

## PATENT ASSIGNMENT COVER SHEET

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<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
NOVARTIS VACCINES AND DIAGNOSTICS S.R.L.	08/12/2013
<b>RECEIVING PARTY DATA</b>	
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<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	14424839
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<b>NAME OF SUBMITTER:</b>	CARLY MORROW
<b>SIGNATURE:</b>	/Carly Morrow/
<b>DATE SIGNED:</b>	07/11/2016
<b>Total Attachments: 3</b>	
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**ASSIGNMENT**

This Assignment Agreement is entered into by and between NOVARTIS VACCINES AND DIAGNOSTICS S.r.l., Via Fiorentina 1, 53100, Siena, Italy, a company organized under the laws of Italy, and NOVARTIS AG, a company incorporated in Switzerland whose address is Lichtstrasse 35, 4056 Basel, Switzerland.

For good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, NOVARTIS VACCINES AND DIAGNOSTICS S.r.l. does hereby sell, assign and transfer to NOVARTIS AG and its successors, assigns and legal representatives (hereinafter referred to collectively as the "ASSIGNEE"), all of its right, title and interest for all countries of the world in and to

(1) all inventions and discoveries described in the provisional or non-provisional patent application(s) entitled

**OUTER MEMBRANE VESICLES [Patent Case PAT055225-US-PSP02]**

and filed in the United States Patent and Trademark Office on \_\_\_\_\_ and accorded Application Number \_\_\_\_\_ and/or filed as a PCT International Application on \_\_\_\_\_ and accorded International Patent Application Number \_\_\_\_\_; and/or filed in the United States Patent and Trademark Office on \_\_\_\_\_ and accorded Application Number \_\_\_\_\_; and/or filed in the United States Patent and Trademark Office on March 15<sup>th</sup>, 2013 and accorded Application Number 61/799,311;

(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 on behalf or in the name(s) of the inventor(s) of said inventions and discoveries, 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 NOVARTIS VACCINES AND DIAGNOSTICS S.r.l. if this sale, assignment and transfer had not been made.

NOVARTIS VACCINES AND DIAGNOSTICS S.r.l. hereby authorizes 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.

NOVARTIS VACCINES AND DIAGNOSTICS S.r.l. hereby covenants and agrees that it 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 Switzerland.

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

Executed this 12<sup>th</sup> day of AUGUST, 2013.

NOVARTIS VACCINES AND DIAGNOSTICS S.r.l.

BY [Signature] L.S.  
Stephen John Evans - Attorney-in Fact

[Signature]  
Witness

Executed this 12<sup>th</sup> day of AUGUST, 2013.

NOVARTIS AG

BY [Signature] L.S.  
Ilaria Ferrarini - Authorized Representative

[Signature]  
Witness

Executed this 12<sup>th</sup> day of AUGUST, 2013.

NOVARTIS AG

BY [Signature] L.S.  
Isabelle Frouin - Authorized Representative

[Signature]  
Witness