

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 THERETO FILED PURSUANT TO 13d-2 (b)

Momenta Pharmaceuticals, Inc.  
(Name of Issuer)

Common Stock  
(Title of Class of Securities)

60877T101  
(CUSIP Number)

December 31, 2004  
(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 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).

(Continued on following pages)

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Exhibit Index on Page 15

CUSIP NO. 60877T101

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-----  
1 NAME OF REPORTING  
SS OR I.R.S. IDENTIFICATION NO. OF ABOVE PERSON  
  
Polaris Venture Partners III, L.P. ("PVP III")  
Tax ID Number:  
-----

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

3 SEC USE ONLY  
-----

4 CITIZENSHIP OR PLACE OF ORGANIZATION  
  
Delaware  
-----

5 SOLE VOTING POWER

4,863,016 shares, except that Polaris Venture Management Co.  
III, L.L.C. ("Polaris III"), the general partner of PVP III,

may be deemed to have sole power to vote these shares, and Jonathan A. Flint ("Flint"), Terrance G. McGuire ("McGuire"), Stephen D. Arnold ("Arnold") and Alan G. Spoon ("Spoon"), the managing members of Polaris III, may be deemed to have shared power to vote these shares.

NUMBER OF  
SHARES  
BENEFICIALLY  
OWNED BY  
EACH  
REPORTING  
PERSON  
WITH

-----  
6 SHARED VOTING POWER

See response to row 5.  
-----

7 SOLE DISPOSITIVE POWER

4,863,016 shares, except that Polaris III, the general partner of PVP III, may be deemed to have sole power to dispose of these shares, and Flint, McGuire, Arnold and Spoon, the managing members of Polaris III, may be deemed to have shared power to dispose of these shares.  
-----

8 SHARED DISPOSITIVE POWER

See response to row 7.  
-----

9 AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON

4,863,016  
-----

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

[ ]  
-----

11 PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW 9

19.1%  
-----

12 TYPE OF REPORTING PERSON\*

PN  
-----

CUSIP NO. 60877T101

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-----

1 NAME OF REPORTING  
SS OR I.R.S. IDENTIFICATION NO. OF ABOVE PERSON

Polaris Venture Partners Entrepreneurs' Fund III, L.P. ("Entrepreneurs'  
III") Tax ID Number:  
-----

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

(a) [ ]

(b) [X]  
-----

3 SEC USE ONLY  
-----

4 CITIZENSHIP OR PLACE OF ORGANIZATION

Delaware  
-----

5 SOLE VOTING POWER

126,266 shares, except that Polaris III, the general partner of Entrepreneurs' III, may be deemed to have sole power to vote these shares, and Flint, McGuire, Arnold and Spoon, the managing members of Polaris III, may be deemed to have shared power to vote these shares.  
-----

NUMBER OF  
SHARES

6 SHARED VOTING POWER

BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH

See response to row 5.

7 SOLE DISPOSITIVE POWER

126,266 shares, except that Polaris III, the general partner of Entrepreneurs' III, may be deemed to have sole power to dispose of these shares, and Flint, McGuire, Arnold and Spoon, the managing members of Polaris III, may be deemed to have shared power to dispose of these shares.

8 SHARED DISPOSITIVE POWER

See response to row 7.

9 AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON

126,266

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

[ ]

11 PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW 9

0.5%

12 TYPE OF REPORTING PERSON\*

PN

CUSIP NO. 60877T101

13 G

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1 NAME OF REPORTING SS OR I.R.S. IDENTIFICATION NO. OF ABOVE PERSON

Polaris Venture Partners Founders' Fund III, L.P. ("Founders' III")  
Tax ID Number:

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

(a) [ ]  
(b) [X]

3 SEC USE ONLY

4 CITIZENSHIP OR PLACE OF ORGANIZATION

Delaware

5 SOLE VOTING POWER

76,648 shares, except that Polaris III, the general partner of Founders' III, may be deemed to have sole power to vote these shares, and Flint, McGuire, Arnold and Spoon, the managing members of Polaris III, may be deemed to have shared power to vote these shares.

NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH

6 SHARED VOTING POWER

See response to row 5.

7 SOLE DISPOSITIVE POWER

76,648 shares, except that Polaris III, the general partner of Founders' III, may be deemed to have sole power to

dispose of these shares, and Flint, McGuire, Arnold and Spoon, the managing members of Polaris III, may be deemed to have shared power to dispose of these shares.

8 SHARED DISPOSITIVE POWER

See response to row 7.

9 AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON

76,648

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

[ ]

11 PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW 9

0.3%

12 TYPE OF REPORTING PERSON\*

PN

CUSIP NO. 60877T101

13 G

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1 NAME OF REPORTING  
SS OR I.R.S. IDENTIFICATION NO. OF ABOVE PERSON

Polaris Venture Management Co. III, L.L.C. ("Polaris III")  
Tax ID Number:

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

3 SEC USE ONLY

4 CITIZENSHIP OR PLACE OF ORGANIZATION

Delaware

5 SOLE VOTING POWER

5,065,930 shares, of which 4,863,016 are directly owned by PVP III, 126,266 are directly owned by Entrepreneurs' III and 76,648 are directly owned by Founders' III. Polaris III, the general partner of PVP III, Entrepreneurs' III and Founders' III, may be deemed to have sole power to vote these shares, and Flint, McGuire, Arnold and Spoon, the managing members of Polaris III, may be deemed to have shared power to vote these shares.

NUMBER OF  
SHARES  
BENEFICIALLY  
OWNED BY  
EACH  
REPORTING  
PERSON  
WITH

6 SHARED VOTING POWER

See response to row 5.

7 SOLE DISPOSITIVE POWER

5,065,930 shares, of which 4,863,016 are directly owned by PVP III, 126,266 are directly owned by Entrepreneurs' III and 76,648 are directly owned by Founders' III. Polaris III, the general partner of PVP III, Entrepreneurs' III and Founders' III, may be deemed to have sole power to dispose of these shares, and Flint, McGuire, Arnold and Spoon, the

managing members of Polaris III, may be deemed to have shared power to dispose of these shares.

8 SHARED DISPOSITIVE POWER

See response to row 7.

9 AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON

5,065,930

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

[ ]

11 PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW 9

19.9%

12 TYPE OF REPORTING PERSON\*

00

CUSIP NO. 60877T101

13 G

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1 NAME OF REPORTING  
SS OR I.R.S. IDENTIFICATION NO. OF ABOVE PERSON

Jonathan A. Flint ("Flint")  
Tax ID Number:

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

(a) [ ]  
(b) [X]

3 SEC USE ONLY

4 CITIZENSHIP OR PLACE OF ORGANIZATION

U.S. Citizen

5 SOLE VOTING POWER

0 shares.

6 SHARED VOTING POWER

5,065,930 shares, of which 4,863,016 are directly owned by PVP III, 126,266 are directly owned by Entrepreneurs' III and 76,648 are directly owned by Founders' III. Polaris III is the general partner of PVP III, Entrepreneurs' III and Founders' III. Flint is a managing member of Polaris III, and may be deemed to have shared power to vote these shares.

NUMBER OF  
SHARES  
BENEFICIALLY  
OWNED BY  
EACH  
REPORTING  
PERSON  
WITH

7 SOLE DISPOSITIVE POWER

0 shares.

8 SHARED DISPOSITIVE POWER

5,065,930 shares, of which 4,863,016 are directly owned by PVP III, 126,266 are directly owned by Entrepreneurs' III and 76,648 are directly owned by Founders' III. Polaris III is the general partner of PVP III, Entrepreneurs' III and

Founders' III. Flint is a managing member of Polaris III, and may be deemed to have shared power to dispose of these shares.

9 AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  
5,065,930

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

11 PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW 9  
19.9%

12 TYPE OF REPORTING PERSON\*  
IN

CUSIP NO. 60877T101

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1 NAME OF REPORTING  
SS OR I.R.S. IDENTIFICATION NO. OF ABOVE PERSON  
  
Terrance G. McGuire ("McGuire")  
Tax ID Number:

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

3 SEC USE ONLY

4 CITIZENSHIP OR PLACE OF ORGANIZATION  
U.S. Citizen

5 SOLE VOTING POWER  
0 shares.

6 SHARED VOTING POWER  
5,065,930 shares, of which 4,863,016 are directly owned by PVP III, 126,266 are directly owned by Entrepreneurs' III and 76,648 are directly owned by Founders' III. Polaris III is the general partner of PVP III, Entrepreneurs' III and Founders' III. McGuire is a managing member of Polaris III, and may be deemed to have shared power to vote these shares.

NUMBER OF  
SHARES  
BENEFICIALLY  
OWNED BY  
EACH  
REPORTING  
PERSON  
WITH

7 SOLE DISPOSITIVE POWER  
0 shares.

8 SHARED DISPOSITIVE POWER

5,065,930 shares, of which 4,863,016 are directly owned by PVP III, 126,266 are directly owned by Entrepreneurs' III and 76,648 are directly owned by Founders' III. Polaris III is the general partner of PVP III, Entrepreneurs' III and Founders' III. McGuire is a managing member of Polaris III, and may be deemed to have shared power to dispose of these shares.

9 AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON

5,065,930

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

[ ]

11 PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW 9

19.9%

12 TYPE OF REPORTING PERSON\*

IN

CUSIP NO. 60877T101

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1 NAME OF REPORTING  
SS OR I.R.S. IDENTIFICATION NO. OF ABOVE PERSON

Stephen D. Arnold ("Arnold")  
Tax ID Number:

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

(a) [ ]  
(b) [X]

3 SEC USE ONLY

4 CITIZENSHIP OR PLACE OF ORGANIZATION

U.S. Citizen

5 SOLE VOTING POWER

0 shares.

6 SHARED VOTING POWER

NUMBER OF  
SHARES  
BENEFICIALLY  
OWNED BY  
EACH  
REPORTING  
PERSON  
WITH

5,065,930 shares, of which 4,863,016 are directly owned by PVP III, 126,266 are directly owned by Entrepreneurs' III and 76,648 are directly owned by Founders' III. Polaris III is the general partner of PVP III, Entrepreneurs' III and Founders' III. Arnold is a managing member of Polaris III, and may be deemed to have shared power to vote these shares.

7 SOLE DISPOSITIVE POWER

0 shares.

8 SHARED DISPOSITIVE POWER

5,065,930 shares, of which 4,863,016 are directly owned by PVP III, 126,266 are directly owned by Entrepreneurs' III and 76,648 are directly owned by Founders' III. Polaris III is the general partner of PVP III, Entrepreneurs' III and Founders' III. Arnold is a managing member of Polaris III, and may be deemed to have shared power to dispose of these shares.

9 AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON

5,065,930

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

[ ]

11 PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW 9 20.6%

19.9%

12 TYPE OF REPORTING PERSON\* IN

IN

CUSIP NO. 60877T101

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1 NAME OF REPORTING  
SS OR I.R.S. IDENTIFICATION NO. OF ABOVE PERSON

Alan G. Spoon ("Spoon")  
Tax ID Number:

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

(a) [ ]  
(b) [X]

3 SEC USE ONLY

4 CITIZENSHIP OR PLACE OF ORGANIZATION

U.S. Citizen

5 SOLE VOTING POWER

0 shares.

6 SHARED VOTING POWER

NUMBER OF  
SHARES  
BENEFICIALLY  
OWNED BY  
EACH  
REPORTING  
PERSON  
WITH

5,065,930 shares, of which 4,863,016 are directly owned by  
PVP III, 126,266 are directly owned by Entrepreneurs' III and  
76,648 are directly owned by Founders' III. Polaris III is  
the general partner of PVP III, Entrepreneurs' III and  
Founders' III. spoon is a managing member of Polaris III,  
and may be deemed to have shared power to vote these shares.

7 SOLE DISPOSITIVE POWER

0 shares.

8 SHARED DISPOSITIVE POWER

5,065,930 shares, of which 4,863,016 are directly owned by  
PVP III, 126,266 are directly owned by Entrepreneurs' III and  
76,648 are directly owned by Founders' III. Polaris III is  
the general partner of PVP III, Entrepreneurs' III and  
Founders' III. Spoon is a managing member of Polaris III,  
and may be deemed to have shared power to dispose of these  
shares.

9 AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON

5,065,930

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



[ ]

-----  
11 PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW 9 20.6%

19.9%

-----  
12 TYPE OF REPORTING PERSON\* IN

IN  
-----

CUSIP NO. 60877T101

13 G

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ITEM 1(A). NAME OF ISSUER

Momenta Pharmaceuticals, Inc.

ITEM 1(B). ADDRESS OF ISSUER'S PRINCIPAL EXECUTIVE OFFICES

43 Moulton Street  
Cambridge, Massachusetts 02138

ITEM 2(A). NAME OF PERSONS FILING

This Statement is filed by Polaris Venture Partners III, L.P., a Delaware limited partnership ("PVP III"), Polaris Venture Partners Entrepreneurs' Fund III, L.P., a Delaware limited partnership ("Entrepreneurs' III"), Polaris Venture Partners Founders' Fund III, L.P., a Delaware limited partnership ("Founders' III"), Polaris Venture Management Co. III, L.L.C., a Delaware limited liability company ("Polaris III"), Jonathan A. Flint ("Flint"), Terrance G. McGuire ("McGuire"), Stephen D. Arnold ("Arnold") and Alan G. Spoon ("Spoon"). Flint, McGuire, Arnold and Spoon are the managing members of Polaris III. The foregoing entities and individuals are collectively referred to as the "Reporting Persons."

Polaris III, the general partner of PVP III, Entrepreneurs' III and Founders' III, may be deemed to have sole power to vote and sole power to dispose of shares of the issuer directly owned by PVP III, Entrepreneurs' III and Founders' III. Flint, McGuire, Arnold and Spoon are the managing members of Polaris III and may be deemed to have shared power to vote and shared power to dispose of shares of the issuer directly owned by PVP III, Entrepreneurs' III and Founders' III.

ITEM 2(B). ADDRESS OF PRINCIPAL OFFICE

The address for each of the Reporting Persons is:

Polaris Venture Partners  
1000 Winter Street, Suite 3350  
Waltham, Massachusetts 02451

ITEM 2(C) CITIZENSHIP

PVP III, Entrepreneurs' III and Founders' III are Delaware limited partnerships; Polaris III is a Delaware Limited Liability Company; Flint, McGuire, Arnold and Spoon are United States citizens.

ITEM 2(D) AND (E). TITLE OF CLASS OF SECURITIES AND CUSIP NUMBER

Common Stock  
CUSIP # 60877T101

ITEM 3. Not Applicable

ITEM 4. OWNERSHIP

The following information with respect to the ownership of the Common Stock of the issuer by the persons filing this Statement is

(a) Amount beneficially owned:

See Row 9 of cover page for each Reporting Person.

(b) Percent of Class:

See Row 11 of cover page for each Reporting Person.

(c) Number of shares as to which such person has:

(i) Sole power to vote or to direct the vote:

See Row 5 of cover page for each Reporting Person.

(ii) Shared power to vote or to direct the vote:

See Row 6 of cover page for each Reporting Person.

(iii) Sole power to dispose or to direct the disposition of:

See Row 7 of cover page for each Reporting Person.

(iv) Shared power to dispose or to direct the disposition of:

See Row 8 of cover page for each Reporting Person.

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.

Under certain circumstances set forth in the limited partnership agreements of PVP III, Entrepreneurs' III and Founders' III, the general and limited partners of each of such entities may be deemed to have the right to receive dividends from, or the proceeds from, the sale of shares of the issuer owned by each such entity of which they are a partner.

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

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.

Not applicable.

SIGNATURES

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: February 11, 2005

POLARIS VENTURE PARTNERS III, L.P.,  
a Delaware Limited Partnership

/s/ Kevin Littlejohn  
-----  
Signature

Kevin Littlejohn  
Authorized Signatory

POLARIS VENTURE PARTNERS  
ENTREPRENEURS' FUND III, L.P.,  
a Delaware Limited Partnership

/s/ Kevin Littlejohn  
-----  
Signature

Kevin Littlejohn  
Authorized Signatory

POLARIS VENTURE PARTNERS  
FOUNDERS' FUND III, L.P.,  
a Delaware Limited Partnership

/s/ Kevin Littlejohn  
-----  
Signature

Kevin Littlejohn  
Authorized Signatory

POLARIS VENTURE  
MANAGEMENT CO. III, L.L.C.,  
a Delaware Limited Liability Company

/s/ Kevin Littlejohn  
-----  
Signature

Kevin Littlejohn  
Authorized Signatory

JONATHAN A. FLINT

/s/ Kevin Littlejohn  
-----  
Signature

Kevin Littlejohn  
Authorized Signatory

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TERRANCE G. MCGUIRE

/s/ Kevin Littlejohn  
-----  
Signature

Kevin Littlejohn  
Authorized Signatory

STEPHEN D. ARNOLD

/s/ Kevin Littlejohn  
-----  
Signature

Kevin Littlejohn  
Authorized Signatory

ALAN G. SPOON

/s/ Kevin Littlejohn  
-----  
Signature

Kevin Littlejohn  
Authorized Signatory

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Exhibit -----	Found on Sequentially Numbered Page -----
Exhibit A: Agreement of Joint Filing	16
Exhibit B: Reference to Kevin Littlejohn as Authorized Signatory	18
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EXHIBIT A

Agreement of Joint Filing

The undersigned hereby agree that a single Schedule 13G (or any amendment thereto) relating to the Common Stock of Momenta Pharmaceuticals, Inc. shall be filed on behalf of each of the undersigned and that this Agreement shall be filed as an exhibit to such Schedule 13G.

Dated: February 11, 2005

POLARIS VENTURE PARTNERS III, L.P., a Delaware Limited Partnership	/s/ Kevin Littlejohn ----- Signature  Kevin Littlejohn Authorized Signatory
---	--

POLARIS VENTURE PARTNERS ENTREPRENEURS' FUND III, L.P., a Delaware Limited Partnership	/s/ Kevin Littlejohn ----- Signature  Kevin Littlejohn Authorized Signatory
--	--

POLARIS VENTURE PARTNERS FOUNDERS' FUND III, L.P., a Delaware Limited Partnership	/s/ Kevin Littlejohn ----- Signature  Kevin Littlejohn Authorized Signatory
---	--

POLARIS VENTURE MANAGEMENT CO. III, L.L.C., a Delaware Limited Liability Company	/s/ Kevin Littlejohn ----- Signature  Kevin Littlejohn Authorized Signatory
--	--

JONATHAN A. FLINT	/s/ Kevin Littlejohn ----- Signature  Kevin Littlejohn Authorized Signatory
-------------------	--

TERRANCE G. MCGUIRE	/s/ Kevin Littlejohn ----- Signature  Kevin Littlejohn Authorized Signatory
---------------------	--

STEPHEN D. ARNOLD

/s/ Kevin Littlejohn

-----  
Signature

Kevin Littlejohn  
Authorized Signatory

ALAN G. SPOON

/s/ Kevin Littlejohn

-----  
Signature

Kevin Littlejohn  
Authorized Signatory

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EXHIBIT B

REFERENCE TO KEVIN LITTLEJOHN AS AUTHORIZED SIGNATORY

Kevin Littlejohn has signed the enclosed documents as Authorized Signatory. Note that copies of the applicable Agreement to File Jointly and Statement Appointing Designated Filer And Authorized Signatory are already on file with the appropriate agencies.