

SCHEDULE 14A
(Rule 14a-101)
INFORMATION REQUIRED IN PROXY STATEMENT
SCHEDULE 14A INFORMATION

Proxy Statement Pursuant to Section 14(a) of the
Securities Exchange Act of 1934

Filed by the registrant

Filed by a Party other than the registrant

Check the appropriate box:

- Preliminary proxy statement
- Confidential, for use of the commission only (as permitted by Rule 14a-6(e)(2))**
- Definitive proxy statement
- Definitive additional materials
- Soliciting material under Rule 14a-12

XCYTE THERAPIES, INC.
(Name of Registrant as Specified in Its Charter)

(Name of Person(s) Filing Proxy Statement, if other than the Registrant)

Payment of Filing Fee (Check the appropriate box):

- No fee required.
- Fee computed on table below per Exchange Act Rules 14a-6(i)(1) and 0-11.

(1) Title of each class of securities to which transaction applies:

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(3) Per unit price or other underlying value of transaction computed pursuant to Exchange Act Rule 0-11 (set forth the amount on which the filing fee is calculated and state how it was determined):

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- Check box if any part of the fee is offset as provided by Exchange Act Rule 0-11(a)(2) and identify the filing for which the offsetting fee was paid previously. Identify the previous filing by registration statement number, or the form or schedule and the date of its filing.

(1) Amount Previously Paid:

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Xcyte Therapies and Invitrogen Announce Signing of Asset Purchase Agreement

Invitrogen to Acquire Xcyte's T Cell Expansion Technology

SEATTLE & CARLSBAD, Calif. — Dec. 15, 2005 — Xcyte Therapies, Inc. (Xcyte) (Nasdaq:XCYT) (Nasdaq:XCYP) and Invitrogen Corporation (Nasdaq:IVGN) today announced they have entered into a definitive agreement for Invitrogen to acquire Xcyte's T cell expansion technology, known as the "Xcellerate Process." The acquired assets will include intellectual property, the clinical data generated by Xcyte in the course of six clinical trials of its lead product, Xcellerated T Cells, as well as raw materials and equipment.

Under the terms of the definitive agreement, upon the closing of the transaction Invitrogen will make a \$5 million cash payment to Xcyte. In addition, Xcyte is entitled to receive a percentage of any sublicensing revenue Invitrogen derives from the further licensing of Xcyte's intellectual property for therapeutic purposes, subject to certain minimum revenue requirements.

"Xcyte has had a long and productive collaboration with Dynal Biotech for the production of Xcyte Dynabeads, the proprietary magnetic bead Xcyte has used to expand and activate T cells for potential therapeutic indications in oncology and infectious disease," said Robert L. Kirkman, M.D., Acting President and Chief Executive Officer of Xcyte. "With Xcyte's decision earlier this year to pursue a new strategic direction and Invitrogen's acquisition of Dynal, Invitrogen was our first choice to acquire the Xcellerate Technology. We are very pleased that they have agreed to do so and will continue to make this exciting and important approach to immunotherapy available to the research community."

"To Invitrogen, this transaction represents a cornerstone in a broader effort to substantially increase our offering to customers working within immunotherapy. We firmly believe T-cell based therapy will become an important contributor in the efforts to fight disease in the future," said Dr. Oystein Amellem, Business Area Manager for Invitrogen's Dynal Bead Based Separation group. "Expansion of T cells ex vivo using Dynabeads(R) to which anti-CD3 and anti-CD28 monoclonal antibodies are linked may prove useful for the treatment of cancer, infectious diseases and recently autoimmune diseases. We are very excited to be able to bring this unique technology to our customers in the emerging field of cell-based immunotherapy."

The transaction is subject to certain customary closing conditions, including the approval of Xcyte's stockholders.

Additional Information

Xcyte today separately announced an agreement to acquire all of the capital stock of Cyclacel Limited, a wholly-owned subsidiary of Cyclacel Group plc. In conjunction with that transaction, Xcyte plans to file a registration statement containing a proxy statement/prospectus with the Securities and Exchange Commission. Xcyte will also include in its proxy statement/prospectus a resolution for stockholder approval of the sale of its T cell expansion technology to Invitrogen Corporation. XCYTE'S STOCKHOLDERS AND OTHER INVESTORS ARE ENCOURAGED TO READ THE PROXY STATEMENT/PROSPECTUS, INCLUDING ANY SUBSEQUENT AMENDMENTS OR SUPPLEMENTS TO THE PROXY STATEMENT/PROSPECTUS, WHEN IT BECOMES AVAILABLE, AS IT WILL CONTAIN IMPORTANT INFORMATION. Copies of the proxy statement/prospectus will be available free of charge at the Securities and Exchange Commission website (www.sec.gov) or from Xcyte Therapies, Inc., 1124 Columbia Street, Suite 130, Seattle, WA 98104, Attention: Investor Relations, Telephone: 206-262-6200.

Xcyte and its executive officers and directors may be deemed to be participants in the solicitation of proxies from stockholders of Xcyte with respect to the proposed transactions. Information regarding such officers and directors is included in Xcyte's proxy statement for its 2005 Annual Meeting of Stockholders filed with the Securities and Exchange Commission on April 29, 2005, and will be included in the proxy statement/prospectus referred to above. These documents are or will be available free of charge at the Securities and Exchange Commission website (www.sec.gov) or from Investor Relations at Xcyte at the address referred to above.

Forward-Looking Statements

Certain statements contained in this press release are considered "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995, and it is Xcyte's and Invitrogen's intent that such statements be protected by the safe harbor created thereby. Forward-looking statements include, but are not limited to, statements regarding the proposed acquisition by Invitrogen of Xcyte's T cell expansion technology, the purchase price payments to be made upon the closing of such transaction and that Xcyte will issue a proxy statement/prospectus seeking stockholder approval. Such forward-looking statements are subject to a number of risks, uncertainties and other factors that could cause actual results to differ materially from future results expressed or implied by such forward-looking statements. Potential risks and uncertainties include, but are not limited to, the risks that Xcyte's stockholders will not approve the proposed transaction, the failure to obtain required regulatory approvals, if any, that the closing of the transaction will be delayed or the transaction will not close, that the purchase price payment will not be made or that Xcyte and Cyclacel will not consummate their proposed transaction. Further information about the risks and uncertainties faced by both Xcyte Therapies and Invitrogen Corporation is contained in their respective periodic filings with the Securities and Exchange Commission.

About Xcyte Therapies

From its inception in 1996 until early July 2005, Xcyte Therapies devoted substantially all of its efforts to the research and development of therapies that harness the power of the immune system to treat cancer and other serious illnesses. Xcyte derived its therapeutic products from a patient's own T cells, which are cells of the immune system that orchestrate immune responses and can detect and eliminate cancer cells and infected cells in the body. Xcyte used its patented and proprietary Xcellerate Technology to generate activated T cells, called Xcellerated T Cells, from blood that is collected from the patient. Activated T cells are T cells that have been stimulated to carry out immune functions. The Xcellerate Technology is designed to rapidly activate and expand the number of the patient's T cells outside of the body. These Xcellerated T Cells are then administered to the patient.

About Invitrogen

Invitrogen Corporation (Nasdaq:IVGN) provides products and services that support academic and government research institutions and pharmaceutical and biotech companies worldwide in their efforts to improve the human condition. The company provides essential life science technologies for disease research, drug discovery and commercial bio-production. Invitrogen's own research and development efforts are focused on breakthrough innovation in all major areas of biological discovery, including functional genomics, proteomics, bio-informatics and cell biology, placing Invitrogen's products in nearly every major laboratory in the world. Founded in 1987, Invitrogen is headquartered in Carlsbad, Calif., and conducts business in more than 70 countries around the world. The company globally employs approximately 4,800 scientists and other

professionals, and had revenues in excess of \$1 billion in 2004. Information about Invitrogen is available on the Web at www.invitrogen.com.

Xcyte(R), Xcellerate(R) and Xcellerated T Cells(R) are registered trademarks and Xcyte Therapies(TM) is a trademark of Xcyte Therapies, Inc.

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