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PATENT ASSIGNMENT COVER SHEET

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| NATURE OF CONVEYANCE: | | ASSIGNMENT | ASSIGNMENT | | |
| CONVEYING PARTY | DATA | | | | |
| | | Name | Execution Date | | |
| NOVARTIS VACCINE | S AND DIA | GNOSTICS GMBH & CO. KG | 01/20/2010 | | |
| | | | | | |
| RECEIVING PARTY | | | | | |
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| City: | BASEL | BASEL | | | |
| State/Country: | SWITZE | SWITZERLAND | | | |
| Postal Code: | 4056 | | | | |
| | • | | | | |
| PROPERTY NUMBER | RS Total: 1 | | | | |
| Property Type | | Number | | | |
| Application Number: | | 14011258 | | | |
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| DATE SIGNED: | | 05/24/2017 | | | |
| Total Attachments: 2 | | | | | |
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ASSIGNMENT OF PATENT APPLICATION

Whereas Novartis Vaccines & Diagnostics GmbH & Co. KG, a corporation of the country of the Germany, having a place of business at Emil-von-Behring Strasse 76, Marburg, Germany 35041, ("ASSIGNOR") and Novartis AG, a corporation of Switzerland having a place of business at Lichtstrasse 35, 4056 Basel, Switzerland, ("ASSIGNEE") have agreed that ASSIGNEE shall acquire from ASSIGNOR the following patents and/or patent applications ("PATENT PROPERTIES"):

| Patent No. | Application No. | Filing Date | Issue Date |
|------------|-------------------|------------------|------------|
| | PCT/IB2007/004229 | November 6, 2007 | |
| | 12/312,629 | May 18, 2009 | |

Therefore, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, ASSIGNOR, the owner of the entire right, title, and interest in the PATENT PROPERTIES, hereby sells, assigns, transfers and conveys to ASSIGNEE, its designees, successors, assigns and legal representatives, the entire right, title and interest in the PATENT PROPERTIES and all divisions, continuations, reissues and reexaminations thereof, the inventions therein, and all rights to claim priority from the PATENT PROPERTIES and all applications for patent that may be filed for the inventions in any foreign country and all patents that may be granted on the inventions in any foreign country, and all extensions, renewals, and reissues thereof: each and every of the foregoing rights, titles and interests herein assigned shall be held and enjoyed by ASSIGNEE, its successors, assigns and legal representatives, as fully and entirely as the same would have been held and enjoyed by ASSIGNOR had this Assignment not been made.



IN TESTIMONY WHEREOF, Assignor has caused this Assignment to be duly executed in its name and behalf by affixing its hand and seal thereto by its designated officer, director, or agent, whose name and title appear below.

Executed at Emeryville, California this <u>20</u> day of January, 2010.

Novartis Vaccines & Diagnostics GmbH & Co. KG

Signature Name: Amy Hessler Title: Attorney-in-Fact

State of California)) County of Alameda)

On JANUARY 20. 2010 before me, <u>VAIA N. Shure</u>, <u>Notary Public</u>, personally appeared <u>Amy Hessler</u>, personally known to me to be the person whose name is subscribed to the within instrument and acknowledged to me that she executed the same in her authorized capacity, and that by her signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

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 of Notary Public



Place Notary Seal Above

PATENT REEL: 023690 FRAME:03780

RECORDED: 05/20/20170