

SECURITIES AND EXCHANGE COMMISSION  
Washington, DC 20549

**SCHEDULE 13G**  
**(Rule 13d-102)**

INFORMATION TO BE INCLUDED IN STATEMENTS FILED PURSUANT  
TO RULES 13d-1(b) (c) AND (d) AND AMENDMENTS THERETO FILED  
PURSUANT TO 13d-2(b)

(Amendment No. 2)\*

**Targacept, Inc.**

(Name of Issuer)

**Common Stock**

(Title of Class of Securities)

**87611R306**

(CUSIP Number)

**December 31, 2008**

(Date of Event Which Requires Filing of this Statement)

Check the appropriate box to designate the rule pursuant to which this Schedule is filed:

- Rule 13d-1(b)
- Rule 13d-1(c)
- Rule 13d-1(d)

\*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 the 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 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 NAME OF REPORTING PERSON:

**Biotechnology Value Fund, L.P.**

I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS (ENTITIES ONLY):

2 CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP\*

(a)

(b)

3 SEC USE ONLY

4 CITIZENSHIP OR PLACE OF ORGANIZATION

**Delaware**

NUMBER OF SHARES	5 SOLE VOTING POWER
	<b>0</b>
BENEFICIALLY OWNED	6 SHARED VOTING POWER
BY	<b>472,301</b>
EACH	7 SOLE DISPOSITIVE POWER
REPORTING	<b>0</b>
PERSON	8 SHARED DISPOSITIVE POWER
WITH:	<b>472,301</b>

9 AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON

**472,301**

10 CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES\*

11 PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)

**1.89%**

12 TYPE OF REPORTING PERSON\*

1 NAME OF REPORTING PERSON:

**Biotechnology Value Fund II, L.P.**

I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS (ENTITIES ONLY):

2 CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP\*

(a)

(b)

3 SEC USE ONLY

4 CITIZENSHIP OR PLACE OF ORGANIZATION

**Delaware**

NUMBER OF SHARES	5	SOLE VOTING POWER	<b>0</b>
BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH:	6	SHARED VOTING POWER	<b>317,300</b>
	7	SOLE DISPOSITIVE POWER	<b>0</b>
	8	SHARED DISPOSITIVE POWER	<b>317,300</b>

9 AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON

**317,300**

10 CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES\*

11 PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)

**1.27%**

12 TYPE OF REPORTING PERSON\*

**PN**

1 NAME OF REPORTING PERSON:  
**BVF Investments, L.L.C.**  
I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS (ENTITIES ONLY):

2 CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP\* (a)  X  
(b)  0

3 SEC USE ONLY

4 CITIZENSHIP OR PLACE OF ORGANIZATION  
**Delaware**

NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH:	5	SOLE VOTING POWER	<b>0</b>
	6	SHARED VOTING POWER	<b>1,160,800</b>
	7	SOLE DISPOSITIVE POWER	<b>0</b>
	8	SHARED DISPOSITIVE POWER	<b>1,160,800</b>

9 AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  
**1,160,800**

10 CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES\*  0

11 PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)  
**4.65%**

12 TYPE OF REPORTING PERSON\*  
**00**

1 NAME OF REPORTING PERSON:

**Investment 10, L.L.C.**

I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS (ENTITIES ONLY):

2 CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP\*

(a)

(b)

3 SEC USE ONLY

4 CITIZENSHIP OR PLACE OF ORGANIZATION

**Illinois**

NUMBER OF SHARES	5 SOLE VOTING POWER
	<b>0</b>
BENEFICIALLY OWNED	6 SHARED VOTING POWER
BY	<b>136,600</b>
EACH	7 SOLE DISPOSITIVE POWER
REPORTING	<b>0</b>
PERSON	
WITH:	8 SHARED DISPOSITIVE POWER
	<b>136,600</b>

9 AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON

**136,600**

10 CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES\*

11 PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)

**0.55%**

12 TYPE OF REPORTING PERSON\*

**OO**

1 NAME OF REPORTING PERSON:  
**BVF Partners L.P.**  
I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS (ENTITIES ONLY):

2 CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP\* (a)  X  
(b)  0

3 SEC USE ONLY

4 CITIZENSHIP OR PLACE OF ORGANIZATION  
**Delaware**

NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH:	5 SOLE VOTING POWER <b>0</b>
	6 SHARED VOTING POWER <b>2,087,001</b>
	7 SOLE DISPOSITIVE POWER <b>0</b>
	8 SHARED DISPOSITIVE POWER <b>2,087,001</b>

9 AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  
**2,087,001**

10 CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES\*  0

11 PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)  
**8.36%**

12 TYPE OF REPORTING PERSON\*  
**PN**

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1 NAME OF REPORTING PERSON:  
**BVF Inc.**  
S.S. OR I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS (ENTITIES ONLY):

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2 CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP\* (a)  X  
(b)  0

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3 SEC USE ONLY

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4 CITIZENSHIP OR PLACE OF ORGANIZATION  
**Delaware**

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NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH:	5	SOLE VOTING POWER	<b>0</b>
	6	SHARED VOTING POWER	<b>2,087,001</b>
	7	SOLE DISPOSITIVE POWER	<b>0</b>
	8	SHARED DISPOSITIVE POWER	<b>2,087,001</b>

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9 AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  
**2,087,001**

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10 CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES\*  0

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11 PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)  
**8.36%**

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12 TYPE OF REPORTING PERSON\*  
**IA, CO**

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**ITEM 1(a). NAME OF ISSUER:**

Targacept, Inc. ("TRGT")

**ITEM 1(b). ADDRESS OF ISSUER'S PRINCIPAL EXECUTIVE OFFICES:**

200 East First Street, Suite 300  
Winston-Salem, North Carolina 27101

**ITEM 2(a). NAME OF PERSON FILING:**

This Amendment No. 2 to Schedule 13G is being filed on behalf of the following persons (the "Reporting Persons"):

- (i) Biotechnology Value Fund, L.P. ("BVF")
- (ii) Biotechnology Value Fund II, L.P. ("BVF2")
- (iii) BVF Investments, L.L.C. ("Investments")
- (iv) Investment 10, L.L.C. ("ILL10")
- (v) BVF Partners L.P. ("Partners")
- (vi) BVF Inc. ("BVF Inc.")

**ITEM 2(b). ADDRESS OF PRINCIPAL BUSINESS OFFICE:**

The principal business office of the Reporting Persons comprising the group filing this Amendment No. 2 to Schedule 13G is located at 900 North Michigan Avenue, Suite 1100, Chicago, Illinois, 60611.

**ITEM 2(c). CITIZENSHIP:**

BVF:	a Delaware limited partnership
BVF2:	a Delaware limited partnership
Investments:	a Delaware limited liability company
ILL10:	an Illinois limited liability company
Partners:	a Delaware limited partnership
BVF Inc.:	a Delaware corporation

**ITEM 2(d). TITLE OF CLASS OF SECURITIES:**

This Amendment No. 2 to Schedule 13G is being filed with respect to the common stock, par value \$0.001 per share ("Common Stock"), of TRGT. The Reporting Persons' percentage ownership of Common Stock is based on 24,964,373 shares of Common Stock being outstanding.

As of December 31, 2008, BVF beneficially owned 472,301 shares of Common Stock, BVF2 beneficially owned 317,300 shares of Common Stock, Investments beneficially owned 1,160,800 shares of Common Stock and ILL10 beneficially owned 136,600 shares of Common Stock. Beneficial ownership by Partners and BVF Inc. includes 2,087,001 shares of Common Stock.

**ITEM 2(e). CUSIP Number: 87611R306****ITEM 3. IF THIS STATEMENT IS FILED PURSUANT TO RULE 13d-1(b), or 13d-2(b) or (c) CHECK WHETHER THE PERSON FILING IS: One of the following**

Not applicable as this Amendment No. 2 to Schedule 13G is filed pursuant to Rule 13d-1(c).

**ITEM 4. OWNERSHIP:**

The information in items 1 and 5 through 11 on the cover pages (pp. 2 - 7) on this Amendment No. 2 to Schedule 13G is hereby incorporated by reference.



**ITEM 5. OWNERSHIP OF FIVE PERCENT OR LESS OF A CLASS:**

If this statement is being filed to report the fact that as of the date hereof the Reporting Persons have ceased to be the beneficial owner of more than five percent of the class of securities check the following. [ ].

**ITEM 6. OWNERSHIP OF MORE THAN FIVE PERCENT ON BEHALF OF ANOTHER PERSON:**

Pursuant to the operating agreement of Investments, Partners is authorized, among other things, to invest the funds of Samana Capital, L.P., the majority member of Investments, in shares of the Common Stock beneficially owned by Investments and to vote and exercise dispositive power over those shares of the Common Stock. Partners and BVF Inc. share voting and dispositive power over shares of the Common Stock beneficially owned by BVF, BVF2, Investments and those owned by ILL10, on whose behalf Partners acts as an investment manager and, accordingly, Partners and BVF Inc. have beneficial ownership of all of the shares of the Common Stock owned by such parties.

**ITEM 7. IDENTIFICATION AND CLASSIFICATION OF THE SUBSIDIARY WHICH ACQUIRED THE SECURITY BEING REPORTED ON BY THE PARENT HOLDING COMPANY:**

Mr. Lampert is the owner, sole director and an officer of BVF Inc. BVF Inc. is the general partner of Partners, which is the general partner of BVF and BVF 2. Partners is the manager of Investments and is investment adviser to ILL10.

**ITEM 8. IDENTIFICATION AND CLASSIFICATION OF MEMBERS OF A GROUP:**

The members of the group making this filing on Amendment No. 2 to Schedule 13G are: Biotechnology Value Fund, L.P., Biotechnology Value Fund II, L.P., BVF Investments, L.L.C., Investment 10, L.L.C., BVF Partners L.P. and BVF Inc.

**ITEM 9. NOTICE OF DISSOLUTION OF GROUP:**

Not applicable.

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**ITEM 10. CERTIFICATION**

By signing below I certify that, to the best of my knowledge and belief, the securities referred to above were not acquired and are not held for the purpose of or with the effect of changing or influencing the control of the issuer of the securities and were not acquired and are not held in connection with or as a participant in any transaction having that purpose or effect.

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

Dated: January 27, 2009

**BIOTECHNOLOGY VALUE FUND, L.P.\***

By: BVF Partners, L.P., its general partner

By: BVF Inc., its general partner

By: /s/ Mark N. Lampert  
Mark N. Lampert, President

**BIOTECHNOLOGY VALUE FUND II, L.P.\***

By: BVF Partners, L.P., its general partner

By: BVF Inc., its general partner

By: /s/ Mark N. Lampert  
Mark N. Lampert, President

**BVF INVESTMENTS, L.L.C.\***

By: BVF Partners, L.P., its manager

By: BVF Inc., its general partner

By: /s/ Mark N. Lampert  
Mark N. Lampert, President

**INVESTMENT 10, L.L.C.\***

By: BVF Partners, L.P., its investment manager

By: BVF Inc., its general partner

By: /s/ Mark N. Lampert  
Mark N. Lampert, President

**BVP PARTNERS L.P.\***

By: BVF Inc., its general partner

By: /s/ Mark N. Lampert  
Mark N. Lampert, President

**BVF INC.\***

By: /s/ Mark N. Lampert  
Mark N. Lampert, President

**\*The Reporting Person disclaims beneficial ownership except to the extent of its pecuniary interest therein.**

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**Exhibit A**

**JOINT FILING AGREEMENT**

The undersigned agree that this Amendment No. 2 to Schedule 13G, dated December 31, 2008, relating to the Common Stock of TRGT shall be filed on behalf of the undersigned.

Dated: January 27, 2009

**BIOTECHNOLOGY VALUE FUND, L.P.**

By: BVF Partners, L.P., its general partner

By: BVF Inc., its general partner

By: /s/ Mark N. Lampert  
Mark N. Lampert, President

**BIOTECHNOLOGY VALUE FUND II, L.P.**

By: BVF Partners, L.P., its general partner

By: BVF Inc., its general partner

By: /s/ Mark N. Lampert  
Mark N. Lampert, President

**BVF INVESTMENTS, L.L.C.**

By: BVF Partners, L.P., its manager

By: BVF Inc., its general partner

By: /s/ Mark N. Lampert  
Mark N. Lampert, President

**INVESTMENT 10, L.L.C.**

By: BVF Partners, L.P., its investment manager

By: BVF Inc., its general partner

By: /s/ Mark N. Lampert  
Mark N. Lampert, President

**BVF PARTNERS L.P.**

By: BVF Inc., its general partner

By: /s/ Mark N. Lampert  
Mark N. Lampert, President

**BVF INC.**

By: /s/ Mark N. Lampert  
Mark N. Lampert, President