale of the Securities on the Closing Date pursuant to Section 2.1 of the Purchase Agreement.

"Closing Date" means the Trading Day on which all of the Transaction Documents have been executed and delivered by the applicable parties thereto and all conditions precedent to (i) each Holder's obligations to pay the Subscription Amount and (ii) the Corporation's obligations to deliver the Securities have been satisfied or waived.

"Commission" means the United States Securities and Exchange Commission.

"Common Stock" means the Corporation's common stock, par value $0.01 per share, and stock of any other class of securities into which such securities may hereafter be reclassified or changed.

"Common Stock Equivalents" means any securities of the Corporation or the Subsidiaries which would entitle the holder thereof to acquire at any time Common Stock, including, without limitation, any debt, preferred stock, rights, options, warrants or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, Common Stock.

"Conversion Amount" means the sum of the Stated Value at issue.

"Conversion Date" shall have the meaning set forth in Section 6(a).

"Conversion Price" shall have the meaning set forth in Section 6(b).

"Conversion Shares" means, collectively, the shares of Common Stock issuable upon conversion of the shares of Preferred Stock in accordance with the terms hereof.

"Conversion Shares Registration Statement" means a registration statement that registers the resale of the Conversion Shares of the Holders, who shall be named as "selling stockholders" therein and meets the requirements of the Registration Rights Agreement.

"Effective Date" means the date that the Conversion Shares Registration Statement filed by the Corporation pursuant to the Registration Rights Agreement is first declared effective by the Commission.

"Exchange Act" means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

"Exempt Issuance" means the issuance of (a) shares of Common Stock or options to employees, officers or directors of the Corporation pursuant to any stock or option plan duly adopted for such purpose, by a majority of the non-employee members of the Board of Directors or a majority of the members of a committee of non-employee directors established for such purpose for services rendered to the Company, (b) securities upon the exercise or exchange of or conversion of any Securities issued hereunder and/or other securities exercisable or exchangeable for or convertible into shares of Common Stock issued and outstanding on the date of the Purchase Agreement, provided that such securities have not been amended since the date of the Purchase Agreement to increase the number of such securities or to decrease the exercise price, exchange price or conversion price of such securities (other than in connection with stock splits or combinations) or to extend the term of such securities, (c) securities issued pursuant to acquisitions or strategic transactions approved by a majority of the disinterested directors of the Corporation, provided that such securities are issued as "restricted securities" (as defined in Rule 144) and carry no registration rights that require or permit the filing of any registration statement in connection therewith during the prohibition period in Section 4.12(a) of the Purchase Agreement, and provided that any such issuance shall only be to a Person (or to the equityholders of a Person) which is, itself or through its subsidiaries, an operating company or an owner of an asset in a business synergistic with the business of the Corporation and shall provide to the Corporation additional benefits in addition to the investment of funds, but shall not include a transaction in which the Company is issuing securities primarily for the purpose of raising capital or to an entity whose primary business is investing in securities; (d) up to 923 shares of Preferred Stock and Warrants to purchase up to 15,382,992 shares of Common Stock to be issued simultaneously with the initial Closing hereunder to certain persons (the "MFN Investors") in settlement of their prior claims against the Corporation (the "MFN Investors Settlement"); (e)) up to $10 million in shares of Preferred Stock and Warrants, on the same

terms and conditions and prices as set out hereunder, with investors executing definitive agreements for the purchase of such Securities and such transactions having closed on or before the 30th calendar day following the Closing Date; and (f) securities issued upon the conversion of any of the Existing Notes, following the amendment of the Existing Notes in accordance with Section 4.11 of the Purchase Agreement, provided that such Existing Notes shall not have been further amended since the date of the Purchase Agreement to increase the number of such securities or to decrease the conversion price of such securities (other than in connection with stock splits or combinations) or to extend the term of such securities.

"Fundamental Transaction" shall have the meaning set forth in Section 7(e).

"Holder" shall have the meaning given such term in Section 2.

"Issuable Maximum" shall have the meaning set forth in Section 6(e)

"Liquidation" shall have the meaning set forth in Section 5.

"Measurement Period" shall have the meaning set forth in Section 6(b).

"New York Courts" shall have the meaning set forth in Section 11(d).

"Notice of Conversion" shall have the meaning set forth in Section 6(a).

"Original Issue Date" means the date of the first issuance of any shares of the Preferred Stock regardless of the number of transfers of any particular shares of Preferred Stock and regardless of the number of certificates which may be issued to evidence such Preferred Stock.

"Person" means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

"Preferred Stock" shall have the meaning set forth in Section 2.

"Purchase Agreement" means the Securities Purchase Agreement, dated as of the Original Issue Date, among the Corporation and certain of the original Holders, as amended, modified or supplemented from time to time in accordance with its terms.

"Registration Rights Agreement" means the Registration Rights Agreement, dated as of the date of the Purchase Agreement, among the Corporation and the original Holders, in the form of attached as an exhibit to the Purchase Agreement.

"Registration Statement" means a registration statement meeting the requirements set forth in the Registration Rights Agreement and covering the resale of the Underlying Shares.

"Reset Conversion Price" shall have the meaning set forth in Section 6(b).

"Reverse Stock Split" mean the first reverse stock split that is effected by the Corporation following the Closing Date.

"Reverse Stock Split Date" means the first Trading Day that the Common Stock trades on a split adjusted basis following the time on which the Reverse Stock Split is effected by the Corporation's filing of an amendment to its certificate of incorporation with the State of Delaware.

"Rule 144" means Rule 144 promulgated by the Commission pursuant to the Securities Act, as such Rule may be amended from time to time, or any similar rule or regulation hereafter adopted by the Commission having substantially the same effect as such Rule.

"Rule 424" means Rule 424 promulgated by the Commission pursuant to the Securities Act, as such Rule may be amended or interpreted from time to time, or any similar rule or regulation hereafter adopted by the Commission having substantially the same purpose and effect as such Rule.

"Securities" means the Preferred Stock, the Warrants, the Warrant Shares and the Underlying Shares.

"Securities Act" means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

"Share Delivery Date" shall have the meaning set forth in Section 6(c).

"Standard Settlement Period" shall have the meaning set forth in Section 6(c).

"Stated Value" shall have the meaning set forth in Section 2.

"Subscription Amount" shall mean, (i) as to each Holder which is a party to the Purchase Agreement, the aggregate amount to be paid for the Preferred Stock purchased pursuant to the Purchase Agreement as specified below such Holder's name on the signature page of the Purchase Agreement and next to the heading "Subscription Amount," in United States dollars and in immediately available funds; and (ii) as to each other Holder, $1.00.

"Subsidiary" means any subsidiary of the Corporation as set forth on Schedule 3.1(a) of the Purchase Agreement and shall, where applicable, also include any direct or indirect subsidiary of the Corporation formed or acquired after the date of the Purchase Agreement.

"Successor Entity" shall have the meaning set forth in Section 7(e).

"Trading Day" means a day on which the principal Trading Market is open for business.

"Trading Market" means any of the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: the NYSE American, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market, the New York Stock Exchange, the OTCQB or the OTCQX (or any successors to any of the foregoing).

"Transaction Documents" shall have the meaning set forth in the Purchase Agreement.

"Transfer Agent" means American Stock Transfer and Trust Company, LLC, the current transfer agent of the Corporation with a mailing address of 6201 15th Ave., Brooklyn, NY 11219 and any successor transfer agent of the Corporation.

"Trigger Date" shall means each of: (i) the 3rd Trading Day immediately following the Reverse Stock Split Date (ii) the date that the initial Registration Statement is declared effective by the Commission and (iii) the date that all of the Underlying Shares issuable pursuant to the Transaction Documents (without giving effect to any limitations on conversion or exercise) may be sold pursuant to Rule 144 (assuming cashless exercise of the Warrants with regard to the Warrant Shares), in the event that all of the Registrable Securities (as defined in the Registration Rights Agreement) are not then registered on an effective Registration Statement.

"Trigger Date Adjustment Notice" shall have the meaning set forth in Section 6(b).

"Underlying Shares" means the shares of Common Stock issued and issuable upon conversion of the Preferred Stock and upon exercise of the Warrants.

"VWAP" means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the daily volume weighted average price of the Common Stock for such date (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported in the "Pink Sheets" published by OTC Markets, Inc. (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by an independent appraiser selected in good faith by the Purchasers of a majority in interest of the Securities then outstanding and reasonably acceptable to the Corporation, the fees and expenses of which shall be paid by the Corporation.

"Warrant Shares" means the shares of Common Stock issuable upon exercise of the Warrants.

"Warrants" means, collectively, the Common Stock purchase warrants delivered to the Holder at the Closing in accordance with Section 2.2(a) of the Purchase Agreement, which Warrants shall be exercisable immediately and have a term of exercise equal to 5 years, in the form of Exhibit C attached to the Purchase Agreement.

Section 2. Designation, Amount and Par Value. The series of preferred stock shall be designated as its Series E Convertible Preferred Stock (the "Preferred Stock") and the number of shares so designated shall be up to 40,000 (which shall not be subject to increase without the written consent of all of the holders of the Preferred Stock (each, a "Holder" and collectively, the "Holders")). Each share of Preferred Stock shall have a par value of $0.01 per share and a stated value equal to $1,000 (the "Stated Value").

Section 3. Dividends. Except for stock dividends or distributions for which adjustments are to be made pursuant to Section 7, Holders shall be entitled to receive, and the Corporation shall pay, dividends on shares of Preferred Stock equal (on an as-if-converted-to-Common-Stock basis) to and in the same form as dividends actually paid on shares of the Common Stock when, as and if such dividends are paid on shares of the Common Stock. Any such dividends which are not paid to the Holders shall increase the Stated Value of the Preferred Stock. No other dividends shall be paid on shares of Preferred Stock.

Section 4. Voting Rights. Except as otherwise provided herein or as otherwise required by law, the Preferred Stock shall vote on an "as converted" basis, subject to the Beneficial Ownership Limitation (which Beneficial Ownership Limitation shall be calculated on a basis which includes, for purposes of this Section 4, the number of shares of Common Stock which are issuable upon conversion of the unconverted Stated Value of Preferred Stock beneficially owned by such Holder or any of its Affiliates or Attribution Parties) on all matters submitted to the holders of Common Stock for approval. In addition, as long as any shares of Preferred Stock are outstanding, the Corporation shall not, without the affirmative vote of the Holders of a majority of the then outstanding shares of the Preferred Stock, (a) alter or change adversely the powers, preferences or rights given to the Preferred Stock or alter or amend this Certificate of Designation, (b) amend its certificate of incorporation or other charter documents in any manner that adversely affects any rights of the Holders, (c) increase the number of authorized shares of Preferred Stock, or (d) enter into any agreement with respect to any of the foregoing.

Section 5. Liquidation. Upon any liquidation, dissolution or winding-up of the Corporation, whether voluntary or involuntary (a "Liquidation"), the Holders shall be entitled to receive out of the assets, whether capital or surplus, of the Corporation an amount equal to the Stated Value, plus any accrued and unpaid dividends thereon, for each share of Preferred Stock before any distribution or payment shall be made to the holders of the Common Stock, and if the assets of the Corporation shall be insufficient to pay in full such amounts, then the entire assets to be distributed to the Holders shall be ratably distributed among the Holders in accordance with the respective amounts that would be payable on such shares if all amounts payable thereon were paid in full. The Corporation shall mail written notice of any such Liquidation, not less than 45 days prior to the payment date stated therein, to each Holder.

Section 6. Conversion.

a) Conversions at Option of Holder. Each share of Preferred Stock shall be convertible, at any time and from time to time from and after the Original Issue Date at the option of the Holder thereof, into that number of shares of Common Stock (subject to the limitations set forth in Section 6(d) and Section 6(e)) determined by dividing the Stated Value of such share of Preferred Stock by the Conversion Price. Holders shall effect conversions by providing the Corporation with the form of conversion notice attached hereto as Annex A (a "Notice of Conversion"). Each Notice of Conversion shall specify the number of shares of Preferred Stock to be converted, the number of shares of Preferred Stock owned prior to the conversion at issue, the number of shares of Preferred Stock owned subsequent to the conversion at issue and the date on which such conversion is to be effected, which date may not be prior to the date the applicable Holder delivers by email such Notice of Conversion to the Corporation (such date, the "Conversion Date"). If no Conversion Date is specified in a Notice of Conversion, the Conversion Date shall be the date that such Notice of Conversion to the Corporation is deemed delivered hereunder. No ink-original Notice of Conversion shall be required, nor shall any medallion guarantee (or other type of guarantee or notarization) of any Notice of Conversion form be required. The calculations and entries set forth in the Notice of Conversion shall control in the absence of manifest or mathematical error. To effect conversions of shares of Preferred Stock, a Holder shall not be required to surrender the certificate(s) representing the shares of Preferred Stock to the Corporation unless all of the shares of Preferred Stock represented thereby are so converted, in which case such Holder shall deliver the certificate representing such shares of Preferred Stock promptly following the Conversion Date at issue. Partial conversions of Preferred Stock certificates shall have the effect of lowering the number of shares of Common Stock issuable thereunder upon conversion in an amount equal to the applicable number of shares of Common Stock previously issued upon conversions. The Holder and the Corporation shall maintain records showing the number of shares of Common Stock issued upon conversions and the date of such conversions. Shares of Preferred Stock converted into Common Stock or redeemed in accordance with the terms hereof shall be canceled and shall not be reissued.

b) Conversion Price. The conversion price for the Preferred Stock shall equal $0.06, subject to adjustment herein (the "Conversion Price"). In addition, on each Trigger Date, the Conversion Price shall be reduced, and only reduced, to the lesser of (i) the then Conversion Price and (ii) 90% of the average of the five (5) VWAPs immediately prior to the Trigger Date (the "Reset Conversion Price", which shall thereafter be the new Conversion Price, subject to further adjustment hereunder, and each 5 Trading Day period shall be referred to herein as a "Measurement Period"). The

Corporation shall notify each Holder of the applicable adjustment to the Conversion Price as of such date (each notice, a "Trigger Date Adjustment Notice"). For purposes of clarification, whether or not the Corporation provides a Trigger Date Adjustment Notice pursuant to this Section 6(b), each Holder shall receive a number of Conversion Shares and retain a number of shares of Preferred Stock based upon the Conversion Price as adjusted pursuant to this Section, regardless of whether a Holder accurately refers to such price or number of shares of Preferred Stock converted in any Notice of Conversion. Any adjustment to the Conversion Price pursuant to this Section shall be effective retroactively to the first Trading Day during each Measurement Period. Accordingly, with respect to Notices of Conversion effected during the Measurement Period, in the event the Conversion Price is reduced pursuant to this Section, within the 2 Trading Days immediately following the end of each Measurement Period, the Corporation shall issue the applicable Holder additional Conversion Shares based on a Conversion Price equal to the Reset Conversion Price with respect to such Notices of Conversion.

c) Mechanics of Conversion

i. Delivery of Conversion Shares Upon Conversion. Not later than the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period (as defined below) after each Conversion Date (the "Share Delivery Date"), the Corporation shall deliver, or cause to be delivered, to the converting Holder (A) Conversion Shares which, on or after the earlier of (i) the six month anniversary of the Original Issue Date or (ii) the Effective Date, shall be free of restrictive legends and trading restrictions (other than those which may then be required by the Purchase Agreement) representing the number of Conversion Shares being acquired upon the conversion of the Preferred Stock, and (B) a wire transfer in the amount of accrued and unpaid dividends, if any, in immediately available funds pursuant to wire instructions provided to the Corporation by such Holder. On or after the earlier of (i) the six month anniversary of the Original Issue Date or (ii) the Effective Date, the Corporation shall deliver the Conversion Shares required to be delivered by the Corporation under this Section 6 electronically through the Depository Trust Company or another established clearing corporation performing similar functions. Upon delivery of a Notice of Conversion by a Holder, such Holder shall be deemed for all corporate purposes to have become the holder of record of the Conversion Shares with respect to which the applicable shares of Preferred Stock have been converted irrespective of the delivery of the Conversion Shares. As used herein, "Standard Settlement Period" means the standard settlement period, expressed in a number of Trading Days, on the Corporation's primary Trading Market with respect to the Common Stock as in effect on the date of delivery of the Notice of Conversion.

ii. Failure to Deliver Conversion Shares. If, in the case of any Notice of Conversion, such Conversion Shares are not delivered to or as directed by the applicable Holder by the Share Delivery Date, the Holder shall be entitled to elect by written notice to the Corporation at any time on or before its receipt of such Conversion Shares, to rescind such conversion, in which event the Corporation shall promptly return to the Holder any original Preferred Stock certificate delivered to the Corporation and the Holder shall promptly return to the Corporation the Conversion Shares issued to such Holder pursuant to the rescinded Notice of Conversion.

iii. Obligation Absolute; Partial Liquidated Damages. The Corporation's obligation to issue and deliver the Conversion Shares upon conversion of Preferred Stock in accordance with the terms hereof are absolute and unconditional, irrespective of any action or inaction by a Holder to enforce the same, any waiver or consent with respect to any provision hereof, the recovery of any judgment against any Person or any action to enforce the same, or any setoff, counterclaim, recoupment, limitation or termination, or any breach or alleged breach by such Holder or any other Person of any obligation to the Corporation or any violation or alleged violation of law by such Holder or any other Person, and irrespective of any other circumstance which might otherwise limit such obligation of the Corporation to such Holder in connection with the issuance of such Conversion Shares; provided, however, that such delivery shall not operate as a waiver by the Corporation of any such action that the Corporation may have against such Holder. In the event a Holder shall elect to convert any or all of the Stated Value of its Preferred Stock, the Corporation may not refuse conversion based on any claim that such Holder or any one associated or affiliated with such Holder has been engaged in any violation of law, agreement or for any other reason, unless an injunction from a court, on notice to Holder, restraining and/or enjoining conversion of all or part of the Preferred Stock of such Holder shall have been sought and obtained. In the absence of such injunction, the Corporation shall issue Conversion Shares and, if applicable, cash, upon a properly noticed conversion. If the Corporation fails to deliver to a Holder such Conversion Shares pursuant to Section 6(c)(i) by the Share Delivery Date applicable to such conversion, the Corporation shall pay to such Holder, in cash, as liquidated damages and not as a penalty, for each $5,000 of Stated Value of Preferred Stock being converted, $50 per Trading Day (increasing to $100 per Trading Day on the third Trading Day and increasing to $200 per Trading Day on the sixth Trading Day after such damages begin to accrue) for each Trading Day after the Share Delivery Date until such Conversion Shares are delivered or Holder rescinds such conversion. Nothing herein shall limit a Holder's right to pursue actual damages for the Corporation's failure to deliver Conversion Shares within the period specified herein and such Holder shall have the right to pursue all remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief. The exercise of any such rights shall not prohibit a Holder from seeking to enforce damages pursuant to any other Section hereof or under applicable law.

iv. Compensation for Buy-In on Failure to Timely Deliver Conversion Shares Upon Conversion. In addition to any other rights available to the Holder, if the Corporation fails for any reason to deliver to a Holder the applicable Conversion Shares by the Share Delivery Date pursuant to Section 6(c)(i), and if after such Share Delivery Date such Holder is required by its brokerage firm to purchase (in an open market transaction or otherwise), or the Holder's brokerage firm otherwise purchases, shares of Common Stock to deliver in satisfaction of a sale by such Holder of the Conversion Shares which such Holder was entitled to receive upon the conversion relating to such Share Delivery Date (a "Buy-In"), then the Corporation shall (A) pay in cash to such Holder (in addition to any other remedies available to or elected by such Holder) the amount, if any, by which (x) such Holder's total purchase price (including any brokerage commissions) for the Common Stock so purchased exceeds (y) the product of (1) the aggregate number of shares of Common Stock that such Holder was entitled to receive from the conversion at issue multiplied by (2) the actual sale price at which the sell order giving rise to such purchase obligation was executed (including any brokerage commissions) and (B) at the option of such Holder, either reissue (if surrendered) the shares of Preferred Stock equal to the number of shares of Preferred Stock submitted for conversion (in which case, such conversion shall be deemed rescinded) or deliver to such Holder the number of shares of Common Stock that would have been issued if the Corporation had timely complied with its delivery requirements under Section 6(c)(i). For example, if a Holder purchases shares of Common Stock having a total purchase price of $11,000 to cover a Buy-In with respect to an attempted conversion of shares of Preferred Stock with respect to which the actual sale price of the Conversion Shares (including any brokerage commissions) giving rise to such purchase obligation was a total of $10,000 under clause (A) of the immediately preceding sentence, the Corporation shall be required to pay such Holder $1,000. The Holder shall provide the Corporation written notice indicating the amounts payable to such Holder in respect of the Buy-In and, upon request of the Corporation, evidence of the amount of such loss. Nothing herein shall limit a Holder's right to pursue any other remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Corporation's failure to timely deliver Conversion Shares upon conversion of the shares of Preferred Stock as required pursuant to the terms hereof.

v. Reservation of Shares Issuable Upon Conversion. The Corporation covenants that it will at all times reserve and keep available out of its authorized and unissued shares of Common Stock for the sole purpose of issuance upon conversion of the Preferred Stock as herein provided, free from preemptive rights or any other actual contingent purchase rights of Persons other than the Holder (and the other Holders of the Preferred Stock), not less than such aggregate number of shares of the Common Stock as shall (subject to the terms and conditions set forth in the Purchase Agreement) be issuable (taking into account the adjustments and restrictions of Section 7) upon the conversion of the then outstanding shares of Preferred Stock (assuming a Conversion Price equal to $0.023 (subject to adjustment for reverse and forward stock splits, recapitalizations and similar transactions following the date of the Purchase Agreement) following the Reverse Stock Split Date). Notwithstanding the foregoing, until the Reverse Stock Split Date, 980,555,497 shares of Common Stock (subject to adjustment for reverse and forward stock splits, recapitalizations and similar transactions following the date of the Purchase Agreement) shall be reserved for issuance upon conversion of the Preferred Stock. The Corporation covenants that all shares of Common Stock that shall be so issuable shall, upon issue, be duly authorized, validly issued, fully paid and nonassessable and, if the Conversion Shares Registration Statement is then effective under the Securities Act, shall be registered for public resale in accordance with such Conversion Shares Registration Statement (subject to such Holder's compliance with its obligations under the Registration Rights Agreement).

vi. Fractional Shares. No fractional shares or scrip representing fractional shares shall be issued upon the conversion of the Preferred Stock. As to any fraction of a share which the Holder would otherwise be entitled to purchase upon such conversion, the Corporation shall at its election, either pay a cash adjustment in respect of such final fraction in an amount equal to such fraction multiplied by the Conversion Price or round up to the next whole share. Notwithstanding anything to the contrary contained herein, but consistent with the provisions of this subsection with respect to fractional Conversion Shares, nothing shall prevent any Holder from converting fractional shares of Preferred Stock.

vii. Transfer Taxes and Expenses. The issuance of Conversion Shares on conversion of this Preferred Stock shall be made without charge to any Holder for any documentary stamp or similar taxes that may be payable in respect of the issue or delivery of such Conversion Shares, provided that the Corporation shall not be required to pay any tax that may be payable in respect of any transfer involved in the issuance and delivery of any such Conversion Shares upon conversion in a name other than that of the Holders of such shares of Preferred Stock and the Corporation shall not be required to issue or deliver such Conversion Shares unless or until the Person or Persons requesting the issuance thereof shall have paid to the Corporation the amount of such tax or shall have established to the satisfaction of the Corporation that such tax has been paid. The Corporation shall pay all Transfer Agent fees required for same-day processing of any Notice of Conversion and all fees to the Depository Trust Company (or another established clearing corporation performing similar functions) required for same-day electronic delivery of the Conversion Shares.

d) Beneficial Ownership Limitation. Notwithstanding anything to the contrary contained herein, the Corporation shall not effect any conversion of the Preferred Stock, and a Holder shall not have the right to convert any portion of the Preferred Stock, to the extent that, after giving effect to the conversion set forth on the applicable Notice of Conversion, such Holder (together with such Holder's Affiliates, and any Persons acting as a group together with such Holder or any of such Holder's Affiliates (such Persons, "Attribution Parties")) would beneficially own in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by such Holder and its Affiliates and Attribution Parties shall include the number of shares of Common Stock issuable upon conversion of the Preferred Stock with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which are issuable upon (i) conversion of the remaining, unconverted Stated Value of Preferred Stock beneficially owned by such Holder or any of its Affiliates or Attribution Parties and (ii) exercise or conversion of the unexercised or unconverted portion of any other securities of the Corporation subject to a limitation on conversion or exercise analogous to the limitation contained herein (including, without limitation, the Preferred Stock or the Warrants) beneficially owned by such Holder or any of its Affiliates or Attribution Parties. Except as set forth in the preceding sentence, for purposes of this Section 6(d), beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. To the extent that the limitation contained in this Section 6(d) applies, the determination of whether the Preferred Stock is convertible (in relation to other securities owned by such Holder together with any Affiliates and Attribution Parties) and of how many shares of Preferred Stock are convertible shall be in the sole discretion of such Holder, and the submission of a Notice of Conversion shall be deemed to be such Holder's determination of whether the shares of Preferred Stock may be converted (in relation to other securities owned by such Holder together with any Affiliates and Attribution Parties) and how many shares of the Preferred Stock are convertible, in each case subject to the Beneficial Ownership Limitation. To ensure compliance with this restriction, each Holder will be deemed to represent to the Corporation each time it delivers a Notice of Conversion that such Notice of Conversion has not violated the restrictions set forth in this paragraph and the Corporation shall have no obligation to verify or confirm the accuracy of such determination. In addition, a determination as to any group status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. For purposes of this Section 6(d), in determining the number of outstanding shares of Common Stock, a Holder may rely on the number of outstanding shares of Common Stock as stated in the most recent of the following: (i) the Corporation's most recent periodic or annual report filed with the

Commission, as the case may be, (ii) a more recent public announcement by the Corporation or (iii) a more recent written notice by the Corporation or the Transfer Agent setting forth the number of shares of Common Stock outstanding. Upon the written or oral request (which may be via email) of a Holder, the Corporation shall within one Trading Day confirm orally and in writing to such Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Corporation, including the Preferred Stock, by such Holder or its Affiliates or Attribution Parties since the date as of which such number of outstanding shares of Common Stock was reported. The "Beneficial Ownership Limitation" shall be 4.99% (or, upon written election by a Holder which is delivered to the Corporation prior to the issuance of any shares of Preferred Stock to such Holder, 9.99%) of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock issuable upon conversion of Preferred Stock held by the applicable Holder. A Holder, upon notice to the Corporation, may increase or decrease the Beneficial Ownership Limitation provisions of this Section 6(d) applicable to its Preferred Stock provided that the Beneficial Ownership Limitation in no event exceeds 9.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock upon conversion of this Preferred Stock held by the Holder and the provisions of this Section 6(d) shall continue to apply. Any such increase in the Beneficial Ownership Limitation will not be effective until the 61st day after such notice is delivered to the Corporation and shall only apply to such Holder and no other Holder. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 6(d) to correct this paragraph (or any portion hereof) which may be defective or inconsistent with the intended Beneficial Ownership Limitation contained herein or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitations contained in this paragraph shall apply to a successor holder of Preferred Stock.

e) Issuance Limitations. Notwithstanding anything herein to the contrary, until the Reverse Stock Split Date, the Corporation may not issue, upon conversion of the Preferred Stock, a number of shares of Common Stock which, when aggregated with any shares of Common Stock issued on or after the Original Issue Date and prior to such Conversion Date in connection with any conversion of Preferred Stock issued pursuant to the Purchase Agreement, would exceed 980,555,497 shares of Common Stock (subject to adjustment for forward and reverse stock splits, recapitalizations and the like) (such number of shares, the "Issuable Maximum"). Each Holder shall be entitled to a portion of the Issuable Maximum equal to the quotient obtained by dividing (x) the original Stated Value of such Holder's Preferred Stock by (y) the aggregate Stated Value of all Preferred Stock issued on the Original Issue Date to all Holders.

Section 7. Certain Adjustments.

a) Stock Dividends and Stock Splits. If the Corporation, at any time while this Preferred Stock is outstanding: (i) pays a stock dividend or otherwise makes a distribution or distributions payable in shares of Common Stock on shares of Common Stock or any other Common Stock Equivalents (which, for avoidance of doubt, shall not include any shares of Common Stock issued by the Corporation upon conversion of, or payment of a dividend on, this Preferred Stock), (ii) subdivides outstanding shares of Common Stock into a larger number of shares, (iii) combines (including by way of any reverse stock split, including but not limited to, the Reverse Stock Split) outstanding shares of Common Stock into a smaller number of shares, or (iv) issues, in the event of a reclassification of shares of the Common Stock, any shares of capital stock of the Corporation, then the Conversion Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock (excluding any treasury shares of the Corporation) outstanding immediately before such event, and of which the denominator shall be the number of shares of Common Stock outstanding immediately after such event. Any adjustment made pursuant to this Section 7(a) shall become effective immediately after the record date for the determination of stockholders entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision, combination or re-classification.

b) Subsequent Equity Sales. Until such date that the Corporation's Common Stock is listed or quoted on a "national securities exchange" as defined in Rule 600(b) of Regulation NMS (the "Uplisting"), the Corporation or any Subsidiary, as applicable sells or grants any option to purchase or sells or grants any right to reprice, or otherwise disposes of or issues (or announces any sale, grant or any option to purchase or other disposition), any Common Stock or Common Stock Equivalents entitling any Person to acquire shares of Common Stock at an effective price per share that is lower than the then Conversion Price (such lower price, the "Base Conversion Price" and such issuances, collectively, a "Dilutive Issuance") (if the holder of the Common Stock or Common Stock Equivalents so issued shall at any time, whether by operation of purchase price adjustments, reset provisions, floating conversion, exercise or exchange prices or otherwise, or due to warrants, options or rights per share which are issued in connection with such issuance, be entitled to receive shares of Common Stock at an effective price per share that is lower than the Conversion Price, such issuance shall be deemed to have occurred for less than the Conversion Price on such date of the Dilutive Issuance), then simultaneously with the consummation (or, if earlier, the announcement) of each Dilutive Issuance the Conversion Price shall be reduced to equal the Base Conversion Price. For purposes of clarification, in the event that there are one or more Dilutive Issuances in connection with the Uplisting, the Conversion Price shall be reduced, and only reduced, in accordance with the terms of this Section 7(b) and immediately following the consummation of the last Dilutive Issuance in connection with the Uplisting, this Section 7(b) shall no longer be applicable with regard to additional Dilutive Issuances. Notwithstanding the foregoing, no adjustment will be made under this Section 7(b) in respect of an Exempt Issuance. If the Corporation enters into a Variable Rate

Transaction, despite the prohibition set forth in the Purchase Agreement, the Corporation shall be deemed to have issued Common Stock or Common Stock Equivalents at the lowest possible conversion price at which such securities may be converted or exercised. The Corporation shall notify the Holders in writing, no later than the Trading Day following the issuance of any Common Stock or Common Stock Equivalents subject to this Section 7(b), indicating therein the applicable issuance price, or applicable reset price, exchange price, conversion price and other pricing terms (such notice, the "Dilutive Issuance Notice"). For purposes of clarification, whether or not the Corporation provides a Dilutive Issuance Notice pursuant to this Section 7(b), upon the occurrence of any Dilutive Issuance, the Holders are entitled to receive a number of Conversion Shares based upon the Base Conversion Price on or after the date of such Dilutive Issuance, regardless of whether a Holder accurately refers to the Base Conversion Price in the Notice of Conversion.

c) Subsequent Rights Offerings. In addition to any adjustments pursuant to Section 7(a) above, if at any time the Corporation grants, issues or sells any Common Stock Equivalents or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of shares of Common Stock (the "Purchase Rights"), then the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of shares of Common Stock acquirable upon complete conversion of such Holder's Preferred Stock (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights (provided, however, to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Purchase Right to such extent (or beneficial ownership of such shares of Common Stock as a result of such Purchase Right to such extent) and such Purchase Right to such extent shall be held in abeyance for the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

d) Pro Rata Distributions. During such time as this Preferred Stock is outstanding, if the Corporation declares or makes any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "Distribution"), at any time after the issuance of this Preferred Stock, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the

number of shares of Common Stock acquirable upon complete conversion of this Preferred Stock (without regard to any limitations on conversion hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution (provided, however, to the extent that the Holder's right to participate in any such Distribution would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Distribution to such extent (or in the beneficial ownership of any shares of Common Stock as a result of such Distribution to such extent) and the portion of such Distribution shall be held in abeyance for the benefit of the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

e) Fundamental Transaction. If, at any time while this Preferred Stock is outstanding, (i) the Corporation, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Corporation with or into another Person, (ii) the Corporation, directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or a series of related transactions, (iii) any, direct or indirect, purchase offer, tender offer or exchange offer (whether by the Corporation or another Person) is completed pursuant to which holders of Common Stock are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of 50% or more of the outstanding Common Stock, (iv) the Corporation, directly or indirectly, in one or more related transactions effects any reclassification, reorganization or recapitalization of the Common Stock or any compulsory share exchange pursuant to which the Common Stock is effectively converted into or exchanged for other securities, cash or property, or (v) the Corporation, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off or scheme of arrangement) with another Person whereby such other Person acquires more than 50% of the outstanding shares of Common Stock (not including any shares of Common Stock held by the other Person or other Persons making or party to, or associated or affiliated with the other Persons making or party to, such stock or share purchase agreement or other business combination) (each a "Fundamental Transaction"), then, upon any subsequent conversion of this Preferred Stock, the Holder shall have the right to receive, for each Conversion Share that would have been issuable upon such conversion immediately prior to the occurrence of such Fundamental Transaction (without regard to any limitation in Section 6(d) and Section 6(e) on the conversion of this Preferred Stock), the number of shares of Common Stock of the successor or acquiring corporation or of the Corporation, if it is the surviving corporation, and any additional consideration (the "Alternate Consideration") receivable as a result of such Fundamental Transaction by a holder of the number of shares of Common Stock for which this Preferred Stock is convertible immediately prior to such Fundamental Transaction (without regard to any

limitation in Section 6(d) and Section 6(e) on the conversion of this Preferred Stock). For purposes of any such conversion, the determination of the Conversion Price shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one share of Common Stock in such Fundamental Transaction, and the Corporation shall apportion the Conversion Price among the Alternate Consideration in a reasonable manner reflecting the relative value of any different components of the Alternate Consideration. If holders of Common Stock are given any choice as to the securities, cash or property to be received in a Fundamental Transaction, then the Holder shall be given the same choice as to the Alternate Consideration it receives upon any conversion of this Preferred Stock following such Fundamental Transaction. To the extent necessary to effectuate the foregoing provisions, any successor to the Corporation or surviving entity in such Fundamental Transaction shall file a new Certificate of Designation with the same terms and conditions and issue to the Holders new preferred stock consistent with the foregoing provisions and evidencing the Holders' right to convert such preferred stock into Alternate Consideration. The Corporation shall cause any successor entity in a Fundamental Transaction in which the Corporation is not the survivor (the "Successor Entity") to assume in writing all of the obligations of the Corporation under this Certificate of Designation and the other Transaction Documents (as defined in the Purchase Agreement) in accordance with the provisions of this Section 7(e) pursuant to written agreements in form and substance reasonably satisfactory to the Holder and approved by the Holder (without unreasonable delay) prior to such Fundamental Transaction and shall, at the option of the holder of this Preferred Stock, deliver to the Holder in exchange for this Preferred Stock a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Preferred Stock which is convertible for a corresponding number of shares of capital stock of such Successor Entity (or its parent entity) equivalent to the shares of Common Stock acquirable and receivable upon conversion of this Preferred Stock (without regard to any limitations on the conversion of this Preferred Stock) prior to such Fundamental Transaction, and with a conversion price which applies the Conversion Price hereunder to such shares of capital stock (but taking into account the relative value of the shares of Common Stock pursuant to such Fundamental Transaction and the value of such shares of capital stock, such number of shares of capital stock and such conversion price being for the purpose of protecting the economic value of this Preferred Stock immediately prior to the consummation of such Fundamental Transaction), and which is reasonably satisfactory in form and substance to the Holder. Upon the occurrence of any such Fundamental Transaction, the Successor Entity shall succeed to, and be substituted for (so that from and after the date of such Fundamental Transaction, the provisions of this Certificate of Designation and the other Transaction Documents referring to the "Corporation" shall refer instead to the Successor Entity), and may exercise every right and power of the Corporation and shall assume all of the obligations of the Corporation under this Certificate of Designation and the other Transaction Documents with the same effect as if such Successor Entity had been named as the Corporation herein.

f) Calculations. All calculations under this Section 7 shall be made to the nearest cent or the nearest 1/100th of a share, as the case may be. For purposes of this Section 7, the number of shares of Common Stock deemed to be issued and outstanding as of a given date shall be the sum of the number of shares of Common Stock (excluding any treasury shares of the Corporation) issued and outstanding.

g) Notice to the Holders.

i. Adjustment to Conversion Price. Whenever the Conversion Price is adjusted pursuant to any provision of this Section 7, the Corporation shall promptly deliver to each Holder a notice setting forth the Conversion Price after such adjustment and setting forth a brief statement of the facts requiring such adjustment.

ii. Notice to Allow Conversion by Holder. If (A) the Corporation shall declare a dividend (or any other distribution in whatever form) on the Common Stock, (B) the Corporation shall declare a special nonrecurring cash dividend on or a redemption of the Common Stock, (C) the Corporation shall authorize the granting to all holders of the Common Stock of rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (D) the approval of any stockholders of the Corporation shall be required in connection with any reclassification of the Common Stock, any consolidation or merger to which the Corporation is a party, any sale or transfer of all or substantially all of the assets of the Corporation, or any compulsory share exchange whereby the Common Stock is converted into other securities, cash or property or (E) the Corporation shall authorize the voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Corporation, then, in each case, the Corporation shall cause to be filed at each office or agency maintained for the purpose of conversion of this Preferred Stock, and shall cause to be delivered to each Holder at its last address as it shall appear upon the stock books of the Corporation, at least twenty (20) calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend, distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of the Common Stock of record to be entitled to such dividend, distributions, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of the Common Stock of record shall be entitled to exchange their shares of the Common Stock for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer or share exchange, provided that the failure to deliver such notice or any defect therein or in the delivery thereof shall not affect the validity of the corporate

action required to be specified in such notice. To the extent that any notice provided hereunder constitutes, or contains, material, non-public information regarding the Corporation or any of the Subsidiaries, the Corporation shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K. The Holder shall remain entitled to convert the Conversion Amount of this Preferred Stock (or any part hereof) during the 20-day period commencing on the date of such notice through the effective date of the event triggering such notice except as may otherwise be expressly set forth herein.

Section 8. Miscellaneous.

a) Notices. Any and all notices or other communications or deliveries to be provided by the Holders hereunder including, without limitation, any Notice of Conversion, shall be in writing and delivered personally, by e-mail, or sent by a nationally recognized overnight courier service, addressed to the Corporation, at the address set forth above Attention: Barbra C. Keck, Secretary, e-mail address bkeck@delcath.com or such other e-mail address or address as the Corporation may specify for such purposes by notice to the Holders delivered in accordance with this Section 11. Any and all notices or other communications or deliveries to be provided by the Corporation hereunder shall be in writing and delivered personally, by e-mail, or sent by a nationally recognized overnight courier service addressed to each Holder at the email address, or address of such Holder appearing on the books of the Corporation, or if no such e-mail address, or address appears on the books of the Corporation, at the principal place of business of such Holder, as set forth in the Purchase Agreement. Any notice or other communication or deliveries hereunder shall be deemed given and effective on the earliest of (i) the time of transmission, if such notice or communication is delivered via e-mail at the e-mail address set forth in this Section prior to 5:30 p.m. (New York City time) on any date, (ii) the next Trading Day after the time of transmission, if such notice or communication is delivered via e-mail at the e-mail address set forth in this Section on a day that is not a Trading Day or later than 5:30 p.m. (New York City time) on any Trading Day, (iii) the second Trading Day following the date of mailing, if sent by U.S. nationally recognized overnight courier service, or (iv) upon actual receipt by the party to whom such notice is required to be given.

b) Absolute Obligation. Except as expressly provided herein, no provision of this Certificate of Designation shall alter or impair the obligation of the Corporation, which is absolute and unconditional, to pay liquidated damages and accrued dividends, as applicable, on the shares of Preferred Stock at the time, place, and rate, and in the coin or currency, herein prescribed.

c) Lost or Mutilated Preferred Stock Certificate. If a Holder's Preferred Stock certificate shall be mutilated, lost, stolen or destroyed, the Corporation shall execute and deliver, in exchange and substitution for and upon cancellation of a mutilated certificate, or in lieu of or in substitution for a lost, stolen or destroyed certificate, a new certificate for the shares of Preferred Stock so mutilated, lost, stolen or destroyed, but only upon receipt of evidence of such loss, theft or destruction of such certificate, and of the ownership hereof reasonably satisfactory to the Corporation.

d) Governing Law. All questions concerning the construction, validity, enforcement and interpretation of this Certificate of Designation shall be governed by and construed and enforced in accordance with the internal laws of the State of Delaware, without regard to the principles of conflict of laws thereof. All legal proceedings concerning the interpretation, enforcement and defense of the transactions contemplated by any of the Transaction Documents (whether brought against a party hereto or its respective Affiliates, directors, officers, shareholders, employees or agents) shall be commenced in the state and federal courts sitting in the City of New York, Borough of Manhattan (the "New York Courts"). The Corporation and each Holder hereby irrevocably submits to the exclusive jurisdiction of the New York Courts for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein (including with respect to the enforcement of any of the Transaction Documents), and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of such New York Courts, or such New York Courts are improper or inconvenient venue for such proceeding. The Corporation and each Holder hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Certificate of Designation and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by applicable law. The Corporation and each Holder hereby irrevocably waives, to the fullest extent permitted by applicable law, any and all right to trial by jury in any legal proceeding arising out of or relating to this Certificate of Designation or the transactions contemplated hereby. If the Corporation or any Holder shall commence an action or proceeding to enforce any provisions of this Certificate of Designation, then the prevailing party in such action or proceeding shall be reimbursed by the other party for its attorneys' fees and other costs and expenses incurred in the investigation, preparation and prosecution of such action or proceeding.

e) Waiver. Any waiver by the Corporation or a Holder of a breach of any provision of this Certificate of Designation shall not operate as or be construed to be a waiver of any other breach of such provision or of any breach of any other provision of this Certificate of Designation or a waiver by any other Holders. The failure of the Corporation or a Holder to insist upon strict adherence to any term of this Certificate of Designation on one or more occasions shall not be considered a waiver or deprive that party (or any other Holder) of the right thereafter to insist upon strict adherence to that term or any other term of this Certificate of Designation on any other occasion. Any waiver by the Corporation or a Holder must be in writing.

f) Severability. If any provision of this Certificate of Designation is invalid, illegal or unenforceable, the balance of this Certificate of Designation shall remain in effect, and if any provision is inapplicable to any Person or circumstance, it shall nevertheless remain applicable to all other Persons and circumstances. If it shall be found that any interest or other amount deemed interest due hereunder violates the applicable law governing usury, the applicable rate of interest due hereunder shall automatically be lowered to equal the maximum rate of interest permitted under applicable law.

g) Next Business Day. Whenever any payment or other obligation hereunder shall be due on a day other than a Business Day, such payment shall be made on the next succeeding Business Day.

h) Headings. The headings contained herein are for convenience only, do not constitute a part of this Certificate of Designation and shall not be deemed to limit or affect any of the provisions hereof.

i) Status of Converted or Redeemed Preferred Stock. Shares of Preferred Stock may only be issued pursuant to the Purchase Agreement. If any shares of Preferred Stock shall be converted, redeemed or reacquired by the Corporation, such shares shall resume the status of authorized but unissued shares of preferred stock and shall no longer be designated as Series E Convertible Preferred Stock.

* * * * * * * * * * *

RESOLVED, FURTHER, that the Chief Executive Officer, and the secretary of the Corporation be and they hereby are authorized and directed to prepare and file this Certificate of Designation of Preferences, Rights and Limitations in accordance with the foregoing resolution and the provisions of Delaware law.

IN WITNESS WHEREOF, the undersigned have executed this Certificate this 11th day of July, 2019.

/s/ Jennifer K. Simpson
Name: Jennifer K. Simpson
Title: Chief Executive Officer

/s/ Barbra C. Keck
Name: Barbra C. Keck
Title: Secretary

ANNEX A

NOTICE OF CONVERSION

(TO BE EXECUTED BY THE REGISTERED HOLDER IN ORDER TO CONVERT SHARES OF PREFERRED STOCK)

The undersigned hereby elects to convert the number of shares of Series [___] Convertible Preferred Stock indicated below into shares of common stock, par value [$____ per share (the "Common Stock"), of Delcath Systems, Inc., a Delaware corporation (the "Corporation"), according to the conditions hereof, as of the date written below. If shares of Common Stock are to be issued in the name of a Person other than the undersigned, the undersigned will pay all transfer taxes payable with respect thereto and is delivering herewith such certificates and opinions as may be required by the Corporation in accordance with the Purchase Agreement. No fee will be charged to the Holders for any conversion, except for any such transfer taxes.

Conversion calculations:

Date to Effect Conversion: _____

Number of shares of Preferred Stock owned prior to Conversion: _____

Number of shares of Preferred Stock to be Converted: _____

Stated Value of shares of Preferred Stock to be Converted: _____

Number of shares of Common Stock to be Issued: _____

Applicable Conversion Price: _____

Number of shares of Preferred Stock subsequent to Conversion: _____

Address for Delivery: _____
or
DWAC Instructions:
Broker no: _____
Account no: _____

[HOLDER]

By: _____
Name:
Title:

DELCATH SYSTEMS, INC.

**CERTIFICATE OF DESIGNATION OF PREFERENCES,
RIGHTS AND LIMITATIONS
OF
SERIES E-1 CONVERTIBLE PREFERRED STOCK**

PURSUANT TO SECTION 151 OF THE
DELAWARE GENERAL CORPORATION LAW

The undersigned, Jennifer K. Simpson and Barbra C. Keck, do hereby certify that:

1. They are the Chief Executive Officer and Secretary, respectively, of Delcath Systems, Inc., a Delaware corporation (the "Corporation").

2. The Corporation is authorized to issue 10,000,000 shares of preferred stock, 40,000 shares of which have been previously designated as "Series E Convertible Preferred Stock" (the "Series E Preferred Stock"), of which 32,423 shares of Series E Preferred Stock are issued and outstanding on the date hereof.

3. The following resolutions were duly adopted by the board of directors of the Corporation (the "Board of Directors"):

WHEREAS, the certificate of incorporation of the Corporation provides for a class of its authorized stock known as preferred stock, consisting of 10,000,000 shares, $0.01 par value per share, issuable from time to time in one or more series;

WHEREAS, the Board of Directors is authorized to fix the dividend rights, dividend rate, voting rights, conversion rights, rights and terms of redemption and liquidation preferences of any wholly unissued series of preferred stock and the number of shares constituting any series and the designation thereof, of any of them; and

WHEREAS, it is the desire of the Board of Directors, pursuant to its authority as aforesaid, to fix the rights, preferences, restrictions and other matters relating to a series of the preferred stock, which shall consist of, except as otherwise set forth in the Purchase Agreement, up to 12,960 shares of the preferred stock which the Corporation has the authority to issue, as follows:

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors does hereby provide for the issuance of a series of preferred stock for cash or exchange of other securities, rights or property and does hereby fix and determine the rights, preferences, restrictions and other matters relating to such series of preferred stock as follows:

TERMS OF PREFERRED STOCK

Section 1. Definitions. For the purposes hereof, the following terms shall have the following meanings:

"Affiliate" means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 of the Securities Act.

"Alternate Consideration" shall have the meaning set forth in Section 7(e).

"Attribution Parties" shall have the meaning set forth in Section 6(d).

"Beneficial Ownership Limitation" shall have the meaning set forth in Section 6(d).

"Board of Directors" shall have the meaning set forth on the cover page hereto.

"Business Day" means any day except any Saturday, any Sunday, any day which is a federal legal holiday in the United States or any day on which banking institutions in the State of New York are authorized or required by law or other governmental action to close.

"Buy-In" shall have the meaning set forth in Section 6(c)(iv).

"Closing" means the closing of the purchase and sale of the Securities on the Closing Date pursuant to Section 2.1 of the Purchase Agreement.

"Closing Date" means the Trading Day on which all of the Transaction Documents have been executed and delivered by the applicable parties thereto and all conditions precedent to (i) each Holder's obligations to pay the Subscription Amount and (ii) the Corporation's obligations to deliver the Securities have been satisfied or waived.

"Commission" means the United States Securities and Exchange Commission.

"Common Stock" means the Corporation's common stock, par value $0.01 per share, and stock of any other class of securities into which such securities may hereafter be reclassified or changed.

"Common Stock Equivalents" means any securities of the Corporation or the Subsidiaries which would entitle the holder thereof to acquire at any time Common Stock, including, without limitation, any debt, preferred stock, rights, options, warrants or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, Common Stock.

"Conversion Amount" means the sum of the Stated Value at issue.

"Conversion Date" shall have the meaning set forth in Section 6(a).

"Conversion Price" shall have the meaning set forth in Section 6(b).

"Conversion Shares" means, collectively, the shares of Common Stock issuable upon conversion of the shares of Preferred Stock in accordance with the terms hereof.

"Conversion Shares Registration Statement" means a registration statement that registers the resale of the Conversion Shares of the Holders, who shall be named as "selling stockholders" therein and meets the requirements of the Registration Rights Agreement.

"Effective Date" means the date that the Conversion Shares Registration Statement filed by the Corporation pursuant to the Registration Rights Agreement is first declared effective by the Commission.

"Exchange Act" means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

"Exempt Issuance" means the issuance of (a) shares of Common Stock or options to employees, officers or directors of the Corporation pursuant to any stock or option plan duly adopted for such purpose, by a majority of the non-employee members of the Board of Directors or a majority of the members of a committee of non-employee directors established for such purpose for services rendered to the Company, (b) securities upon the exercise or exchange of or conversion of any Securities issued hereunder and/or other securities exercisable or exchangeable for or convertible into shares of Common Stock issued and outstanding on the date of the Purchase Agreement, provided that such securities have not been amended since the date of the Purchase Agreement to increase the number of such securities or to decrease the exercise price, exchange price or conversion price of such securities (other than in connection with stock splits or combinations) or to extend the term of such securities, and (c) securities issued pursuant to acquisitions or strategic transactions approved by a majority of the disinterested directors of the Corporation, provided that such securities are issued as "restricted securities" (as defined in Rule 144) and carry no registration rights that require or permit the filing of any registration statement in connection therewith during the prohibition period in Section 4.12(a) of the Purchase Agreement, and provided that any such issuance shall only be to a Person (or to the equityholders of a Person) which is, itself or through its subsidiaries, an operating company or an owner of an asset in a business synergistic with the business of the Corporation and shall provide to the Corporation additional benefits in addition to the investment of funds, but shall not include a transaction in which the Company is issuing securities primarily for the purpose of raising capital or to an entity whose primary business is investing in securities.

"Fundamental Transaction" shall have the meaning set forth in Section 7(e).

"Holder" shall have the meaning given such term in Section 2.

"Issuable Maximum" shall have the meaning set forth in Section 6(e)

"Liquidation" shall have the meaning set forth in Section 5.

"Measurement Period" shall have the meaning set forth in Section 6(b).

"New York Courts" shall have the meaning set forth in Section 11(d).

"Notice of Conversion" shall have the meaning set forth in Section 6(a).

"Original Issue Date" means the date of the first issuance of any shares of the Preferred Stock regardless of the number of transfers of any particular shares of Preferred Stock and regardless of the number of certificates which may be issued to evidence such Preferred Stock.

"Person" means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

"Preferred Stock" shall have the meaning set forth in Section 2.

"Purchase Agreement" means the Securities Purchase Agreement, dated as of the Original Issue Date, among the Corporation and the original Holders, as amended, modified or supplemented from time to time in accordance with its terms.

"Registration Rights Agreement" means the Registration Rights Agreement, dated as of the date of the Purchase Agreement, among the Corporation and the original Holders, in the form attached as an exhibit to the Purchase Agreement.

"Registration Statement" means a registration statement meeting the requirements set forth in the Registration Rights Agreement and covering the resale of the Underlying Shares.

"Reset Conversion Price" shall have the meaning set forth in Section 6(b).

"Reverse Stock Split" mean the first reverse stock split that is effected by the Corporation following the Closing Date.

"Reverse Stock Split Date" means the first Trading Day that the Common Stock trades on a split adjusted basis following the time on which the Reverse Stock Split is effected by the Corporation's filing of an amendment to its certificate of incorporation with the State of Delaware.

"Rule 144" means Rule 144 promulgated by the Commission pursuant to the Securities Act, as such Rule may be amended from time to time, or any similar rule or regulation hereafter adopted by the Commission having substantially the same effect as such Rule.

"Rule 424" means Rule 424 promulgated by the Commission pursuant to the Securities Act, as such Rule may be amended or interpreted from time to time, or any similar rule or regulation hereafter adopted by the Commission having substantially the same purpose and effect as such Rule.

"Securities" means the Preferred Stock, the Warrants, the Warrant Shares and the Underlying Shares.

"Securities Act" means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

"Series E Preferred Stock" shall have the meaning set forth in the preamble.

"Share Delivery Date" shall have the meaning set forth in Section 6(c).

"Standard Settlement Period" shall have the meaning set forth in Section 6(c).

"Stated Value" shall have the meaning set forth in Section 2.

"Subscription Amount" shall mean, as to each Holder which is a party to the Purchase Agreement, the aggregate amount to be paid for the Preferred Stock purchased pursuant to the Purchase Agreement as specified below such Holder's name on the signature page of the Purchase Agreement and next to the heading "Subscription Amount," in United States dollars and in immediately available funds.

"Subsidiary" means any subsidiary of the Corporation as set forth on Schedule 3.1(a) of the Purchase Agreement and shall, where applicable, also include any direct or indirect subsidiary of the Corporation formed or acquired after the date of the Purchase Agreement.

"Successor Entity" shall have the meaning set forth in Section 7(e).

"Trading Day" means a day on which the principal Trading Market is open for business.

"Trading Market" means any of the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: the NYSE American, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market, the New York Stock Exchange, the OTCQB or the OTCQX (or any successors to any of the foregoing).

"Transaction Documents" shall have the meaning set forth in the Purchase Agreement.

"Transfer Agent" means American Stock Transfer and Trust Company, LLC, the current transfer agent of the Corporation with a mailing address of 6201 15th Ave., Brooklyn, NY 11219 and any successor transfer agent of the Corporation.

"Trigger Date" shall means each of: (i) the 3rd Trading Day immediately following the Reverse Stock Split Date (ii) the date that the initial Registration Statement is declared effective by the Commission and (iii) the date that all of the Underlying Shares issuable pursuant to the Transaction Documents (without giving effect to any limitations on conversion or exercise) may be sold pursuant to Rule 144 (assuming cashless exercise of the Warrants with regard to the Warrant Shares), in the event that all of the Registrable Securities (as defined in the Registration Rights Agreement) are not then registered on an effective Registration Statement.

"Trigger Date Adjustment Notice" shall have the meaning set forth in Section 6(b).

"Underlying Shares" means the shares of Common Stock issued and issuable upon conversion of the Preferred Stock and upon exercise of the Warrants.

"VWAP" means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the daily volume weighted average price of the Common Stock for such date (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported in the "Pink Sheets" published by OTC Markets, Inc. (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by an independent appraiser selected in good faith by the Purchasers of a majority in interest of the Securities then outstanding and reasonably acceptable to the Corporation, the fees and expenses of which shall be paid by the Corporation.

"Warrant Shares" means the shares of Common Stock issuable upon exercise of the Warrants.

"Warrants" means, collectively, the Common Stock purchase warrants delivered to the Holder at the Closing in accordance with Section 2.2(a) of the Purchase Agreement, which Warrants shall be exercisable on or after the Reverse Stock Split Date and have a term of exercise equal to 5 years, in the form of Exhibit C attached to the Purchase Agreement.

Section 2. Designation, Amount and Par Value. The series of preferred stock shall be designated as its Series E-1 Convertible Preferred Stock (the "Preferred Stock") and the number of shares so designated shall be up to 12,960 (which shall not be subject to increase without the written consent of all of the holders of the Preferred Stock (each, a "Holder" and collectively, the "Holders")). Each share of Preferred Stock shall have a par value of $0.01 per share and a stated value equal to $1,000 (the "Stated Value").

Section 3. Dividends. Except for stock dividends or distributions for which adjustments are to be made pursuant to Section 7, Holders shall be entitled to receive, and the Corporation shall pay, dividends on shares of Preferred Stock equal (on an as-if-converted-to-Common-Stock basis) to and in the same form as dividends actually paid on shares of the Common Stock when, as and if such dividends are paid on shares of the Common Stock. Any such dividends which are not paid to the Holders shall increase the Stated Value of the Preferred Stock. No other dividends shall be paid on shares of Preferred Stock.

Section 4. Voting Rights. Except as otherwise provided herein or as otherwise required by law, the Preferred Stock shall vote on an "as converted" basis, subject to

the Beneficial Ownership Limitation (which Beneficial Ownership Limitation shall be calculated on a basis which includes, for purposes of this Section 4, the number of shares of Common Stock which are issuable upon conversion of the unconverted Stated Value of Preferred Stock beneficially owned by such Holder or any of its Affiliates or Attribution Parties) on all matters submitted to the holders of Common Stock for approval. In addition, as long as any shares of Preferred Stock are outstanding, the Corporation shall not, without the affirmative vote of the Holders of a majority of the then outstanding shares of the Preferred Stock, (a) alter or change adversely the powers, preferences or rights given to the Preferred Stock or alter or amend this Certificate of Designation, (b) amend its certificate of incorporation or other charter documents in any manner that adversely affects any rights of the Holders, (c) increase the number of authorized shares of Preferred Stock, or (d) enter into any agreement with respect to any of the foregoing.

Section 5. Liquidation. Upon any liquidation, dissolution or winding-up of the Corporation, whether voluntary or involuntary (a "Liquidation"), the Holders shall be entitled to receive out of the assets, whether capital or surplus, of the Corporation, on a ***pari passu*** basis with the holders of Series E Preferred Stock, an amount equal to the Stated Value, plus any accrued and unpaid dividends thereon, for each share of Preferred Stock before any distribution or payment shall be made to the holders of the Common Stock, and if the assets of the Corporation shall be insufficient to pay in full such amounts, then the entire assets to be distributed to the Holders shall be ratably distributed among the Holders, on a ***pari passu*** basis with the holders of Series E Preferred Stock, in accordance with the respective amounts that would be payable on such shares if all amounts payable thereon were paid in full. The Corporation shall mail written notice of any such Liquidation, not less than 45 days prior to the payment date stated therein, to each Holder.

Section 6. Conversion.

a) Conversions at Option of Holder. Each share of Preferred Stock shall be convertible, at any time and from time to time from and after the Original Issue Date at the option of the Holder thereof, into that number of shares of Common Stock (subject to the limitations set forth in Section 6(d) and Section 6(e)) determined by dividing the Stated Value of such share of Preferred Stock by the Conversion Price. Holders shall effect conversions by providing the Corporation with the form of conversion notice attached hereto as Annex A (a "Notice of Conversion"). Each Notice of Conversion shall specify the number of shares of Preferred Stock to be converted, the number of shares of Preferred Stock owned prior to the conversion at issue, the number of shares of Preferred Stock owned subsequent to the conversion at issue and the date on which such conversion is to be effected, which date may not be prior to the date the applicable Holder delivers by email such Notice of Conversion to the Corporation (such date, the "Conversion Date"). If no Conversion Date is specified in a Notice of Conversion, the Conversion Date shall be the date that such Notice of Conversion to the Corporation is deemed delivered hereunder. No ink-original Notice of Conversion shall be required, nor shall any medallion guarantee (or other type of guarantee or notarization) of any Notice of Conversion form be required. The calculations and entries set forth in the Notice of Conversion shall control in the absence of manifest or mathematical error. To effect

conversions of shares of Preferred Stock, a Holder shall not be required to surrender the certificate(s) representing the shares of Preferred Stock to the Corporation unless all of the shares of Preferred Stock represented thereby are so converted, in which case such Holder shall deliver the certificate representing such shares of Preferred Stock promptly following the Conversion Date at issue. Partial conversions of Preferred Stock certificates shall have the effect of lowering the number of shares of Common Stock issuable thereunder upon conversion in an amount equal to the applicable number of shares of Common Stock previously issued upon conversions. The Holder and the Corporation shall maintain records showing the number of shares of Common Stock issued upon conversions and the date of such conversions. Shares of Preferred Stock converted into Common Stock or redeemed in accordance with the terms hereof shall be canceled and shall not be reissued.

b) Conversion Price. The conversion price for the Preferred Stock shall equal $0.06, subject to adjustment herein (the "Conversion Price"). In addition, on each Trigger Date, the Conversion Price shall be reduced, and only reduced, to the lesser of (i) the then Conversion Price and (ii) 90% of the average of the five (5) VWAPs immediately prior to the Trigger Date (the "Reset Conversion Price", which shall thereafter be the new Conversion Price, subject to further adjustment hereunder, and each 5 Trading Day period shall be referred to herein as a "Measurement Period"). The Corporation shall notify each Holder of the applicable adjustment to the Conversion Price as of such date (each notice, a "Trigger Date Adjustment Notice"). For purposes of clarification, whether or not the Corporation provides a Trigger Date Adjustment Notice pursuant to this Section 6(b), each Holder shall receive a number of Conversion Shares and retain a number of shares of Preferred Stock based upon the Conversion Price as adjusted pursuant to this Section, regardless of whether a Holder accurately refers to such price or number of shares of Preferred Stock converted in any Notice of Conversion. Any adjustment to the Conversion Price pursuant to this Section shall be effective retroactively to the first Trading Day during each Measurement Period. Accordingly, with respect to Notices of Conversion effected during the Measurement Period, in the event the Conversion Price is reduced pursuant to this Section, within the 2 Trading Days immediately following the end of each Measurement Period, the Corporation shall issue the applicable Holder additional Conversion Shares based on a Conversion Price equal to the Reset Conversion Price with respect to such Notices of Conversion.

c) Mechanics of Conversion

i. Delivery of Conversion Shares Upon Conversion. Not later than the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period (as defined below) after each Conversion Date (the "Share Delivery Date"), the Corporation shall deliver, or cause to be delivered, to the converting Holder (A) Conversion Shares which, on or after the earlier of (i) the six month anniversary of the Original Issue Date, or (ii) the Effective Date, shall be free of restrictive legends and trading restrictions (other than those which may then be required by the Purchase Agreement) representing the number of Conversion Shares being acquired upon the

conversion of the Preferred Stock, and (B) a wire transfer in the amount of accrued and unpaid dividends, if any, in immediately available funds pursuant to wire instructions provided to the Corporation by such Holder. On or after the earlier of (i) the six month anniversary of the Original Issue Date, or (ii) the Effective Date, the Corporation shall deliver the Conversion Shares required to be delivered by the Corporation under this Section 6 electronically through the Depository Trust Company or another established clearing corporation performing similar functions. Upon delivery of a Notice of Conversion by a Holder, such Holder shall be deemed for all corporate purposes to have become the holder of record of the Conversion Shares with respect to which the applicable shares of Preferred Stock have been converted irrespective of the delivery of the Conversion Shares. As used herein, "Standard Settlement Period" means the standard settlement period, expressed in a number of Trading Days, on the Corporation's primary Trading Market with respect to the Common Stock as in effect on the date of delivery of the Notice of Conversion.

ii. Failure to Deliver Conversion Shares. If, in the case of any Notice of Conversion, such Conversion Shares are not delivered to or as directed by the applicable Holder by the Share Delivery Date, the Holder shall be entitled to elect by written notice to the Corporation at any time on or before its receipt of such Conversion Shares, to rescind such conversion, in which event the Corporation shall promptly return to the Holder any original Preferred Stock certificate delivered to the Corporation and the Holder shall promptly return to the Corporation the Conversion Shares issued to such Holder pursuant to the rescinded Notice of Conversion.

iii. Obligation Absolute; Partial Liquidated Damages. The Corporation's obligation to issue and deliver the Conversion Shares upon conversion of Preferred Stock in accordance with the terms hereof are absolute and unconditional, irrespective of any action or inaction by a Holder to enforce the same, any waiver or consent with respect to any provision hereof, the recovery of any judgment against any Person or any action to enforce the same, or any setoff, counterclaim, recoupment, limitation or termination, or any breach or alleged breach by such Holder or any other Person of any obligation to the Corporation or any violation or alleged violation of law by such Holder or any other Person, and irrespective of any other circumstance which might otherwise limit such obligation of the Corporation to such Holder in connection with the issuance of such Conversion Shares; provided, however, that such delivery shall not operate as a waiver by the Corporation of any such action that the Corporation may have against such Holder. In the event a Holder shall elect to convert any or all of the Stated Value of its Preferred Stock, the Corporation may not refuse conversion based on any claim that such Holder or anyone associated or affiliated with such Holder has been engaged in any violation of law, agreement or for any other reason, unless an injunction from a court, on notice to Holder, restraining and/or enjoining conversion of all or part of the Preferred Stock of such Holder

shall have been sought and obtained. In the absence of such injunction, the Corporation shall issue Conversion Shares and, if applicable, cash, upon a properly noticed conversion. If the Corporation fails to deliver to a Holder such Conversion Shares pursuant to Section 6(c)(i) by the Share Delivery Date applicable to such conversion, the Corporation shall pay to such Holder, in cash, as liquidated damages and not as a penalty, for each $5,000 of Stated Value of Preferred Stock being converted, $50 per Trading Day (increasing to $100 per Trading Day on the third Trading Day and increasing to $200 per Trading Day on the sixth Trading Day after such damages begin to accrue) for each Trading Day after the Share Delivery Date until such Conversion Shares are delivered or Holder rescinds such conversion. Nothing herein shall limit a Holder's right to pursue actual damages for the Corporation's failure to deliver Conversion Shares within the period specified herein and such Holder shall have the right to pursue all remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief. The exercise of any such rights shall not prohibit a Holder from seeking to enforce damages pursuant to any other Section hereof or under applicable law.

iv. Compensation for Buy-In on Failure to Timely Deliver Conversion Shares Upon Conversion. In addition to any other rights available to the Holder, if the Corporation fails for any reason to deliver to a Holder the applicable Conversion Shares by the Share Delivery Date pursuant to Section 6(c)(i), and if after such Share Delivery Date such Holder is required by its brokerage firm to purchase (in an open market transaction or otherwise), or the Holder's brokerage firm otherwise purchases, shares of Common Stock to deliver in satisfaction of a sale by such Holder of the Conversion Shares which such Holder was entitled to receive upon the conversion relating to such Share Delivery Date (a "Buy-In"), then the Corporation shall (A) pay in cash to such Holder (in addition to any other remedies available to or elected by such Holder) the amount, if any, by which (x) such Holder's total purchase price (including any brokerage commissions) for the Common Stock so purchased exceeds (y) the product of (1) the aggregate number of shares of Common Stock that such Holder was entitled to receive from the conversion at issue multiplied by (2) the actual sale price at which the sell order giving rise to such purchase obligation was executed (including any brokerage commissions) and (B) at the option of such Holder, either reissue (if surrendered) the shares of Preferred Stock equal to the number of shares of Preferred Stock submitted for conversion (in which case, such conversion shall be deemed rescinded) or deliver to such Holder the number of shares of Common Stock that would have been issued if the Corporation had timely complied with its delivery requirements under Section 6(c)(i). For example, if a Holder purchases shares of Common Stock having a total purchase price of $11,000 to cover a Buy-In with respect to an attempted conversion of shares of Preferred Stock with respect to which the actual sale price of the Conversion Shares (including any brokerage commissions) giving rise to such purchase obligation was a total of $10,000 under clause (A) of the immediately preceding sentence, the Corporation shall be

required to pay such Holder $1,000. The Holder shall provide the Corporation written notice indicating the amounts payable to such Holder in respect of the Buy-In and, upon request of the Corporation, evidence of the amount of such loss. Nothing herein shall limit a Holder's right to pursue any other remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Corporation's failure to timely deliver Conversion Shares upon conversion of the shares of Preferred Stock as required pursuant to the terms hereof.

v. Reservation of Shares Issuable Upon Conversion. The Corporation covenants that it will at all times reserve and keep available out of its authorized and unissued shares of Common Stock for the sole purpose of issuance upon conversion of the Preferred Stock as herein provided, free from preemptive rights or any other actual contingent purchase rights of Persons other than the Holder (and the other Holders of the Preferred Stock), not less than such aggregate number of shares of the Common Stock as shall (subject to the terms and conditions set forth in the Purchase Agreement) be issuable (taking into account the adjustments and restrictions of Section 7) upon the conversion of the then outstanding shares of Preferred Stock (assuming a Conversion Price equal to $0.023 (subject to adjustment for reverse and forward stock splits, recapitalizations and similar transactions following the date of the Purchase Agreement) following the Reverse Stock Split Date). Notwithstanding the foregoing, until the Reverse Stock Split Date, 980,555,497 shares of Common Stock (subject to adjustment for reverse and forward stock splits, recapitalizations and similar transactions following the date of the Purchase Agreement) shall be reserved for issuance upon conversion of the Preferred Stock and the Series E Preferred Stock. The Corporation covenants that all shares of Common Stock that shall be so issuable shall, upon issue, be duly authorized, validly issued, fully paid and nonassessable and, if the Conversion Shares Registration Statement is then effective under the Securities Act, shall be registered for public resale in accordance with such Conversion Shares Registration Statement (subject to such Holder's compliance with its obligations under the Registration Rights Agreement).

vi. Fractional Shares. No fractional shares or scrip representing fractional shares shall be issued upon the conversion of the Preferred Stock. As to any fraction of a share which the Holder would otherwise be entitled to purchase upon such conversion, the Corporation shall at its election, either pay a cash adjustment in respect of such final fraction in an amount equal to such fraction multiplied by the Conversion Price or round up to the next whole share. Notwithstanding anything to the contrary contained herein, but consistent with the provisions of this subsection with respect to fractional Conversion Shares, nothing shall prevent any Holder from converting fractional shares of Preferred Stock.

vii. Transfer Taxes and Expenses. The issuance of Conversion Shares on conversion of this Preferred Stock shall be made without charge to any Holder for any documentary stamp or similar taxes that may be payable in respect of the issue or delivery of such Conversion Shares, provided that the Corporation shall not be required to pay any tax that may be payable in respect of any transfer involved in the issuance and delivery of any such Conversion Shares upon conversion in a name other than that of the Holders of such shares of Preferred Stock and the Corporation shall not be required to issue or deliver such Conversion Shares unless or until the Person or Persons requesting the issuance thereof shall have paid to the Corporation the amount of such tax or shall have established to the satisfaction of the Corporation that such tax has been paid. The Corporation shall pay all Transfer Agent fees required for same-day processing of any Notice of Conversion and all fees to the Depository Trust Company (or another established clearing corporation performing similar functions) required for same-day electronic delivery of the Conversion Shares.

d) Beneficial Ownership Limitation. Notwithstanding anything to the contrary contained herein, the Corporation shall not effect any conversion of the Preferred Stock, and a Holder shall not have the right to convert any portion of the Preferred Stock, to the extent that, after giving effect to the conversion set forth on the applicable Notice of Conversion, such Holder (together with such Holder's Affiliates, and any Persons acting as a group together with such Holder or any of such Holder's Affiliates (such Persons, "Attribution Parties")) would beneficially own in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by such Holder and its Affiliates and Attribution Parties shall include the number of shares of Common Stock issuable upon conversion of the Preferred Stock and Series E Preferred Stock with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which are issuable upon (i) conversion of the remaining, unconverted Stated Value of Preferred Stock and Series E Preferred Stock beneficially owned by such Holder or any of its Affiliates or Attribution Parties and (ii) exercise or conversion of the unexercised or unconverted portion of any other securities of the Corporation subject to a limitation on conversion or exercise analogous to the limitation contained herein (including, without limitation, the Preferred Stock, the Series E Preferred Stock or the Warrants) beneficially owned by such Holder or any of its Affiliates or Attribution Parties. Except as set forth in the preceding sentence, for purposes of this Section 6(d), beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. To the extent that the limitation contained in this Section 6(d) applies, the determination of whether the Preferred Stock is convertible (in relation to other securities owned by such Holder together with any Affiliates and Attribution Parties) and of how many shares of Preferred Stock are convertible shall be in the sole discretion of such Holder, and the submission of a Notice of Conversion shall be deemed to be such Holder's determination of whether the shares of Preferred Stock may be converted (in relation to other securities owned by such Holder together with any Affiliates and Attribution Parties) and how many shares of the Preferred Stock are convertible, in each case subject to the Beneficial Ownership Limitation. To ensure compliance with this restriction, each Holder will be

deemed to represent to the Corporation each time it delivers a Notice of Conversion that such Notice of Conversion has not violated the restrictions set forth in this paragraph and the Corporation shall have no obligation to verify or confirm the accuracy of such determination. In addition, a determination as to any group status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. For purposes of this Section 6(d), in determining the number of outstanding shares of Common Stock, a Holder may rely on the number of outstanding shares of Common Stock as stated in the most recent of the following: (i) the Corporation's most recent periodic or annual report filed with the Commission, as the case may be, (ii) a more recent public announcement by the Corporation or (iii) a more recent written notice by the Corporation or the Transfer Agent setting forth the number of shares of Common Stock outstanding. Upon the written or oral request (which may be via email) of a Holder, the Corporation shall within one Trading Day confirm orally and in writing to such Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Corporation, including the Preferred Stock and Series E Preferred Stock, by such Holder or its Affiliates or Attribution Parties since the date as of which such number of outstanding shares of Common Stock was reported. The "Beneficial Ownership Limitation" shall be 4.99% (or, upon written election by a Holder which is delivered to the Corporation prior to the issuance of any shares of Preferred Stock to such Holder, 9.99%) of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock issuable upon conversion of Preferred Stock held by the applicable Holder. A Holder, upon notice to the Corporation, may increase or decrease the Beneficial Ownership Limitation provisions of this Section 6(d) applicable to its Preferred Stock provided that the Beneficial Ownership Limitation in no event exceeds 9.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock upon conversion of this Preferred Stock held by the Holder and the provisions of this Section 6(d) shall continue to apply. Any such increase in the Beneficial Ownership Limitation will not be effective until the 61st day after such notice is delivered to the Corporation and shall only apply to such Holder and no other Holder. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 6(d) to correct this paragraph (or any portion hereof) which may be defective or inconsistent with the intended Beneficial Ownership Limitation contained herein or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitations contained in this paragraph shall apply to a successor holder of Preferred Stock.

e) Issuance Limitations. Notwithstanding anything herein to the contrary, until the Reverse Stock Split Date, the Corporation may not issue, upon conversion of the Preferred Stock and Series E Preferred Stock, a number of shares of Common Stock which, when aggregated with any shares of Common Stock issued on or after the Original Issue Date and prior to such Conversion Date in connection with any conversion of Preferred Stock issued pursuant to the Purchase Agreement or Series E Preferred Stock,

would exceed 980,555,497 shares of Common Stock (subject to adjustment for forward and reverse stock splits, recapitalizations and the like) (such number of shares, the "Issuable Maximum"). Each Holder shall be entitled to a portion of the Issuable Maximum equal to the quotient obtained by dividing (x) the original Stated Value of such Holder's Preferred Stock by (y) the aggregate Stated Value of all Preferred Stock issued on the Original Issue Date to all Holders and the total number of shares of Series E Preferred Stock originally issued.

Section 7. Certain Adjustments.

a) Stock Dividends and Stock Splits. If the Corporation, at any time while this Preferred Stock is outstanding: (i) pays a stock dividend or otherwise makes a distribution or distributions payable in shares of Common Stock on shares of Common Stock or any other Common Stock Equivalents (which, for avoidance of doubt, shall not include any shares of Common Stock issued by the Corporation upon conversion of, or payment of a dividend on, this Preferred Stock), (ii) subdivides outstanding shares of Common Stock into a larger number of shares, (iii) combines (including by way of any reverse stock split, including but not limited to, the Reverse Stock Split) outstanding shares of Common Stock into a smaller number of shares, or (iv) issues, in the event of a reclassification of shares of the Common Stock, any shares of capital stock of the Corporation, then the Conversion Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock (excluding any treasury shares of the Corporation) outstanding immediately before such event, and of which the denominator shall be the number of shares of Common Stock outstanding immediately after such event. Any adjustment made pursuant to this Section 7(a) shall become effective immediately after the record date for the determination of stockholders entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision, combination or re-classification.

b) Subsequent Equity Sales. Until such date that the Corporation's Common Stock is listed or quoted on a "national securities exchange" as defined in Rule 600(b) of Regulation NMS (the "Uplisting"), the Corporation or any Subsidiary, as applicable sells or grants any option to purchase or sells or grants any right to reprice, or otherwise disposes of or issues (or announces any sale, grant or any option to purchase or other disposition), any Common Stock or Common Stock Equivalents entitling any Person to acquire shares of Common Stock at an effective price per share that is lower than the then Conversion Price (such lower price, the "Base Conversion Price" and such issuances, collectively, a "Dilutive Issuance") (if the holder of the Common Stock or Common Stock Equivalents so issued shall at any time, whether by operation of purchase price adjustments, reset provisions, floating conversion, exercise or exchange prices or otherwise, or due to warrants, options or rights per share which are issued in connection with such issuance, be entitled to receive shares of Common Stock at an effective price per share that is lower than the Conversion Price, such issuance shall be deemed to have occurred for less than the Conversion Price on such date of the Dilutive Issuance), then simultaneously with the consummation (or, if earlier, the announcement) of each Dilutive Issuance the Conversion Price shall be reduced to equal the Base Conversion Price. For

purposes of clarification, in the event that there are one or more Dilutive Issuances in connection with the Uplisting, the Conversion Price shall be reduced, and only reduced, in accordance with the terms of this Section 7(b) and immediately following the consummation of the last Dilutive Issuance in connection with the Uplisting, this Section 7(b) shall no longer be applicable with regard to additional Dilutive Issuances. Notwithstanding the foregoing, no adjustment will be made under this Section 7(b) in respect of an Exempt Issuance. If the Corporation enters into a Variable Rate Transaction, despite the prohibition set forth in the Purchase Agreement, the Corporation shall be deemed to have issued Common Stock or Common Stock Equivalents at the lowest possible conversion price at which such securities may be converted or exercised. The Corporation shall notify the Holders in writing, no later than the Trading Day following the issuance of any Common Stock or Common Stock Equivalents subject to this Section 7(b), indicating therein the applicable issuance price, or applicable reset price, exchange price, conversion price and other pricing terms (such notice, the "Dilutive Issuance Notice"). For purposes of clarification, whether or not the Corporation provides a Dilutive Issuance Notice pursuant to this Section 7(b), upon the occurrence of any Dilutive Issuance, the Holders are entitled to receive a number of Conversion Shares based upon the Base Conversion Price on or after the date of such Dilutive Issuance, regardless of whether a Holder accurately refers to the Base Conversion Price in the Notice of Conversion.

c) Subsequent Rights Offerings. In addition to any adjustments pursuant to Section 7(a) above, if at any time the Corporation grants, issues or sells any Common Stock Equivalents or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of shares of Common Stock (the "Purchase Rights"), then the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of shares of Common Stock acquirable upon complete conversion of such Holder's Preferred Stock (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights (provided, however, to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Purchase Right to such extent (or beneficial ownership of such shares of Common Stock as a result of such Purchase Right to such extent) and such Purchase Right to such extent shall be held in abeyance for the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

d) Pro Rata Distributions. During such time as this Preferred Stock is outstanding, if the Corporation declares or makes any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash,

stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "Distribution"), at any time after the issuance of this Preferred Stock, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of shares of Common Stock acquirable upon complete conversion of this Preferred Stock (without regard to any limitations on conversion hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution (provided, however, to the extent that the Holder's right to participate in any such Distribution would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Distribution to such extent (or in the beneficial ownership of any shares of Common Stock as a result of such Distribution to such extent) and the portion of such Distribution shall be held in abeyance for the benefit of the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

e) Fundamental Transaction. If, at any time while this Preferred Stock is outstanding, (i) the Corporation, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Corporation with or into another Person, (ii) the Corporation, directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or a series of related transactions, (iii) any, direct or indirect, purchase offer, tender offer or exchange offer (whether by the Corporation or another Person) is completed pursuant to which holders of Common Stock are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of 50% or more of the outstanding Common Stock, (iv) the Corporation, directly or indirectly, in one or more related transactions effects any reclassification, reorganization or recapitalization of the Common Stock or any compulsory share exchange pursuant to which the Common Stock is effectively converted into or exchanged for other securities, cash or property, or (v) the Corporation, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off or scheme of arrangement) with another Person whereby such other Person acquires more than 50% of the outstanding shares of Common Stock (not including any shares of Common Stock held by the other Person or other Persons making or party to, or associated or affiliated with the other Persons making or party to, such stock or share purchase agreement or other business combination) (each a "Fundamental Transaction"), then, upon any subsequent conversion of this Preferred Stock, the Holder shall have the right to receive, for each Conversion Share that would have been issuable upon such conversion immediately prior to the occurrence of such Fundamental Transaction (without regard to any limitation in Section 6(d) and Section 6(e) on the conversion of this Preferred Stock), the number of shares of Common Stock of the successor or acquiring corporation or of the Corporation, if it is the surviving corporation, and any additional consideration (the

"Alternate Consideration") receivable as a result of such Fundamental Transaction by a holder of the number of shares of Common Stock for which this Preferred Stock is convertible immediately prior to such Fundamental Transaction (without regard to any limitation in Section 6(d) and Section 6(e) on the conversion of this Preferred Stock). For purposes of any such conversion, the determination of the Conversion Price shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one share of Common Stock in such Fundamental Transaction, and the Corporation shall apportion the Conversion Price among the Alternate Consideration in a reasonable manner reflecting the relative value of any different components of the Alternate Consideration. If holders of Common Stock are given any choice as to the securities, cash or property to be received in a Fundamental Transaction, then the Holder shall be given the same choice as to the Alternate Consideration it receives upon any conversion of this Preferred Stock following such Fundamental Transaction. To the extent necessary to effectuate the foregoing provisions, any successor to the Corporation or surviving entity in such Fundamental Transaction shall file a new Certificate of Designation with the same terms and conditions and issue to the Holders new preferred stock consistent with the foregoing provisions and evidencing the Holders' right to convert such preferred stock into Alternate Consideration. The Corporation shall cause any successor entity in a Fundamental Transaction in which the Corporation is not the survivor (the "Successor Entity") to assume in writing all of the obligations of the Corporation under this Certificate of Designation and the other Transaction Documents (as defined in the Purchase Agreement) in accordance with the provisions of this Section 7(e) pursuant to written agreements in form and substance reasonably satisfactory to the Holder and approved by the Holder (without unreasonable delay) prior to such Fundamental Transaction and shall, at the option of the holder of this Preferred Stock, deliver to the Holder in exchange for this Preferred Stock a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Preferred Stock which is convertible for a corresponding number of shares of capital stock of such Successor Entity (or its parent entity) equivalent to the shares of Common Stock acquirable and receivable upon conversion of this Preferred Stock (without regard to any limitations on the conversion of this Preferred Stock) prior to such Fundamental Transaction, and with a conversion price which applies the Conversion Price hereunder to such shares of capital stock (but taking into account the relative value of the shares of Common Stock pursuant to such Fundamental Transaction and the value of such shares of capital stock, such number of shares of capital stock and such conversion price being for the purpose of protecting the economic value of this Preferred Stock immediately prior to the consummation of such Fundamental Transaction), and which is reasonably satisfactory in form and substance to the Holder. Upon the occurrence of any such Fundamental Transaction, the Successor Entity shall succeed to, and be substituted for (so that from and after the date of such Fundamental Transaction, the provisions of this Certificate of Designation and the other Transaction Documents referring to the "Corporation" shall refer instead to the Successor Entity), and may exercise every right and power of the Corporation and shall assume all of the obligations of the Corporation under this Certificate of Designation and the other Transaction Documents with the same effect as if such Successor Entity had been named as the Corporation herein.

f) Calculations. All calculations under this Section 7 shall be made to the nearest cent or the nearest 1/100th of a share, as the case may be. For purposes of this Section 7, the number of shares of Common Stock deemed to be issued and outstanding as of a given date shall be the sum of the number of shares of Common Stock (excluding any treasury shares of the Corporation) issued and outstanding.

g) Notice to the Holders.

i. Adjustment to Conversion Price. Whenever the Conversion Price is adjusted pursuant to any provision of this Section 7, the Corporation shall promptly deliver to each Holder a notice setting forth the Conversion Price after such adjustment and setting forth a brief statement of the facts requiring such adjustment.

ii. Notice to Allow Conversion by Holder. If (A) the Corporation shall declare a dividend (or any other distribution in whatever form) on the Common Stock, (B) the Corporation shall declare a special nonrecurring cash dividend on or a redemption of the Common Stock, (C) the Corporation shall authorize the granting to all holders of the Common Stock of rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (D) the approval of any stockholders of the Corporation shall be required in connection with any reclassification of the Common Stock, any consolidation or merger to which the Corporation is a party, any sale or transfer of all or substantially all of the assets of the Corporation, or any compulsory share exchange whereby the Common Stock is converted into other securities, cash or property or (E) the Corporation shall authorize the voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Corporation, then, in each case, the Corporation shall cause to be filed at each office or agency maintained for the purpose of conversion of this Preferred Stock, and shall cause to be delivered to each Holder at its last address as it shall appear upon the stock books of the Corporation, at least twenty (20) calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend, distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of the Common Stock of record to be entitled to such dividend, distributions, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of the Common Stock of record shall be entitled to exchange their shares of the Common Stock for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer or share exchange, provided that the failure to deliver such notice or any defect therein or in the delivery thereof shall not affect the validity of the corporate

action required to be specified in such notice. To the extent that any notice provided hereunder constitutes, or contains, material, non-public information regarding the Corporation or any of the Subsidiaries, the Corporation shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K. The Holder shall remain entitled to convert the Conversion Amount of this Preferred Stock (or any part hereof) during the 20-day period commencing on the date of such notice through the effective date of the event triggering such notice except as may otherwise be expressly set forth herein.

Section 8. Miscellaneous.

a) Notices. Any and all notices or other communications or deliveries to be provided by the Holders hereunder including, without limitation, any Notice of Conversion, shall be in writing and delivered personally, by e-mail, or sent by a nationally recognized overnight courier service, addressed to the Corporation, at the address set forth above Attention: Barbra C. Keck, Secretary, e-mail address bkeck@delcath.com or such other e-mail address or address as the Corporation may specify for such purposes by notice to the Holders delivered in accordance with this Section 11. Any and all notices or other communications or deliveries to be provided by the Corporation hereunder shall be in writing and delivered personally, by e-mail, or sent by a nationally recognized overnight courier service addressed to each Holder at the email address, or address of such Holder appearing on the books of the Corporation, or if no such e-mail address, or address appears on the books of the Corporation, at the principal place of business of such Holder, as set forth in the Purchase Agreement. Any notice or other communication or deliveries hereunder shall be deemed given and effective on the earliest of (i) the time of transmission, if such notice or communication is delivered via e-mail at the e-mail address set forth in this Section prior to 5:30 p.m. (New York City time) on any date, (ii) the next Trading Day after the time of transmission, if such notice or communication is delivered via e-mail at the e-mail address set forth in this Section on a day that is not a Trading Day or later than 5:30 p.m. (New York City time) on any Trading Day, (iii) the second Trading Day following the date of mailing, if sent by U.S. nationally recognized overnight courier service, or (iv) upon actual receipt by the party to whom such notice is required to be given.

b) Absolute Obligation. Except as expressly provided herein, no provision of this Certificate of Designation shall alter or impair the obligation of the Corporation, which is absolute and unconditional, to pay liquidated damages and accrued dividends, as applicable, on the shares of Preferred Stock at the time, place, and rate, and in the coin or currency, herein prescribed.

c) Lost or Mutilated Preferred Stock Certificate. If a Holder's Preferred Stock certificate shall be mutilated, lost, stolen or destroyed, the Corporation shall execute and deliver, in exchange and substitution for and upon cancellation of a mutilated certificate, or in lieu of or in substitution for a lost, stolen or destroyed certificate, a new certificate for the shares of Preferred Stock so mutilated, lost, stolen or destroyed, but only upon receipt of evidence of such loss, theft or destruction of such certificate, and of the ownership hereof reasonably satisfactory to the Corporation.

d) Governing Law. All questions concerning the construction, validity, enforcement and interpretation of this Certificate of Designation shall be governed by and construed and enforced in accordance with the internal laws of the State of Delaware, without regard to the principles of conflict of laws thereof. All legal proceedings concerning the interpretation, enforcement and defense of the transactions contemplated by any of the Transaction Documents (whether brought against a party hereto or its respective Affiliates, directors, officers, shareholders, employees or agents) shall be commenced in the state and federal courts sitting in the City of New York, Borough of Manhattan (the "New York Courts"). The Corporation and each Holder hereby irrevocably submits to the exclusive jurisdiction of the New York Courts for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein (including with respect to the enforcement of any of the Transaction Documents), and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of such New York Courts, or such New York Courts are improper or inconvenient venue for such proceeding. The Corporation and each Holder hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Certificate of Designation and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by applicable law. The Corporation and each Holder hereby irrevocably waives, to the fullest extent permitted by applicable law, any and all right to trial by jury in any legal proceeding arising out of or relating to this Certificate of Designation or the transactions contemplated hereby. If the Corporation or any Holder shall commence an action or proceeding to enforce any provisions of this Certificate of Designation, then the prevailing party in such action or proceeding shall be reimbursed by the other party for its attorneys' fees and other costs and expenses incurred in the investigation, preparation and prosecution of such action or proceeding.

e) Waiver. Any waiver by the Corporation or a Holder of a breach of any provision of this Certificate of Designation shall not operate as or be construed to be a waiver of any other breach of such provision or of any breach of any other provision of this Certificate of Designation or a waiver by any other Holders. The failure of the Corporation or a Holder to insist upon strict adherence to any term of this Certificate of Designation on one or more occasions shall not be considered a waiver or deprive that party (or any other Holder) of the right thereafter to insist upon strict adherence to that term or any other term of this Certificate of Designation on any other occasion. Any waiver by the Corporation or a Holder must be in writing.

f) Severability. If any provision of this Certificate of Designation is invalid, illegal or unenforceable, the balance of this Certificate of Designation shall remain in effect, and if any provision is inapplicable to any Person or circumstance, it shall nevertheless remain applicable to all other Persons and circumstances. If it shall be found that any interest or other amount deemed interest due hereunder violates the applicable law governing usury, the applicable rate of interest due hereunder shall automatically be lowered to equal the maximum rate of interest permitted under applicable law.

g) Next Business Day. Whenever any payment or other obligation hereunder shall be due on a day other than a Business Day, such payment shall be made on the next succeeding Business Day.

h) Headings. The headings contained herein are for convenience only, do not constitute a part of this Certificate of Designation and shall not be deemed to limit or affect any of the provisions hereof.

i) Status of Converted or Redeemed Preferred Stock. Shares of Preferred Stock may only be issued pursuant to the Purchase Agreement. If any shares of Preferred Stock shall be converted, redeemed or reacquired by the Corporation, such shares shall resume the status of authorized but unissued shares of preferred stock and shall no longer be designated as Series E-1 Convertible Preferred Stock.

* * * * * * * * * *

RESOLVED, FURTHER, that the Chief Executive Officer, and the secretary of the Corporation be and they hereby are authorized and directed to prepare and file this Certificate of Designation of Preferences, Rights and Limitations in accordance with the foregoing resolution and the provisions of Delaware law.

IN WITNESS WHEREOF, the undersigned have executed this Certificate this 15th day of August, 2019.

/s/ Jennifer K. Simpson
Name: Jennifer K. Simpson
Title: Chief Executive Officer

/s/ Barbra C. Keck
Name: Barbra C. Keck
Title: Secretary

ANNEX A

NOTICE OF CONVERSION

(TO BE EXECUTED BY THE REGISTERED HOLDER IN ORDER TO CONVERT SHARES OF PREFERRED STOCK)

The undersigned hereby elects to convert the number of shares of Series [____] Convertible Preferred Stock indicated below into shares of common stock, par value [$___ per share (the "Common Stock"), of Delcath Systems, Inc., a Delaware corporation (the "Corporation"), according to the conditions hereof, as of the date written below. If shares of Common Stock are to be issued in the name of a Person other than the undersigned, the undersigned will pay all transfer taxes payable with respect thereto and is delivering herewith such certificates and opinions as may be required by the Corporation in accordance with the Purchase Agreement. No fee will be charged to the Holders for any conversion, except for any such transfer taxes.

Conversion calculations:

Date to Effect Conversion: _____

Number of shares of Preferred Stock owned prior to Conversion: _____

Number of shares of Preferred Stock to be Converted: _____

Stated Value of shares of Preferred Stock to be Converted: _____

Number of shares of Common Stock to be Issued: _____

Applicable Conversion Price: _____

Number of shares of Preferred Stock subsequent to Conversion: _____

Address for Delivery: _____
or
DWAC Instructions:
Broker no: _____
Account no: _____

[HOLDER]

By: _____
Name:
Title:

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We have issued our report dated March 16, 2018 (except for the matter described in Note 2, second paragraph, as to which the date is May 2, 2018), with respect to the consolidated financial statements of Delcath Systems, Inc. contained in the Registration Statement. We consent to the use of the aforementioned report in the Registration Statement and to the use of our name as it appears under the caption “Experts”.

/s/ Grant Thornton, LLP

New York, New York
September 25, 2019.

Exhibit 23.2

INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM'S CONSENT

We consent to the inclusion in this Registration Statement of Delcath Systems, Inc. on Form S-1, Amendment No. 1 [File No. 333-233396] of our report dated June 14, 2019, which includes an explanatory paragraph as to the Company's ability to continue as a going concern, with respect to our audit of the consolidated financial statements of Delcath Systems, Inc. as of December 31, 2018 and for the year then ended , which report appears in the Prospectus, which is part of this Registration Statement. We also consent to the reference to our Firm under the heading "Experts" in such Prospectus.

/s/ Marcum LLP

Marcum LLP
New York, NY
September 25, 2019.