

**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 No.)

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

(Address, Including Zip Code and Telephone Number, Including  
Area Code, of Registrant's Principal Executive Offices)

**Christopher J. Calhoun**  
**Chief Executive Officer**  
**Cytori Therapeutics, Inc.**  
**3020 Callan Road**  
**San Diego, CA 92121**  
**(858) 458-0900**

(Name, Address, Including Zip Code and Telephone Number, Including  
Area Code, of Agent for Service)

*With a Copy to:*

**Jeffrey T. Baglio**  
**DLA Piper LLP (US)**  
**4365 Executive Drive, Suite 1100**  
**San Diego, CA 92121**

**Approximate date of commencement of proposed sale to the public:** From time to time after the effective date of this registration statement.

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.  333-157023

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 upon 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.

Large accelerated filer

Accelerated filer

Non-accelerated filer

Smaller reporting company

**CALCULATION OF REGISTRATION FEE**

Title of Each Class of Securities To Be Registered(1)	Proposed Maximum Aggregate Offering Price(2)(3)(4)(5)	Amount of Registration Fee(5)
Common Stock, par value \$0.001 per share(4)(6)		

Preferred Stock, par value \$0.001 per share(4)		
Debt Securities(4)		
Warrants(4)(7)		
Units(4)(7)		
Total	\$3,501,568	\$250

- (1) In accordance with Rule 462(b) promulgated under the Securities Act of 1933, as amended, an additional amount of securities having a proposed maximum aggregate offering price of no more than 20% of the maximum aggregate offering price of the securities which remain eligible to be sold under the registration statement on Form S-3 (File No. 333-157023) is hereby registered.
- (2) There are being registered hereunder such indeterminate number of shares of common stock, such indeterminate number of shares of preferred stock, such indeterminate principal amount of debt securities, and such indeterminate number of warrants to purchase common stock, preferred stock or debt securities as will have an aggregate offering price not to exceed \$3,501,568. Any securities registered hereunder may be sold separately or as units with other securities registered hereunder. The registrant has estimated the proposed maximum aggregate offering price solely for the purpose of calculating the registration fee pursuant to Rule 457(o) under the Securities Act of 1933, as amended.
- (3) If any debt securities are issued at an original issue discount, then the offering price of such debt securities shall be in such greater principal amount as shall result in an aggregate offering price equal to the amount to be registered. If any debt securities are issued with a principal amount denominated in a foreign currency or composite currency, such principal amount as shall result in an aggregate initial offering price equivalent thereto in United States (U.S.) dollars at the time of initial offering.
- (4) In addition to the securities issued directly under this registration statement, we are registering an indeterminate number of shares of common stock and preferred stock as may be issued upon conversion or exchange of the securities issued directly under this registration statement. No separate consideration will be received for any shares of common stock or preferred stock so issued upon conversion or exchange.
- (5) The registrant previously registered an aggregate \$75,000,000 of its securities on a registration statement on Form S-3 (File No. 333-157023), for which a registration fee of \$2,948 was previously paid.
- (6) This registration statement also relates to rights to purchase one one-thousandth (1/1000th) of a share of Series RP preferred stock, par value \$0.001 per share, which are attached to all shares of the registrant's common stock pursuant to the Rights Agreement, dated as of May 29, 2003, as amended to date. Until the occurrence of events described in the Rights Agreement, the rights are not exercisable, are evidenced by the registrant's common stock certificates and are transferable with and only with the registrant's common stock.
- (7) Includes warrants to purchase common stock, warrants to purchase preferred stock and warrants to purchase debt securities.

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**This registration statement shall become effective upon filing with the Securities and Exchange Commission in accordance with Rule 462(b) under the Securities Act of 1933, as amended.**

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**EXPLANATORY NOTE AND  
INCORPORATION OF CERTAIN INFORMATION BY REFERENCE**

This registration statement is being filed with the Securities and Exchange Commission pursuant to Rule 462(b) under the Securities Act of 1933, as amended, for the sole purpose of registering an additional \$3,501,568 worth of securities of the same class as were included in our registration statement on Form S-3 (File No. 333-157023) declared effective on February 11, 2009 (the "**Base Registration Statement**"). The amount being registered under this registration statement does not represent more than 20% of the maximum aggregate offering price of the securities which remain eligible to be sold under the Base Registration Statement. The contents of the Base Registration Statement, including all amendments, supplements and exhibits thereto, are hereby incorporated by reference.

## SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, 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 October 7, 2010.

CYTORI THERAPEUTICS, INC.

By:           /s/ CHRISTOPHER J. CALHOUN            
**Christopher J. Calhoun**  
Chief Executive Officer

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

<u>SIGNATURE</u>	<u>TITLE</u>	<u>DATE</u>
* _____ <b>Ronald D. Henriksen</b>	Chairman of the Board of Directors	October 7, 2010
/s/ CHRISTOPHER J. CALHOUN _____ <b>Christopher J. Calhoun</b>	Chief Executive Officer, Vice-Chairman, Director (Principal Executive Officer)	October 7, 2010
* _____ <b>Marc H. Hedrick, MD</b>	President, Director	October 7, 2010
/s/ MARK E. SAAD _____ <b>Mark E. Saad</b>	Chief Financial Officer (Principal Financial Officer)	October 7, 2010
* _____ <b>John W. Townsend</b>	Chief Accounting Officer (Principal Accounting Officer)	October 7, 2010
* _____ <b>Richard J. Hawkins</b>	Director	October 7, 2010
* _____ <b>Paul W. Hawran</b>	Director	October 7, 2010
* _____ <b>E. Carmack Holmes, MD</b>	Director	October 7, 2010
* _____ <b>David M. Rickey</b>	Director	October 7, 2010

\*By:           /s/ CHRISTOPHER J. CALHOUN            
**Christopher J. Calhoun, Attorney-in-Fact**

## EXHIBIT INDEX

<u>Exhibit Number</u>	<u>Description</u>
5.1	Opinion of DLA Piper LLP (US)
23.1	Consent of KPMG LLP, independent registered public accounting firm
23.2	Consent of DLA Piper LLP (US) (included in Exhibit 5.1)
24.1	Power of Attorney*

\* Previously filed with the registrant's registration statement on Form S-3 (File No. 333-157023).

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

**Re: Registration Statement on Form S-3 (File No. 333-157023)**

Ladies and Gentlemen:

We have acted as counsel to Cytori Therapeutics, Inc., a Delaware corporation (the “**Company**”), in connection with the filing of a Registration Statement on Form S-3 filed on October 7, 2010 (the “**Registration Statement**”), filed pursuant to Rule 462(b) under the Securities Act of 1933, as amended (the “**Securities Act**”). The Registration Statement is being filed to register additional securities pursuant to Rule 462(b) for the offering related to the Company’s Registration Statement on Form S-3 (Commission File No. 333-157023) declared effective February 11, 2009. The Registration Statement relates to the Company’s:

- (i) common stock, \$0.001 par value per share (the “**Common Stock**”);
- (ii) preferred stock, \$0.001 par value per share (the “**Preferred Stock**”);
- (iii) senior debt securities (the “**Senior Debt Securities**”);
- (iv) subordinated debt securities (the “**Subordinated Debt Securities**” and, together with the Senior Debt Securities, the “**Debt Securities**”);
- (v) warrants representing rights to purchase Common Stock, Preferred Stock, or Debt Securities (the “**Warrants**”); and
- (vi) units comprised of one or more Debt Securities, shares of Common Stock, shares of Preferred Stock, or Warrants in any combination (the “**Units**”).

Collectively, the Common Stock, the Preferred Stock, the Debt Securities, the Warrants, and the Units are referred to herein as the “**Securities**”; all of which may be issued from time to time on a delayed or continuous basis pursuant to Rule 415 under the Securities Act at an aggregate initial offering price not to exceed \$3,501,568.

We have been advised by the Company that:

1. The rights, preferences, privileges and restrictions, including voting rights, dividend rights, conversion rights, redemption privileges and liquidation privileges of each series of Preferred Stock will be set forth in a certificate of designation to be approved by the Company's Board of Directors, or in an amendment to the Company's Amended and Restated Certificate of Incorporation to be approved by the Company's Board of Directors and stockholders, and that one or both of these documents will be filed either as an exhibit to an amendment to the Registration Statement to be filed after the date of this opinion or as an exhibit to a Current Report on Form 8-K to be filed after the Registration Statement has become effective;

2. The Senior Debt Securities may be issued pursuant to an indenture between the Company and a trustee to be named in such indenture, which indenture will be filed either as an exhibit to an amendment to the Registration Statement to be filed after the date of this opinion or as an exhibit to a Current Report on Form 8-K to be filed after the Registration Statement has become effective;

3. The Subordinated Debt Securities may be issued pursuant to an indenture between the Company and a trustee to be named in such indenture, which indenture will be filed either as an exhibit to an amendment to the Registration Statement to be filed after the date of this opinion or as an exhibit to a Current Report on Form 8-K to be filed after the Registration Statement has become effective;

4. The particular terms of any Debt Securities will be set forth in a supplement to the prospectus forming a part of the Registration Statement;

5. Warrants may be issued pursuant to a warrant agreement to be entered into between the Company and a financial institution as warrant agent or directly issued by the Company to the purchasers of such Warrants (in each case, the "**Warrant Agreement**"). The Warrant Agreement will be filed either as an exhibit to an amendment to the Registration Statement to be filed after the date of this opinion or as an exhibit to a Current Report on Form 8-K to be filed after the Registration Statement has become effective, and the particular terms of any series of Warrants will be set forth in a supplement to the prospectus forming a part of the Registration Statement; and

6. Units may be issued pursuant to a unit agreement to be entered into between the Company and a financial institution as unit agent or directly issued by the Company to the purchasers of such Units (in each case, the "**Unit Agreement**"). The Unit Agreement will be filed either as an exhibit to an amendment to the Registration Statement to be filed after the date of this opinion or as an exhibit to a Current Report on Form 8-K to be filed after the Registration Statement has become effective, and the particular terms of any series of Units will be set forth in a supplement to the prospectus forming a part of the Registration Statement.

In rendering the opinions set forth below, we have assumed that (i) all information contained in all documents reviewed by us is true and correct; (ii) all signatures on all documents examined by us are genuine; (iii) all documents submitted to us as originals are authentic and all documents submitted to us as copies conform to the originals of those documents; (iv) each natural person signing any document reviewed by us had the legal capacity to do so; (v) the Registration Statement, and any further amendments thereto (including post-effective amendments) will have become effective and comply with all applicable laws; (vi) a prospectus supplement will have been prepared and filed with the Commission describing the Securities offered thereby; (vii) all Securities will be issued and sold in compliance with applicable federal and state securities laws and in the manner stated in the Registration Statement and the applicable prospectus supplement; (viii) a definitive purchase, underwriting or similar agreement with respect to any Securities offered will have been duly authorized and validly executed and delivered by the Company and the other parties thereto; (ix) the Company has reserved from its authorized but unissued and unreserved shares of stock a number sufficient to issue all Securities; (x) the certificates representing the Securities will be duly executed and delivered; and (xi) if the holders of the Debt Securities are granted rights to inspect corporate books and records and to vote in the election of directors or any matters on which stockholders of the Company may vote, such rights are set forth in the Company's Amended and Restated Certificate of Incorporation or the Amended and Restated Certificate of Incorporation grants to the Company's Board of Directors the power to confer such voting or inspection rights and the Company's Board of Directors has conferred such rights.

We have examined the Registration Statement, including the exhibits thereto, and such other documents, corporate records, and instruments and have examined such laws and regulations as we have deemed necessary for purposes of rendering the opinions set forth herein. Based upon such examination and subject to the further provisions hereof, we are of the following opinion:

1. The Common Stock will be validly issued, fully paid and nonassessable, *provided that* (i) the Company's Board of Directors or an authorized committee thereof has specifically authorized the issuance of such Common Stock in exchange for consideration that the Board of Directors or such committee determines as adequate and in excess of the par value of such Common Stock ("**Common Stock Authorizing Resolutions**"), (ii) the terms of the offer, issuance and sale of shares of Common Stock have been duly established in conformity with the Company's Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws and do not violate any applicable law or result in a default under or breach of any agreement or instrument binding on the Company and comply with any requirement or restriction imposed by any court or governmental body having jurisdiction over the Company and (iii) the Company has received the consideration provided for in the applicable Common Stock Authorizing Resolutions.

2. The Preferred Stock will be validly issued, fully paid and nonassessable, *provided that* (i) the Company's Board of Directors or an authorized committee thereof has specifically authorized the issuance of such Preferred Stock in exchange for consideration that the Board of Directors or such committee determines as adequate and in excess of the par value of such Preferred Stock ("**Preferred Stock Authorizing Resolutions**"), (ii) the rights, preferences, privileges and restrictions of the Preferred Stock have been established in conformity with applicable law, (iii) an appropriate certificate of designation approved by the Company's Board of Directors, or an amendment to the Company's Amended and Restated Certificate of Incorporation approved by the Company's Board of Directors and stockholders, has been duly filed with the State of Delaware, (iv) the terms of the offer, issuance and sale of shares of such class or series of Preferred Stock have been duly established in conformity with the Company's Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws and do not violate any applicable law or result in a default under or breach of any agreement or instrument binding upon the Company and comply with any requirement or restriction imposed by any court or governmental body having jurisdiction over the Company, and (v) the Company has received the consideration provided for in the applicable Preferred Stock Authorizing Resolutions.

3. The Debt Securities will constitute valid and legally binding obligations of the Company, *provided that* (i) the Company's Board of Directors or an authorized committee thereof has specifically authorized the issuance of such Debt Securities in exchange for consideration that the Board of Directors or such committee determines as adequate ("**Debt Securities Authorizing Resolutions**"), (ii) the applicable indenture conforms with applicable law and is enforceable in accordance with its terms, (iii) the terms of the Debt Securities and of the offer, issuance and sale of such Debt Securities have been duly established in conformity with the applicable indenture, the Company's Amended and Restated Certificate of Incorporation and the applicable Debt Securities Authorizing Resolutions and do not violate any applicable law or result in a default under or breach of any agreement or instrument binding upon the Company and comply with any requirement or restriction imposed by any court or governmental body having jurisdiction over the Company, (iv) such Debt Securities have been duly executed and authenticated in accordance with the applicable indenture and offered, issued and sold as contemplated in the Registration Statement, and (v) the Company has received the consideration provided for in the applicable Debt Securities Authorizing Resolutions.



4. The Warrants will constitute valid and legally binding obligations of the Company, *provided that* (i) the Company's Board of Directors or an authorized committee thereof has specifically authorized the issuance of such Warrants in exchange for consideration that the Board of Directors or such committee determines as adequate ("**Warrant Authorizing Resolutions**"), which include the terms upon which the Warrants are to be issued, their form and content and the consideration for which shares are to be issued upon exercise of the Warrants, (ii) the Warrant Agreement relating to the Warrants has been duly authorized, executed and delivered and is enforceable in accordance with its terms, (iii) the terms of the offer, issuance and sale of such Warrants have been duly established in conformity with the applicable Warrant Agreement and the applicable Warrant Authorizing Resolutions, (iv) the Warrant Agreement and the offer, issuance and sale of the Warrants do not violate any applicable law or result in a default under or breach of any agreement or instrument binding upon the Company and comply with any requirement or restriction imposed by any court or governmental body having jurisdiction over the Company, (v) such Warrants have been duly executed and countersigned in accordance with the Warrant Agreement and offered, issued and sold as contemplated in the Registration Statement, the applicable Warrant Authorizing Resolutions and the Warrant Agreement, and (vi) the Company has received the consideration provided for in the applicable Warrant Authorizing Resolutions.

5. Units will constitute valid and legally binding obligations of the Company, *provided that* (i) the Company's Board of Directors or an authorized committee thereof has specifically authorized the issuance of such Units in exchange for consideration that the Board of Directors or such committee determines as adequate ("**Unit Authorizing Resolutions**"), which include the terms upon which the Units are to be issued, their form and content and the consideration for which the Units and any securities issuable upon exercise of any warrants included in the Units are to be issued, (ii) the Unit Agreement relating to the Units has been duly authorized, executed and delivered and is enforceable in accordance with its terms, (iii) the terms of the offer, issuance and sale of such Units have been duly established in conformity with the Unit Agreement and the Unit Authorizing Resolutions, (iv) the Unit Agreement and the offer, issuance and sale of the Units do not violate any applicable law or result in a default under or breach of any agreement or instrument binding upon the Company and comply with any requirement or restriction imposed by any court or governmental body having jurisdiction over the Company, (v) such Units have been duly executed and countersigned in accordance with the Unit Agreement and offered, issued and sold as contemplated in the Registration Statement, the applicable Unit Authorizing Resolutions and the Unit Agreement, and (vi) the Company has received the consideration provided for in the applicable Unit Authorizing Resolutions.

The foregoing opinions are qualified to the extent that the enforceability of any document, instrument or the Securities may be limited by or subject to bankruptcy, insolvency, fraudulent transfer or conveyance, reorganization, moratorium or other similar laws relating to or affecting creditors' rights generally, and general equitable or public policy principles.

We express no opinions concerning (i) the validity or enforceability of any provisions contained in indentures that purport to waive or not give effect to rights to notices, defenses, subrogation or other rights or benefits that cannot be effectively waived under applicable law; (ii) the validity or enforceability of any provisions contained in Warrant Agreements or Unit Agreements that purport to waive or not give effect to rights to notices, defenses, subrogation or other rights or benefits that cannot be effectively waived under applicable law; or (iii) any securities (other than shares of common stock) into which the Preferred Stock, the Debt Securities, the Warrants, and the securities comprising the Units may be convertible or exercisable.

In providing this opinion, we have relied as to certain matters on information obtained from public officials and officers of the Company.

We hereby consent to the filing of this opinion as an exhibit to the Registration Statement and the reference to us under the caption "Legal Matters" in the prospectus included in the Registration Statement. In giving this consent, we do not admit that we are within the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the Securities and Exchange Commission promulgated thereunder.

This opinion letter is given to you solely for use in connection with the offer and sale of the Securities while the Registration Statement is in effect and is not to be relied upon for any other purpose. Our opinion is expressly limited to the matters set forth above, and we render no opinion, whether by implication or otherwise, as to any other matters relating to the Company, the Securities or the Registration Statement.

Very truly yours,

/s/ DLA Piper LLP (US)

DLA Piper LLP (US)

**Consent of Independent Registered Public Accounting Firm**

The Board of Directors  
Cytori Therapeutics, Inc:

We consent to the use of our reports dated March 12, 2010, with respect to the consolidated balance sheets of Cytori Therapeutics, Inc. and subsidiaries (the Company) as of December 31, 2009 and 2008, the related consolidated statements of operations and comprehensive loss, stockholders' deficit, and cash flows for each of the years in the three-year period ended December 31, 2009, and the related financial statement schedule of valuation and qualifying accounts, and the effectiveness of internal control over financial reporting of Cytori Therapeutics, Inc. as of December 31, 2009, incorporated by reference herein and to the reference to our firm under the heading "Experts" in the prospectus.

Our report on the consolidated financial statements dated March 12, 2010 refers to a change in the Company's method of accounting for certain warrants due to the adoption of a new accounting pronouncement in 2009.

/s/ KPMG LLP

San Diego, California  
October 7, 2010