

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
Stylesheet Version v1.2

EPAS ID: PAT2973298

|                              |  |
|------------------------------|--|
| <b>SUBMISSION TYPE:</b>      | CORRECTIVE ASSIGNMENT  |
| <b>NATURE OF CONVEYANCE:</b> | Corrective Assignment to correct the ASSIGNOR NAME FROM "PAX VAX, INC." TO "PAXVAX, INC." AND REMOVE ERRONEOUSLY RECORDED APPLICATION NO. 61449591 previously recorded on Reel 033449 Frame 0733. Assignor(s) hereby confirms the SECURITY INTEREST. |

## CONVEYING PARTY DATA

| Name         | Execution Date |
|--------------|----------------|
| PAXVAX, INC. | 07/25/2014     |

## RECEIVING PARTY DATA

|                          |  |
|--------------------------|--|
| <b>Name:</b>             | BIOPHARMA SECURED INVESTMENTS III HOLDINGS CAYMAN LP |
| <b>Street Address:</b>   | C/O INTERTRUST CORPORATE SERVICES (CAYMAN) LIMITED   |
| <b>Internal Address:</b> | 190 ELGIN AVENUE                                     |
| <b>City:</b>             | GEORGETOWN   |
| <b>State/Country:</b>    | CAYMAN ISLANDS                                       |
| <b>Postal Code:</b>      | KY1-9005   |

## PROPERTY NUMBERS Total: 30

| Property Type       | Number   |
|---------------------|----------|
| Application Number: | 61024164 |
| Application Number: | 61086438 |
| Application Number: | 61230617 |
| Application Number: | 61446309 |
| Application Number: | 61618016 |
| Application Number: | 61492597 |
| Application Number: | 61412829 |
| Application Number: | 61439225 |
| Application Number: | 61522295 |
| Application Number: | 61499591 |
| Application Number: | 61635179 |
| Application Number: | 61645542 |
| Application Number: | 60670826 |
| Application Number: | 12847767 |
| Application Number: | 13369021 |
| Application Number: | 13404950 |
| Application Number: | 13486949 |

PATENT

| Property Type       | Number       |
|---------------------|--------------|
| Application Number: | 13294954     |
| Application Number: | 11911189     |
| PCT Number:         | US2006013384 |
| Patent Number:      | 8163545      |
| Application Number: | 60649249     |
| Application Number: | 60697655     |
| Application Number: | 60752268     |
| PCT Number:         | US2006003601 |
| Patent Number:      | 8404244      |
| Application Number: | 11883495     |
| Application Number: | 13772893     |
| Application Number: | 60629722     |
| Application Number: | 11282319     |

#### CORRESPONDENCE DATA

**Fax Number:** (214)969-4343

*Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.*

**Phone:** 214-969-2877

**Email:** TRADEMARKDALLAS@AKINGUMP.COM

**Correspondent Name:** AKIN GUMP STRAUSS HAUER & FELD LLP

**Address Line 1:** PO BOX 130688

**Address Line 4:** DALLAS, TEXAS 75313-0688

|                           |                          |
|---------------------------|--------------------------|
| <b>NAME OF SUBMITTER:</b> | SANFORD E. WARREN, JR.   |
| <b>SIGNATURE:</b>         | /Sanford E. Warren, Jr./ |
| <b>DATE SIGNED:</b>       | 08/07/2014               |

#### Total Attachments: 23

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| <b>PATENT ASSIGNMENT COVER SHEET</b> |
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Electronic Version v1.1

Stylesheet Version v1.2

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|-----------------------------------|--|
| <b>SUBMISSION TYPE:</b>           | NEW ASSIGNMENT                                       |
| <b>NATURE OF CONVEYANCE:</b>      | SECURITY INTEREST                                    |
| <b>CONVEYING PARTY DATA</b>       |  |
| Name                              | Execution Date                                       |
| PAX VAX, INC.                     | 07/25/2014   |
| <b>RECEIVING PARTY DATA</b>       |  |
| Name:                             | BIOPHARMA SECURED INVESTMENTS III HOLDINGS CAYMAN LP |
| Street Address:                   | C/O INTERTRUST CORPORATE SERVICES (CAYMAN) LIMITED   |
| Internal Address:                 | 190 ELGIN AVENUE                                     |
| City:                             | GEORGETOWN   |
| State/Country:                    | CAYMAN ISLANDS                                       |
| Postal Code:                      | KY1-9005   |
| <b>PROPERTY NUMBERS Total: 31</b> |  |
| Property Type                     | Number   |
| Application Number:               | 61024164   |
| Application Number:               | 61086438   |
| Application Number:               | 61230617   |
| Application Number:               | 61446309   |
| Application Number:               | 61618016   |
| Application Number:               | 61492597   |
| Application Number:               | 61412829   |
| Application Number:               | 61439225   |
| Application Number:               | 61449591   |
| Application Number:               | 61522295   |
| Application Number:               | 61499591   |

PATENT

REEL: 033502 FRAME: 0931

|                     |              |
|---------------------|--------------|
| Application Number: | 61635179     |
| Application Number: | 61645542     |
| Application Number: | 60670826     |
| Application Number: | 12847767     |
| Application Number: | 13369021     |
| Application Number: | 13404950     |
| Application Number: | 13486949     |
| Application Number: | 13294954     |
| Application Number: | 11911189     |
| PCT Number:         | US2006013384 |
| Patent Number:      | 8163545      |
| Application Number: | 60649249     |
| Application Number: | 60697655     |
| Application Number: | 60752268     |
| PCT Number:         | US2006003601 |
| Patent Number:      | 8404244      |
| Application Number: | 11883495     |
| Application Number: | 13772893     |
| Application Number: | 60629722     |
| Application Number: | 11282319     |

**CORRESPONDENCE DATA**

Fax Number: (214)969-4343  
Phone: 214-969-2877  
Email: trademarkdallas@akingump.com

*Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.*

Correspondent Name: AKIN GUMP STRAUSS HAUER & FELD LLP  
Address Line 1: PO BOX 130688  
Address Line 4: DALLAS, TEXAS 75313-0688

|                         |                          |
|-------------------------|--------------------------|
| ATTORNEY DOCKET NUMBER: | 687747-0021              |
| NAME OF SUBMITTER:      | SANFORD E. WARREN, JR.   |
| Signature:              | /Sanford E. Warren, Jr./ |
| Date:                   |                          |

**PATENT****REEL: 093502 FRAME: 0932**

07/30/2014

**Total Attachments: 16**

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**RECEIPT INFORMATION**

EPAS ID: PAT2961105  
Receipt Date: 07/30/2014

**PATENT****REEL: 033502 FRAME: 0933**

## PATENT SECURITY AGREEMENT

THIS PATENT SECURITY AGREEMENT, dated as of July 25, 2014, is made by PaxVax, Inc. ("Grantor"), in favor of BioPharma Secured Investments III Holdings Cayman LP, as lender (in such capacity, together with its successors and permitted assigns, "Lender") for the Secured Parties (as defined in the Credit Agreement referred to below).

### WITNESSETH:

WHEREAS, pursuant to the Loan and Security Agreement, dated as of July 25, 2014 (as the same may be amended, restated, supplemented or otherwise modified from time to time, the "Credit Agreement"), by and among PaxVax, Inc. ("Borrower"), Lender and the other parties thereto, Lender has agreed to make extensions of credit to Borrower upon the terms and subject to the conditions set forth therein;

WHEREAS, Grantor has agreed, pursuant to a Guaranty and Security Agreement of even date herewith in favor of Lender (as such agreement may be amended, restated, supplemented or otherwise modified from time to time, the "Guaranty and Security Agreement"), to guarantee the Obligations (as defined in the Credit Agreement) of Borrower; and

WHEREAS, Grantor is party to the Guaranty and Security Agreement pursuant to which Grantor is required to execute and deliver this Patent Security Agreement;

NOW, THEREFORE, in consideration of the premises and to induce Lender to enter into the Credit Agreement and to induce Lender to make extensions of credit to Borrower thereunder, Grantor hereby agrees with Lender as follows:

Section 1.      Defined Terms. Capitalized terms used herein without definition are used as defined in the Guaranty and Security Agreement.

Section 2.      Grant of Security Interest in Patent Collateral. Grantor, as collateral security for the prompt and complete payment and performance when due (whether at stated maturity, by acceleration or otherwise) of the Secured Obligations of Grantor, hereby mortgages, pledges and hypothecates to Lender, for the benefit of itself and the other Secured Parties, and grants to Lender, for the benefit of itself and the other Secured Parties, a first priority Lien (subject to Permitted Liens) on and security interest in, all of its right, title and interest in, to and under the following Collateral of Grantor (the "Patent Collateral"):

(a)      all of its Patents and all IP Licenses and IP Ancillary Rights providing for the grant by or to Grantor of any right under any Patent, including, without limitation, those referred to on Schedule 1 hereto;

(b)      all reissues, reexaminations, continuations, continuations-in-part, divisionals, renewals and extensions of the foregoing; and

(c)      all income, royalties, proceeds and liabilities at any time due or payable or asserted under and with respect to any of the foregoing, including, without limitation, all rights to sue and recover at law or in equity for any past, present and future infringement, misappropriation, dilution, violation or other impairment thereof;

provided, however, that, notwithstanding the foregoing, no Lien or security interest is hereby granted on, and "Patent Collateral" shall not include, any Excluded Property; provided, further, that if and when any of such excluded property shall cease to be "Excluded Property", Grantor shall be deemed to have mortgaged, pledged and hypothecated to Lender, for the benefit of itself and the other Secured Parties, and to have

granted to Lender, for the benefit of itself and the other Secured Parties, a first priority Lien (subject to Permitted Liens) on and security interest in, all of its right, title and interest in, to and under such property

Section 3.      Guaranty and Security Agreement. The security interest granted pursuant to this Patent Security Agreement is granted in conjunction with the security interest granted to Agent pursuant to the Guaranty and Security Agreement and Grantor hereby acknowledges and agrees that the obligations, rights and remedies of Grantor and of Lender with respect to the security interest in the Patent Collateral made and granted hereby are more fully set forth in the Guaranty and Security Agreement, the terms and provisions of which are incorporated by reference herein as if fully set forth herein.

Section 4.      Grantor Remains Liable. Grantor hereby agrees that, anything herein to the contrary notwithstanding, Grantor shall assume full and complete responsibility for the prosecution, defense, enforcement or any other necessary or desirable actions in connection with their Patents and IP Licenses subject to a security interest hereunder.

Section 5.      Counterparts. This Patent Security Agreement may be executed in any number of counterparts and by different parties in separate counterparts, each of which when so executed shall be deemed to be an original and all of which taken together shall constitute one and the same agreement. Signature pages may be detached from multiple separate counterparts and attached to a single counterpart.

Section 6.      Governing Law. This Patent Security Agreement and the rights and obligations of the parties hereto shall be governed by, and construed and interpreted in accordance with, the law of the State of New York.

[SIGNATURE PAGES FOLLOW]



IN WITNESS WHEREOF, Grantor has caused this Patent Security Agreement to be executed and delivered by its duly authorized officer as of the date first set forth above.

Very truly yours,

**PAXVAX, INC.,**  
as Grantor

By: *Kenneth J. Ke Han*  
Name: *Kenneth J. Ke Han*  
Title: *CEO*

ACCEPTED AND AGREED  
as of the date first above written:

**BIOPHARMA SECURED INVESTMENTS III HOLDINGS CAYMAN LP,**  
as Lender

By: Pharmakon Advisors, LP,  
its Investment Manager

By: Pharmakon Management I, LLC,  
its General Partner

By: \_\_\_\_\_  
Name: Pedro Gonzalez de Cosio  
Title: Managing Member

[Signature Page to Patent Security Agreement]

# CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

State of California

County of SANTA CRUZ

On July 22, 2014  
Date

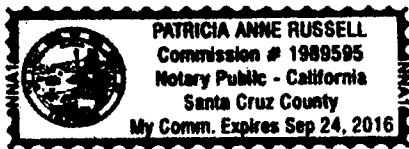
before me,

Patricia Anne Russell, Notary  
Here Insert Name and Title of the Officer

personally appeared

Kenneth J. Kelley  
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.



Place Notary Seal Above

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature

Patricia Anne Russell  
Signature of Notary Public

## OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

### Description of Attached Document

Title or Type of Document: \_\_\_\_\_

Document Date: \_\_\_\_\_ Number of Pages: \_\_\_\_\_

Signer(s) Other Than Named Above: \_\_\_\_\_

### Capacity(ies) Claimed by Signer(s)

Signer's Name: \_\_\_\_\_

- ☐ Individual
- ☐ Corporate Officer — Title(s): \_\_\_\_\_
- ☐ Partner — ☐ Limited ☐ General
- ☐ Attorney in Fact
- ☐ Trustee
- ☐ Guardian or Conservator
- ☐ Other: \_\_\_\_\_

RIGHT THUMBPRINT  
OF SIGNER  
Top of thumb here

Signer Is Representing: \_\_\_\_\_

Signer's Name: \_\_\_\_\_

- ☐ Individual
- ☐ Corporate Officer — Title(s): \_\_\_\_\_
- ☐ Partner — ☐ Limited ☐ General
- ☐ Attorney in Fact
- ☐ Trustee
- ☐ Guardian or Conservator
- ☐ Other: \_\_\_\_\_

RIGHT THUMBPRINT  
OF SIGNER  
Top of thumb here

Signer Is Representing: \_\_\_\_\_

IN WITNESS WHEREOF, Grantor has caused this Patent Security Agreement to be executed and delivered by its duly authorized officer as of the date first set forth above.

Very truly yours,

**PAXVAX, INC.,  
as Grantor**

By: \_\_\_\_\_  
Name:  
Title:

ACCEPTED AND AGREED  
as of the date first above written:

**BIOPHARMA SECURED INVESTMENTS III HOLDINGS CAYMAN LP,  
as Lender**

By: Pharmakon Advisors, LP,  
its Investment Manager

By: Pharmakon Management I, LLC,  
its General Partner

By:  \_\_\_\_\_  
Name: Pedro Gonzalez de Cosio  
Title: Managing Member

[Signature Page to Patent Security Agreement]

SCHEDULE I  
TO  
PATENT SECURITY AGREEMENT

Patent Registrations

| <b><u>Assigned to PaxVax</u></b>       |  |   |   |  |  |
|--|--|---|---|--|--|
| <b><u>Patent /<br/>Publication</u></b> | <b><u>Priority /<br/>Application</u></b>                             | <b><u>Inventors /<br/>Assignee</u></b>  | <b><u>Title / Current<br/>Claims</u></b>                              | <b><u>Status</u></b>   | <b><u>Foreign Patent<br/>Family</u></b>  |
| <b>PAXV-001</b>                        |  |   |   |  |  |
| Not Published                          | US<br>61/024,164<br>2008-01-28                                       | Henderson,<br>Daniel R.<br>PaxVax   | ORAL<br>ADENOVIRUS-<br>BASED  | EXPIRED  | None   |
| <b>PAXV-003</b>                        |  |   |   |  |  |
| Not Published                          | US<br>61/086,438<br>2008-08-05                                       | Shabram, Paul   | STABLE, DRY,<br>IMMUNE-<br>MASKED<br>ADENOVIRAL<br>VECTOR<br>VACCINES | EXPIRED  | None   |
| <b>PAXV-004</b>                        |  |   |   |  |  |
| Not Published                          | US<br>61/230,617<br>2009-07-31                                       | Mayall,<br>Timothy P.<br>Alexander,<br>Jeff<br><br>PAXVAX,<br>INC.<br>(024628/0567) | ADENOVIRAL-<br>BASED<br>VACCINES                                      | EXPIRED  |  |
| US<br>2011/0123564<br>A1<br>2011-05-26 | US<br>61/230,617<br>2009-07-31<br><br>US<br>12/847,767<br>2010-07-30 | Mayall,<br>Timothy P.<br>Alexander,<br>Jeff<br><br>PAXVAX,<br>INC.<br>(025351/0357) | ADENOVIRAL-<br>BASED<br>VECTORS                                       | ALLOWED<br><br>Expires: 2030-07-<br>30<br>(projected)<br><br>2014-06-06 Notice<br>of allowance<br>mailed | AU 2010278797 A1<br>AU 2010278797<br>(Pending)<br><br>BR 112012008060-1<br>(Pending)<br><br>CA 2,769,752 A1<br>CA 2,769,752<br>(Pending)<br><br>CN 102549152 A<br>CN 201080044581.9<br>(Pending) |

| <u>Assigned to PaxVax</u>       |   |   |  |               |   |
|---------------------------------|---|---|--|---------------|---|
| <u>Patent /<br/>Publication</u> | <u>Priority /<br/>Application</u>                   | <u>Inventors /<br/>Assignee</u>   | <u>Title / Current<br/>Claims</u>                      | <u>Status</u> | <u>Foreign Patent<br/>Family</u>  |
|                                 |   |   |  |               | EP 2459716 A1<br><i>EP 10805122.8</i><br>(Pending)<br><br><i>IN</i><br><i>1827/DELNP/2012</i><br>(Pending)<br><br>JP 2013-501001 A<br><i>JP 2012-523098</i><br>(Pending)<br><br>KR 20120052369 A<br><i>KR 10-2012-7005335</i><br>(Pending)<br><br>MX 2012001404 A<br><i>MX</i><br><i>MX/a/2012/001404</i><br>(Pending)<br><br>RU 2012107702 A<br><i>RU 2012107702</i><br>(Pending)<br><br>WO 2011/014794 A1<br><i>PCT/US2010/043951</i><br>(Closed) |
| <b>PAXV-010</b>                 |   |   |  |               |   |
| Not Published                   | <i>US</i><br><i>61/446,309</i><br><i>2011-02-24</i> | Patel, Amish<br>A.<br>Shabram, Paul<br>W.<br><br>PAXVAX,<br>INC.<br>(027521/0615) | FORMULATIONS<br>USEFUL FOR<br>SPRAY DRYING<br>VACCINES | EXPIRED       |   |
| Not Published                   | US  | Patel, Amish  | FORMULATIONS   | ABANDONED     |   |

| <u>Assigned to PaxVax</u>              |   |   |  |   |  |
|--|---|---|--|---|--|
| <u>Patent / Publication</u>            | <u>Priority / Application</u>   | <u>Inventors / Assignee</u>   | <u>Title / Current Claims</u>                          | <u>Status</u>   | <u>Foreign Patent Family</u>   |
|  | 61/446,309<br>2011-02-24<br><br><i>US</i><br><i>13/369,021</i><br><i>2012-02-08</i>       | A.<br>Shabram, Paul<br>W.   | USEFUL FOR<br>SPRAY DRYING<br>VACCINES                 |   |  |
| US<br>2012/0219590<br>A1<br>2012-08-30 | US<br>61/446,309<br>2011-02-24<br><br><i>US</i><br><i>13/404,950</i><br><i>2012-02-24</i> | Patel, Amish<br>A.<br>Shabram, Paul<br>W.<br><br>PAXVAX,<br>INC.<br>(028181/0142) | FORMULATIONS<br>USEFUL FOR<br>SPRAY DRYING<br>VACCINES | PENDING<br><br>Expires: 2032-02-24<br>(projected)<br><br>2014-07-01 Final<br>Rejection mailed | AU 2012222150 A1<br><i>AU 2012222150</i><br>(Pending)<br><br>CA 2,828,248 A1<br><i>CA 2,828,248</i><br>(Pending)<br><br>EP 2678020 A2<br><i>EP 12749476.3</i><br>(Pending)<br><br><i>RU 2013143149</i><br>(Pending)<br><br>WO 2012/116280 A2<br><i>PCT/US2012/026518</i><br>(Closed) |
| PAXV-011                               |   |   |  |   |  |
| Not Published                          | <i>US</i><br><i>61/618,016</i><br><i>2012-03-30</i>                                       | Mayall,<br>Timothy P.<br><br>PAXVAX,<br>INC.<br>(029107/0146)                     | ADENOVIRAL-<br>BASED<br>VECTORS                        | EXPIRED   | None   |
| PAXV-012                               |   |   |  |   |  |
| Not Published                          | <i>US</i><br><i>61/492,597</i><br><i>2011-06-02</i>                                       | Patel, Amish<br>A.<br>Shabram, Paul<br>W.<br><br>PAXVAX,                          | NANOFILM<br>COATING FOR<br>ADENOVIRUS                  | EXPIRED   |  |

| <u>Assigned to PaxVax</u>              |  |  |   |  |  |
|--|--|--|---|--|--|
| <u>Patent / Publication</u>            | <u>Priority / Application</u>  | <u>Inventors / Assignee</u>  | <u>Title / Current Claims</u>   | <u>Status</u>  | <u>Foreign Patent Family</u>                       |
|  |  | INC.<br>(027521/0723)  |   |  |  |
| US<br>2012/0308660<br>A1<br>2012-12-06 | US<br>61/492,597<br>2011-06-02<br><br>US<br>13/486,949<br>2012-06-01 | Patel, Amish A.<br>Shabram, Paul W.<br><br>PAXVAX, INC.<br>(028337/0900) | NANOCOATINGS FOR BIOLOGICAL MATERIALS   | PENDING<br><br>Expires: 2032-06-01<br>(projected)<br><br>2014-04-16<br>Requirement for Restriction/Election mailed | WO 2012/167144 A1<br>PCT/US2012/040546<br>(Closed) |
| PAXV-013                               |  |  |   |  |  |
| Not Published                          | US<br>61/412,829<br>2010-11-12                                       | Monath, Thomas P.  | CHEMICALLY INACTIVATED AND REPLICATION-INCOMPETENT CHIMERIC DENGUE VIRUS AS VACCINES FOR PREVENTION OF DENGUE FEVER AND SEVERE DENGUE | EXPIRED  |  |
| Not Published                          | US<br>61/439,225<br>2011-02-03                                       | Monath, Thomas P.  | CHEMICALLY INACTIVATED AND REPLICATION-INCOMPETENT CHIMERIC DENGUE VIRUS AS VACCINES FOR PREVENTION OF DENGUE FEVER                   | EXPIRED  |  |

| <b><u>Assigned to PaxVax</u></b>       |  |   |  |                      |  |
|--|--|---|--|----------------------|--|
| <b><u>Patent / Publication</u></b>     | <b><u>Priority / Application</u></b>   | <b><u>Inventors / Assignee</u></b>  | <b><u>Title / Current Claims</u></b>   | <b><u>Status</u></b> | <b><u>Foreign Patent Family</u></b>                |
|  |  |   | AND SEVERE DENGUE  |                      |  |
| Not Published                          | US<br>61/499,591<br>2011-06-21   | Monath,<br>Thomas P.<br>Vasilakis,<br>Nikos<br><br>PAXVAX,<br>INC.<br>(026565/0200,<br>027202/0388)   | CHEMICALLY<br>INACTIVATED<br>AND<br>REPLICATION-<br>INCOMPETENT<br>CHIMERIC<br>DENGUE VIRUS<br>AS VACCINES<br>FOR<br>PREVENTION OF<br>DENGUE FEVER<br>AND SEVERE<br>DENGUE | EXPIRED              |  |
| Not Published                          | US<br>61/522,295<br>2011-08-11   | Monath,<br>Thomas P.<br>Vasilakis,<br>Nikos<br><br>PAXVAX,<br>INC.<br>(027202/0388,<br>no assignment<br>recorded for<br>Nikos<br>Vasilakis) | CHEMICALLY<br>INACTIVATED<br>AND<br>REPLICATION-<br>INCOMPETENT<br>CHIMERIC<br>DENGUE VIRUS<br>AS VACCINES<br>FOR<br>PREVENTION OF<br>DENGUE FEVER<br>AND SEVERE<br>DENGUE | EXPIRED              |  |
| US<br>2012/0294889<br>A1<br>2012-11-22 | US<br>61/412,829<br>2010-11-12<br><br>US<br>61/439,225<br>2011-02-03<br><br>US | Monath,<br>Thomas P.<br>Vasilakis,<br>Nikos<br><br>PAXVAX,<br>INC.<br>(028137/0060)   | CHIMERIC<br>FLAVIVIRUS<br>VACCINES   | ABANDONED            | WO 2012/065105 A2<br>PCT/US2011/060436<br>(Closed) |



| <b><u>Assigned to PaxVax</u></b>   |  |   |   |                      |                                     |
|------------------------------------|--|---|---|----------------------|-------------------------------------|
| <b><u>Patent / Publication</u></b> | <b><u>Priority / Application</u></b>   | <b><u>Inventors / Assignee</u></b>  | <b><u>Title / Current Claims</u></b>        | <b><u>Status</u></b> | <b><u>Foreign Patent Family</u></b> |
|                                    | 61/499,591<br>2011-06-21<br><br>US<br>61/522,295<br>2011-08-11<br><br>US<br>13/294,954<br>2011-11-11 |   |   |                      |                                     |
| <b>PAXV-014</b>                    |  |   |   |                      |                                     |
| Not Published                      | US<br>61/635,179<br>2012-04-18   | Patel, Amish<br>Bessette,<br>Shannyn<br>Shabram, Paul<br><br>PAXVAX,<br>INC.<br>(029040/0552)             | FORMULATION<br>FOR VACCINE<br>STABILIZATION | EXPIRED              | None                                |
| <b>PAXV-015</b>                    |  |   |   |                      |                                     |
| Not Published                      | US<br>61/645,542<br>2012-05-10   | Monath,<br>Thomas P.<br>Vasilakis,<br>Nikos<br>Volkova,<br>Zhenia<br><br>PAXVAX,<br>INC.<br>(029106/0615) | CHIMERIC<br>FLAVIVIRUS<br>VACCINES          | EXPIRED              | None                                |

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|-------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|----------------------|--------------------------------------|
| <b><u>Patent / Publication</u></b>  | <b><u>Priority / Application</u></b> | <b><u>Inventors / Assignee</u></b> | <b><u>Title / Current Claims</u></b> | <b><u>Status</u></b> | <b><u>Foreign Patent Family</u></b>  |
| <b>PAXV-005</b>                     |                                      |                                    |                                      |                      |                                      |
| US<br>2008/0187557                  | US<br>60/670,826                     | Sambhara,<br>Suryaprakash          | VACCINE<br>AGAINST                   | ABANDON<br>ED        | AU 2006236910 A1<br>AU 2006236910 B2 |

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| <b><u>Patent / Publication</u></b>   | <b><u>Priority / Application</u></b>  | <b><u>Inventors / Assignee</u></b>  | <b><u>Title / Current Claims</u></b>                                 | <b><u>Status</u></b>  | <b><u>Foreign Patent Family</u></b>  |
|--|---|---|--|---|--|
| A1<br>2008-08-07   | 2005-04-11<br><br>PCT/US20<br>06/013384<br>2006-04-10<br><br>US<br>11/911,189<br>2007-10-10                     | Katz, Jacqueline<br>Hoelscher, Mary<br>Mittal, Suresh<br>K.<br>Bangari, Dinesh<br>S.<br><br>PURDUE<br>RESEARCH<br>FOUNDATION<br>;<br>THE<br>GOVERNMENT OF THE<br>UNITED<br>STATES OF<br>AMERICA AS<br>REPRESENTED BY THE<br>SECRETARY<br>OF THE<br>DEPARTMENT<br>OF HEALTH<br>AND HUMAN<br>SERVICES,<br>CENTERS FOR<br>DISEASE<br>CONTROL<br>AND<br>PREVENTION<br>(019184/0339,<br>021162/0260,<br>019183/0772,<br>021162/0294) | PANDEMIC<br>STRAINS OF<br>INFLUENZA<br>VIRUSES                       |   | AU 2006236910<br>(Abandoned)<br><br>BR PI0609362 A2<br>BR PI 0609362-0<br>(Abandoned)<br><br>CA 2,604,732 A1<br>CA 2,604,732<br>(Pending)<br><br>CN 101193655 A<br>CN 200680020766.X<br>(Pending)<br><br>EP 1877088 A2<br>EP 06769811.8<br>(Abandoned)<br><br>IL 186611<br>(Abandoned)<br><br>IN 23/2008<br>IN 4150/KOLNP/2007<br>(Pending)<br><br>KR 10-2008-0052509 A<br>KR 10-2007-7026275<br>(Abandoned)<br><br>WO 2006/113214 A2<br>PCT/US2006/013384<br>(Closed) |
| US 8,163,545<br>B2<br>2012-04-24<br><br>US<br>2010/0158939<br>A1<br>2010-06-24 | US<br>60/670,826<br>2005-04-11<br><br>PCT/US20<br>06/013384<br>2006-04-10<br><br>US<br>11/911,189<br>2007-10-10 | Sambhara,<br>Suryaprakash<br>Katz, Jacqueline<br>Hoelscher, Mary<br>Mittal, Suresh<br>K.<br>Bangari, Dinesh<br>S.<br><br>PURDUE<br>RESEARCH<br>FOUNDATION   | VACCINE<br>AGAINST<br>PANDEMIC<br>STRAINS OF<br>INFLUENZA<br>VIRUSES | ISSUED<br><br>Expires:<br>2026-04-10<br><br>1 <sup>st</sup> fee due<br>2016-04-25<br><br>2 <sup>nd</sup> fee due<br>2020-04-24<br><br>3 <sup>rd</sup> fee due | AU 2006236910 A1<br>AU 2006236910 B2<br>AU 2006236910<br>(Abandoned)<br><br>BR PI0609362 A2<br>BR PI 0609362-0<br>(Abandoned)<br><br>CA 2,604,732 A1<br>CA 2,604,732<br>(Pending)  |

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| <b><u>Patent / Publication</u></b>  | <b><u>Priority / Application</u></b>  | <b><u>Inventors / Assignee</u></b>  | <b><u>Title / Current Claims</u></b>   | <b><u>Status</u></b> | <b><u>Foreign Patent Family</u></b>   |
|                                     | US<br>12/646,078<br>2009-12-23  | ; THE GOVERNMENT OF THE UNITED STATES OF AMERICA AS REPRESENTED BY THE SECRETARY OF THE DEPARTMENT OF HEALTH AND HUMAN SERVICES, CENTERS FOR DISEASE CONTROL AND PREVENTION (023696/0676, 023696/0665)              |  | 2024-04-24           | CN 101193655 A<br>CN 200680020766.X<br>(Pending)<br><br>EP 1877088 A2<br>EP 06769811.8<br>(Abandoned)<br><br>IL 186611<br>(Abandoned)<br><br>IN 23/2008<br>IN 4150/KOLNP/2007<br>(Pending)<br><br>KR 10-2008-0052509 A<br>KR 10-2007-7026275<br>(Abandoned)<br><br>WO 2006/113214 A2<br>PCT/US2006/013384<br>(Closed) |
| <b>PAXV-007</b>                     |   |   |  |                      |   |
| WO<br>2006/083984 A1<br>2006-08-10  | US<br>60/649,249<br>2005-02-01<br><br>US<br>60/697,655<br>2005-07-07<br><br>US<br>60/752,268<br>2005-12-21<br><br>PCT/US2006/003601<br>2006-02-01 | Schiller, John T.<br>Pastrana, Diana V.<br>Gambhira, Ratish<br>Lowy, Douglas R.<br>Roden, Richard B.S.<br><br>THE GOVERNMENT OF THE UNITED STATES OF AMERICA, AS REPRESENTED BY THE SECRETARY, DEPARTMENT OF HEALTH | PAPILLOMAVIRUS L2 N-TERMINAL PEPTIDES FOR THE INDUCTION OF BROADLY CROSS-NEUTRALIZING ANTIBODIES | CLOSED               | AU 2006210792 A1<br>AU 2006210792 B2<br>AU 2006210792<br>(Granted)<br><br>BR PI0607097 A2<br>BR PI 0607097-3<br>(Pending)<br><br>CA 2,596,698 A1<br>CA 2,596,698<br>(Pending)<br><br>CN 101193653 A<br>CN 101193653 B<br>CN 200680011079.1<br>(Granted)<br><br>EP 1853307 A1<br>EP 06734177.6<br>(Pending)            |

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| <b><u>Patent / Publication</u></b>                                    | <b><u>Priority / Application</u></b>   | <b><u>Inventors / Assignee</u></b>  | <b><u>Title / Current Claims</u></b>   | <b><u>Status</u></b>   | <b><u>Foreign Patent Family</u></b>  |
|   |  | AND HUMAN SERVICES;<br>THE JOHNS HOPKINS UNIVERSITY   |  |  | IN 35/2007<br><i>IN 6219/DELNP/2007</i><br>(Pending)<br><br>JP 5224821 B2<br>JP 2008-530010 A<br><i>JP 2007-554194</i><br>(Granted)  |
| US 8,404,244 B2<br>2013-03-26<br><br>US 2009/0047301 A1<br>2009-02-19 | US 60/649,249<br>2005-02-01<br><br>US 60/697,655<br>2005-07-07<br><br>US 60/752,268<br>2005-12-21<br><br>PCT/US20 06/003601<br>2006-02-01<br><br>US 11/883,495<br>2008-05-13 | Schiller, John T.<br>Pastrana, Diana V.<br>Gambhira, Ratish<br>Lowy, Douglas R.<br>Roden, Richard B.S.<br><br>THE GOVERNMENT OF THE UNITED STATES OF AMERICA, AS REPRESENTED BY THE SECRETARY, DEPARTMENT OF HEALTH AND HUMAN SERVICES;<br>THE JOHNS HOPKINS UNIVERSITY<br>(019555/0491, 021103/0253, 019555/0140, 021103/0257) | PAPILLOMAVIRUS L2 N-TERMINAL PEPTIDES FOR THE INDUCTION OF BROADLY CROSS-NEUTRALIZING ANTIBODIES | ISSUED<br><br>Expires: 2028-03-23<br>(2026-02-01 + 781 days)<br><br>1 <sup>st</sup> fee due 2017-03-27<br><br>2 <sup>nd</sup> fee due 2021-03-26<br><br>3 <sup>rd</sup> fee due 2025-03-26 | AU 2006210792 A1<br>AU 2006210792 B2<br><i>AU 2006210792</i><br>(Granted)<br><br>BR PI0607097 A2<br><i>BR PI 0607097-3</i><br>(Pending)<br><br>CA 2,596,698 A1<br><i>CA 2,596,698</i><br>(Pending)<br><br>CN 101193653 A<br>CN 101193653 B<br><i>CN 200680011079.1</i><br>(Granted)<br><br>EP 1853307 A1<br><i>EP 06734177.6</i><br>(Pending)<br><br>IN 35/2007<br><i>IN 6219/DELNP/2007</i><br>(Pending)<br><br>JP 5224821 B2<br>JP 2008-530010 A<br><i>JP 2007-554194</i><br>(Granted) |
| US 2013/0177585 A1<br>2013-07-11                                      | US 60/649,249<br>2005-02-01  | Schiller, John T.<br>Pastrana, Diana V.<br>Gambhira,  | PAPILLOMAVIRUS L2 N-TERMINAL PEPTIDES FOR  | PENDING<br><br>Expires: 2026-02-01   | AU 2006210792 A1<br>AU 2006210792 B2<br><i>AU 2006210792</i><br>(Granted)  |

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| <b><u>Patent / Publication</u></b>     | <b><u>Priority / Application</u></b>  | <b><u>Inventors / Assignee</u></b>   | <b><u>Title / Current Claims</u></b>                                   | <b><u>Status</u></b>   | <b><u>Foreign Patent Family</u></b>   |
|  | US<br>60/697,655<br>2005-07-07<br><br>US<br>60/752,268<br>2005-12-21<br><br>PCT/US20<br>06/003601<br>2006-02-01<br><br>US<br>11/883,495<br>2008-05-13<br><br>US<br>13/772,893<br>2013-02-21 | Ratish<br>Lowy, Douglas<br>R.<br>Roden, Richard<br>B.S.<br><br>THE<br>GOVERNMENT OF THE<br>UNITED<br>STATES OF<br>AMERICA, AS<br>REPRESENTED BY THE<br>SECRETARY,<br>DEPARTMENT<br>OF HEALTH<br>AND HUMAN<br>SERVICES;<br>THE JOHNS<br>HOPKINS<br>UNIVERSITY<br>(Parent) | THE<br>INDUCTION<br>OF BROADLY<br>CROSS-<br>NEUTRALIZING<br>ANTIBODIES | (projected)<br><br>2014-06-19<br>Final<br>Rejection<br>mailed  | BR PI0607097 A2<br>BR PI 0607097-3<br>(Pending)<br><br>CA 2,596,698 A1<br>CA 2,596,698<br>(Pending)<br><br>CN 101193653 A<br>CN 101193653 B<br>CN 200680011079.1<br>(Granted)<br><br>EP 1853307 A1<br>EP 06734177.6<br>(Pending)<br><br>IN 35/2007<br>IN 6219/DELNP/2007<br>(Pending)<br><br>JP 5224821 B2<br>JP 2008-530010 A<br>JP 2007-554194<br>(Granted) |
| <b>PAXV-008</b>                        |   |  |  |  |   |
| US<br>2006/0115456<br>A1<br>2006-06-01 | US<br>60/629,722<br>2004-11-18<br><br>US<br>11/282,319<br>2005-11-17  | Peng, Bo<br>Voltan, Rebecca<br>Ensoli, Barbara<br>Robert-Guroff,<br>Marjorie<br><br>ISTITUTO<br>SUPERIORE DI<br>SANITA;<br>THE<br>GOVERNMENT OF THE<br>UNITED<br>STATES OF<br>AMERICA AS<br>REPRESENTED BY THE<br>SECRETARY<br>OF THE                                    | REPLICATION-<br>COMPETENT<br>ADENOVIRAL<br>VECTORS                     | PENDING<br><br>Expires:<br>2025-11-17<br>(projected)<br><br>2014-07-03<br>Final<br>Rejection<br>mailed | None  |

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|--|--|---|--|----------------------|-------------------------------------|
| <b><u>Patent /<br/>Publication</u></b> | <b><u>Priority /<br/>Application</u></b> | <b><u>Inventors /<br/>Assignee</u></b>  | <b><u>Title / Current<br/>Claims</u></b> | <b><u>Status</u></b> | <b><u>Foreign Patent Family</u></b> |
|  |  | DEPARTMENT<br>OF HEALTH<br>AND HUMAN<br>SERVICES<br>(017238/0794,<br>017238/0783) |  |                      |                                     |