

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549

SCHEDULE 13D

(Amendment No. __)*

Under the Securities Exchange Act of 1934

ZIOPHARM ONCOLOGY, INC.

(Name of Issuer)

Common Stock, par value \$0.001 per share

(Title of Class of Securities)

98973P101

(CUSIP Number)

Third Security, LLC
1881 Grove Avenue
Radford, Virginia 24141
Attention: Marcus E. Smith, Esq.
(540) 633-7900

(Name, Address and Telephone Number of Person
Authorized to Receive Notices and Communications)

Copy to:
Intrexon Corporation
Attention: Legal
20358 Seneca Meadows Parkway
Germantown, Maryland 20876
(301) 556-9809

January 12, 2011

(Date of Event which Requires Filing of this Statement)

If the filing person has previously filed a statement on Schedule 13G to report the acquisition which is the subject of this Schedule 13D, and is filing this schedule because of Rule 13d-1(b)(3) or (4), check the following box .

NOTE: Schedules filed in paper format shall include a signed original and five copies of the schedule, including all exhibits. See §240.13d-7 for other parties to whom copies are to be sent.

* The remainder of this cover page shall be filled out for a reporting person's initial filing on this form with respect to the subject class of securities, and for any subsequent amendment containing information which would alter disclosures provided in a prior cover page.

The information required on the remainder of this cover page shall not be deemed to be "filed" for the purpose of Section 18 of the Securities Exchange Act of 1934 ("Act") or otherwise subject to the liabilities of that section of the Act but shall be subject to all other provisions of the Act (however, see the Notes).

1	NAMES OF REPORTING PERSONS I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS Randal J. Kirk		
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF GROUP (a) <input type="radio"/> (b) <input checked="" type="radio"/>		
3	SEC USE ONLY		
4	SOURCE OF FUNDS PF		
5	CHECK IF DISCLOSURE OF LEGAL PROCEEDINGS IS REQUIRED PURSUANT TO ITEM 2(d) OR 2(e)		0
6	CITIZENSHIP OR PLACE OF ORGANIZATION United States		
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	7	SOLE VOTING POWER 25,000	
	8	SHARED VOTING POWER 6,063,161	
	9	SOLE DISPOSITIVE POWER 25,000	
	10	SHARED DISPOSITIVE POWER 6,063,161	
11	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON 6,088,161		
12	CHECK IF THE AGGREGATE AMOUNT IN ROW (11) EXCLUDES CERTAIN SHARES		0
13	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (11) 11.1%		
14	TYPE OF REPORTING PERSON IN		

1	NAMES OF REPORTING PERSONS I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS Intrexon Corporation I.R.S. IDENTIFICATION NO.: 26-0084895		
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF GROUP (a) <input type="radio"/> (b) <input checked="" type="radio"/>		
3	SEC USE ONLY		
4	SOURCE OF FUNDS WC		
5	CHECK IF DISCLOSURE OF LEGAL PROCEEDINGS IS REQUIRED PURSUANT TO ITEM 2(d) OR 2(e)		0
6	CITIZENSHIP OR PLACE OF ORGANIZATION Virginia		
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	7	SOLE VOTING POWER 0	
	8	SHARED VOTING POWER 6,063,161	
	9	SOLE DISPOSITIVE POWER 0	
	10	SHARED DISPOSITIVE POWER 6,063,161	
11	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON 6,063,161		
12	CHECK IF THE AGGREGATE AMOUNT IN ROW (11) EXCLUDES CERTAIN SHARES		0
13	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (11) 11.1%		
14	TYPE OF REPORTING PERSON CO		

Item 1. Security and Issuer.

The class of equity securities to which this Statement on Schedule 13D (the "Statement"), relates is the common stock, par value \$0.001 per share (the "Common Stock"), of ZIOPHARM Oncology, Inc., a Delaware corporation (the "Company"), whose principal executive offices are located at 1180 Avenue of the Americas, 19th Floor, New York, New York 10036.

Item 2. Identity and Background.

This Statement is being filed on behalf of Mr. Randal J. Kirk ("Mr. Kirk") and Intrexon Corporation, a Virginia corporation that is controlled by Mr. Kirk ("Intrexon" and, together with Mr. Kirk, the "Reporting Persons").

(a)-(c) The address of the principal business office of Mr. Kirk is The Governor Tyler, 1881 Grove Avenue, Radford, Virginia 24141. The address of the principal business office of Intrexon is 20358 Seneca Meadows Parkway, Germantown, Maryland 20876. The present principal occupation/employment of Mr. Kirk is as the Senior Managing Director of Third Security, LLC, an investment management firm founded by Mr. Kirk. Mr. Kirk also serves as the Chairman and CEO of Intrexon. The principal business of Intrexon is employing modular DNA control systems to enhance capabilities, improve safety and lower cost in human therapeutics, protein production, industrial products and agricultural biotechnology.

(d)-(e) During the last five years, none of the Reporting Persons has been convicted in a criminal proceeding (excluding traffic violations or similar misdemeanors) or been a party to a civil proceeding of a judicial or administrative body of competent jurisdiction and as a result of such proceeding is or was subject to a judgment, decree or final order enjoining future violations of, or prohibiting or mandating activities subject to, federal or state securities laws or finding any violation with respect to such laws.

(f) Mr. Kirk is a citizen of the United States. Intrexon is a corporation organized under the laws of the Commonwealth of Virginia.

Item 3. Source and Amount of Funds or Other Consideration.

On January 6, 2011, the Company entered into an Exclusive Channel Partner Agreement (the "Channel Agreement") with Intrexon that governs a "channel partnering" arrangement in which the Company will use Intrexon's technology directed towards in vivo expression of effectors in connection with the development of two existing clinical-stage product candidates and generally to research, develop and commercialize products, in each case in which DNA is administered to humans for expression of anti-cancer effectors for the purpose of treatment or prophylaxis of cancer. In connection therewith, on January 6, 2011, the Company entered into a Stock Purchase Agreement with Intrexon pursuant to which Intrexon agreed to purchase a number of shares of Common Stock equal to 5.00% of the number of shares of Common Stock issued and outstanding immediately prior to the issuance of such shares (the "Purchase Shares"), at a purchase price equal to \$4.80 per share. At the same time, the Company agreed to issue to Intrexon a number of additional shares of Common Stock equal to 7.495% of the number of shares of Common Stock issued and outstanding prior to such issuance (the "First Tranche Shares") at a purchase price equal to the \$0.001 par value of such shares, which price was deemed paid in partial consideration for the execution and delivery of the Channel Agreement. The closing of the purchase of the Purchase Shares and the First Tranche Shares occurred on January 12, 2011 and in connection therewith the Company issued to Intrexon in a private placement (i) 2,426,235 shares of Common Stock as the Purchase Shares for aggregate cash consideration of \$11,645,928, reflecting a purchase price per share of \$4.80, and (ii) 3,636,926 shares of Common Stock as the First Tranche Shares at a purchase price equal to the \$0.001 par value of such shares, which price was deemed paid in partial consideration for the execution and delivery of the Channel Agreement.

The Company has also agreed to issue additional shares of Common Stock to Intrexon upon dosing of the first patient in a ZIOPHARM-conducted Phase II clinical trial in the United States, or similar study as the parties may agree in a country other than the United States, of a product that is created, produced, developed or identified directly or indirectly by the Company during the term of the Channel Agreement and that, subject to certain exceptions, involves DNA administered to humans for expression of anti-cancer effectors for the purpose of treatment or prophylaxis of cancer. Upon satisfaction of such contingency, the Company has agreed to issue to Intrexon an additional 3,636,926 shares of Common Stock (the "Second Tranche Shares"), which number of shares is equal to 7.495% of the number of shares Common Stock issued and outstanding immediately prior to the First Tranche Closing, for a purchase price equal to the \$0.001 par value of such shares, which price will be deemed paid in partial consideration for the execution and delivery of the Channel Agreement.

Under the Stock Purchase Agreement, if requested by the Company and subject to certain restrictions and limitations, Intrexon has agreed to purchase securities in conjunction with future securities offerings of the Company that constitute "Qualified Financings" and that are conducted while the Channel Agreement remains in effect. For this purpose, a "Qualified Financing" means a sale of Common Stock or equity securities convertible into Common Stock in a public or private offering, raising gross proceeds of at least \$10,000,000, where the sale of shares is either registered under the Securities Act of 1933, as amended, at the time of issuance or the Company agrees to register the resale of such shares. In conjunction with a Qualified Financing, Intrexon has committed to purchase up to 19.99% of the securities issued and sold by the Company therein (such amount to be calculated exclusive of Intrexon's purchase). Intrexon will not be obligated to purchase securities in a Qualified Financing unless the Company is then in substantial compliance with its obligations under the Channel Agreement and, with respect to a Qualified Financing that is completed following January 6, 2012, the Company confirms its intent that 40% of the net offering proceeds (the "Use of Proceeds Commitment Amount") shall have been spent, or in the next year will be spent, by the Company under the Channel Agreement. In the case of a Qualified Financing that is completed after January 6, 2012, Intrexon's purchase commitment will be further limited to an amount equal to 50% of the Use of Proceeds Commitment Amount. Intrexon's aggregate purchase commitment for all future Qualified Financings is capped at \$50,000,000.

The foregoing references to and description of the Channel Agreement and the Stock Purchase Agreement do not purport to be complete and are subject to, and are qualified in their entirety by reference to, the full text of the Channel Agreement and the Purchase Agreement, which are included as Exhibits 1 and 2 hereto, respectively, and are incorporated by reference to this Item 3.

Item 4. Purpose of Transaction.

The information set forth in Items 3 and 6 is incorporated herein by reference.

The Reporting Persons acquired the shares disclosed hereunder for investment purposes. The Reporting Persons may, from time to time, depending upon market conditions and other factors deemed relevant by the Reporting Persons, acquire shares of Common Stock or other capital stock of the Company, outside of those contemplated by the Purchase Agreement. The Reporting Persons reserve the right to, and may in the future choose to, change their purpose with respect to the investment and take such actions as they deem appropriate in light of the circumstances including, without limitation, to dispose of, in the open market, in a privately negotiated transaction, by transfer, by exchange or by gift, all or a portion of the shares of Common Stock or other securities of the Company that they now own or may hereafter acquire. Any decision of the Reporting Persons to increase their holdings in Common Stock or securities convertible into Common Stock, will depend, however, on numerous factors, including, without limitation, the price of shares of Common Stock, the terms and conditions related to their purchase and sale, the prospects and profitability of the Company, other business and investment alternatives of the Reporting Persons, tax considerations and general economic and market conditions. At any time, the Reporting Persons, or any of them, may determine to dispose of some or all of their holdings of Common Stock depending on those and other considerations.

At the date of this Statement, the Reporting Persons have plans or proposals which would result in:

- (a) The acquisition of additional securities of the Company.

Intrexon plans to acquire additional shares of Common Stock as set forth in Item 3 above.

- (d) A change in the present board of directors of the Company.

Pursuant to the Stock Purchase Agreement, effective immediately prior to the closing of the purchase of the First Tranche Shares on January 12, 2011, the Company elected Randal J. Kirk to its Board of Directors to fill an existing vacancy. In addition, the Company has agreed that at each stockholders' meeting at which directors are to be elected, it will nominate and recommend for election to the Board of Directors an individual designated by Intrexon, provided that the Board of Directors determines that he or she is a suitable candidate. If such Intrexon designee is not elected to the Board of Directors by the Company's stockholders, then, at Intrexon's election, such designee will be entitled to attend all Board of Directors and committee meetings as an observer subject to certain conditions and limitations. At such time as Intrexon controls 20% or more of the Company's stock, the Company will cause a second individual designated by Intrexon to be elected to the Board of Directors and, so long thereafter as Intrexon continues to control 20% or more of the Company's stock, at each stockholders' meeting at which directors are to be elected, the Company will nominate and recommend for election to the Board of Directors a second individual designated by Intrexon, provided that such second designee is an "independent director" under Nasdaq's listing standards and that the Board of Directors determines that he or she is a suitable candidate. The rights of Intrexon to designate director nominees discussed above will terminate upon the termination of the Channel Agreement or upon an earlier sale of the Company.

Except as described above, at the date of this Statement, each of the Reporting Persons have no present plans or proposals which would result in:

- (a) The acquisition by any person of additional securities of the Company, or the disposition of securities of the Company;
- (b) An extraordinary corporate transaction involving the Company or any of its subsidiaries;
- (c) A sale or transfer of a material amount of assets of the Company or any of its subsidiaries;
- (d) Any change in the present board of directors or management of the Company, including any plans or proposals to change the number or term of directors or to fill any existing vacancies on the board;
- (e) Any material change in the present capitalization or dividend policy of the Company;
- (f) Any other material change in the Company's business or corporate structure, including but not limited to, if the Company is a registered closed-end investment company, any plans or proposals to make any changes in its investment policy for which a vote is required by section 13 of the Investment Company Act of 1940;
- (g) Changes in the Company's charter, bylaws or instruments corresponding thereto or other actions which may impede the acquisition of control of the Company by any person;
- (h) Causing a class of securities of the Company to be delisted from a national securities exchange or to cease to be authorized to be quoted in an inter-dealer quotation system of a registered national securities association;
- (i) A class of equity securities of the Company becoming eligible for termination of registration pursuant to Section 12(g)(4) of the Securities Exchange Act of 1934; or
- (j) Any action similar to any of those actions enumerated above.

Item 5. Interest in Securities of the Issuer.

The information contained on the cover pages to this Statement and the information set forth or incorporated in Items 2, 3, 4 and 6 is incorporated herein by reference.

(a) and (b) See Items 11 and 13 of the cover pages to this Statement for the aggregate number of shares and percentage of issued and outstanding shares of Common Stock of the Company owned by the Reporting Persons. The percentage ownership is calculated based on 48,524,704 shares of Common Stock issued and outstanding as of the closing of the purchase of the Purchase Shares and the First Tranche Shares pursuant to the Stock Purchase Agreement on January 12, 2011, increased by (i) the 6,063,161 shares constituting the Purchase Shares and the First Tranche Shares and (ii) the 25,000 shares of restricted stock issued to Mr. Kirk in connection with his election to the Company's Board of Directors.

Reporting Person	Amount of Common Stock Beneficially Owned	Percent of Class	Sole Power to Vote or Direct the Vote	Shared Power to Vote or Direct the Vote	Sole Power to Dispose or to Direct the Disposition	Shared Power to Dispose or to Direct the Disposition
Randal J. Kirk	6,088,161	11.1%	25,000	6,063,161	25,000	6,063,161
Intrexon Corporation	6,063,161	11.1%	—	6,063,161	—	6,063,161

Mr. Kirk could be deemed to have indirect beneficial ownership of the shares of Common Stock directly beneficially owned by Intrexon.

(c) Except as set forth in this Item 5, none of the Reporting Persons have engaged in any transactions in the Common Stock in the past 60 days.

(d)-(e) Not Applicable

Item 6. Contracts, Arrangements, Understandings or Relationships with Respect to Securities of the Issuer.

The Reporting Persons' response to Item 4 is incorporated herein by reference.

The Stock Purchase Agreement contains a standstill provision pursuant to which, among other things, Intrexon has agreed that, for a period of three years, subject to certain exceptions and unless invited in writing by the Company to do so, neither Intrexon nor its affiliates will, directly or indirectly: (i) effect or seek, initiate, offer or propose to effect, or cause or participate in any acquisition of securities or assets of the Company; any tender or exchange offer, merger, consolidation or other business combination involving the Company; any recapitalization, restructuring, liquidation, dissolution or other extraordinary transaction with respect to the Company; or any "solicitation" of "proxies" or consents to vote any voting securities of the Company, or in any way advise or, assist any other person in doing so; (ii) form, join or in any way participate in a "group" with respect to any securities of the Company; (iii) otherwise act to seek to control or influence the management, Board of Directors or policies of the Company; provided that the Intrexon director designees, in their capacity as directors, may fully exercise their rights and duties as directors of the Company including freely communicating with the Company's executive management and Board of Directors; (iv) take any action reasonably expected to force the Company to make a public announcement regarding any such matters; or (v) enter into any agreements, discussions or arrangements with any third party with respect to any of the foregoing. Among other things and subject to certain exceptions, the standstill restrictions do not apply to the future purchase by Intrexon and/or its affiliates of up to 10% of the number of shares of Common Stock then issued and outstanding in addition to the shares issuable pursuant to the Stock Purchase Agreement.

In connection with the transactions contemplated by the Stock Purchase Agreement, on January 12, 2011, the Company and Intrexon entered into a Registration Rights Agreement pursuant to which the Company agreed to file a "resale" registration statement (the "Registration Statement") registering the resale of the Purchase Shares, the First Tranche Shares and the Second Tranche Shares within 120 days of the First Tranche Closing. Under that agreement, the Company is obligated to use its reasonable best efforts to cause the Registration Statement to be declared effective as promptly as practicable after filing and to maintain the effectiveness of the registration statement until all securities therein are sold or otherwise can be sold pursuant to Rule 144, without any restrictions.

The foregoing references to and description of the Stock Purchase Agreement and Registration Rights Agreement do not purport to be complete and are subject to, and are qualified in their entirety by reference to, the full text of the Stock Purchase Agreement and Registration Rights Agreement, which are included as Exhibits 2 and 3, respectively, and are incorporated by reference to this Item 6.

Except as set forth herein, there are no contracts, arrangements, understandings or relationships (legal or otherwise), including, but not limited to, transfer or voting of any of the securities, finder's fees, joint ventures, loan or option arrangements, puts or calls, guarantees of profits, division of profits or loss, or the giving or withholding of proxies, between the Reporting Persons, and any other person, with respect to any securities of the Company, including any securities pledged or otherwise subject to a contingency the occurrence of which would give another person voting power or investment power over such securities other than standard default and similar provisions contained in loan agreements.

Item 7. Material to be Filed as Exhibits.

- Exhibit 1 Exclusive Channel Partner Agreement by and between the Company and Intrexon dated as of January 6, 2011 (filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, dated January 6, 2011, and incorporated herein by reference)**
- Exhibit 2 Stock Purchase Agreement by and between the Company and Intrexon dated as of January 6, 2011 (filed as Exhibit 10.2 to the Company's Current Report on Form 8-K, dated January 6, 2011, and incorporated herein by reference)
- Exhibit 3 Form of Registration Rights Agreement by and between the Company and Intrexon (incorporated by reference to Exhibit A to the Stock Purchase Agreement filed as Exhibit 10.2 to the Company's Current Report on Form 8-K, dated January 6, 2011, and incorporated herein by reference)
- Exhibit 4 Joint Filing Agreement, dated as of January 20, 2011, by and between Mr. Kirk and Intrexon

**Confidential treatment has been requested as to certain portions of this exhibit pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

SIGNATURES

After reasonable inquiry and to the best of their knowledge and belief, the undersigned certify that the information set forth in this statement is true, complete and correct.

Date: January 20, 2011

/s/ Randal J. Kirk

Randal J. Kirk

INTREXON CORPORATION

By: /s/ Randal J. Kirk

Randal J. Kirk

Chief Executive Officer

EXHIBIT INDEX

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- Exhibit 3 Form of Registration Rights Agreement by and between the Company and Intrexon (incorporated by reference to Exhibit A to the Stock Purchase Agreement filed as Exhibit 10.2 to the Company's Current Report on Form 8-K, dated January 6, 2011, and incorporated herein by reference)
- [Exhibit 4](#) Joint Filing Agreement, dated as of January 20, 2011, by and between Mr. Kirk and Intrexon

**Confidential treatment has been requested as to certain portions of this exhibit pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

Joint Filing Agreement

In accordance with Rule 13d-1(k) promulgated under the Securities Exchange Act of 1934, as amended, the persons named below agree to the joint filing on behalf of each of them a Statement on Schedule 13D (including amendments thereto) with regard to the common stock of ZIOPHARM Oncology, Inc., and further agree that this Joint Filing Agreement be included as an exhibit to such joint filings. In evidence thereof, the undersigned, being duly authorized, hereby execute this agreement as of the 20th day of January, 2011.

/s/ Randal J. Kirk

Randal J. Kirk

INTREXON CORPORATION

By: /s/ Randal J. Kirk

Randal J. Kirk

Chief Executive Officer
