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| OMB APPROVAL  |
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**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

**SCHEDULE 13G**

(Rule 13d-102)

**Information to be Included in Statements Filed Pursuant to Rules 13d-1(b), (c) and (d) and Amendments  
Thereof Filed Pursuant to Rule 13d-2(b)**

**Under the Securities Exchange Act of 1934  
(Amendment No. )\***

**A.P. Pharma, Inc.**

(Name of Issuer)

Common Stock

(Title of Class of Securities)

00202J104

(CUSIP Number)

June 13, 2007

(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 in 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).

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|---|--|--|
| <b>1</b>  | NAMES OF REPORTING PERSONS:<br><br>I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS (ENTITIES ONLY):<br>RA Capital Management, LLC            |  |
| <b>2</b>  | CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (SEE INSTRUCTIONS):<br><br>(a) <input type="checkbox"/><br>(b) <input type="checkbox"/> |  |
| <b>3</b>  | SEC USE ONLY:  |  |
| <b>4</b>  | CITIZENSHIP OR PLACE OF ORGANIZATION:<br><br>Delaware  |  |
| NUMBER OF<br>SHARES<br>BENEFICIALLY<br>OWNED BY<br><br>EACH<br>REPORTING<br>PERSON<br><br>WITH: | <b>5</b>   | SOLE VOTING POWER:<br><br>0                |
|   | <b>6</b>   | SHARED VOTING POWER:<br><br>2,424,242      |
|   | <b>7</b>   | SOLE DISPOSITIVE POWER:<br><br>0           |
|   | <b>8</b>   | SHARED DISPOSITIVE POWER:<br><br>2,424,242 |
| <b>9</b>  | AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON:<br><br>2,424,242   |  |
| <b>10</b>   | CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES (SEE INSTRUCTIONS):<br><br><input type="checkbox"/>                     |  |
| <b>11</b>   | PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9):<br><br>8.8%   |  |
| <b>12</b>   | TYPE OF REPORTING PERSON (SEE INSTRUCTIONS):<br><br>IA   |  |

\* SEE INSTRUCTIONS BEFORE FILLING OUT.

|   |  |  |
|---|--|--|
| <b>1</b>  | NAMES OF REPORTING PERSONS:<br><br>I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS (ENTITIES ONLY):<br>Richard H. Aldrich              |  |
| <b>2</b>  | CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (SEE INSTRUCTIONS):<br><br>(a) <input type="radio"/><br>(b) <input type="radio"/> |  |
| <b>3</b>  | SEC USE ONLY:  |  |
| <b>4</b>  | CITIZENSHIP OR PLACE OF ORGANIZATION:<br><br>USA   |  |
| NUMBER OF<br>SHARES<br>BENEFICIALLY<br>OWNED BY<br><br>EACH<br>REPORTING<br>PERSON<br><br>WITH: | <b>5</b>   | SOLE VOTING POWER:<br><br>-0-              |
|   | <b>6</b>   | SHARED VOTING POWER:<br><br>2,424,242      |
|   | <b>7</b>   | SOLE DISPOSITIVE POWER:<br><br>-0-         |
|   | <b>8</b>   | SHARED DISPOSITIVE POWER:<br><br>2,424,242 |
| <b>9</b>  | AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON:<br><br>2,424,242   |  |
| <b>10</b>   | CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES (SEE INSTRUCTIONS):<br><br><input type="radio"/>                  |  |
| <b>11</b>   | PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9):<br><br>8.8%   |  |
| <b>12</b>   | TYPE OF REPORTING PERSON (SEE INSTRUCTIONS):<br><br>IN   |  |

\* SEE INSTRUCTIONS BEFORE FILLING OUT.

|   |  |  |
|---|--|--|
| <b>1</b>  | NAMES OF REPORTING PERSONS:<br><br>I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS (ENTITIES ONLY):<br>Peter Kolchinsky                |  |
| <b>2</b>  | CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (SEE INSTRUCTIONS):<br><br>(a) <input type="radio"/><br>(b) <input type="radio"/> |  |
| <b>3</b>  | SEC USE ONLY:  |  |
| <b>4</b>  | CITIZENSHIP OR PLACE OF ORGANIZATION:<br><br>USA   |  |
| NUMBER OF<br>SHARES<br>BENEFICIALLY<br>OWNED BY<br><br>EACH<br>REPORTING<br>PERSON<br><br>WITH: | <b>5</b>   | SOLE VOTING POWER:<br><br>-0-              |
|   | <b>6</b>   | SHARED VOTING POWER:<br><br>2,424,242      |
|   | <b>7</b>   | SOLE DISPOSITIVE POWER:<br><br>-0-         |
|   | <b>8</b>   | SHARED DISPOSITIVE POWER:<br><br>2,424,242 |
| <b>9</b>  | AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON:<br><br>2,424,242   |  |
| <b>10</b>   | CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES (SEE INSTRUCTIONS):<br><br><input type="radio"/>                  |  |
| <b>11</b>   | PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9):<br><br>8.8%   |  |
| <b>12</b>   | TYPE OF REPORTING PERSON (SEE INSTRUCTIONS):<br><br>IN   |  |

\* SEE INSTRUCTIONS BEFORE FILLING OUT.

|   |  |  |
|---|--|--|
| <b>1</b>  | NAMES OF REPORTING PERSONS:<br><br>I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS (ENTITIES ONLY):<br>RA Capital Biotech Fund, L.P.         |  |
| <b>2</b>  | CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (SEE INSTRUCTIONS):<br><br>(a) <input type="checkbox"/><br>(b) <input type="checkbox"/> |  |
| <b>3</b>  | SEC USE ONLY:  |  |
| <b>4</b>  | CITIZENSHIP OR PLACE OF ORGANIZATION:<br><br>Delaware  |  |
| NUMBER OF<br>SHARES<br>BENEFICIALLY<br>OWNED BY<br>EACH<br>REPORTING<br>PERSON<br>WITH: | <b>5</b>   | SOLE VOTING POWER:<br><br>-0-              |
|   | <b>6</b>   | SHARED VOTING POWER:<br><br>2,381,576      |
|   | <b>7</b>   | SOLE DISPOSITIVE POWER:<br><br>-0-         |
|   | <b>8</b>   | SHARED DISPOSITIVE POWER:<br><br>2,381,576 |
| <b>9</b>  | AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON:<br><br>2,381,576   |  |
| <b>10</b>   | CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES (SEE INSTRUCTIONS):<br><br><input type="checkbox"/>                     |  |
| <b>11</b>   | PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9):<br><br>8.6%   |  |
| <b>12</b>   | TYPE OF REPORTING PERSON (SEE INSTRUCTIONS):<br><br>PN   |  |

\* SEE INSTRUCTIONS BEFORE FILLING OUT.

**Item 1(a) Name of Issuer:**

The name of the issuer is A.P. Pharma, Inc. (the "Issuer").

**Item 1(b) Address of Issuer's Principal Executive Offices:**

The Company's principal executive office is located at 123 Saginaw Drive, Redwood City, CA 94063.

**Item 2(a) Name of Person Filing:**

This joint statement on Schedule 13G is being filed by Richard H. Aldrich, Peter Kolchinsky, RA Capital Management, LLC and RA Capital Biotech Fund, L.P., who are collectively referred to as the "Reporting Persons." Mr. Aldrich and Mr. Kolchinsky (together, the "Managers") are the managers of RA Capital Management, LLC ("Capital"), which is the sole general partner of RA Capital Biotech Fund, L.P. ("Fund I").

The Reporting Persons have entered into a Joint Filing Agreement, dated as of the date hereof, a copy of which is filed with this Schedule 13G as Exhibit A (which is incorporated herein by reference), pursuant to which the Reporting Persons have agreed to file this statement jointly in accordance with the provisions of Rule 13d-1(k) under the Act.

**Item 2(b) Address of Principal Business Office or, if none, Residence:**

The address of the principal business office of each of the Reporting Persons is 111 Huntington Avenue, Suite 610, Boston, MA 02199.

**Item 2(c) Citizenship:**

Capital is a Delaware limited liability company. Fund I is a Delaware limited partnership. The Managers are U.S. citizens.

**Item 2(d) Title of Class of Securities:**

Common Stock, par value \$0.01 per share (the "Common Stock").

**Item 2(e) CUSIP No.:**

00202J104

**Item 3 If this statement is filed pursuant to Rules 13d-1(b), or 13d-2(b), check whether the person filing is a:**

Not Applicable.

**Item 4 Ownership:**

Capital and each of the Managers each beneficially owns 2,424,242 shares of Common Stock, representing 8.8% of the class, and consisting of 2,381,576 shares of Common Stock beneficially owned by Fund I and 42,666 shares of Common Stock beneficially owned by RA Capital Biotech Fund II, L.P. ("Fund II" and, together with Fund I, the "Funds"), which is not a Reporting Person. Capital is the sole general partner of Fund II.

Fund I beneficially owns 2,381,576 shares of Common Stock, representing 8.6% of the class.

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Fund I has the shared power to vote and dispose of the shares of Common Stock beneficially owned by it. Capital, as the sole general partner of each of the Funds, has the shared power to vote and dispose of all of the shares of Common Stock reported in this Schedule 13G. Each Manager, by virtue of his position as a manager of Capital, has the shared power to vote and dispose of all of the shares of Common Stock reported in this Schedule 13G.

**Item 5 Ownership of Five Percent or Less of a Class:**

Not applicable.

**Item 6 Ownership of More Than Five Percent on Behalf of Another Person:**

See Item 4.

**Item 7 Identification and Classification of the Subsidiary Which Acquired the Security Being Reported on by the Parent Holding Company or Control Person:**

Not applicable.

**Item 8 Identification and Classification of Members of the Group:**

Not applicable.

**Item 9 Notice of Dissolution of Group:**

Not applicable.

**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 participant in any transaction having that purpose or effect.

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**SIGNATURE**

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.

Date: June 20, 2007

RA CAPITAL MANAGEMENT, LLC

By: /s/ Richard H. Aldrich  
Richard H. Aldrich  
Manager

RA CAPITAL BIOTECH FUND, L.P.

By: RA Capital Management, LLC  
General Partner

By: /s/ Richard H. Aldrich  
Richard H. Aldrich  
Manager

RICHARD H. ALDRICH

/s/ Richard H. Aldrich  
Richard H. Aldrich

PETER KOLCHINSKY

/s/ Peter Kolchinsky  
Peter Kolchinsky

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AGREEMENT REGARDING THE JOINT FILING OF SCHEDULE 13G

The undersigned hereby agree as follows:

(i) Each of them is individually eligible to use the Schedule 13G to which this Exhibit is attached, and such Schedule 13G is filed on behalf of each of them; and

(ii) Each of them is responsible for the timely filing of such Schedule 13G and any amendments thereto, and for the completeness and accuracy of the information concerning such person contained therein; but none of them is responsible for the completeness or accuracy of the information concerning the other persons making the filing, unless such person knows or has reason to believe that such information is inaccurate.

Date: June 20, 2007

RA CAPITAL MANAGEMENT, LLC

By: /s/ Richard H. Aldrich  
Richard H. Aldrich  
Manager

RA CAPITAL BIOTECH FUND, L.P.

By: RA Capital Management, LLC  
General Partner

By: /s/ Richard H. Aldrich  
Richard H. Aldrich  
Manager

RICHARD H. ALDRICH

/s/ Richard H. Aldrich  
Richard H. Aldrich

PETER KOLCHINSKY

/s/ Peter Kolchinsky  
Peter Kolchinsky