

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT4105576

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT
CONVEYING PARTY DATA	
Name	Execution Date
YEON-HEE LIM	05/25/2016
ZHUYAN GUO	05/23/2016
AMJAD ALI	12/10/2015
SCOTT D. EDMONDSON	03/23/2016
WEIGUO LIU	05/23/2016
GIOCONDA V. GALLO-ETIENNE	05/31/2016
HEPING WU	05/26/2016
YING-DUO GAO	05/24/2016
ANDREW M. STAMFORD	05/25/2016
YOUNONG YU	05/24/2016
NANCY J. KEVIN	03/23/2016
RAJAN ANAND	03/23/2016
SANTHOSH F. NEELAMKAVIL	03/23/2016
REMOND MONINGKA	03/23/2016
JOSEPH L. DUFFY	05/26/2016
ZAHID HUSSAIN	03/23/2016
PUNEET KUMAR	05/26/2016
JIAYI XU	05/26/2016
DEYOU SHA	09/28/2016
YU JIANG	09/22/2016
RECEIVING PARTY DATA	
Name:	MERCK SHARP & DOHME CORP.
Street Address:	126 EAST LINCOLN AVENUE
Internal Address:	RY86-2011A
City:	RAHWAY
State/Country:	NEW JERSEY
Postal Code:	07065
PROPERTY NUMBERS Total: 1	

Property Type	Number
Application Number:	15305421

CORRESPONDENCE DATA

Fax Number: (732)594-4720
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: 732-594-4488
Email: us_efs@merck.com
Correspondent Name: MERCK
Address Line 1: P O BOX 2000
Address Line 4: RAHWAY, NEW JERSEY 07065-0907

ATTORNEY DOCKET NUMBER:	23754-US-PCT
NAME OF SUBMITTER:	MICHELLE A. SISKO
SIGNATURE:	/Michelle A. Sisko/
DATE SIGNED:	10/20/2016

Total Attachments: 36
source=23754-Assign-MSD#page1.tif
source=23754-Assign-MSD#page2.tif
source=23754-Assign-MSD#page3.tif
source=23754-Assign-MSD#page4.tif
source=23754-Assign-MSD#page5.tif
source=23754-Assign-MSD#page6.tif
source=23754-Assign-MSD#page7.tif
source=23754-Assign-MSD#page8.tif
source=23754-Assign-MSD#page9.tif
source=23754-Assign-MSD#page10.tif
source=23754-Assign-MSD#page11.tif
source=23754-Assign-MSD#page12.tif
source=23754-Assign-MSD#page13.tif
source=23754-Assign-MSD#page14.tif
source=23754-Assign-MSD#page15.tif
source=23754-Assign-MSD#page16.tif
source=23754-Assign-MSD#page17.tif
source=23754-Assign-MSD#page18.tif
source=23754-Assign-MSD#page19.tif
source=23754-Assign-MSD#page20.tif
source=23754-Assign-MSD#page21.tif
source=23754-Assign-MSD#page22.tif
source=23754-Assign-MSD#page23.tif
source=23754-Assign-MSD#page24.tif
source=23754-Assign-MSD#page25.tif
source=23754-Assign-MSD#page26.tif
source=23754-Assign-MSD#page27.tif
source=23754-Assign-MSD#page28.tif

source=23754-Assign-MSD#page29.tif
source=23754-Assign-MSD#page30.tif
source=23754-Assign-MSD#page31.tif
source=23754-Assign-MSD#page32.tif
source=23754-Assign-MSD#page33.tif
source=23754-Assign-MSD#page34.tif
source=23754-Assign-MSD#page35.tif
source=23754-Assign-MSD#page36.tif

WORLDWIDE ASSIGNMENT

WHEREAS, I/WE,

- (1) Yeon-Hee Lim, located at Piscataway, New Jersey, 08854,
- (2) Zhuyan Guo, located at Scotch Plains, New Jersey, 07076,
- (3) Amjad Ali, located at Freehold, New Jersey, 07728,
- (4) Scott D. Edmondson, located at Clark, New Jersey, 07066,
- (5) Weiguo Liu, located at Princeton, New Jersey, 08540,
- (6) Gioconda V. Gallo-Etienne, located at Union, New Jersey, 07083,
- (7) Heping Wu, located at Edison, New Jersey, 08820,
- (8) Ying-Duo Gao, located at Holmdel, New Jersey, 07733,
- (9) Andrew W. Stamford, located at Chatham Township, New Jersey, 07928,
- (10) Younong Yu, located at East Brunswick, New Jersey, 08816,
- (11) Nancy J. Kevin, located at East Brunswick, New Jersey, 08816,
- (12) Rajan Anand, located at Fanwood, New Jersey, 07023,
- (13) Deyou Sha, located at Yardley, Pennsylvania. 19067,
- (14) Santhosh F. Neelamkavil, located at Edison, New Jersey, 08820,
- (15) Zahid Hussain, located at Dayton, New Jersey, 08810,
- (16) Puneet Kumar, located at Woodbridge, New Jersey, 07095,
- (17) Remond Moningka, located at Jersey City, New Jersey, 07307,
- (18) Joseph L. Duffy, located at Cranford, New Jersey, 07016,
- (19) Jiayi Xu, located at Marlboro, New Jersey, 07746,
- (20) Yu Jiang, located at East Windsor, New Jersey, 08512,

(hereinafter ASSIGNOR(S)), together with Hiroki Sone, located at Singapore, and Anjan Chakrabarti, located at Singapore, are the inventors of the invention described in an application for Patents having the Attorney Docket Number indicated above and the following Title of the Invention:

FACTOR XIA INHIBITORS

and/or in the following application(s):

- U.S. Provisional Application No. 61/982,420 filed on 04-22-2014;
- U.S. Application No. _____ having a filing date of _____; and
- PCT International Application No. _____ having a filing date of _____.

WHEREAS I/WE covenant that the rights and property herein conveyed are free and clear of any encumbrance, and that I/we have the full right to convey the same as herein expressed.

WHEREAS, **MERCK SHARP & DOHME CORP.** a corporation organized under the laws of State of New Jersey, having an office at 126 East Lincoln Avenue, Rahway, New Jersey, 07065, and its successors, assigns and legal representatives (hereinafter **ASSIGNEE**), is desirous of obtaining the entire right, title and interest in, to and under the invention disclosed in said application or applications;

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, I/we, said ASSIGNOR(S), do each hereby sell, assign and transfer or confirm the grant and assignment to said **ASSIGNEE** my/our entire right, title and interest in all countries of the world in and to my/our invention described in said application for Patents, in and to the right to file patent applications in the name of **ASSIGNEE**, its designee, or in any or all of our names, at its election, on the aforesaid invention in all countries of the world, together with all rights of priority in the aforesaid countries deriving from the above-identified application for Patents under the International Convention for the Protection of Industrial Property, under the Inter-American Convention relating to Inventions, Patents, Designs and Industrial Models and under any other international arrangement relating to patents or intellectual property, in and to any and all Letters Patent that are granted from the aforesaid application for Patents, in and to any applications claiming priority benefits to a provisional patent application or other applications filed on said invention, and in and to any continuations, divisions, reexaminations, reissues, renewals and extensions thereof of any of said Letters Patent, the same to be held and enjoyed by said **ASSIGNEE**, to the full ends of the terms for which all Letters Patent therefore may be granted, as fully and entirely as the same would have been held and enjoyed by us if this assignment and sale had not been made.

AND I/WE HEREBY covenant and agree that we will at any time, upon the request and at the expense of **ASSIGNEE**, without further compensation or charge to said **ASSIGNEE**, execute and deliver any and all documents that may be necessary or desirable to perfect the title to the foregoing invention, patent applications, and Letters Patent and continuations, divisions, reexaminations, reissues, renewals and extensions thereof in the name of **ASSIGNEE**, including the execution and procurement of any and all further documents evidencing this assignment and sale as may

Worldwide Assignment

be necessary or desirable for recording the same in the Patent Office of any country concerned, and will make all rightful oaths and declarations and do all lawful acts requisite for procuring the same or for aiding therein.

I/WE HEREBY authorize **ASSIGNEE** to insert in this instrument the Application Number(s) and the filing date(s) of said application for Patents when officially notified thereof.

This document may be executed in any number of counterparts, each of which so executed shall be deemed to be an original, but all such components shall together constitute but one and the same document.

Executed this 25 day of May, 201~~5~~⁶

Yeon-Hee Lim
Yeon-Hee Lim

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this 25 day of May, 201~~5~~⁶, personally appeared before me **Yeon-Hee Lim** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Michelle Ann Sisko
Notary Public

MICHELLE ANN SISCO
Notary Public of New Jersey
My Commission Expires on October 24, 2017

Executed this 23 day of May, 201~~5~~⁶

Zhuyan Guo
Zhuyan Guo

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this 23 day of May, 201~~5~~⁶, personally appeared before me **Zhuyan Guo** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Michelle Ann Sisko
Notary Public

MICHELLE ANN SISCO
Notary Public of New Jersey
My Commission Expires on October 24, 2017

Executed this 10 day of December, 2015.

[Signature]
Amjad Ali

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this 10 day of December, 2015, personally appeared before me **Amjad Ali** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

[Signature]
Notary Public

MICHELLE ANN SISCO
Notary Public of New Jersey
My Commission Expires on October 24, 2017

Executed this 23 day of March, 2015.

[Signature]
Scott D. Edmondson

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this 23 day of March, 2015, personally appeared before me **Scott D. Edmondson** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

[Signature]
Notary Public

MICHELLE ANN SISCO
Notary Public of New Jersey
My Commission Expires on October 24, 2017

Executed this 23 day of May, 201⁶5.

[Signature]
Weiguo Liu

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this 23 day of May, 201⁶5, personally appeared before me **Weiguo Liu** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

[Signature]
Notary Public

MICHELLE ANN SISCO
Notary Public of New Jersey
My Commission Expires on October 24, 2017

Executed this 31 day of May, 201⁶5.

[Signature]
Gioconda V. Gallo-Etienne

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this 31 day of May, 201⁶5, personally appeared before me **Gioconda V. Gallo-Etienne** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

[Signature]
Notary Public

MICHELLE ANN SISCO
Notary Public of New Jersey
My Commission Expires on October 24, 2017

Executed this 26 day of May, 2016.

Heping Wu
Heping Wu

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this 26 day of May, 2016, personally appeared before me **Heping Wu** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Michelle Ann Sisko
Notary Public

MICHELLE ANN SISCO
Notary Public of New Jersey
My Commission Expires on October 24, 2017

Executed this 24 day of May, 2016.

Ying-Duo Gao
Ying-Duo Gao

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

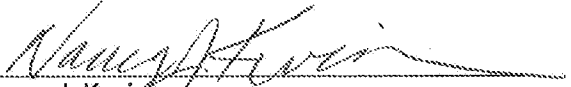
On this 24 day of May, 2016, personally appeared before me **Ying-Duo Gao** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Michelle Ann Sisko
Notary Public

MICHELLE ANN SISCO
Notary Public of New Jersey
My Commission Expires on October 24, 2017

Executed this 23 day of March, 2015.



Nancy J. Kevin

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this 23 day of March, 2015, personally appeared before me **Nancy J. Kevin** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.


(Seal)



Notary Public

MICHELLE ANN SISCO
Notary Public of New Jersey
My Commission Expires on October 24, 2017

Executed this 23 day of March, 2015.



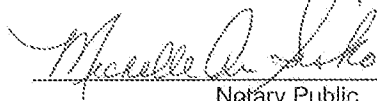
Rajan Anand

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this 23 day of March, 2015, personally appeared before me **Rajan Anand** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)



Notary Public

MICHELLE ANN SISCO
Notary Public of New Jersey
My Commission Expires on October 24, 2017

Executed this _____ day of _____, 2015.

Deyou Sha

ACKNOWLEDGEMENT

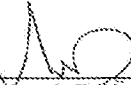
State of New Jersey)
) s.s.:
County of Union)

On this _____ day of _____, 2015, personally appeared before me **Deyou Sha** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this 23 day of March, 2015.




Santhosh F. Neelamkavil

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this 23 day of March, 2015, personally appeared before me **Santhosh F. Neelamkavil** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)



Notary Public

MICHELLE ANN SISCO
Notary Public of New Jersey
My Commission Expires on October 24, 2017

Executed this 23 day of March, 2016.



Remond Moningka

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this 23 day of March, 2016, personally appeared before me **Remond Moningka** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)



Notary Public

MICHELLE ANN SISKO
Notary Public of New Jersey
My Commission Expires on October 24, 2017

Executed this 26 day of May, 2016.



Joseph L. Duffy

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this 26 day of May, 2016, personally appeared before me **Joseph L. Duffy** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)



Notary Public

MICHELLE ANN SISKO
Notary Public of New Jersey
My Commission Expires on October 24, 2017

Executed this 23 day of March, 2015.

Zahid Hussain

Zahid Hussain

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this 23 day of March, 2015, personally appeared before me Zahid Hussain to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Michelle Ann Sisko

Notary Public

MICHELLE ANN SISCO
Notary Public of New Jersey
My Commission Expires on October 24, 2017

Executed this 20 day of May, 2015.

Puneet Kumar

Puneet Kumar

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this 20 day of May, 2015, personally appeared before me Puneet Kumar to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Michelle Ann Sisko

Notary Public

MICHELLE ANN SISCO
Notary Public of New Jersey
My Commission Expires on October 24, 2017

Executed this 26 day of May, 2015.

Jiayi Xu
Jiayi Xu

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this 26 day of May, 2015, personally appeared before me **Jiayi Xu** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Michelle Ann Sisko
Notary Public

MICHELLE ANN SISCO
Notary Public of New Jersey
My Commission Expires on October 24, 2017

Executed this _____ day of _____, 2015.

Yu Jiang

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this _____ day of _____, 2015, personally appeared before me **Yu Jiang** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

WORLDWIDE ASSIGNMENT

WHEREAS, I/WE,

- (1) Yeon-Hee Lim, located at Piscataway, New Jersey, 08854,
- (2) Zhuyan Guo, located at Scotch Plains, New Jersey, 07076,
- (3) Amjad Ali, located at Freehold, New Jersey, 07728,
- (4) Scott D. Edmondson, located at Clark, New Jersey, 07066,
- (5) Weiguo Liu, located at Princeton, New Jersey, 08540,
- (6) Gioconda V. Gallo-Etienne, located at Union, New Jersey, 07083,
- (7) Heping Wu, located at Edison, New Jersey, 08820,
- (8) Ying-Duo Gao, located at Holmdel, New Jersey, 07733,
- (9) Andrew W. Stamford, located at Chatham Township, New Jersey, 07928,
- (10) Younong Yu, located at East Brunswick, New Jersey, 08816,
- (11) Nancy J. Kevin, located at East Brunswick, New Jersey, 08816,
- (12) Rajan Anand, located at Fanwood, New Jersey, 07023,
- (13) Deyou Sha, located at Yardley, Pennsylvania, 19067,
- (14) Santhosh F. Neelamkavil, located at Edison, New Jersey, 08820,
- (15) Zahid Hussain, located at Dayton, New Jersey, 08810,
- (16) Puneet Kumar, located at Woodbridge, New Jersey, 07095,
- (17) Remond Moningka, located at Jersey City, New Jersey, 07307,
- (18) Joseph L. Duffy, located at Cranford, New Jersey, 07016,
- (19) Jiayi Xu, located at Marlboro, New Jersey, 07746,
- (20) Yu Jiang, located at East Windsor, New Jersey, 08512,

(hereinafter ASSIGNOR(S)), together with Hiroki Sone, located at Singapore, and Anjan Chakrabarti, located at Singapore, are the inventors of the invention described in an application for Patents having the Attorney Docket Number indicated above and the following Title of the Invention:

FACTOR XIA INHIBITORS

and/or in the following application(s):

U.S. Provisional Application No. 61/982,420 filed on 04-22-2014;
U.S. Application No. _____ having a filing date of _____; and
PCT International Application No. _____ having a filing date of _____.

WHEREAS I/WE covenant that the rights and property herein conveyed are free and clear of any encumbrance, and that I/we have the full right to convey the same as herein expressed.

WHEREAS, **MERCK SHARP & DOHME CORP.** a corporation organized under the laws of State of New Jersey, having an office at 126 East Lincoln Avenue, Rahway, New Jersey, 07065, and its successors, assigns and legal representatives (hereinafter **ASSIGNEE**), is desirous of obtaining the entire right, title and interest in, to and under the invention disclosed in said application or applications;

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, I/we, said ASSIGNOR(S), do each hereby sell, assign and transfer or confirm the grant and assignment to said **ASSIGNEE** my/our entire right, title and interest in all countries of the world in and to my/our invention described in said application for Patents, in and to the right to file patent applications in the name of **ASSIGNEE**, its designee, or in any or all of our names, at its election, on the aforesaid invention in all countries of the world, together with all rights of priority in the aforesaid countries deriving from the above-identified application for Patents under the International Convention for the Protection of Industrial Property, under the Inter-American Convention relating to Inventions, Patents, Designs and Industrial Models and under any other international arrangement relating to patents or intellectual property, in and to any and all Letters Patent that are granted from the aforesaid application for Patents, in and to any applications claiming priority benefits to a provisional patent application or other applications filed on said invention, and in and to any continuations, divisions, reexaminations, reissues, renewals and extensions thereof of any of said Letters Patent, the same to be held and enjoyed by said **ASSIGNEE**, to the full ends of the terms for which all Letters Patent therefore may be granted, as fully and entirely as the same would have been held and enjoyed by us if this assignment and sale had not been made.

AND I/WE HEREBY covenant and agree that we will at any time, upon the request and at the expense of **ASSIGNEE**, without further compensation or charge to said **ASSIGNEE**, execute and deliver any and all documents that may be necessary or desirable to perfect the title to the foregoing invention, patent applications, and Letters Patent and

Worldwide Assignment

continuations, divisions, reexaminations, reissues, renewals and extensions thereof in the name of **ASSIGNEE**, including the execution and procurement of any and all further documents evidencing this assignment and sale as may be necessary or desirable for recording the same in the Patent Office of any country concerned, and will make all rightful oaths and declarations and do all lawful acts requisite for procuring the same or for aiding therein.

I/WE HEREBY authorize **ASSIGNEE** to insert in this instrument the Application Number(s) and the filing date(s) of said application for Patents when officially notified thereof.

This document may be executed in any number of counterparts, each of which so executed shall be deemed to be an original, but all such components shall together constitute but one and the same document.

Executed this ____ day of _____, 2016.

Yeon-Hee Lim

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Yeon-Hee Lim** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Zhuyan Guo

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Zhuyan Guo** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Amjad Ali

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Amjad Ali** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Scott D. Edmondson

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Scott D. Edmondson** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Weiguo Liu

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Weiguo Liu** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Gioconda V. Gallo-Etienne

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Gioconda V. Gallo-Etienne** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Heping Wu

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Heping Wu** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Ying-Duo Gao

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Ying-Duo Gao** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Andrew W. Stamford

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Andrew W. Stamford** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Younong Yu

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Younong Yu** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Nancy J. Kevin

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Nancy J. Kevin** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Rajan Anand

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Rajan Anand** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this 28 day of Sept, 2016.

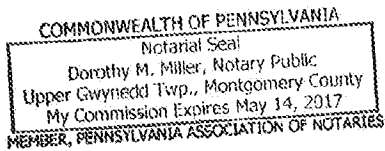
Deyou Sha
Deyou Sha

ACKNOWLEDGEMENT

State of Pennsylvania)
) s.s.:
County of Montgomery)

On this 28 day of September, 2016, personally appeared before me Deyou Sha to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)



Dorothy M. Miller
Notary Public

Executed this _____ day of _____, 2016.

Santhosh F. Neelamkavil

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this _____ day of _____, 2016, personally appeared before me Santhosh F. Neelamkavil to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Zahid Hussain

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Zahid Hussain** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Puneet Kumar

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Puneet Kumar** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Remond Moningka

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Remond Moningka** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Joseph L. Duffy

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Joseph L. Duffy** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Jiayi Xu

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Jiayi Xu** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Yu Jiang

ACKNOWLEDGEMENT

On this ____ day of _____, 2016, personally appeared before me **Yu Jiang** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

Witness 1:

Print Name

Signature

Witness 2:

Print Name

Signature

WORLDWIDE ASSIGNMENT

WHEREAS, I/WE,

- (1) Yeon-Hee Lim, located at Piscataway, New Jersey, 08854,
- (2) Zhuyan Guo, located at Scotch Plains, New Jersey, 07076,
- (3) Amjad Ali, located at Freehold, New Jersey, 07728,
- (4) Scott D. Edmondson, located at Clark, New Jersey, 07066,
- (5) Weiguo Liu, located at Princeton, New Jersey, 08540,
- (6) Gioconda V. Gallo-Etienne, located at Union, New Jersey, 07083,
- (7) Heping Wu, located at Edison, New Jersey, 08820,
- (8) Ying-Duo Gao, located at Holmdel, New Jersey, 07733,
- (9) Andrew W. Stamford, located at Chatham Township, New Jersey, 07928,
- (10) Younong Yu, located at East Brunswick, New Jersey, 08816,
- (11) Nancy J. Kevin, located at East Brunswick, New Jersey, 08816,
- (12) Rajan Anand, located at Fanwood, New Jersey, 07023,
- (13) Deyou Sha, located at Yardley, Pennsylvania, 19067,
- (14) Santhosh F. Neelamkavil, located at Edison, New Jersey, 08820,
- (15) Zahid Hussain, located at Dayton, New Jersey, 08810,
- (16) Puneet Kumar, located at Woodbridge, New Jersey, 07095,
- (17) Remond Moningka, located at Jersey City, New Jersey, 07307,
- (18) Joseph L. Duffy, located at Cranford, New Jersey, 07016,
- (19) Jiayi Xu, located at Marlboro, New Jersey, 07746,
- (20) Yu Jiang, located at East Windsor, New Jersey, 08512,

(hereinafter ASSIGNOR(S)), together with Hiroki Sone, located at Singapore, and Anjan Chakrabarti, located at Singapore, are the inventors of the invention described in an application for Patents having the Attorney Docket Number indicated above and the following Title of the Invention:

FACTOR XIA INHIBITORS

and/or in the following application(s):

- U.S. Provisional Application No. 61/982,420 filed on 04-22-2014;
- U.S. Application No. _____ having a filing date of _____; and
- PCT International Application No. _____ having a filing date of _____.

WHEREAS I/WE covenant that the rights and property herein conveyed are free and clear of any encumbrance, and that I/we have the full right to convey the same as herein expressed.

WHEREAS, **MERCK SHARP & DOHME CORP.** a corporation organized under the laws of State of New Jersey, having an office at 126 East Lincoln Avenue, Rahway, New Jersey, 07065, and its successors, assigns and legal representatives (hereinafter **ASSIGNEE**), is desirous of obtaining the entire right, title and interest in, to and under the invention disclosed in said application or applications;

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, I/we, said ASSIGNOR(S), do each hereby sell, assign and transfer or confirm the grant and assignment to said **ASSIGNEE** my/our entire right, title and interest in all countries of the world in and to my/our invention described in said application for Patents, in and to the right to file patent applications in the name of **ASSIGNEE**, its designee, or in any or all of our names, at its election, on the aforesaid invention in all countries of the world, together with all rights of priority in the aforesaid countries deriving from the above-identified application for Patents under the International Convention for the Protection of Industrial Property, under the Inter-American Convention relating to Inventions, Patents, Designs and Industrial Models and under any other international arrangement relating to patents or intellectual property, in and to any and all Letters Patent that are granted from the aforesaid application for Patents, in and to any applications claiming priority benefits to a provisional patent application or other applications filed on said invention, and in and to any continuations, divisions, reexaminations, reissues, renewals and extensions thereof of any of said Letters Patent, the same to be held and enjoyed by said **ASSIGNEE**, to the full ends of the terms for which all Letters Patent therefore may be granted, as fully and entirely as the same would have been held and enjoyed by us if this assignment and sale had not been made.

AND I/WE HEREBY covenant and agree that we will at any time, upon the request and at the expense of **ASSIGNEE**, without further compensation or charge to said **ASSIGNEE**, execute and deliver any and all documents that may be necessary or desirable to perfect the title to the foregoing invention, patent applications, and Letters Patent and

Worldwide Assignment

continuations, divisions, reexaminations, reissues, renewals and extensions thereof in the name of **ASSIGNEE**, including the execution and procurement of any and all further documents evidencing this assignment and sale as may be necessary or desirable for recording the same in the Patent Office of any country concerned, and will make all rightful oaths and declarations and do all lawful acts requisite for procuring the same or for aiding therein.

I/WE HEREBY authorize **ASSIGNEE** to insert in this instrument the Application Number(s) and the filing date(s) of said application for Patents when officially notified thereof.

This document may be executed in any number of counterparts, each of which so executed shall be deemed to be an original, but all such components shall together constitute but one and the same document.

Executed this ____ day of _____, 2016.

Yeon-Hee Lim

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Yeon-Hee Lim** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Zhuyan Guo

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Zhuyan Guo** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Amjad Ali

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Amjad Ali** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Scott D. Edmondson

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Scott D. Edmondson** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Weiguo Liu

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Weiguo Liu** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Gioconda V. Gallo-Etienne

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Gioconda V. Gallo-Etienne** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Heping Wu

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Heping Wu** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Ying-Duo Gao

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Ying-Duo Gao** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Andrew W. Stamford

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Andrew W. Stamford** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Younong Yu

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Younong Yu** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Nancy J. Kevin

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Nancy J. Kevin** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Rajan Anand

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Rajan Anand** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Deyou Sha

ACKNOWLEDGEMENT

State of Pennsylvania)
) s.s.:
County of Montgomery)

On this ____ day of _____, 2016, personally appeared before me **Deyou Sha** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Santhosh F. Neelamkavil

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Santhosh F. Neelamkavil** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Zahid Hussain

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Zahid Hussain** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Puneet Kumar

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Puneet Kumar** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Remond Moningka

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Remond Moningka** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2016.

Joseph L. Duffy

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2016, personally appeared before me **Joseph L. Duffy** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this ____ day of _____, 2015.

Jiayi Xu

ACKNOWLEDGEMENT

State of New Jersey)
) s.s.:
County of Union)

On this ____ day of _____, 2015, personally appeared before me **Jiayi Xu** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

(Seal)

Notary Public

Executed this 22 day of September, 2016.

Yu Jiang

ACKNOWLEDGEMENT

On this ____ day of _____, 2016, personally appeared before me **Yu Jiang** to me known, and known by me to be the same person described in and who executed the foregoing instrument, and acknowledged that he (she) executed the same, of his (her) own free will for the purpose set forth.

Witness 1:

Zhang wenjuan 张 Wenjuan
Print Name

张 Wenjuan
Signature

Witness 2:

Chen Xiaogin 陈晓勤
Print Name

陈晓勤
Signature