PATENT ASSIGNMENT COVER SHEET

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SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
KRISTEN JOHNSON	05/30/2013
JIAN SHI	05/30/2013

RECEIVING PARTY DATA

Name:	NOVARTIS INSTITUTE FOR FUNCTIONAL GENOMICS, INC.
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PROPERTY NUMBERS Total: 1

Property Type	Number
Application Number:	15835290

CORRESPONDENCE DATA

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using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

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ATTORNEY DOCKET NUMBER:	PAT055625-US-DIV03
NAME OF SUBMITTER:	MARK LAZAROW
SIGNATURE:	/Mark Lazarow/
DATE SIGNED:	06/26/2019

Total Attachments: 6

source=55625-US-DIV03 P1 Assignment Johnsen Shi to GNF#page1.tif source=55625-US-DIV03 P1 Assignment Johnsen Shi to GNF#page2.tif source=55625-US-DIV03_P1 Assignment_Johnsen Shi to GNF#page3.tif source=55625-US-DIV03 P1 Assignment Johnsen Shi to GNF#page4.tif source=55625-US-DIV03 P1 Assignment Johnsen Shi to GNF#page5.tif source=55625-US-DIV03_P1 Assignment_Johnsen Shi to GNF#page6.tif

PATENT REEL: 049586 FRAME: 0952 505544129

ASSIGNMENT

This Assignment Agreement is entered into by and between

Kristen JOHNSON	citizen of United States of America	Novartis Institute for Functional Genomics, Inc. dba Genomics institute of the Novartie Research Foundation (GNF) 10675 John Jay Hopkins Drive San Diego, California 92121 US
Jian SHI	citizen of United States of America	Novertis Institute for Functional Genomics, Inc. dba Genomics Institute of the Novertis Research Foundation (GNF) 10675 John Jay Hopkins Drive San Diego, California 92121 US

c/o NOVARTIS INSTITUTE FOR FUNCTIONAL GENOMICS, INC., Genomics Institute of the Novartis Research Foundation, 10675 John Jay Hopkins Drive, San Diego, California 92121, USA, hereinafter "Inventor(s)", and the NOVARTIS INSTITUTE FOR FUNCTIONAL GENOMICS, INC., dba the GENOMICS INSTITUTE OF THE NOVARTIS RESEARCH FOUNDATION (GNF), 10675 John Jay Hopkins Drive, San Diego, California 92121, USA, 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, GNF 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 GNF 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

PEPTIDES AND COMPOSITIONS FOR TREATMENT OF JOINT DAMAGE [Patent Case 55625]

and filed in the (to be determined) Office on (to be determined) and accorded Application Number (to be determined) and/or filed as a PCT international Application on (to be determined)

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and accorded International Patent Application Number PCT (to be determined); and/or filed in the United States Patent and Trademark Office on March 8, 2013 and accorded Application Number 61/775,400.

- (2) the application(s) identified in paragraph (i), 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

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certificates, supplementary protection certificates, relissues, 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 Delaware.

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

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Executed this 20 day of _	<u> 1994</u> , 20 <u>1</u>	2	
BY NOT Krisien JOHNSON	1	S.	
ACKNOWLEDGEMENT			
State of California).		
County of San Diego) s.s.:)		
On /NAy 20 20/3 appeared Kristen JOHNSON whose name(s)/k/are subscribed executed the same in his new the instrument the person(s), or the executed the same in the person(s), or the executed the same in the person(s), or the executed the person(s).	d to the within instrument in authorized capacity(ies)	nt and acknowledge, and that by histh	ed to me that he he he they guither signature (a) on the
I certify under PENALTY OF I paragraph is true and correct.	ERJURY under the laws	of the State of Ca	difornia that the foregoing
WITNESS my hand and offici			SUSAN SESNOVICH Commississ # 1982383 Notary Public - California San Diago County

Executed this day of		13.	
BY Ji V		L.S.	
ACKNOWLEDGEMENT			
State of California)		
County of San Diego) s.s,:		
On MAN 20 200 personally appeared Jian SHI whose name of judger subscribed executed the same in his ferther instrument the person(s), or the entire of the person (s), or the entire of the person (s).	to proved to me on the bit to the within instrume reauthorized especity(is: tity upon behalf of which	asis of satisfactory evidence on and acknowledged to so, and that by his region execute person (*) acted, execute the person (*) acted, execute the person (*) acted.	to be the person(e) me that he
I certify under PENALTY OF P paragraph is true and correct.	ERJURY under the law	s of the State of Californi	ia that the foregoing
WITNESS my hand and official Signature	ai seal. Marie (Seai)	Tamenton of	este costa de la companya de la comp

NOVARTIS INSTITUTE FO	R FUNCTIONAL GENOMICS, INC.
Executed this 2 day of	July 20/3
BY Robert C. Downs	L.S.
ACKNOWLEDGEMENT	
State of California)
County of San Diego) s.s.:)
appeared Robert C. Downs who whose name(s) is not subscribed executed the same in his howther	perfore me, <u>SUSAN SEXULA</u> , Notary Public, personally proved to me on the basis of satisfactory evidence to be the person(s) to the within instrument and acknowledged to me that he she/they r authorized capacity(jes), and that by (is/her/their signature(s) on the tity upon behalf of which the person(s) acted, executed the instrument.
I certify under PENALTY OF P paragraph is true and correct.	ERJURY under the laws of the State of California that the foregoing
WITNESS my hand and officia	d soal.
Signature <u>Lesse</u>	(Seal) SUSAN SESMOVON Commission # 1862303 Nutsry Public - Celifornia San Diego County No Constr. Expires Dec 2, 2018

RECORDED: 06/26/2019