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

Form S-3

**REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933**

CYTORI THERAPEUTICS, INC.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

33-0827593
(I.R.S. Employer
Identification Number)

**3020 Callan Road
San Diego, California 92121
(858) 458-0900**

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

**Marc H. Hedrick, M.D.
President and Chief Executive Officer
Cytori Therapeutics, Inc.
3020 Callan Road
San Diego, California 92121
(858) 458-0900**

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

Copies to:

**Cheston J. Larson, Esq.
Latham & Watkins LLP
12670 High Bluff Drive
San Diego, California 92130
(858) 523-5400**

If the only securities being registered on this Form are being offered pursuant to dividend or interest reinvestment plans, please check the following box.

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, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box.

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

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

If this Form is a registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective on filing with the Commission pursuant to Rule 462(e) under the Securities Act, check the following box.

If this Form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box.

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

Large accelerated filer

Accelerated filer

Non-accelerated filer
(Do not check if a smaller reporting
company)

Smaller reporting
company

CALCULATION OF REGISTRATION FEE

Title of each class of securities to be registered	Number of Shares to be Registered (1)	Proposed Maximum Offering Price Per Share (2)	Proposed Maximum Aggregate Offering Price	Amount of registration fee
Common Stock, \$0.001 per share	1,173,241	\$1.62	\$1,900,650	\$221

- (1) This Registration Statement registers 1,173,241 shares of common stock. Pursuant to Rule 416(a) under the Securities Act of 1933, as amended (the "Securities Act"), this Registration Statement is also registering an indeterminate number of shares of common stock that may be issued as a result of stock split, dividends or similar transactions.
- (2) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(c) of the Securities Act based upon the average of the high and low prices of the Registrant's common stock as reported on the NASDAQ Capital Market on March 22, 2017.

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

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

Subject to Completion, dated March 24, 2017.

PROSPECTUS



CYTORI THERAPEUTICS, INC.

1,173,241 Shares of Common Stock

This prospectus relates solely to the resale or other disposition by the selling stockholder identified in the prospectus of up to 1,173,241 shares of our common stock issued by us to the selling stockholder on February 15, 2017 pursuant to the transactions described in “Description of Asset Purchase Agreement.”

The selling stockholder, or its pledgees, donees, transferees or other successors-in-interest, may, from time to time, sell, transfer, or otherwise dispose of any or all of its shares through public or private transactions at prevailing market prices, at prices related to prevailing market prices or at privately negotiated prices. However, the selling stockholder has agreed to abide by certain weekly and monthly sale/transfer volume limitations with respect to the shares offered in this prospectus.

We are not selling any common stock under this prospectus, and will not receive any proceeds from the sale of the shares. The selling stockholder will sell the shares in accordance with the “Plan of Distribution” set forth in this prospectus. The selling stockholder will bear all commissions, discounts and brokerage fees, if any, attributable to the sales of shares. We will bear all costs, expenses and fees in connection with the registration of the shares.

Any brokers or dealers participating in any sales of common stock offered by the selling stockholder may act either as principals or agents, may use block trades to position and resell the shares of common stock, and may be deemed to be “underwriters” within the meaning of the Securities Act of 1933, as amended, or the Securities Act. Commissions received by any broker-dealer may be deemed to be underwriting commissions under the Securities Act. See “Plan of Distribution.”

INVESTING IN OUR COMMON STOCK INVOLVES RISKS. YOU SHOULD CONSIDER THE RISKS THAT WE HAVE DESCRIBED IN “RISK FACTORS” ON PAGE 6, AS UPDATED IN ANY FUTURE FILINGS MADE WITH THE SECURITIES AND EXCHANGE COMMISSION THAT ARE INCORPORATED BY REFERENCE IN THIS PROSPECTUS, BEFORE INVESTING IN OUR COMMON STOCK.

Our common stock is listed on the NASDAQ Capital Market under the symbol “CYTX.” On March 23, 2017, the last reported sale price of our common stock on the NASDAQ Capital Market was \$1.64 per share.

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 _____, 2017.

TABLE OF CONTENTS

<u>ABOUT THIS PROSPECTUS</u>	1
<u>WHERE YOU CAN FIND MORE INFORMATION; INCORPORATION BY REFERENCE</u>	2
<u>THE COMPANY</u>	4
<u>THE OFFERING</u>	5
<u>RISK FACTORS</u>	6
<u>CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS</u>	7
<u>DESCRIPTION OF ASSET PURCHASE AGREEMENT</u>	8
<u>USE OF PROCEEDS</u>	9
<u>SELLING STOCKHOLDER</u>	10
<u>PLAN OF DISTRIBUTION</u>	11
<u>LEGAL MATTERS</u>	14
<u>EXPERTS</u>	14

ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the U.S. Securities and Exchange Commission, or the SEC, using a “shelf” registration process, pursuant to which a selling stockholder may from time to time offer to sell shares of common stock in one or more offerings. In some cases, the selling stockholder will also be required to provide a prospectus supplement containing specific information about the selling stockholder and the terms on which it is offering and selling our common stock. We may also authorize one or more free writing prospectuses to be provided to you that may contain material information relating to those offerings. Before purchasing any securities, you should carefully read this prospectus, any applicable prospectus supplement, and any related free writing prospectus, together with the additional information described under the heading “Where You Can Find More Information; Incorporation by Reference.” The prospectus supplement and any related free writing prospectus may also add, update or change information contained in this prospectus with respect to that offering. If there is any inconsistency between the information in this prospectus, any applicable prospectus supplement and any related free writing prospectus, you should rely on the prospectus supplement and any related free writing prospectus.

Neither we nor the selling stockholder have authorized any other person to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. The selling stockholder will not make an offer to sell these securities in any jurisdiction where the offer or sale is not permitted. You should assume that the information appearing in this prospectus, any applicable prospectus supplement and any related free writing prospectus is accurate only as of the date on its respective cover, and that any information incorporated by reference is accurate only as of the date of the document incorporated by reference, unless we indicate otherwise. Our business, financial condition, results of operations and prospects may have changed since those dates.

Unless the context otherwise requires, references in this prospectus to “Cytori,” “the Company,” “we,” “us” and “our” refer to Cytori Therapeutics, Inc. Solely for convenience, trademarks and tradenames referred to in this prospectus may appear without the ® or ™ symbols, but such references are not intended to indicate in any way that we will not assert, to the fullest extent under applicable law, our rights, or that the applicable owner will not assert its rights, to these trademarks and tradenames.

Unless the context otherwise requires, references in this prospectus to shares of our common stock, including prices per share of our common stock, reflect the 1-for-15 reverse split that was approved by our stockholders and board of directors on May 10, 2016. Our common stock commenced trading on a split-adjusted basis on May 12, 2016.

WHERE YOU CAN FIND MORE INFORMATION; INCORPORATION BY REFERENCE

Available Information

We file reports, proxy statements and other information with the SEC. Information filed with the SEC by us can be inspected and copied at the Public Reference Room maintained by the SEC at 100 F Street, N.E., Washington, D.C. 20549. You may also obtain copies of this information by mail from the Public Reference Room of the SEC at prescribed rates. Further information on the operation of the SEC's Public Reference Room in Washington, D.C. can be obtained by calling the SEC at 1-800-SEC-0330. The SEC also maintains a web site that contains reports, proxy and information statements and other information about issuers, such as us, who file electronically with the SEC. The address of that website is <http://www.sec.gov>.

Our web site address is www.cytori.com. The information on our web site, however, is not, and should not be deemed to be, a part of this prospectus.

This prospectus, any prospectus supplement and any related free writing prospectus are part of a registration statement that we filed with the SEC and do not contain all of the information in the registration statement. The full registration statement may be obtained from the SEC or us, as provided below. Statements in this prospectus, any prospectus supplement or any related free writing prospectus about these documents are summaries and each statement is qualified in all respects by reference to the document to which it refers. You should refer to the actual documents for a more complete description of the relevant matters. You may inspect a copy of the registration statement at the SEC's Public Reference Room in Washington, D.C. or through the SEC's website, as provided above.

Incorporation by Reference

The SEC's rules allow us to "incorporate by reference" information into this prospectus, which means that we can disclose important information to you by referring you to another document filed separately with the SEC. The information incorporated by reference is deemed to be part of this prospectus, and subsequent information that we file with the SEC will automatically update and supersede that information. Any statement contained in a previously filed document incorporated by reference will be deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus modifies or replaces that statement.

We incorporate by reference our documents listed below and any future filings made by us with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934, as amended, which we refer to as the Exchange Act, in this prospectus, between the date of this prospectus and the termination of the offering of the securities described in this prospectus. We are not, however, incorporating by reference any documents or portions thereof, whether specifically listed below or filed in the future, that are not deemed "filed" with the SEC, including our Compensation Committee report and performance graph or any information furnished pursuant to Items 2.02 or 7.01 of Form 8-K or related exhibits furnished pursuant to Item 9.01 of Form 8-K.

This prospectus and any accompanying prospectus supplement incorporate by reference the documents set forth below that have previously been filed with the SEC:

- our Annual Report on Form 10-K for the year ended December 31, 2016, filed on March 24, 2017;
- our Current Reports on Form 8-K filed on January 19, 2017, February 15, 2017 and March 3, 2017; and
- the description of our common stock contained in our registration statement on Form 10/A filed on July 16, 2001 and any amendment or report filed with the SEC for the purpose of updating the description.

All reports and other documents we subsequently file pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act prior to the termination of this offering, including all such documents we may file with the SEC after the date of the initial registration statement and prior to the effectiveness of the registration statement, but excluding

any information furnished to, rather than filed with, the SEC, will also be incorporated by reference into this prospectus and deemed to be part of this prospectus from the date of the filing of such reports and documents.

You may request a free copy of any of the documents incorporated by reference in this prospectus (other than exhibits, unless they are specifically incorporated by reference in the documents) by writing or telephoning us at the following address:

Cytori Therapeutics, Inc.
Attn: Investor Relations
3020 Callan Road
San Diego, California 92121
(858) 458-0900

Exhibits to the filings will not be sent, however, unless those exhibits have specifically been incorporated by reference in this prospectus and any accompanying prospectus supplement.

THE COMPANY

Our strategy is to build a profitable and growing specialty therapeutics company focused on rare and niche opportunities often overlooked by larger companies but requiring breadth of scope, expertise and focus often not possessed by, or available to, smaller companies. To meet this objective, we have, thus far, identified two therapeutic development platforms and candidate therapeutics in our pipeline that hold promise for millions of patients and significant market potential.

Our current corporate activities fall substantially into one of two key areas related to our two technical therapeutic development platforms: Cytori Cell Therapy™ and Cytori Naonomedicine™. Our Cytori Cell Therapy, or CCT platform, is based on the scientific discovery that the human adipose or fat tissue compartment is a source of a unique mixed population of stem, progenitor and regenerative cells that may hold substantial promise in the treatment of numerous diseases. To bring this promise to patients, we are developing the processes and procedures via proprietary hardware- and software-based devices and single-use reagents and consumable sets, to enable doctors to have access to a variety of therapies at the bedside derived fundamentally from each patient's own adipose tissue. Our lead product candidate is for the treatment of hand manifestations of scleroderma, and we have recently completed a U.S. pivotal clinical trial for this indication using our Habeo™ Cell Therapy product. We have additional CCT treatments in various stages of development. Further, our CCT platform is the subject of investigator-initiated trials conducted by our partners, licensees and other third parties, some of which are supported by us and/or funded by government agencies and other funding sources. Currently, we internally manufacture or source our CCT-related products from third parties. We also have obtained regulatory approval to sell some of our CCT products in certain markets outside the United States. In those markets, we have been able to further develop and improve our core technologies, gain expanded clinical experience and data and generate sales.

Our Cytori Nanomedicine platform features a versatile and novel protein-stabilized liposomal nanoparticle technology for drug encapsulation that has thus far provided the foundation to bring two promising drugs into early/late stage clinical trials. By encapsulating certain drugs, we can create both novel compounds and improve the performance via reformulated versions of existing drugs. Nanoparticle encapsulation is promising because it can help improve the trafficking and metabolism of many drugs, thus potentially enhancing the therapeutic profile and patient benefits. Our lead drug candidate, ATI-0918 is a generic version of liposomal encapsulated doxorubicin. Liposomal encapsulated doxorubicin is a heavily relied upon chemotherapeutic used in many cancer types on a global basis. Data from a 60-patient European trial indicated that ATI-0918 is bioequivalent to the existing reference listed drug in Europe. The second drug in clinical trials is ATI-1123, a new chemical entity which is a nanoparticle encapsulated form of docetaxel, also a standard chemotherapeutic drug used for many cancers. A phase I clinical trial has been completed, and we plan to expand this trial to phase II, most likely in conjunction with a development partner. In addition, we are early in the long-term research and development of encapsulated regenerative medicine drugs, focused first on the treatment of scleroderma and related connective disorders. Finally, in connection with our acquisition of the ATI-0918 and ATI-1123 drug candidates, we have acquired know-how (including proprietary processes and techniques) and a scalable nanoparticle manufacturing plant in San Antonio, Texas, that we intend to employ to test, validate and eventually manufacture commercial quantities of our nanoparticle drugs.

Corporate Information

We were initially formed as a California general partnership in July 1996, and incorporated in the State of Delaware in May 1997. We were formerly known as MacroPore Biosurgery, Inc., and before that as MacroPore, Inc. Our corporate offices are located at 3020 Callan Road, San Diego, CA 92121. Our telephone number is (858) 458-0900. We maintain an Internet website at www.cytori.com. The information contained on, or that can be accessed through, our website is not part of this prospectus. Through this site, we make available free of charge our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC. In addition, we publish on our website all reports filed under Section 16(a) of the Exchange Act by our directors, officers and 10% stockholders. These materials are accessible via the Investor Relations—Reports and Filings section of our website within the “SEC Filings” link. Some of the information is stored directly on our website, while other information can be accessed by selecting the provided link to the section on the SEC website, which contains filings for our company and its insiders.

THE OFFERING

Common stock offered by the selling stockholder	1,173,241 shares.
Use of proceeds	We will not receive any proceeds from the sale or other disposition of the shares of common stock offered hereby.
Risk Factors	Investing in our common stock involves a high degree of risk. See “Risk Factors” beginning on page 6 of this prospectus.
NASDAQ Capital Market symbol	CYTX

RISK FACTORS

Investment in any securities offered pursuant to this prospectus, any applicable prospectus supplement and any related free writing prospectus involves risks. You should carefully consider the risk factors incorporated by reference to our most recent Annual Report on Form 10-K and any subsequent Quarterly Reports on Form 10-Q or Current Reports on Form 8-K we file after the date of this prospectus, and all other information contained or incorporated by reference into this prospectus, as updated by our subsequent filings under the Exchange Act, and the risk factors and other information contained in any applicable prospectus supplement and any related free writing prospectus before acquiring any of such securities. The occurrence of any of these risks might cause you to lose all or part of your investment in the offered securities.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated herein by reference contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. These statements are based on our management's current beliefs, expectations and assumptions about future events, conditions and results and on information currently available to us. Discussions containing these forward-looking statements may be found, among other places, in the Sections entitled "Business," "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" incorporated by reference from our most recent Annual Report on Form 10-K and our Quarterly Reports on Form 10-Q, as well as any amendments thereto, filed with the SEC.

All statements, other than statements of historical fact, included or incorporated herein regarding our strategy, future operations, financial position, future revenues, projected costs, plans, prospects and objectives are forward-looking statements. Words such as "expect," "anticipate," "intend," "plan," "believe," "seek," "estimate," "think," "may," "could," "will," "would," "should," "continue," "potential," "likely," "opportunity" and similar expressions or variations of such words are intended to identify forward-looking statements, but are not the exclusive means of identifying forward-looking statements. Additionally, forward-looking statements include statements concerning future matters such as our anticipated expenditures, including those related to pre-clinical and clinical trials and research studies and general and administrative expenses, the potential size of the markets for our products, future development and/or expansion of our products and therapies in our markets, our ability to generate product revenues or effectively manage our gross profit margins, our ability to obtain regulatory clearances, our ability to commercialize our novel cell therapy platform products and our nanomedicine platform, expectations as to our future performance, liquidity and capital resources, including our potential need for additional financing and the availability thereof as well as our ability to continue to service our existing debt, and the potential enhancement of our cash position and stock price through development, marketing and licensing arrangements. Such statements are based on currently available operating, financial and competitive information and are subject to various risks, uncertainties and assumptions that could cause actual results to differ materially from those anticipated or implied in our forward-looking statements due to a number of factors including, but not limited to, our need and ability to raise additional cash, our joint ventures, risks associated with laws or regulatory requirements applicable to us, market conditions, product performance, potential litigation, competition within the regenerative medicine field and other factors set forth above under the section entitled "Risk Factors" in this prospectus. Given these risks, uncertainties and other factors, many of which are beyond our control, you should not place undue reliance on these forward-looking statements.

Except as required by law, we assume no obligation to update these forward-looking statements publicly, or to revise any forward-looking statements to reflect events or developments occurring after the date of this prospectus, even if new information becomes available in the future.

DESCRIPTION OF ASSET PURCHASE AGREEMENT

On January 16, 2017, we entered into an Asset Purchase Agreement, or the Purchase Agreement, with Azaya, pursuant to which we agreed to acquire substantially all of the assets and assume certain liabilities of Azaya, or the Acquisition. On February 15, 2017, or the Closing Date, we closed the Acquisition and acquired the rights, title and interest in and to: (i) Azaya's ATI-0918 drug candidate, a generic bioequivalent formulation of DOXIL®/CAELYX®, a chemotherapy drug that is a liposomal encapsulation of doxorubicin, or ATI-0918; (ii) Azaya's ATI-1123 drug candidate, a liposomal formulation of docetaxel, or ATI-1123; and (iii) certain equipment, inventory and other assets necessary to develop, manufacture, test and validate ATI-0918 and ATI-1123.

Pursuant to the Purchase Agreement, on the Closing Date, (i) we issued to Azaya 1,173,241 shares of our common stock, or the Shares, (A) 879,931 of which were delivered to Azaya at the Closing and (B) 293,310 of which were deposited into a 15-month escrow pursuant to a customary escrow agreement; and (ii) we assumed the obligation to pay approximately \$2.0 million of Azaya's existing trade payables. The price per Share was \$1.7047, which price was equal to the volume weighted average closing price of the Shares on the Nasdaq Capital Market over the ten consecutive trading days ending on the trading date immediately prior to the Closing Date. Pursuant to the Purchase Agreement, we also agreed to file with the SEC, and have declared effective, a registration statement covering the resale of the Shares. Azaya agreed that it will not transfer or sell more than: (i) 150,000 Shares in any calendar week or (ii) 600,000 Shares in any calendar month.

In addition, on the Closing Date, we assumed the obligations to: (i) pay Azaya fixed commercialization milestone payments of up to \$16.3 million in the aggregate, based upon achievement of certain net sales milestones for ATI-0918; (ii) make certain earn-out payments to Azaya equal to a mid-single-digit percentage of net sales of ATI-0918; and (iii) make certain earn-out payments to Azaya equal to a low single-digit percentage of net sales of any product, each a Patented Product, including ATI-1123, that practices a claim in the related patent assigned by Azaya to us, or the ATI-1123 Patent. Our aggregate earn-out payment obligations to Azaya from global net sales of both ATI-0918 and any Patented Product will not exceed \$100.0 million, or the Earn-Out Cap.

Further, the Purchase Agreement provides that if we enter into certain assignments, licenses or other transfers of rights to a Patented Product or the ATI-1123 Patent, we will pay Azaya a percentage in the low to mid-teens of the consideration received by us, provided, that our aggregate payment obligation to Azaya for any such assignment, license or other transfer of rights will not exceed \$50.0 million.

If we or our successors, sublicensees or transferees sell a competing product to ATI-0918 at any time prior to satisfaction of the Earn-Out Cap, other than because ATI-0918 fails to receive marketing authorization from the European Medicines Agency within a certain period of time or fails to generate a minimum threshold of net sales within a pre-determined amount of time, then 50% of the net sales of such competing product would be deemed to be net sales of ATI-0918 under the Purchase Agreement for purposes of calculating commercialization milestone payments and earn-out payments.

We have agreed to, and have agreed to require that any successors, sublicensees or transferees, use commercially reasonable efforts to develop and commercialize ATI-0918 and any Patented Product. We and Azaya also agreed to customary representations, warranties and covenants and customary indemnification obligations under the Purchase Agreement, provided, that Azaya's maximum liability to us for breaches of Azaya's representations and warranties in the Purchase Agreement and any ancillary agreements entered into in connection therewith, is limited to \$3.9 million, subject to limited exceptions.

USE OF PROCEEDS

We are registering the shares of our common stock covered by this prospectus pursuant to registration rights granted to the selling stockholder in the Purchase Agreement. We are not selling any securities under this prospectus and will not receive any proceeds from the sale or other disposition of the shares covered hereby.

We have agreed to pay all costs relating to the registration of the shares of our common stock covered by this prospectus.

SELLING STOCKHOLDER

We have prepared this prospectus to allow the selling stockholder or its pledgees, donees, transferees or other successors-in-interest to sell or otherwise dispose of, from time to time, up to an aggregate of 1,173,241 shares of our common stock. The table below presents information regarding the selling stockholder, the shares of common stock beneficially owned by it, the shares of common stock that it may sell or otherwise dispose of from time to time under this prospectus and the number and percentage of our common stock the selling stockholder will own assuming all of the shares covered by this prospectus are sold by the selling stockholder.

We do not know whether, when or in what amounts the selling stockholder may sell or otherwise dispose of the shares of common stock covered hereby. However, the selling stockholder has agreed that it will not transfer or sell more than: (i) 150,000 Shares in any calendar week or (ii) 600,000 Shares in any calendar month. The selling stockholder might not sell or dispose of any or all of the shares covered by this prospectus or, subject to the foregoing restrictions, may sell or dispose of some or all of the shares other than pursuant to this prospectus. Because the selling stockholder may not sell or otherwise dispose of some or all of the shares covered by this prospectus and because there are currently no agreements, arrangements or understandings with respect to the sale or other disposition of any of the shares by the selling stockholder, we cannot estimate the number of the shares that will be held by the selling stockholder after completion of the offering. However, for purposes of this table, we have assumed that all of the shares of common stock covered by this prospectus will be sold by the selling stockholder and that any other shares of our common stock beneficially owned by the selling stockholder will continue to be beneficially owned.

The information in the table is based on 23,568,403 shares outstanding as of February 28, 2017 and was prepared based on information supplied to us by the selling stockholder. Beneficial ownership is determined in accordance with Section 13(d) of the Exchange Act and generally includes voting or investment power with respect to securities and including any securities that grant the selling stockholder the right to acquire shares of common stock within 60 days of February 28, 2017. Other than the transactions referred to herein and in documents filed by us with the SEC pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act, the selling stockholder has not within the past three years had any position, office or other material relationship with us or any of our subsidiaries other than as a holder of our securities.

Name of Selling Stockholder ⁽¹⁾	Number of Shares Beneficially Owned Prior to the Offering	Number of Shares Offered Hereby	Number of Shares Beneficially Owned After the Offering	Percent of Class Beneficially Owned After the Offering
Azaya Therapeutics, Inc. ⁽²⁾	1,173,241	1,173,241	—	—

(1) Additional information concerning the named selling stockholder or pledgees, donees, transferees or other successors-in-interest of the stockholder may be set forth in a prospectus supplement to this prospectus.

(2) The address of Azaya Therapeutics, Inc. is 250 W. Nottingham Pl. #120, San Antonio, Texas 78209. We issued 1,173,241 shares of our common stock to Azaya, (i) 879,931 of which was delivered to Azaya on the Closing Date of the Acquisition pursuant to the Purchase Agreement, and (ii) 293,310 of which was deposited into a 15-month escrow pursuant to a customary escrow agreement. See “Description of Asset Purchase Agreement.”

PLAN OF DISTRIBUTION

The selling stockholder, including its pledgees, donees, transferees or other successors-in-interest, may from time to time offer some or all of the shares of common stock covered by this prospectus, subject to the restrictions set forth in "Description of Asset Purchase Agreement." To the extent required, this prospectus and any free writing prospectus may be amended and supplemented from time to time to describe a specific plan of distribution.

The selling stockholder will not pay any of the costs, expenses and fees in connection with the registration of the shares covered by this prospectus, but it will pay any and all commissions, discounts and brokerage fees, if any, attributable to sales of the shares. We will not receive any proceeds from the sale of the shares of our common stock covered hereby.

The selling stockholder may sell the shares of common stock covered by this prospectus from time to time, and may also decide not to sell all or any of the shares of common stock that it is allowed to sell under this prospectus. The selling stockholder will act independently of us in making decisions regarding the timing, manner and size of each sale. These dispositions may be at prevailing market prices, at prices related to prevailing market prices, or at privately negotiated prices. Sales may be made by the selling stockholder in one or more types of transactions, which may include:

- purchases by underwriters, dealers and agents who may receive compensation in the form of underwriting discounts, concessions or commissions from the selling stockholder and/or the purchasers of the shares of common stock for whom they may act as agent;
- one or more block transactions, including transactions in which the broker-dealer so engaged will attempt to sell the shares of common stock as agent but may position and resell a portion of the block as principal to facilitate the transaction, or in crosses, in which the same broker acts as an agent on both sides of the trade;
- ordinary brokerage transactions or transactions in which a broker-dealer solicits purchasers;
- purchases by a broker-dealer or market maker, as principal, and resale by the broker-dealer for its account;
- the pledge of shares of common stock for any loan or obligation, including pledges to brokers or dealers who may from time to time effect distributions of shares of common stock;
- short sales or transactions to cover short sales relating to the shares of common stock;
- one or more exchanges or over-the-counter market transactions;
- through distribution by a selling stockholder or its successor in interest to its members, general or limited partners or shareholders (or their respective members, general or limited partners or shareholders);
- public or privately negotiated transactions;
- the writing of options or other hedging transactions, whether the options are listed on an options exchange or otherwise;
- distributions to creditors and equity holders of the selling stockholder;
- trading plans entered into by the selling stockholder pursuant to Rule 10b5-1 under the Exchange Act; and
- any combination of the foregoing, or any other available means allowable under applicable law.

The selling stockholder may also resell all or a portion of its common stock in open market transactions in reliance upon Rule 144 under the Securities Act provided it meets the criteria and conforms to the requirements of Rule 144.

The selling stockholder may enter into sale, forward-sale and derivative transactions with third parties, or may sell securities not covered by this prospectus to third parties in privately negotiated transactions. If the applicable prospectus supplement or related free writing prospectus indicates, in connection with those sale, forward-sale or derivative transactions, the third parties may sell securities covered by this prospectus, the applicable prospectus supplement or any related free writing prospectus, including in short sale transactions and by issuing securities that are not covered by this prospectus but are exchangeable for or represent beneficial interests in the common stock. The third parties also may use shares received under those sale, forward-sale or derivative arrangements or shares pledged by the selling stockholder or borrowed from the selling stockholder or others to settle such third-party sales or to close out any related open borrowings of common stock. The third parties may deliver this prospectus in connection with any such transactions. Any third party in such sale transactions will be an underwriter and will be identified in the applicable prospectus supplement (or a post-effective amendment to the registration statement of which this prospectus is a part).

In addition, the selling stockholder may engage in hedging transactions with broker-dealers in connection with distributions of common stock or otherwise. In those transactions, broker-dealers may engage in short sales of securities in the course of hedging the positions they assume with the selling stockholder. The selling stockholder may also sell securities short and redeliver securities to close out such short positions. The selling stockholder may also enter into option or other transactions with broker-dealers which require the delivery of securities to the broker-dealer. The broker-dealer may then resell or otherwise transfer such securities pursuant to this prospectus. The selling stockholder also may loan or pledge shares, and the borrower or pledgee may sell or otherwise transfer the common stock so loaned or pledged pursuant to this prospectus. Such borrower or pledgee also may transfer those shares of common stock to investors in our securities or the selling stockholder's securities or in connection with the offering of other securities not covered by this prospectus.

The selling stockholder also may transfer or donate the shares of common stock in other circumstances, in which case the transferees, donees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus and may, subject to the transfer restrictions, sell the shares of common stock from time to time under this prospectus after we have filed a post-effective amendment to the registration statement, of which this prospectus forms a part, or a prospectus supplement under applicable provisions of the Securities Act supplementing or amending this list of selling stockholders to include the pledgee, donee, transferee or other successors in interest as selling stockholders under this prospectus.

To the extent necessary, we may amend or supplement this prospectus from time to time to describe a specific plan of distribution. We will file a supplement to this prospectus, if required, upon being notified by the selling stockholder that any material arrangement has been entered into with a broker-dealer for the sale of shares through a block trade, offering or a purchase by a broker or dealer. The applicable prospectus supplement will set forth the specific terms of the offering of securities, including:

- the number of shares of common stock offered;
- the price of such common stock;
- the proceeds to the selling stockholder from the sale of such common stock;
- the names of the underwriters or agents, if any;
- any underwriting discounts, agency fees or other compensation to underwriters or agents; and
- any discounts or concessions allowed or paid to dealers.

In connection with sales of common stock covered hereby, any underwriter, broker-dealer or agent and any other participating broker-dealer that executes sales for the selling stockholder may be deemed to be an “underwriter” within the meaning of the Securities Act. Accordingly, any compensation earned by such underwriter, broker-dealer or agent may be deemed to be underwriting discounts and commissions.

We and the selling stockholder have agreed to indemnify each other against certain liabilities, including liabilities under the Securities Act. In addition, we or the selling stockholder may agree to indemnify any underwriters, broker-dealers and agents against or contribute to any payments the underwriters, broker-dealers or agents may be required to make with respect to civil liabilities, including liabilities under the Securities Act. Underwriters, broker-dealers and agents and their affiliates are permitted to be customers of, engage in transactions with, or perform services for us and our affiliates or the selling stockholder or its affiliates in the ordinary course of business.

We are required to pay certain fees and expenses incident to the registration of the shares of common stock. See “Use of Proceeds.” We have also agreed to indemnify the selling stockholder against certain losses, claims, damages and liabilities, including liabilities under the Securities Act, relating to the registration statement and prospectus and any supplements or amendments thereof.

If the selling stockholder uses this prospectus for any sale of the shares of common stock, it will be subject to the prospectus delivery requirements of the Securities Act.

We have agreed with the selling stockholder to use our best efforts to keep the registration statement, of which this prospectus constitutes a part, effective until the sale of all shares of common stock registered in the registration statement, of which this prospectus is a part. There can be no assurance that the selling stockholder will sell any or all of the shares of common stock registered pursuant to the registration statement.

The provisions of Regulation M of the Exchange Act and the rules and regulations thereunder, which provisions may limit the timing of purchases and sales of any of the common stock by the selling stockholder may also apply to sales of shares of all common stock by and the activities of the selling stockholder. Regulation M may also restrict the ability of any person engaged in the distribution of the common stock to engage in market-making activities with respect to the common stock. These restrictions may affect the marketability of such common stock.

To the extent permitted by applicable law, this plan of distribution may be modified in a prospectus supplement or otherwise.

LEGAL MATTERS

Latham & Watkins LLP, San Diego, California, will pass upon certain legal matters relating to the issuance and sale of the securities offered hereby on behalf of Cytori Therapeutics, Inc. Additional legal matters may be passed upon for us or any underwriters, dealers or agents, by counsel that we will name in the applicable prospectus supplement.

EXPERTS

The consolidated financial statements and schedule as of and for the year ended December 31, 2016 incorporated by reference in this prospectus have been so incorporated in reliance on the report of BDO USA, LLP, an independent registered public accounting firm (the report on the consolidated financial statements and schedule contains an explanatory paragraph regarding the Company's ability to continue as a going concern), incorporated herein by reference, given on the authority of said firm as experts in auditing and accounting.

KPMG LLP, independent registered public accounting firm, has audited the consolidated financial statements as of and for the year ended December 31, 2015 included in our Annual Report on Form 10-K for the year ended December 31, 2016, as set forth in their report, which is incorporated by reference in this prospectus and elsewhere in the registration statement. Our financial statements are incorporated by reference in reliance on KPMG LLP's report, given on their authority as experts in accounting and auditing.

The audit report covering the December 31, 2015 consolidated financial statements contains an explanatory paragraph that states that our recurring losses from operations, liquidity position and debt service requirements raises substantial doubt about our ability to continue as a going concern. The consolidated financial statements and financial statement schedule do not include any adjustments that might result from the outcome of that uncertainty.

We have agreed to indemnify and hold KPMG LLP harmless against and from any and all legal costs and expenses incurred by KPMG in successful defense of any legal action or proceeding that arises as a result of KPMG's consent to the incorporation by reference of its audit report on the Company's past financial statements incorporated by reference in this registration statement.

PART II
INFORMATION NOT REQUIRED IN PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution

The following is an estimate of the expenses that we may incur in connection with the securities being registered hereby. All amounts are estimates except the SEC registration fee.

SEC registration fee	\$ 221
Printing expenses	\$ 2,000
Legal fees and expenses	\$ 20,000
Accounting fees and expenses	\$ 30,000
Total	<u>\$ 52,211</u>

Item 15. Indemnification of Directors and Officers

Section 145 of the DGCL authorizes a court to award or a corporation's board of directors to grant indemnification to directors and officers in terms sufficiently broad to permit such indemnification under certain circumstances for liabilities (including reimbursement for expenses incurred) arising under the Securities Act of 1933, as amended, or the Securities Act.

Our amended and restated certificate of incorporation, as amended, or our Certificate, includes a provision that, to the fullest extent permitted by the Delaware General Corporation Law, eliminates the personal liability of our directors for monetary damages for breach of fiduciary duty as a director. In addition, together our Certificate and our amended and restated bylaws, as amended, or our Bylaws, require us to indemnify, to the fullest extent permitted by law, any person made or threatened to be made a party to an action or proceeding (whether criminal, civil, administrative or investigative) by reason of the fact that such person is or was a director, officer or employee of Cytori or any predecessor of ours, or serves or served at any other enterprise as a director, officer or employee at our request or the request of any predecessor of ours, against expenses (including attorneys' fees), judgments, fines, settlements and other amounts actually and reasonably incurred in connection with any proceeding, arising by reason of the fact that such person is or was an agent of ours. Our Bylaws also provide that we may, to the fullest extent provided by law, indemnify any person against expenses (including attorneys' fees), judgments, fines, settlements and other amounts actually and reasonably incurred in connection with any proceeding, arising by reason of the fact that such person is or was an agent of ours. We are required to advance expenses incurred by our directors, officers, employees and agents in defending any action or proceeding for which indemnification is required or permitted, subject to certain limited exceptions. The indemnification rights conferred by our Bylaws are not exclusive.

Item 16. Exhibits

(a) *Exhibits*

A list of exhibits filed with this registration statement on Form S-3 is set forth on the Exhibit Index and is incorporated herein by reference.

Item 17. Undertakings

(a) 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 of 1933;

(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 Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and

(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 (a)(1)(i), (a)(1)(ii), and (a)(1)(iii) above 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 Section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is a part of 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 of 1933 to any purchaser:

(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 of 1933 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.

(5) That, for the purpose of determining liability of the registrant under the Securities Act of 1933 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.

(b) The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement 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.

(c) 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 Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of San Diego, State of California, on the 24th day of March, 2017.

CYTORI THERAPEUTICS, INC.

By: /s/ Marc H. Hedrick, M.D.

Marc H. Hedrick, M.D.
President and Chief Executive Officer

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Marc H. Hedrick and Tiago Girão as his true and lawful attorneys-in-fact and agents, with full powers of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to sign any and all amendments to this Registration Statement (including post-effective amendments and any related registration statements filed pursuant to Rule 462 and otherwise), and to file the same with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents and full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully for all intents and purposes as he might or could do in person, hereby ratifying and confirming that said attorney-in-fact and agent, or any substitute or resubstitute, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, as amended, this registration statement has been signed below by the following persons on behalf of the registrant in the capacities and on the dates indicated.

SIGNATURE	TITLE	DATE
<u>/s/ David M. Rickey</u> David M. Rickey	Chairman of the Board	March 24, 2017
<u>/s/ Marc H. Hedrick, M.D.</u> Marc H. Hedrick, M.D.	President, Chief Executive Officer and Director (Principal Executive Officer)	March 24, 2017
<u>/s/ Tiago Girão</u> Tiago Girão	Chief Financial Officer (Principal Financial and Accounting Officer)	March 24, 2017
<u>/s/ Richard J. Hawkins</u> Richard J. Hawkins	Director	March 24, 2017
<u>/s/ Paul W. Hawran</u> Paul W. Hawran	Director	March 24, 2017
<u>/s/ Gary A. Lyons</u> Gary A. Lyons	Director	March 24, 2017
<u>/s/ Gail K. Naughton, Ph.D.</u> Gail K. Naughton, Ph.D.	Director	March 24, 2017
<u>/s/ Ronald A. Martell</u> Ronald A. Martell	Director	March 24, 2017

EXHIBIT INDEX

		CYTORI THERAPEUTICS, INC.				
		EXHIBIT INDEX				
Exhibit Number	Exhibit Title	Filed herewith	Incorporated by Reference			Date Filed
			Form/Schedule	Exhibit/Appendix	File No.	
4.1	Warrant to Purchase Common Stock issued by the Company on October 14, 2008 in favor of Silicon Valley Bank, pursuant to the Loan and Security Agreement dated October 14, 2008.		10-K	10.62	000-32501	03/06/2009
4.2	Warrant to Purchase Common Stock issued by the Company on June 11, 2010 in favor of GE Capital Equity Investments, Inc., pursuant to the Amended and Restated Loan and Security Agreement dated June 11, 2010.		8-K	10.73	001-34375	06/17/2010
4.3	Warrant to Purchase Common Stock issued by the Company on June 11, 2010 in favor of Silicon Valley Bank, pursuant to the Amended and Restated Loan and Security Agreement dated June 11, 2010.		8-K	10.74	001-34375	06/17/2010
4.4	Warrant to Purchase Common Stock issued by the Company on June 11, 2010 in favor of Oxford Financial Corporation, pursuant to the Amended and Restated Loan and Security Agreement dated June 11, 2010.		8-K	10.75	001-34375	06/17/2010
4.5	Warrant to Purchase Common Stock issued by the Company on September 9, 2011 in favor of GE Capital Equity Investments, Inc., pursuant to the Amended and Restated Loan and Security Agreement dated September 9, 2011.		8-K	10.84	001-34375	09/15/2011
4.6	Warrant to Purchase Common Stock issued by the Company on September 9, 2011 in favor of Silicon Valley Bank, pursuant to the Amended and Restated Loan and Security Agreement dated September 9, 2011.		8-K	10.85	001-34375	09/15/2011
4.7	Warrant to Purchase Common Stock issued by the Company on September 9, 2011 in favor of Oxford Financial Corporation, pursuant to the Amended and Restated Loan and Security Agreement dated September 9, 2011.		8-K	10.86	001-34375	09/15/2011
4.8	Warrant to Purchase Common Stock issued by the Company on September 9, 2011 in favor of Oxford Financial Corporation, pursuant to the Amended and Restated Loan and Security Agreement dated September 9, 2011.		8-K	10.87	001-34375	09/15/2011
4.9	Warrant to Purchase Common Stock issued by the Company on June 28, 2013 in favor of Oxford Finance LLC pursuant to the Loan and Security Agreement dated June 28, 2013.		10-Q	4.17	001-34375	08/09/2013

4.10	Warrant to Purchase Common Stock issued by the Company on June 28, 2013 in favor of Oxford Finance LLC pursuant to the Loan and Security Agreement dated June 28, 2013.		10-Q	4.18	001-34375	08/09/2013
4.12	Warrant to Purchase Common Stock issued by the Company on June 28, 2013 in favor of Oxford Finance LLC pursuant to the Loan and Security Agreement dated June 28, 2013.		10-Q	4.19	001-34375	08/09/2013
4.13	Warrant to Purchase Common Stock issued by the Company on June 28, 2013 in favor of Oxford Finance LLC pursuant to the Loan and Security Agreement dated June 28, 2013.		10-Q	4.20	001-34375	08/09/2013
4.14	Warrant to Purchase Common Stock issued by the Company on June 28, 2013 in favor of Silicon Valley Bank pursuant to the Loan and Security Agreement dated June 28, 2013.		10-Q	4.21	001-34375	08/09/2013
4.15	Form of Warrant to Purchase Common Stock for Investors in the Units.		8-K	4.1	001-34375	05/30/2014
4.16	Form of Warrant to Purchase Common Stock for Placement Agent of the Units.		8-K	4.2	001-34375	05/30/2014
4.17	Form of Amendment to Warrant to Purchase Common Stock.		8-K	4.1	001-34375	09/08/2014
4.18	Form of Warrant to Purchase Common Stock.		8-K	4.2	001-34375	09/08/2014
4.19	Form of Warrant for Purchasers in the Units.		8-K	4.1	001-34375	10/08/2014
4.20	Form of Initial Warrant to Purchase Common Stock.		8-K	4.1	001-34375	05/05/2015
4.21	Form of Additional Warrant to Purchase Common Stock.		8-K	4.2	001-34375	05/05/2015
4.22	Form of Pre-Funded Warrant to Purchase Common Stock.		8-K	4.3	001-34375	05/05/2015
4.23	Amendment to Common Stock Purchase Warrant.		10-K	4.23	001-34375	03/11/2015
4.24	Amendment to Series A-1 Warrant to Purchase Common Stock.		10-K	4.24	001-34375	03/11/2015
4.25	Amendment to Series A-2 Warrant to Purchase Common Stock.		10-K	4.25	001-34375	03/11/2015
4.26	Form of Non-Transferable Subscription Rights Certificate.		S-1/A	4.26	333-210628	05/11/2016
4.27	Form of Series R Warrant underlying the Units.		S-1/A	4.27	333-210628	05/11/2016
4.28	Form of Warrant Agreement between the Company and Broadridge Corporate Issuer Solutions, Inc.		S-1/A	4.28	333-210628	05/11/2016

4.29†	Asset Purchase Agreement, dated January 16, 2017, by and between the Company and Azaya Therapeutics, Inc.		10-K	10.40	001-34375	03/24/2017
5.1	Opinion of Latham & Watkins LLP.	X				
23.1	Consent of BDO USA, LLP, Independent Registered Public Accounting Firm.	X				
23.2	Consent of KPMG LLP, Independent Registered Public Accounting Firm.	X				
23.3	Consent of Latham & Watkins LLP (included in Exhibit 5.1).	X				
24.1	Power of Attorney (included on signature page).	X				

† Confidential treatment has been requested with respect to certain portions of this exhibit. Omitted portions have been filed separately with the Securities and Exchange Commission.

12670 High Bluff Drive
 San Diego, California 92130
 Tel: +1.858.523.5400 Fax: +1.858.523.5450
 www.lw.com

FIRM / AFFILIATE OFFICES
 Barcelona Moscow
 Beijing Munich
 Boston New York
 Brussels Orange County
 Century City Paris
 Chicago Riyadh
 Dubai Rome
 Düsseldorf San Diego
 Frankfurt San Francisco
 Hamburg Seoul
 Hong Kong Shanghai
 Houston Silicon Valley
 London Singapore
 Los Angeles Tokyo
 Madrid Washington, D.C.
 Milan

LATHAM & WATKINS LLP

March 24, 2017

Cytori Therapeutics, Inc.
 3020 Callan Road
 San Diego, California 92121

Re: 1,173,241 Shares of Common Stock of Cytori Therapeutics, Inc., par value \$0.001 per share

Ladies and Gentlemen:

We have acted as special counsel to Cytori Therapeutics, Inc., a Delaware corporation (the “**Company**”), in connection with the registration for resale from time to time by Azaya Therapeutics, Inc. of 1,173,241 shares of the Company’s common stock, par value \$0.001 per share (the “**Shares**”). The Shares are included in a registration statement on Form S-3 (the “**Registration Statement**”) under the Securities Act of 1933, as amended (the “**Act**”), and the related prospectus included in the Registration Statement (the “**Prospectus**”), filed with the Securities and Exchange Commission (the “**Commission**”) on March 24, 2017.

This opinion is being furnished in connection with the requirements of Item 601(b)(5) of Regulation S-K under the Act, and no opinion is expressed herein as to any matter pertaining to the contents of the Registration Statement or related Prospectus, other than as expressly stated herein with respect to the issue of the Shares.

As such counsel, we have examined such matters of fact and questions of law as we have considered appropriate for purposes of this letter. With your consent, we have relied upon certificates and other assurances of officers of the Company and others as to factual matters without having independently verified such factual matters. We are opining herein as to General Corporation Law of the State of Delaware, and we express no opinion with respect to any other laws.

Subject to the foregoing and the other matters set forth herein, it is our opinion that, as of the date hereof, the issue and sale of the Shares have been duly authorized by all necessary

corporate action of the Company and the Shares have been validly issued and are fully paid and nonassessable.

This opinion is for your benefit in connection with the Registration Statement and may be relied upon by you and by persons entitled to rely upon it pursuant to the applicable provisions of the Act. We consent to your filing this opinion as an exhibit to the Registration Statement and to the reference to our firm in the Prospectus under the heading "Legal Matters." In giving such consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Act or the rules and regulations of the Commission thereunder.

Very truly yours,

/s/ Latham & Watkins LLP

Consent of Independent Registered Public Accounting Firm

Cytori Therapeutics, Inc.
San Diego, California

We hereby consent to the incorporation by reference in the Prospectus constituting a part of this Registration Statement of our report dated March 24, 2017, relating to the consolidated financial statements and schedule of Cytori Therapeutics, Inc. (the “Company”) appearing in the Company’s Annual Report on Form 10-K for the year ended December 31, 2016. Our report contains an explanatory paragraph regarding the Company’s ability to continue as a going concern.

We also consent to the reference to us under the caption “Experts” in the Prospectus.

/s/ BDO USA, LLP

San Diego, California
March 24, 2017

Consent of Independent Registered Public Accounting Firm

The Board of Directors
Cytori Therapeutics, Inc.:

We consent to the incorporation by reference in the registration statement on Form S-3 of Cytori Therapeutics, Inc. issued on March 24, 2017, of our reports dated March 11, 2016, with respect to the consolidated balance sheet of Cytori Therapeutics, Inc. and subsidiaries as of December 31, 2015, and the related consolidated statements of operations and comprehensive loss, stockholders' equity, and cash flows for the year ended December 31, 2015, and the accompanying schedule of valuation and qualifying accounts of Cytori Therapeutics, Inc. and subsidiaries as of and for the year ended December 31, 2015, and to the reference to our firm under the heading "Experts" in the prospectus.

Our report dated March 11, 2016 contains an explanatory paragraph that states that the Company's recurring losses from operations and liquidity position raises substantial doubt about its ability to continue as a going concern. The consolidated financial statements and financial statement schedule do not include any adjustments that might result from the outcome of that uncertainty.

/s/ KPMG LLP

San Diego, California
March 24, 2017