

## PATENT ASSIGNMENT

Electronic Version v1.1  
 Stylesheet Version v1.1

SUBMISSION TYPE:	NEW ASSIGNMENT										
NATURE OF CONVEYANCE:	ASSIGNMENT										
CONVEYING PARTY DATA											
<table border="1"> <thead> <tr> <th>Name</th> <th>Execution Date</th> </tr> </thead> <tbody> <tr> <td>SIDDHARTHA JAIN</td> <td>03/12/2013</td> </tr> <tr> <td>MANMOHAN SINGH</td> <td>03/08/2013</td> </tr> <tr> <td>DEREK O'HAGAN</td> <td>03/29/2013</td> </tr> </tbody> </table>		Name	Execution Date	SIDDHARTHA JAIN	03/12/2013	MANMOHAN SINGH	03/08/2013	DEREK O'HAGAN	03/29/2013		
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SIDDHARTHA JAIN	03/12/2013										
MANMOHAN SINGH	03/08/2013										
DEREK O'HAGAN	03/29/2013										
RECEIVING PARTY DATA											
<table border="1"> <tr> <td>Name:</td> <td>NOVARTIS VACCINES AND DIAGNOSTICS, INC.</td> </tr> <tr> <td>Street Address:</td> <td>4560 HORTON STREET</td> </tr> <tr> <td>City:</td> <td>EMERYVILLE</td> </tr> <tr> <td>State/Country:</td> <td>CALIFORNIA</td> </tr> <tr> <td>Postal Code:</td> <td>94608-2916</td> </tr> </table>		Name:	NOVARTIS VACCINES AND DIAGNOSTICS, INC.	Street Address:	4560 HORTON STREET	City:	EMERYVILLE	State/Country:	CALIFORNIA	Postal Code:	94608-2916
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PROPERTY NUMBERS Total: 1											
<table border="1"> <thead> <tr> <th>Property Type</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>Application Number:</td> <td>13808245</td> </tr> </tbody> </table>		Property Type	Number	Application Number:	13808245						
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Application Number:	13808245										
CORRESPONDENCE DATA											
<p>Fax Number: 5106553542  <i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i></p> <p>Phone: (510) 923-2192        Email: felicia.soria@novartis.com        Correspondent Name: Helen Lee        Address Line 1: 4560 Horton Street        Address Line 2: IP Services M/S X-100B        Address Line 4: Emeryville, CALIFORNIA 94608-2916</p>											
ATTORNEY DOCKET NUMBER:	PAT054181-US-PCT										
NAME OF SUBMITTER:	Felicia Soria										
Signature:	/Felicia Soria/										

Date:

04/15/2013

**Total Attachments: 13**

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RECORDATION FORM COVER SHEET  
**PATENTS ONLY**

U.S. DEPARTMENT OF COMMERCE  
U.S. Patent and Trademark Office

Atty Docket No.: PAT054181-WO-PCT

To the Director of Patents and Trademarks: Please record the attached original documents or copy thereof.

1. Name of conveying party(ies):

SIDDHARTHA JAIN  
MANMOHAN SINGH  
DEREK O'HAGAN

Additional name(s) of conveying party(ies) attached? ☐ Yes ☒ No

3. Nature of conveyance:

- ☒ Assignment ☐ Merger  
☐ Security Agreement ☐ Change of Name  
☐ Joint Research Agreement ☐ Other \_\_\_\_\_  
☐ Government Interest Assignment  
☐ Executive Order 9424, Confirmatory License

Execution Date(s): 03/12/2013, 03/08/2013, 03/29/2013

2. Name and address of receiving party(ies)  
Name:

Novartis Vaccines and Diagnostics, Inc.  
4560 Horton Street  
Emeryville, California  
94608-2916

☐ Other

Additional name(s) & address(es) attached? ☐ Yes ☒ No

4. Application number(s) or patent number(s):

If this document is being filed together with a new application, the execution date of the application is: \_\_\_\_\_.

A. Patent Application No.(s)

PCT/US2011/043086 (now 13/808,245)

B. Patent No.(s)

Additional number(s) attached ☐ Yes ☒ No

5. Name and address of party to whom correspondence concerning document should be mailed:

NOVARTIS VACCINES AND DIAGNOSTICS, INC.  
Corporate Intellectual Property - X 100B  
P.O. Box 8097  
Emeryville, CA 94662-8097

6. Total number of applications and patents involved **1**

7. Total fee (37 CFR 3.41)..... \$40.00

☐ Enclosed

☒ Authorized to be charged to deposit account.

8. Deposit account number: **03-1664**

(Attach duplicate copy of this page if paying by deposit account)

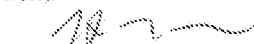
DO NOT USE THIS SPACE

9. Statement and signature.

*To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.*

**Helen Lee, Reg. No. 39,270**

Name of Person Signing



Signature

**15 April 2013**

Date

Total number of pages including cover sheet, attachments, and document: **13**

Documents to be recorded (including cover sheet) should be faxed to (571) 273-0140, or mailed to:  
Mail Stop Assignment Recordation Services, Director of the USPTO, P.O. Box 1450, Alexandria, VA 22313-1450

# ASSIGNMENT

This Assignment Agreement is entered into by and between Siddhartha Jain, a citizen of India, Manmohan Singh, a citizen of the United States of America, and Derek O'Hagan, a citizen of the United States of America (hereinafter "Inventor(s)"), and NOVARTIS VACCINES AND DIAGNOSTICS, INC., 4560 Horton Street, Emeryville, California 94608, a company organized under the laws of the State of Delaware.

For good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, I/We the Inventor(s) do hereby confirm and agree that, by operation of law and/or contract, and/or by the fulfillment of any and all legal requirements regarding the transfer of employee inventions in my/our country of employment, NOVARTIS VACCINES AND DIAGNOSTICS, INC., is the true and lawful owner of all right, title and interest in all inventions, discoveries, patents/utility models, applications, and rights described in paragraphs (1) through (8) below.

If, however, under the laws of any country, I/We the Inventor(s) nevertheless have any ownership right, title or interest in any of the items described herein (which I/We do not believe to be the case and make no claim in or to), for good and valuable consideration, the receipt and adequacy of which is hereby acknowledged, I/We the Inventor(s) do hereby sell, assign and transfer to NOVARTIS VACCINES AND DIAGNOSTICS, INC., and its successors, assigns and legal representatives (hereinafter referred to collectively as the "ASSIGNEE"), all of our right, title and interest for all countries of the world in and to

(1) all of our inventions and discoveries described in the provisional or non-provisional patent, utility model, or other application(s) entitled

## **DELIVERY OF SELF-REPLICATING RNA USING BIODEGRADABLE POLYMER PARTICLES [Patent Case PAT054181-WO-PCT]**

and filed in the United States Patent and Trademark Office on \_\_\_\_\_, 2013 and accorded Application Number \_\_\_\_\_ and/or filed as a PCT International Application on July 6, 2011 and accorded International Patent Application Number PCT/US2011/043086; and/or filed in the United States Patent and Trademark Office on \_\_\_\_\_ and accorded Application Number \_\_\_\_\_;

(2) the application(s) identified in paragraph (1), and all applications claiming priority from such application(s), directly or indirectly, including all national stages of any international patent application(s);

(3) the right to file patent, utility model, or other applications on any invention or discovery disclosed in any of the applications identified in paragraphs (1) and (2), including the right to file such applications on said inventions and discoveries in the names of ASSIGNEE or their designees or in our/my name, at ASSIGNEE's election and in accordance with applicable law in all countries and regions; and the right to file all patent, utility model, or other

applications in all countries and regions claiming the priority of any of the provisional or non-provisional application(s) identified in paragraphs (1) or (2);

(4) all rights to claim priority from any of the applications referred to in paragraphs (1), (2), and (3) or from any application from which any of the applications referred to in paragraphs (1), (2) and (3) claim priority in all countries and regions under the Paris Convention for the Protection of Industrial Property, the WTO GATT TRIPS Agreement, the Inter-American Convention relating to Inventions, Patents, Designs, and Industrial Models and all other international agreements to which the United States now is or hereafter becomes a signatory and, if the United States patent application is a provisional patent application, under 35 USC 119(e);

(5) all continuations, continuations-in-part, and divisionals of any United States patent application(s) or international patent application(s) designating the United States, any national stages of any international application(s), and any other patent application(s) described in paragraphs (1) through (4) hereof, including further continuations, continuations-in-part, and divisionals such as, but not limited to, continuations of continuations and continuations of divisionals;

(6) all patents, utility models, or other grants that issue from any of the applications referred to herein and all rights and remedies associated therewith including the right to sue for and recover past damages and to recover under 35 U.S.C. § 154 (d) or any other law permitting remedies for infringement prior to issuance of the patent;

(7) all registrations and confirmations of, and importation certificates based upon, one or more of said patents, utility models, or other grants, and applications for such registrations, confirmations and importation certificates and;

(8) all reissues, renewals and extensions of said patents, utility models, registrations, confirmations and importation certificates, reexamination certificates issued for said patents and supplementary protection certificates based upon said patents and applications for such reissues, renewals, extensions, reexamination certificates and supplementary protection certificates, the same to be held and enjoyed by said ASSIGNEE to the full ends of the terms for which said patents, utility models, registrations, confirmations, importation certificates, reexamination certificates, supplementary protection certificates, reissues, renewals and extensions may be granted, as fully and entirely as the same would have been held and enjoyed by me/us if this sale, assignment and transfer had not been made.

I/We the Inventor(s) hereby authorize ASSIGNEE and their representatives to insert in paragraph (1) of this Assignment the filing date(s) and Application Number(s) of said patent, utility model, or other application(s) when notified thereof.

I/We the Inventor(s) hereby covenant and agree that I/We will, at any time, (i) upon the request, but at the expense, of ASSIGNEE, execute and deliver all documents that may be necessary or desirable to perfect the title to the foregoing inventions and discoveries, applications, patents, utility models, registrations, confirmations, importation certificates, reissues, renewals, extensions, reexamination certificates, supplementary protection certificates,


and applications within the scope of (7) and (8), in ASSIGNEE, including the execution and procurement of all further documents evidencing this sale, assignment and transfer as may be necessary or desirable for recording the same in the patent office or other intellectual property office, agency or the like of any country or region, (ii) upon the request, but at the expense, of ASSIGNEE execute all additional applications within the scope of paragraphs (1) through (6) and all applications within the scope of (7) or (8), and (iii) make all rightful oaths and declarations and do all lawful acts requisite for procuring the same or for aiding therein, without further compensation, but at the expense of ASSIGNEE .

Should any provision of this Assignment be deemed invalid or unenforceable by reason of any law, statute, regulation or judgment, existing now or in the future in any jurisdiction, such provision shall be modified in such jurisdiction so as to nearly approximate the intent of the Parties. If this cannot be done, such invalid or unenforceable provision shall be divisible and be deleted in any such jurisdiction, and all other provisions shall remain in full force and effect. The modification or deletion of any provision in one jurisdiction shall have no effect on this Assignment in any other jurisdiction.

This Assignment shall be governed by the laws of the State of Delaware.

This Assignment is effective as from the earliest priority date as stated above.

Executed this 12 day of MARCH, 2013.

Siddhartha Jain  L.S.

Kamlesh  
Witness

Executed this \_\_\_\_\_ day of \_\_\_\_\_, 2013.

\_\_\_\_\_  
Manmohan Singh L.S.

\_\_\_\_\_  
Witness

Executed this \_\_\_\_\_ day of \_\_\_\_\_, 2013.

\_\_\_\_\_  
Derek O'Hagan L.S.

\_\_\_\_\_  
Witness

Executed this \_\_\_\_\_ day of \_\_\_\_\_, 2013.

NOVARTIS VACCINES AND DIAGNOSTICS, INC.

BY \_\_\_\_\_ L.S.

\_\_\_\_\_  
Witness

## ASSIGNMENT

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(1) all of our inventions and discoveries described in the provisional or non-provisional patent, utility model, or other application(s) entitled

### **DELIVERY OF SELF-REPLICATING RNA USING BIODEGRADABLE POLYMER PARTICLES [Patent Case PAT054181-WO-PCT]**

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applications in all countries and regions claiming the priority of any of the provisional or non-provisional application(s) identified in paragraphs (1) or (2);

(4) all rights to claim priority from any of the applications referred to in paragraphs (1), (2), and (3) or from any application from which any of the applications referred to in paragraphs (1), (2) and (3) claim priority in all countries and regions under the Paris Convention for the Protection of Industrial Property, the WTO GATT TRIPS Agreement, the Inter-American Convention relating to Inventions, Patents, Designs, and Industrial Models and all other international agreements to which the United States now is or hereafter becomes a signatory and, if the United States patent application is a provisional patent application, under 35 USC 119(e);

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(8) all reissues, renewals and extensions of said patents, utility models, registrations, confirmations and importation certificates, reexamination certificates issued for said patents and supplementary protection certificates based upon said patents and applications for such reissues, renewals, extensions, reexamination certificates and supplementary protection certificates, the same to be held and enjoyed by said ASSIGNEE to the full ends of the terms for which said patents, utility models, registrations, confirmations, importation certificates, reexamination certificates, supplementary protection certificates, reissues, renewals and extensions may be granted, as fully and entirely as the same would have been held and enjoyed by me/us if this sale, assignment and transfer had not been made.

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Executed this \_\_\_\_\_ day of \_\_\_\_\_, 2013.

\_\_\_\_\_  
Siddhartha Jain L.S.

\_\_\_\_\_  
Witness

Executed this 24 day of March, 2013.

[Signature]  
Manmohan Singh L.S.

[Signature]  
Witness

Executed this \_\_\_\_\_ day of \_\_\_\_\_, 2013.

\_\_\_\_\_  
Derek O'Hagan L.S.

\_\_\_\_\_  
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Siddhartha Jain L.S.

\_\_\_\_\_  
Witness

Executed this \_\_\_\_\_ day of \_\_\_\_\_, 2013.

\_\_\_\_\_  
Manmohan Singh L.S.

\_\_\_\_\_  
Witness

Executed this 29 day of March, 2013.

Derek O'Hagan L.S.  
Derek O'Hagan

Collette R. D'Amico  
Witness Collette R. D'Amico

Executed this 9th day of April, 2013.

NOVARTIS VACCINES AND DIAGNOSTICS, INC.

BY Mei Hong L.S.  
Mei Hong

Felicia Soria  
Witness Felicia Soria