PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2 EPAS ID: PAT4940321

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
JIPING FU	04/13/2018
WOOSEOK HAN	04/13/2018
SUBRAMANIAN KARUR	04/13/2018
PEICHAO LU	04/13/2018
KEITH BRUCE PFISTER	04/13/2018
JOSEPH MICHAEL YOUNG	04/13/2018

RECEIVING PARTY DATA

Name:	NOVARTIS INSTITUTES FOR BIOMEDICAL RESEARCH INC.	
Street Address:	250 MASSACHUSETTS AVENUE	
City:	CAMBRIDGE	
State/Country:	MASSACHUSETTS	
Postal Code:	02139	

PROPERTY NUMBERS Total: 1

Property Type	Number
Application Number:	15965172

CORRESPONDENCE DATA

Fax Number:

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: (510) 879-9719

Email: lisa.nash@novartis.com

Correspondent Name: NOVARTIS INSTITUTES FOR BIOMEDICAL RESEARCH INC.

Address Line 1: 5300 CHIRON WAY

Address Line 4: EMERYVILLE, CALIFORNIA 94608

ATTORNEY DOCKET NUMBER:	PAT057714-US-NP
NAME OF SUBMITTER:	LISA NASH
SIGNATURE:	/lisa nash/
DATE SIGNED:	05/01/2018

Total Attachments: 21

PATENT REEL: 046478 FRAME: 0501

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ASSIGNMENT

This Assignment Agreement is entered into by and between

Jiping FU	citizen of United States of	Novartis Institutes for BioMedical
	America	Research Inc.
		5300 Chiron Way
		Emeryville, CA 94608
		United States of America
Wooseok HAN	citizen of United States of	Novartis Institutes for BioMedical
	America	Research, Inc.
		250 Massachusetts Avenue
		Cambridge, MA 02139
		United States of America
Subramanian KARUR	citizen of India	Novartis Institutes for BioMedical
		Research Inc.
		5300 Chiron Way
		Emeryville, CA 94608 United
		States of America
Peichao LU	citizen of China	Novartis Institutes for BioMedical
		Research Inc.
		5300 Chiron Way
		Emeryville, CA 94608
		United States of America
Keith Bruce PFISTER		Novartis Institutes for BioMedical
	America	Research, Inc.
		5300 Chiron Way
		Emeryville, CA 94608 USA
		United States of America
Joseph Michael		Novartis Institutes for BioMedical
YOUNG	America	Research Inc.
		5300 Chiron Way
		Emeryville, CA 94608
		United States of America

(hereinafter "Inventor(s)"), and **NOVARTIS INSTITUTES FOR BIOMEDICAL RESEARCH INC.**, 250 Massachusetts Ave, Cambridge, MA 02139, USA, a company organized under the laws 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 INSTITUTES FOR BIOMEDICAL RESEARCH 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 Institutes for Biomedical Research 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

FUSED INDAZOLE PYRIDONE COMPOUNDS AS ANTIVIRALS [Patent Application Reference: PAT057714]

and filed in the United States Patent and Trademark Office on 27 40(\ 20\) and
accorded Application Number 151905, 192 and/or filed as a PCT International
Application on 21 201 and accorded International Patent Application Number
PCT/ <u>TS/2018/052921</u> ;

- (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.

This Assignment is effective as from	if the earnest priority date as stated above.
Executed this 13 day of April	, 2018
BY Jiping FU	
Witnessed by:	
Name: Kelly Hovan	Name: Green Sharkey Address: 166 St. Helicha Ct. Panville, CA 94526
Address: 166 St. Helena Ct. Danville ; CA 94526	Address: 166 St. Helicha Ct. Panville, CA 94526
Executed this day of	, 2018
BYWooseok HAN	
Witnessed by:	
Name:	Name:
Address:	Address:

Executed this day of	, 2018	
BY		
BYSubramanian KARUR		
Witnessed by:		
J		
Name:	Name:	
c/o 5300 Chiron Way	c/o 5300 Chiron Way	
Emeryville, CA 94608	Emeryville, CA 94608	
Executed this day of	2010	
Executed this day of	, 2018	
BY		
BYPeichao LU		
Witnessed by:		
•		
Name:	Name:	
c/o 5300 Chiron Way	c/o 5300 Chiron Way	
Emeryville, CA 94608	Emeryville, CA 94608	
Executed this day of	, 2018	
BY		
Keith Bruce PFISTER		
Witnessed by:		
Name:	Name:	
c/o 5300 Chiron Way	c/o 5300 Chiron Way	
Emeryville, CA 94608	Emeryville, CA 94608	

Executed this day of	, 2018	
BY		
Joseph Michael YOUNG		
Witnessed by:		
Name:	Name:	
c/o 5300 Chiron Way	c/o 5300 Chiron Way	
Emeryville, CA 94608	Emeryville, CA 94608	

NOVARTIS INSTITUTES FOR BIOMEDICAL RESEARCH INC.

Executed this 17th day of April, 2018

BY Mark Hopkins

Authorized Signatory

Witnessed by:

James Grant

/c/o 5300 Chiron Way Emeryville, CA 94608 Lisa Nash

c/o 5300 Chiron Way Emeryville, CA 94608

ASSIGNMENT

This Assignment Agreement is entered into by and between

Jiping FU	citizen of United States of	Novartis Institutes for BioMedical
	America	Research Inc.
		5300 Chiron Way
		Emeryville, CA 94608
		United States of America
Wooseok HAN	citizen of United States of	Novartis Institutes for BioMedical
	America	Research, Inc.
		250 Massachusetts Avenue
		Cambridge, MA 02139
		United States of America
Subramanian KARUR	citizen of India	Novartis Institutes for BioMedical
		Research Inc.
		5300 Chiron Way
		Emeryville, CA 94608 United
		States of America
Peichao LU	citizen of China	Novartis Institutes for BioMedical
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		United States of America
Keith Bruce PFISTER	citizen of United States of	Novartis Institutes for BioMedical
	America	Research, Inc.
		5300 Chiron Way
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		United States of America
Joseph Michael	citizen of United States of	Novartis Institutes for BioMedical
YOUNG	America	Research Inc.
		5300 Chiron Way
		Emeryville, CA 94608
		United States of America

(hereinafter "Inventor(s)"), and **NOVARTIS INSTITUTES FOR BIOMEDICAL RESEARCH INC.**, 250 Massachusetts Ave, Cambridge, MA 02139, USA, a company organized under the laws 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 INSTITUTES FOR BIOMEDICAL RESEARCH 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 Institutes for Biomedical Research 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

FUSED INDAZOLE PYRIDONE COMPOUNDS AS ANTIVIRALS [Patent Application Reference: PAT057714]

and filed in the United States Patent and Trademark Office on 21 406 2018 and
accorded Application Number 15/905,100 and/or filed as a PCT International
Application on at Application Number and accorded International Patent Application Number
PCT/ <u>(32018)052921</u> ;

- (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.

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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 day of	, 2018
BY Jiping FU	
Witnessed by:	
Name: Address:	Name: Address:
Executed this <u>/</u> day of <u></u>	<u>L</u> , 2018
BY Wooseok HAN	·
Witnessed by:	
Name: Victoria L. Smith Address: 700 Main St Combinday, MM 02139	Katley M. Drury Name: Kathleen M. Drufy Address: 700 Main Street Cambridge, MA 122139

Executed this day of	, 2018	
RY		
BYSubramanian KARUR		
Witnessed by:		
Name:	Name:	
c/o 5300 Chiron Way	c/o 5300 Chiron Way	
Emeryville, CA 94608	Emeryville, CA 94608	
	2010	
Executed this day of	, 2018	
BYPeichao LU		
reionati De		
Witnessed by:		
Name:	Name:	
c/o 5300 Chiron Way	c/o 5300 Chiron Way	
Emeryville, CA 94608	Emeryville, CA 94608	
Executed this day of	, 2018	
	,	
BY		
Keith Bruce PFISTER		
Witnessed by:		
Name:	Name:	· · · · · · · · · · · · · · · · · · ·
c/o 5300 Chiron Way	c/o 5300 Chiron Way	
Emeryville, CA 94608	Emeryville, CA 94608	

Executed this day of	, 2018	
BY		
Witnessed by:		
Name: c/o 5300 Chiron Way Emeryville, CA 94608	Name: c/o 5300 Chiron Way Emeryville, CA 94608	-

Executed this Again, 2018

Authorized Signatory

Witnessed by:

Name: Kathleen M. Drugg Address: 700 Main Street

Cambridge, MA 02/39

Name: Victoria L Smith Address: 700 Main St.

Combridge, MA 02139

ASSIGNMENT

This Assignment Agreement is entered into by and between

Jiping FU	citizen of United States of	Novartis Institutes for BioMedical
	America	Research Inc.
		5300 Chiron Way
,		Emeryville, CA 94608
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Subramanian KARUR	citizen of India	Novartis Institutes for BioMedical
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		5300 Chiron Way
		Emeryville, CA 94608
		United States of America
Keith Bruce PFISTER	citizen of United States of	Novartis Institutes for BioMedical
	America	Research, Inc.
		5300 Chiron Way
		Emeryville, CA 94608 USA
		United States of America
Joseph Michael		Novartis Institutes for BioMedical
YOUNG	America	Research Inc.
		5300 Chiron Way
		Emeryville, CA 94608
W		United States of America

(hereinafter "Inventor(s)"), and **NOVARTIS INSTITUTES FOR BIOMEDICAL RESEARCH INC.**, 250 Massachusetts Ave, Cambridge, MA 02139, USA, a company organized under the laws 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 INSTITUTES FOR BIOMEDICAL RESEARCH 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.

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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

FUSED INDAZOLE PYRIDONE COMPOUNDS AS ANTIVIRALS [Patent Application Reference: PAT057714]

and filed in the United States Patent and Trademark Office on 27 900 2000 and	
accorded Application Number 1519519 and/or filed as a PCT International	
Application on Application on and accorded International Patent Application Num	ber
PCT/	

- (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);
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Executed this	day of	, 2018	
BY			
Jiping FU			
Witnessed by:			
Name: Address:		Name:	
Address.		Address:	
Executed this	day of	, 2018	
BY			
Wooseok I	HAN		
Witnessed by:			
Name: Address:		Name: Address:	
z raaross.		Audicss.	

Executed this 13th day of April.	, 2018
BY Subramanian KARUR	
Witnessed by:	s s
Name: c/o 5300 Chiron Way Emeryville, CA 94608	Name: Vivian TRan/ c/o 5300 Chiron Way Emeryville, CA 94608
Executed this day of April	, 2018
BY Peichao LU	
Witnessed by:	
Name: Jo Jan Honser c/o 5300 Chiron Way Emeryville, CA 94608	Name: c/o 5300 Chiron Way Emeryville, CA 94608
Executed thisday of	, 2018
BY 1/2 / B O LOTE Keith Bruce PFISTER	
Witnessed by:	
Joseph Joseph Hunter	KINDEL
1955	Name: 1001
c/o 5300 Chiron Way Emeryville, CA 94608	c/o 5300 Chiron Way Emeryville, CA 94608

Witnessed by:

Name: c/o 5300 Chiron Way
Emeryville, CA 94608

Name: MAN THE CO 5300 Chiron Way Emeryville, CA 94608

NOVARTIS INSTITUTES FOR BIOMEDICAL RESEARCH INC.

Executed this 17th day of April, 2018

BY

Mark Hopkins

Authorized Signatory

Witnessed by:

James Grant

c/o 5300 Chiron Way Emeryville, CA 94608 Lisa Nash

c/o 5300 Chiron Way Emeryville, CA 94608