

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
Stylesheet Version v1.2

EPAS ID: PAT4737176

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
COREY ANDERSON	11/28/2017
BRETT BRADLEY BUSCH	11/28/2017
THOMAS CLEVELAND	11/28/2017
BRYAN A. FRIEMAN	11/28/2017
PAUL JOHN KRENITSKY	11/28/2017
DAVID ANDREW SIESEL	11/28/2017
ANDREAS P. TERMIN	11/29/2017
JOHNNY UY	11/28/2017
JINGLAN ZHOU	11/29/2017
PRAMOD VIRUPAX JOSHI	11/29/2017
TIMOTHY ALCACIO	09/28/2017
MINSON BAEK	09/28/2017
PETER GROOTENHUIS	09/28/2017
SARA SABINA HADIDA RUAH	09/28/2017
ROBERT M. HUGHES	09/28/2017
ALI KESHAVARZ-SHOKRI	09/28/2017
RACHEL MCAULEY-AOKI	10/02/2017
JASON MCCARTNEY	09/28/2017
MARK THOMAS MILLER	09/28/2017
FREDRICK VAN GOOR	09/28/2017
BEILI ZHANG	09/28/2017
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	VERTEX PHARMACEUTICALS (SAN DIEGO) LLC
<b>Street Address:</b>	11010 TORREYANA ROAD
<b>City:</b>	SAN DIEGO
<b>State/Country:</b>	CALIFORNIA
<b>Postal Code:</b>	92121
<b>PROPERTY NUMBERS Total: 2</b>	

Property Type	Number
Application Number:	15721390
PCT Number:	US2017054611

**CORRESPONDENCE DATA**

**Fax Number:** (617)646-1666  
*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:** 6176461683  
**Email:** karen.young@finnegan.com  
**Correspondent Name:** CHRISTINA RODRIGO  
**Address Line 1:** 901 NEW YORK AVENUE NW  
**Address Line 2:** FINNEGAN  
**Address Line 4:** WASHINGTON, D.C. 20001

<b>ATTORNEY DOCKET NUMBER:</b>	10275.0116-00000 & 00304
<b>NAME OF SUBMITTER:</b>	CHRISTINA M. RODRIGO, PH.D.
<b>SIGNATURE:</b>	/Christina Rodrigo/
<b>DATE SIGNED:</b>	12/15/2017

**Total Attachments: 30**  
source=16-127 WO Inventors to Vertex San Diego Assignment#page1.tif  
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source=16-127 WO Inventors to Vertex San Diego Assignment#page30.tif

## ASSIGNMENT

WHEREAS We, the below-named inventors (hereinafter referred to as Assignors), of an invention entitled:

**MODULATOR OF CYSTIC FIBROSIS TRANSMEMBRANE CONDUCTANCE REGULATOR, PHARMACEUTICAL COMPOSITIONS, METHODS OF TREATMENT, AND PROCESS FOR MAKING THE MODULATOR**

as disclosed and claimed in the applications identified below this paragraph:

Application Number	Country of Filing	Filing Date
PCT/US2017/054611	PCT	September 29, 2017
15/721,390	US	September 29, 2017
P20170102750	AR	October 2, 2017
106133964	TW	September 30, 2017
37428	UY	October 2, 2017
2017-000377	VE	October 3, 2017

by virtue of our agreements with Vertex Pharmaceuticals (San Diego) LLC, a company of Delaware whose post office address is 11010 Torreyana Road, San Diego, California 92121, USA (hereinafter referred to as Assignee), confirm assignment and hereby assign to assignee the entire right, title, and interest in and to this invention in all countries throughout the world, and in and to all applications for patents on this invention in all countries throughout the world, including any PCT International Application and all national stage applications based thereon that may be filed, and all patents issued upon such applications in all countries throughout the world;

NOW THEREFORE, be it known that, for good and valuable consideration the receipt of which from Assignee is hereby acknowledged, We, as Assignors, confirm that all rights in the inventions and applications listed above automatically transferred to Assignee by virtue of my/our agreements. For the avoidance of doubt, Assignors hereby confirm having sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto the Assignee, its lawful successors and assigns, my/our entire right, title, and interest in and to this invention, the above-referenced applications that disclose and/or claim this invention, any PCT International Application and all national stage applications based thereon that may be filed, any other applications for patents filed anywhere in the world that claim this invention, and all divisions, and continuations of any such application, and all patents which may be granted thereon, and all reissues thereof, and all rights to claim priority in any country on the basis of any such applications, and all extensions, renewals, and reissues thereof; and We hereby authorize and request that any official of any country whose duty it is to issue patents on applications as described above, to issue all Letters Patent for this invention to Assignee, its successors and assigns, in accordance with the terms of this Confirmatory Assignment;

AND, WE covenant that have not executed and will not execute any agreement in conflict with this Confirmatory Assignment;

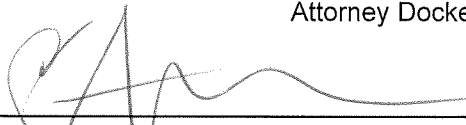
AND, WE further covenant and agree that We will, without further consideration, communicate with Assignee, its successors and assigns, any facts known to us respecting this invention, and testify in any legal proceeding, sign all lawful papers when called upon to do so, execute and deliver any and all papers that may be necessary or desirable to perfect the title to this invention in said Assignee, its successors or assigns, execute all divisional, continuation, and reissue applications, make all rightful oaths and generally do everything possible to aid Assignee, its successors and assigns, to obtain and enforce proper patent protection for this invention in the United States and any foreign country, it being

SOLE/JOINT INVENTION  
(Worldwide Rights)  
Attorney Docket No. VPI/16-127 (10275.0116)

understood that any expense incident to the execution of such papers shall be borne by the Assignee, its successors and assigns.

IN TESTIMONY WHEREOF, We have hereunto set our hands.

**PATENT**  
**REEL: 044744 FRAME: 0901**

  
\_\_\_\_\_  
Corey ANDERSON

Date: 28 Nov 2017

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California  
County of San Diego

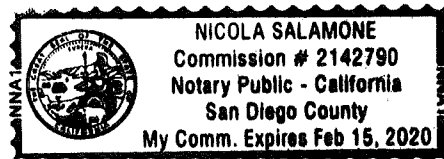
On November 28, 2017 before me, Nicola Salamone Notary Public  
(insert name and title of the officer)

personally appeared Corey Anderson, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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  (Seal)



Brett B Busch

Brett Bradley BUSCH

Date: Nov. 28, 2017

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California  
County of San Diego

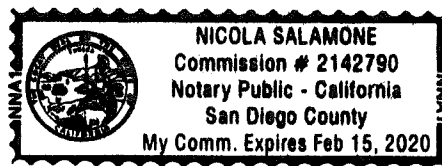
On November 28, 2017 before me, Nicola Salamone, Notary Public  
(insert name and title of the officer)

personally appeared Brett Bradley Busch, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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 Nicola Salamone (Seal)



Thomas Cleveland

Thomas CLEVELAND

Date: 28 Nov 2017

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State of California  
County of San Diego

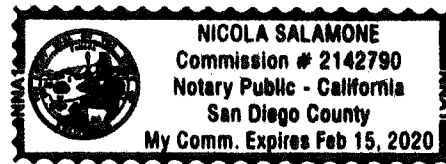
On November 28, 2017 before me, Nicola Salamone, Notary Public  
(insert name and title of the officer)

personally appeared Thomas Cleveland, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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 Nicola Salamone (Seal)





Bryan Frieman

Bryan A. FRIEMAN

Date: 11/28/17

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State of California  
County of San Diego

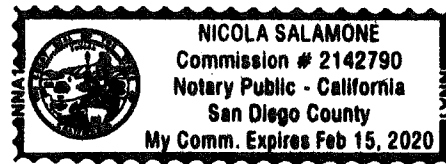
On November 28, 2017 before me, Nicola Salamone, Notary Public  
(insert name and title of the officer)

personally appeared Bryan A. Frieman, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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 Nicola Salamone (Seal)



Paul John Krenitsky

Paul John KRENITSKY

Date: 1/28/17

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State of California  
County of San Diego

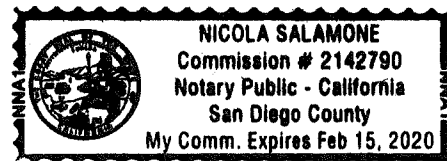
On November 28, 2017 before me, Nicola Salamone Notary Public  
(insert name and title of the officer)

personally appeared Paul John Krenitsky, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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 Nicola Salamone (Seal)



*David A Siesel*

David Andrew SIESEL

Date: 28 NOV 2017

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State of California  
County of San Diego

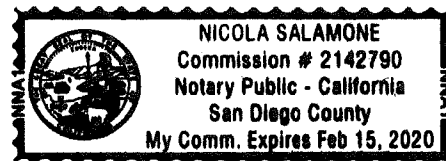
On November 28, 2017 before me, Nicola Salamone Notary Public  
(insert name and title of the officer)

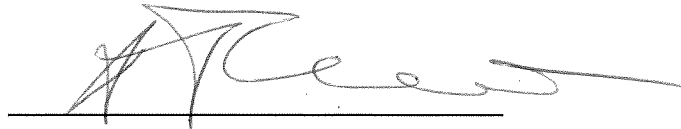
personally appeared David Andrew Siesel, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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 *Nicola Salamone* (Seal)





Andreas P. TERMIN

Date: 11/29/2017

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State of California  
County of San Diego

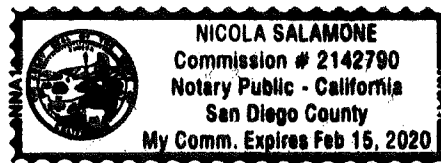
On November 29, 2017 before me, Nicola Salamone, Notary Public  
(insert name and title of the officer)

personally appeared Andreas P. Termin, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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  (Seal)



Johny

Johnny UY

Date: Nov 28, 2017

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State of California  
County of San Diego

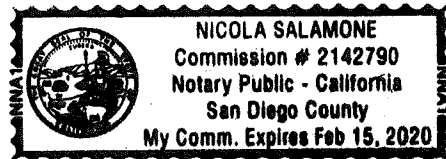
On November 29, 2017 before me, Nicola Salamone Notary Public  
(insert name and title of the officer)

personally appeared Johnny Uy, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/~~she~~/they executed the same in his/~~her~~/their authorized capacity(ies), and that by his/~~her~~/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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 Nicola Salamone (Seal)



[Signature]

Jinglan ZHOU

Date: Nov. 29, 2017

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State of California  
County of San Diego

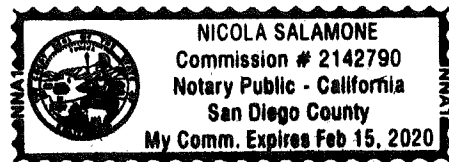
On November 29, 2017 before me, Nicola Salamone, Notary Public  
(insert name and title of the officer)

personally appeared Jinglan Zhou, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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 [Signature] (Seal)



ACKNOWLEDGEMENT OF ASSIGNEE

Kerry A. Flynn  
Name: Kerry A. Flynn

Title: Vice President and Chief IP Counsel

On behalf of Vertex Pharmaceuticals (San Diego) LLC

December 14, 2017

Date

Commonwealth of Massachusetts  
County of Suffolk

On this 14<sup>th</sup> day of December, 2017, before me, the undersigned notary public, personally appeared Kerry A.

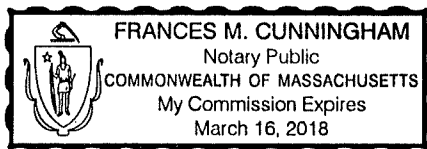
Flynn (name of document signer), proved to me through satisfactory evidence of identification, which was/were

personal knowledge of identity,  a driver's license,  other (please identify) \_\_\_\_\_, to be the person whose name is signed on this document, and who swore or affirmed to me that the contents of the document are truthful and accurate to the best of his/her knowledge and belief.

Frances M. Cunningham

Notary Public

My Commission Expires 3/16/2018



## ASSIGNMENT

WHEREAS We, the below-named inventors (hereinafter referred to as Assignors), of an invention entitled:

### **MODULATOR OF CYSTIC FIBROSIS TRANSMEMBRANE CONDUCTANCE REGULATOR, PHARMACEUTICAL COMPOSITIONS, METHODS OF TREATMENT, AND PROCESS FOR MAKING THE MODULATOR**

as disclosed and claimed in the applications identified below this paragraph:

Application Number	Country of Filing	Filing Date
PCT/US2017/054611	PCT	September 29, 2017
15/721,390	US	September 29, 2017
P20170102750	AR	October 2, 2017
106133964	TW	September 30, 2017
37428	UY	October 2, 2017
2017-000377	VE	October 3, 2017

by virtue of our agreements with Vertex Pharmaceuticals (San Diego) LLC, a company of Delaware whose post office address is 11010 Torreyana Road, San Diego, California 92121, USA (hereinafter referred to as Assignee), confirm assignment and hereby assign to assignee the entire right, title, and interest in and to this invention in all countries throughout the world, and in and to all applications for patents on this invention in all countries throughout the world, including any PCT International Application and all national stage applications based thereon that may be filed, and all patents issued upon such applications in all countries throughout the world;

NOW THEREFORE, be it known that, for good and valuable consideration the receipt of which from Assignee is hereby acknowledged, We, as Assignors, confirm that all rights in the inventions and applications listed above automatically transferred to Assignee by virtue of my/our agreements. For the avoidance of doubt, Assignors hereby confirm having sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto the Assignee, its lawful successors and assigns, my/our entire right, title, and interest in and to this invention, the above-referenced applications that disclose and/or claim this invention, any PCT International Application and all national stage applications based thereon that may be filed, any other applications for patents filed anywhere in the world that claim this invention, and all divisions, and continuations of any such application, and all patents which may be granted thereon, and all reissues thereof, and all rights to claim priority in any country on the basis of any such applications, and all extensions, renewals, and reissues thereof; and We hereby authorize and request that any official of any country whose duty it is to issue patents on applications as described above, to issue all Letters Patent for this invention to Assignee, its successors and assigns, in accordance with the terms of this Confirmatory Assignment;

AND, WE covenant that have not executed and will not execute any agreement in conflict with this Confirmatory Assignment;

AND, WE further covenant and agree that We will, without further consideration, communicate with Assignee, its successors and assigns, any facts known to us respecting this invention, and testify in any legal proceeding, sign all lawful papers when called upon to do so, execute and deliver any and all papers that may be necessary or desirable to perfect the title to this invention in said Assignee, its successors or assigns, execute all divisional, continuation, and reissue applications, make all rightful oaths and generally do everything possible to aid Assignee, its successors and assigns, to obtain and enforce proper patent protection for this invention in the United States and any foreign country, it being

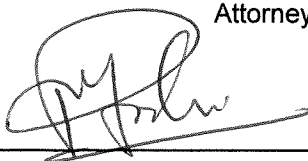


SOLE/JOINT INVENTION  
(Worldwide Rights)  
Attorney Docket No. VPI/16-127 (10275.0116)

understood that any expense incident to the execution of such papers shall be borne by the Assignee, its successors and assigns.

IN TESTIMONY WHEREOF, We have hereunto set our hands.

**PATENT**  
**REEL: 044744 FRAME: 0913**



Pramod Virupax JOSHI

Date: 11/29/17

IN WITNESS WHEREOF, I have hereunto set hand and seal

Signature of witness: (1) Maria M. Joshi

Printed Name of Witness: Maria M. Joshi

this 29 day of November 2017  
Date of signing

Signature of witness: (2) Maria M. Delgado

Printed Name of Witness: Maria M. Delgado

this 29 day of November 2017  
Date of signing

ACKNOWLEDGEMENT OF ASSIGNEE

Kerry A. Flynn  
Name: Kerry A. Flynn

Title: Vice President and Chief IP Counsel

On behalf of Vertex Pharmaceuticals (San Diego) LLC

December 14, 2017

Date

Commonwealth of Massachusetts  
County of Suffolk

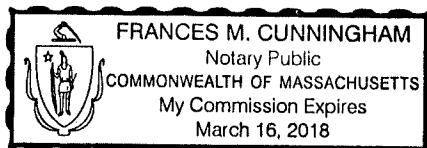
On this 14<sup>th</sup> day of December, 2017, before me, the undersigned notary public, personally appeared Kerry A.

Flynn (name of document signer), proved to me through satisfactory evidence of identification, which was/were  personal knowledge of identity,  a driver's license,  other (please identify) \_\_\_\_\_, to be the person whose name is signed on this document, and who swore or affirmed to me that the contents of the document are truthful and accurate to the best of his/her knowledge and belief.

Francis M. Cunningham

Notary Public

My Commission Expires 3/16/2018



**ASSIGNMENT**

WHEREAS I/We, the below-named inventor(s) (hereinafter referred to as Assignor(s)), of an invention entitled:

**MODULATORS OF CYSTIC FIBROSIS TRANSMEMBRANE CONDUCTANCE  
REGULATOR, PHARMACEUTICAL COMPOSITIONS, METHODS OF  
TREATMENT, AND PROCESS FOR MAKING THE MODULATOR**

as disclosed and claimed in the applications identified below this paragraph:

Application Number <sup>1</sup>	Country of Filing	Filing Date <sup>1</sup>
PCT/US2017/054611	PCT	September 29, 2017
151721,390	United States	September 29, 2017
P20170102750	Argentina	October 2, 2017
106133964	Taiwan	September 30, 2017
37428	Uruguay	October 2, 2017
2017-000377	Venezuela	October 3, 2017

which claim priority to the applications identified below this paragraph:

Application Number	Country of Filing	Filing Date
62/402,838	United States	September 30, 2016
62/410,353	United States	October 19, 2016
62/415,409	United States	October 31, 2016
62/419,935	United States	November 9, 2016

WHEREAS, Vertex Pharmaceuticals (San Diego) LLC, a corporation of Delaware whose post office address is 11010 Torreyana Road, San Diego, California 92121 (hereinafter referred to as Assignee), is desirous of securing the entire right, title, and interest in and to this invention in all countries throughout the world, and in and to all applications for patents on this invention in all

<sup>1</sup> I/We authorize and request ASSIGNEE to insert the filing date and/or application number of said applications when known.

countries throughout the world, including any PCT International Application and all national stage applications based thereon that may be filed, and all patents issued upon such applications in all countries throughout the world;

NOW THEREFORE, be it known that, for good and valuable consideration the receipt of which from Assignee is hereby acknowledged, I/We, as Assignor(s), have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto the Assignee, its lawful successors and assigns, my/our entire right, title, and interest in and to this invention, the above-referenced applications that disclose and claim this invention, any PCT International Application and all national stage applications based thereon that may be filed, any other applications for patents filed anywhere in the world that claim this invention, and all divisions, and continuations of any such application, and all patents which may be granted thereon, and all reissues thereof, and all rights to claim priority in any country on the basis of any such applications, and all extensions, renewals, and reissues thereof; and I/We hereby authorize and request the any official of any country whose duty it is to issue patents on applications as described above, to issue all Letters Patent for this invention to Assignee, its successors and assigns, in accordance with the terms of this Assignment;

AND, I/WE covenant that I/We have the full right to convey the interest assigned by this Assignment, and I/We have not executed and will not execute any agreement in conflict with this Assignment;

AND, I/WE further covenant and agree that I/We will, without further consideration, communicate with Assignee, its successors and assigns, any facts known to me/us respecting this invention, and testify in any legal proceeding, sign all lawful papers when called upon to do so, execute and deliver any and all papers that may be necessary or desirable to perfect the title to this invention in said Assignee, its successors or assigns, execute all divisional, continuation, and reissue applications, make all rightful oaths and generally do everything possible to aid Assignee, its successors and assigns, to obtain and enforce proper patent protection for this invention in the United States and any foreign country, it being understood that any expense incident to the execution of such papers shall be borne by the Assignee, its successors and assigns.

AND, I/WE authorize and request a patent practitioner of record in this application, to insert the filing date, country of filing, and application number of the above-referenced application(s) when known.

IN TESTIMONY WHEREOF, I/We have hereunto set our hands.

*Tim Alcacio*

(I) Timothy Alcacio

Date: 28 Sept 2017

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California  
County of San Diego )

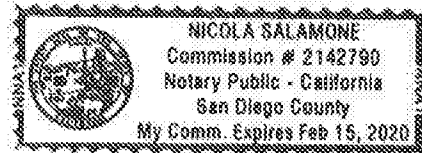
On September 28, 2017 before me, Nicola Salamone, Notary Public  
(insert name and title of the officer)

personally appeared Timothy Alcacio  
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/hers/their authorized capacity(ies), and that by his/hers/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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 *Nicola Salamone* (Seal)



[Signature]

(2) Minson Baek

Date: 9/28/17

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California  
County of San Diego )

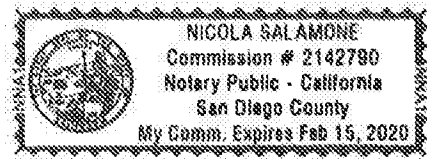
On September 28, 2017 before me, Nicola Salamone, Notary Public  
(insert name and title of the officer)

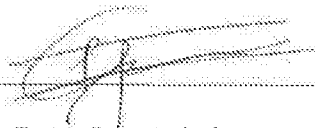
personally appeared Minson Baek, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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 [Signature] (Seal)



  
\_\_\_\_\_  
(3) Peter Grootenhuys

Date: September 28, 2017

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.


State of California  
County of San Diego

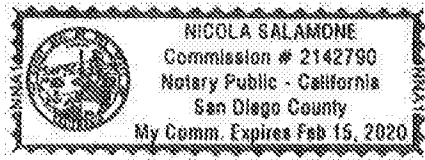
On September 28, 2017 before me, Nicola Salamone, Notary Public  
(insert name and title of the officer)

personally appeared Peter Grootenhuys  
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/het/their authorized capacity(ies), and that by his/het/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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  (Seal)





Nicola Salamone

(4) Sara Sabina Hadida Ruah

Date: 9/28/2017

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State of California  
County of San Diego )

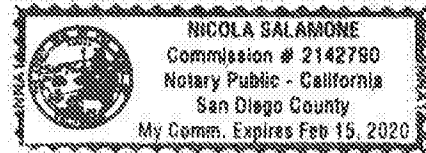
On September 28, 2017 before me, Nicola Salamone, Notary Public  
(insert name and title of the officer)

personally appeared Sara Sabina Hadida Ruah  
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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 Nicola Salamone (Seal)



[Handwritten Signature]

(S) Robert M. Hughes

Date: 9/28/2017

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State of California  
County of San Diego

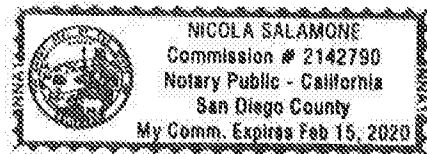
On September 28, 2017 before me, Nicola Salamone, Notary Public  
(insert name and title of the officer)

personally appeared Robert M. Hughes  
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/het/their authorized capacity(ies), and that by his/het/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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 [Handwritten Signature] (Seal)



AKK

(6) Ali Keshavarz-Shokri

Date: Sept 28, 2017

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California  
County of San Diego

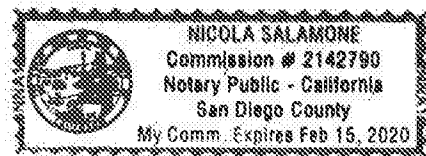
On September 28, 2017 before me, Nicola Salamone, Notary Public  
(insert name and title of the officer)

personally appeared Ali Keshavarz-Shokri  
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/hers/their authorized capacity(ies), and that by his/hers/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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 Nicola Salamone (Seal)



*Rachel McAuley-Aoki*

(7) Rachel McAuley-Aoki

Date: 02 Oct 2017

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California  
County of San Diego)

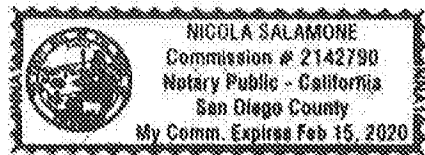
On OCTOBER 2, 2017 before me, Nicola Salamone, Notary Public  
(insert name and title of the officer)

personally appeared Rachel McAuley-Aoki  
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are  
subscribed to the within instrument and acknowledged to me that he/she/they executed the same  
in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument  
the person(s), or the entity upon behalf of which the person(s) 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 *Nicola Salamone* (Seal)



J. McCartney

(X) Jason McCartney

Date: 7/28/17

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State of California  
County of San Diego

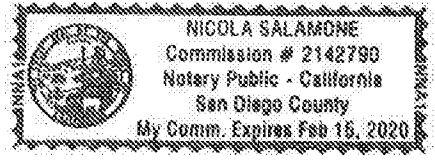
On September 28, 2017 before me, Nicola Salamone, Notary Public  
(insert name and title of the officer)

personally appeared Jason McCartney, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/hers/their authorized capacity(ies), and that by his/hers/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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 Nicola Salamone (Seal)



Mark Thomas Miller

(9) Mark Thomas Miller

Date: 9/28/2017

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State of California  
County of San Diego )

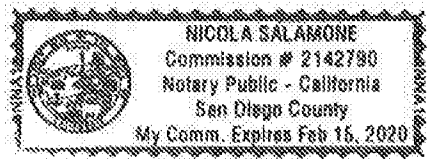
On September 28, 2017 before me, Nicola Salamone, Notary Public  
(insert name and title of the officer)


personally appeared Mark Thomas Miller  
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/het/their authorized capacity(ies), and that by his/het/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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 N. Salamone (Seal)



  
\_\_\_\_\_

(10) Fredrick Van Goor

Date: Sept 28 2017

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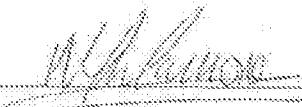
State of California  
County of San Diego )

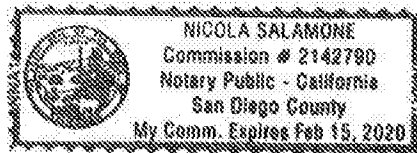
On September 28, 2017 before me, Nicola Salamone, Notary Public  
(insert name and title of the officer)

personally appeared Fredrick Van Goor  
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/hers/their authorized capacity(ies), and that by his/hers/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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  (Seal)



Beili Zhang

(11) Beili Zhang

Date: Sept. 28, 2017

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State of California  
County of San Diego )

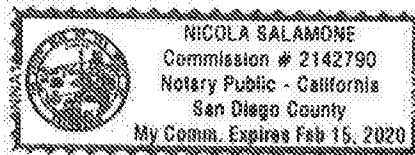
On September 28, 2017 before me, Nicola Salamone, Notary Public  
(insert name and title of the officer)

personally appeared Beili Zhang, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) 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 Nicola Salamone (Seal)





ACKNOWLEDGMENT OF ASSIGNEE

By: Kerry A. Flynn  
Kerry A. Flynn  
Vice President and Chief IP Counsel  
on behalf of Vertex Pharmaceuticals (San Diego) LLC

Date: December 14, 2017

Commonwealth of Massachusetts  
County of Suffolk

On this 14<sup>th</sup> day of December, 2017, before me, the undersigned notary public, personally appeared Kerry A. Flynn (name of document signer), proved to me through satisfactory evidence of identification which was/were:  personal knowledge of identity,  a driver's license,  other (please identify) \_\_\_\_\_, to be the person whose name is signed on this document, and who swore or affirmed to me that the contents of the document are truthful and accurate to the best of his/her knowledge and belief.

Frances M. Cunningham  
Notary Public  
My Commission Expires: 3/16/2018

