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

PATENT REEL: 040431 FRAME: 0001

504058910

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

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PATENT REEL: 040431 FRAME: 0002

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PATENT REEL: 040431 FRAME: 0003

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,
	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

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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	_ , 2018
Executed this 25 day of May	
Yeon-Hee Lim	
ACKNOWLEDGEMENT	
State of New Jersey) s.s.: County of Union) s.s.: On this 25 day of	, 201\$, personally appeared before me Yeon-Hee Lim to me known. ibed in and who executed the foregoing instrument, and acknowledged wn free will for the purpose set forth. Notary Public
	Notary Public
	MICHELLE ANN SISKO Notary Public of New Jersey My Commission Expires on October 24, 2017
Executed this 33 day of May Shirphilpso Zhuyan Guo	
ACKNOWLEDGEMENT	
State of New Jersey)) s.s.: County of Union) On this 33 day of	, 2015, personally appeared before me Zhuyan Guo to me known, libed in and who executed the foregoing instrument, and acknowledged wn free will for the purpose set forth. Notary Public

Executed this <u>//</u> day	of <u>December</u> , 2015.
Amjad Ali	142
ACKNOWLEDGEMEN	τ
known by me to be the) s.s.:) aday of <u>Dicemble</u> , 2015, personally appeared before me Amjad Ali to me known, and same person described in and who executed the foregoing instrument, and acknowledged that same, of his (her) own free will for the purpose set forth. Notary Public
	MICHELLE ANN SISKO Notary Public of New Jersey My Commission Expires on October 24, 2017
Executed this 23 day Scott D. Edmondson	of March, 2016.
ACKNOWLEDGEMEN	т
State of New Jersey))s.s.:
County of Union	
known, and known by n	day of, 201\$, personally appeared before me Scott D. Edmondson to me ne to be the same person described in and who executed the foregoing instrument, and she) executed the same, of his (her) own free will for the purpose set forth.
(Seal)	Mickelle Q. Jisko Notary Public
	Tarans seems a command of the command

Executed this _23 day of	
Weigue Liu Weigue Liu	
ACKNOWLEDGEMENT	
State of New Jersey) s.s.:	
County of Union)	
On this 23 day of 100, 2018, personally appeared before me Weiguo Liu to me known, known by me to be the same person described in and who executed the foregoing instrument, and acknowledged the (she) executed the same, of his (her) own free will for the purpose set forth.	and nat
(Seal) Notary Public	
MICHELLE ANN SISKO Notary Public of New Jersey My Commission Expires on October 24, 2017	
Executed this 31 day of May, , 2015. Giocanda V. Gallo-Etienne	
ACKNOWLEDGEMENT	
State of New Jersey)) s.s.:	
County of Union)	
On this 3/ day of 7/3/4 , 2015, personally appeared before me Gioconda V. Gallo-Etienr 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.	ie to
(Seal) 1 Leally Lealle Notary Public	

Executed this <u>20</u> day of <u>May</u> , 2018.
Heping Wu
Heping Wu
ACKNOWLEDGEMENT
State of New Jersey)
) s.s.: County of Union)
On this
(Seal) Control of the Control of
MICHELLE ANN SISKO Notary Public of New Jersey My Commission Expires on October 24, 2017
Executed this 24 day of May , 2018. Ying-Duo Gao
ACKNOWLEDGEMENT
State of New Jersey)
State of New Jersey)) s.s.: County of Union)
On this <u>24</u> day of <u>700</u> , 2018, 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) Wedelle Discolory Public

xecuted this <u>25</u> day of <u>////</u> , 2016.
Mandelland.
ndrew W. Stamford
CKNOWLEDGEMENT
tate of New Jersey
ounty of Union) s.s.:
On this
(Seal) Mullu On Justo Notary Public
MICHELLE ANN SISKO Notary Public of New Jersey My Commission Expires on October 24, 2017
xecuted this 2 day of May, , 2018.
CKNOWLEDGEMENT
tate of New Jersey)) s.s.:
ounty of Union)
On this <u>24</u> day of <u>///w</u> , 2015 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 hat he (she) executed the same, of his (her) own free will for the purpose set forth.
(Seal) Windelli Juston Notary Public

Executed this 23 day of March	, 20 to.
Nancy J. Keyin	
ACKNOWLEDGEMENT	
State of New Jersey) s.s.:	
County of Union)	1.
On this 33 day of March and known by me to be the same person describe that he (she) executed the same, of his (her) ow	_, 2015, personally appeared before me Nancy J. Kevi n to me known, ped in and who executed the foregoing instrument, and acknowledged in free will for the purpose set forth.
(Seal)	Massla Dilo Notary Public
	ivotary Public
	MICHELLE ANN SISKO Notary Public of New Jersey My Commission Expires on October 24, 2017
Executed this 33 day of Maca.	, 201\$.
Rajan Anand	
ACKNOWLEDGEMENT	
State of New Jersey) s.s.:	
County of Union)	,
On this 25 day of	_, 2013, personally appeared before me Rajan Anand to me known, ped in and who executed the foregoing instrument, and acknowledged in free will for the purpose set forth.
(Seal)	Mccalle Company Public

Executed this day of		2015.
Deyou Sha		
ACKNOWLEDGEMENT		
State of New Jersey)) s County of Union)	.s.:	
known by me to be the same	e person described in	, 2015, personally appeared before me Deyou Sha to me known, and and who executed the foregoing instrument, and acknowledged that will for the purpose set forth.
(Seal)		
		Notary Public
Executed this <u>23</u> day of _	March	2018.
A O		
Santhosh F. Neelamkavil		
ACKNOWLEDGEMENT		
State of New Jersey)	(.s.:	
County of Union)		
me known, and known by me	e to be the same pers	, 2015, personally appeared before me Santhosh F. Neelamkavil to son described in and who executed the foregoing instrument, and of his (her) own free will for the purpose set forth.
(Seal)	, and the second	Medelle Assis

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Executed this 23 day or	7/(2/08) , 2018.
Controlling Control	
Remond Moningka	
ACKNOWLEDGEMENT	
State of New Jersey)
County of Union) s.s.:)
On this <u>23</u> da known, and known by me	y of, 2018, personally appeared before me Remond Moningka to me to be the same person described in and who executed the foregoing instrument, and e) executed the same, of his (her) own free will for the purpose set forth.
(Seal)	Marelle a Siste
	Notáry Public
	MICHELLE ANN SISKO Notary Public of New Jersey My Commission Expires on October 24, 2017
Executed this <u>26</u> day o	F <u>May</u> , 2018.
Joseph L. Duffy	
ACKNOWLEDGEMENT	
State of New Jersey)
County of Union) s.s.:)
and known by me to be th	y of, 201\$, personally appeared before me Joseph L. Duffy to me known, ne same person described in and who executed the foregoing instrument, and acknowledged a same, of his (her) own free will for the purpose set forth.
(Seal)	Messelle Din Sisko Notary Public
	Notary Public
	MICHELLE ANN SISKO

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

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Executed this 23 day of Marc	, 2015.
Why	
Zahid Hussain	······································
ACKNOWLEDGEMENT	
State of New Jersey)	
) s.s.: County of Union)	
On this <u>23</u> day of <u>Ma</u> and known by me to be the same pe that he (she) executed the same, of	, 2018, personally appeared before me Zahid Hussain to me known, rson described in and who executed the foregoing instrument, and acknowledged his (her) own free will for the purpose set forth.
(Seal)	Merelle Que Seelo Notary Public
	Notary Public
	MICHELLE ANN SISKO Notary Public of New Jersey My Commission Expires on October 24, 2017
	,
Executed this <u>26</u> day of <u>May</u>	, 201\$.
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Puncet Kumar	
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Puncet Kumar ACKNOWLEDGEMENT	
ACKNOWLEDGEMENT State of New Jersey)	
ACKNOWLEDGEMENT	
ACKNOWLEDGEMENT State of New Jersey) s.s.: County of Union) On this day of	. 2018, personally appeared before me Puneet Kumar to me known, ason described in and who executed the foregoing instrument, and acknowledged his (her) own free will for the purpose set forth.
ACKNOWLEDGEMENT State of New Jersey) s.s.: County of Union) On this day of	ission described in and who executed the foregoing instrument, and acknowledged
ACKNOWLEDGEMENT State of New Jersey) s.s.: County of Union) On this day of/ and known by me to be the same per that he (she) executed the same, of	ission described in and who executed the foregoing instrument, and acknowledged

Executed this 25 de	ay of May	. 2018.
Ding &	/	,
Jiayi Xu		
ACKNOWLEDGEME	NT	
State of New Jersey County of Union)) s.s.:)	
known by me to be th		, 201%, personally appeared before me Jiayi Xu to me known, and bed in and who executed the foregoing instrument, and acknowledged that in 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 da	ay of	, 2015.
Yu Jiang	······································	
ACKNOWLEDGEME	NT	
State of New Jersey)) s.s.:	
County of Union) 5,50	
known by me to be th	e same person descri	, 2015, personally appeared before me Yu Jiang to me known, and bed in and who executed the foregoing instrument, and acknowledged that <i>i</i> n free will for the purpose set forth.
(Seal)		
		Notary Public

WORLDWIDE ASSIGNMENT

WHEREAS, I/WE,

(1) (2)	Yeon-Hee Lim, Zhuyan Guo,	located at Piscataway, New Jersey, 08854, located at Scotch Plains, New Jersey, 07076, located at Freehold, New Jersey, 07729
(3) (4)	Amjad Ali, Scott D. Edmondson,	located at Freehold, New Jersey, 07728, located at Clark, New Jersey, 07066,
(5)	Weiguo Liu,	located at Olark, New Jersey, 07500,
(6)	Gioconda V. Gallo-Etienne,	located at Union, New Jersey, 07083,
. ,	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. 61/982,42	20 filed on <u>04-22-2014;</u>	
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

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PATENT REEL: 040431 FRAME: 0016

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 known by me to be the same person descr (she) executed the same, of his (her) own to	, 2016, personally appeared before me Yeon-Hee Lim to me known, and ibed in and who executed the foregoing instrument, and acknowledged that he 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 known by me to be the same person descr (she) executed the same, of his (her) own	, 2016, personally appeared before me Zhuyan Guo to me known, and ibed in and who executed the foregoing instrument, and acknowledged that he free will for the purpose set forth.
(Seal)	
	Notary Public

Page 3 of 12
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Executed this day of	, 2016.
Amjad Ali	
ACKNOWLEDGEMENT	
State of New Jersey)) s.s.: County of Union)	
County of Union)	
On this day of known by me to be the same person described i (she) executed the same, of his (her) own free w	_, 2016, personally appeared before me Amjad Ali to me known, and n and who executed the foregoing instrument, and acknowledged that he vill 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)	
known, and known by me to be the same persor	_ , 2016, personally appeared before me Scott D. Edmondson to me n described in and who executed the foregoing instrument, and of his (her) own free will for the purpose set forth.
(Seal)	
	Notary Public

Page 4 of 12
Computer Generated Template "Assignment-Blank Multiple Assignees Worldwide" (Assignment) Merck Sharp & Dohme Corp. 11/04/2010

Executed this day of	, 2016.
Weiguo Liu	
ACKNOWLEDGEMENT	
State of New Jersey)) s.s.: County of Union)	
County of Union)	
On this day of known by me to be the same person c (she) executed the same, of his (her)	, 2016, personally appeared before me Weiguo Liu to me known, and described in and who executed the foregoing instrument, and acknowledged that he own free will for the purpose set forth.
(Seal)	
	Notary Public
Executed this day of	, 2016.
Giocanda V. Gallo-Etienne	
ACKNOWLEDGEMENT	
State of New Jersey)) s.s.:	
County of Union)	
known, and known by me to be the sa	, 2016, personally appeared before me Gioconda V. Gallo-Etienne to me ame person described in and who executed the foregoing instrument, and I the same, of his (her) own free will for the purpose set forth.
(Seal)	
	Notary Public

Page 5 of 12
Computer Generated Template "Assignment-Blank Multiple Assignees Worldwide" (Assignment) Merck Sharp & Dohme Corp. 11/04/2010

Executed this day of	, 2016.
Heping Wu	
ACKNOWLEDGEMENT	
State of New Jersey)) s.s.:	
County of Union)	
On this day of known by me to be the same person describe (she) executed the same, of his (her) own fre	, 2016, personally appeared before me Heping W u to me known, and ed in and who executed the foregoing instrument, and acknowledged that he se 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 known by me to be the same person describe (she) executed the same, of his (her) own free	, 2016, personally appeared before me Ying-Duo Gao to me known, and ed in and who executed the foregoing instrument, and acknowledged that he se will for the purpose set forth.
(Seal)	
	Notary Public

Page 6 of 12
Computer Generated Template "Assignment-Blank Multiple Assignees Worldwide" (Assignment) Merck Sharp & Dohme Corp. 11/04/2010

Executed this	day of	, 2016.
Andrew W. Stamfo	ord	
ACKNOWLEDGEN	MENT	
State of New Jerse	y)) s.s.:	
County of Union	ý	
known, and known	by me to be the same	, 2016, personally appeared before me Andrew W. Stamford to me e person described in and who executed the foregoing instrument, and e same, of his (her) own free will for the purpose set forth.
(Seal)		
		Notary Public
Executed this	day of	, 2016.
V V		
Younong Yu		
ACKNOWLEDGEN	MENT	
State of New Jerse	у)	
County of Union) s.s.:)	
known by me to be	the same person des	, 2016, personally appeared before me Younong Yu to me known, and cribed in and who executed the foregoing instrument, and acknowledged that he n free will for the purpose set forth.
(Seal)		
		Notary Public

Page 7 of 12
Computer Generated Template "Assignment-Blank Multiple Assignees Worldwide" (Assignment) Merck Sharp & Dohme Corp. 11/04/2010

Executed this day of	_ , 2016.
Nancy J. Kevin	
ACKNOWLEDGEMENT	
State of New Jersey)) s.s.:	
County of Union)	
On this day of known by me to be the same person described (she) executed the same, of his (her) own free	, 2016, personally appeared before me Nancy J. Kevin to me known, and in and who executed the foregoing instrument, and acknowledged that he 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) s.s.:	
On this day of known by me to be the same person described (she) executed the same, of his (her) own free	, 2016, personally appeared before me Rajan Anand to me known, and in and who executed the foregoing instrument, and acknowledged that he will for the purpose set forth.
(Seal)	·
	Notary Public

Page 8 of 12
Computer Generated Template "Assignment-Blank Multiple Assignees Worldwide" (Assignment) Merck Sharp & Dohme Corp. 11/04/2010

Executed this 28 day of	Sept	, 2016.
1 GAA	,	
Deyou Sha	***************************************	
ACKNOWLEDGEMENT		
State of Pennsylvania)	
County of Montgomery) s.s.;)	
known by me to be the sam	ie person described	, 2016, personally appeared before me Deyou Sha to me known, and in and who executed the foregoing instrument, and acknowledged that he will for the purpose set forth.
(Seal)		- 100 h 10 m 10 m 10 m
COMMONWEALTH OF Notarial Dorothy M. Miller, Upper Gwynedd Twp., I My Commission Expineration (Commission Expineration) (Commission Expineration) (Commission) (Co	Notary Public Montgomery County	Motary Public
Executed this day of _	·····	, 2016.
Santhosh F. Neelamkavil		
ACKNOWLEDGEMENT		
State of New Jersey		
County of Union)	\$.\$.:	
known, and known by me to	be the same perso	, 2016, personally appeared before me Santhosh F. Neelamkavil to me on described in and who executed the foregoing instrument, and a, of his (her) own free will for the purpose set forth.
(Seal)		
		Notary Public

Page 9 of 12
Computer Generated Template "Assignment-Blank Multiple Assigness Worldwide" (Assignment) Merck Sharp & Dohmo Corp. 11/04/2010

Executed this day of	, 2016.
Zahid Hussain	<u> </u>
Zanid Hussain	
ACKNOWLEDGEMENT	
State of New Jersey)) s.s.:	
County of Union)	
On this day of known by me to be the same person described in (she) executed the same, of his (her) own free w	_, 2016, personally appeared before me Zahid Hussain to me known, and n and who executed the foregoing instrument, and acknowledged that he rill 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) s.s.:	
On this day of known by me to be the same person described i (she) executed the same, of his (her) own free w	_ , 2016, personally appeared before me Puneet Kumar to me known, and n and who executed the foregoing instrument, and acknowledged that he will for the purpose set forth.
(Seal)	
	Notary Public

Page 10 of 12
Computer Generated Template "Assignment-Blank Multiple Assignees Worldwide" (Assignment) Merck Sharp & Dohme Corp. 11/04/2010

Executed this day of	, 2016.
Remond Moningka	
ACKNOWLEDGEMENT	
State of New Jersey)) s.s.:	
County of Union)	
On this day of and known by me to be the same person describ he (she) executed the same, of his (her) own free	, 2016, personally appeared before me Remond Moningka to me known ed in and who executed the foregoing instrument, and acknowledged that a 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 and known by me to be the same person describ he (she) executed the same, of his (her) own free	, 2016, personally appeared before me Joseph L. Duffy to me known, ed in and who executed the foregoing instrument, and acknowledged that e will for the purpose set forth.
(Seal)	
	Notary Public

Page 11 of 12
Computer Generated Template "Assignment-Blank Multiple Assignees Worldwide" (Assignment) Merck Sharp & Dohme Corp. 11/04/2010

Executed this	day of	, 2016.		
Jiayi Xu				
ACKNOWLEDGI	EMENT			
State of New Jers				
County of Union)			
by me to be the s	ame person described	, 2016, personall in and who executed the fo will for the purpose set for	y appeared before me Jiayi Xu to me known, and know oregoing instrument, and acknowledged that he (she) rth.	vn
(Seal)				
		1942-2043-1841-18-11-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	Notary Public	
			•	
Executed this	day of	, 2016.		
	· · · · · · · · · · · · · · · · · · ·			
Yu Jiang				
ACKNOWLEDG	EMENT			
known, and know	n by me to be the sam	e person described in and	16, personally appeared before me Yu Jiang to me who executed the foregoing instrument, and ee will for the purpose set forth.	
Witness 1:				
Pri	nt Name		Signature	
Witness 2:				
Prin	t Name		Signature	

Page 12 of 12
Computer Generated Template "Assignment-Blank Multiple Assignees Worldwide" (Assignment) Merck Sharp & Dohme Corp. 11/04/2010

WORLDWIDE ASSIGNMENT

WHEREAS, I/WE,

(1) Yeon-Hee Lim,	locate	d at Piscataway, New Jersey, 08854,
(2) Zhuyan Guo,	locate	d at Scotch Plains, New Jersey, 07076,
(3) Amjad Ali,	locate	ed at Freehold, New Jersey, 07728,
(4) Scott D. Edmor	ndson, locate	ed at Clark, New Jersey, 07066,
(5) Weiguo Liu,	locate	ed at Princeton, New Jersey, 08540,
(6) Gioconda V. G	allo-Etienne, locate	ed at Union, New Jersey, 07083,
(7) Heping Wu,	locate	ed at Edison, New Jersey, 08820,
(8) Ying-Duo Gao,		ed at Holmdel, New Jersey, 07733,
(9) Andrew W. Sta		ed at Chatham Township, New Jersey, 07928,
(10) Younong Yu,	locate	ed at East Brunswick, New Jersey, 08816,
(11) Nancy J. Kevin	i, locate	ed at East Brunswick, New Jersey, 08816,
(12) Rajan Anand,		ed at Fanwood, New Jersey, 07023,
(13) Deyou Sha,		ed at Yardley, Pennsylvania. 19067,
(14) Santhosh F. No		ed at Edison, New Jersey, 08820,
(15) Zahid Hussain,	locate	ed at Dayton, New Jersey, 08810,
(16) Puneet Kumar,	locate	ed at Woodbridge, New Jersey, 07095,
(17) Remond Monin	ngka, locate	ed at Jersey City, New Jersey, 07307,
(18) Joseph L. Duffy	y, locate	ed at Cranford, New Jersey, 07016,
(19) Jiayi Xu,	locate	ed at Mariboro, New Jersey, 07746,
(20) Yu Jiang,	locate	ed 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. 61/98	2,420 filed on 04-22-2014;	
U.S. Application No.	having a filing date of	; and
PCT International Application No.	having a filing o	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

Computer Generated Template "Assignment-Blank Multiple Assignees Worldwide" (Assignment) Merck Sharp & Dohme Corp. 11/04/2010

PATENT REEL: 040431 FRAME: 0028

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. s .:	
County of Union)		
On this day of known by me to be the same (she) executed the same, of	e person described in a	2016, personally appeared before me Yeon-Hee Lim to me known, and and who executed the foregoing instrument, and acknowledged that he for the purpose set forth.
(Seal)		
		Notary Public
Executed this day of _	4	2016.
	V4	_
Zhuyan Guo		
ACKNOWLEDGEMENT		•
State of New Jersey)	3. s .:	
County of Union)		
On this day on the same of the same o	e person described in	, 2016, personally appeared before me Zhuyan Guo to me known, and and who executed the foregoing instrument, and acknowledged that he 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)	
County of Union)	
On this day of known by me to be the same person describ (she) executed the same, of his (her) own from	, 2016, personally appeared before me Amjad Ali to me known, and ned in and who executed the foregoing instrument, and acknowledged that he see 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)	
known, and known by me to be the same pe	, 2016, personally appeared before me Scott D. Edmondson to me erson described in and who executed the foregoing instrument, and ame, 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 known by me to be the same person descrik (she) executed the same, of his (her) own fr	ped in and who executed the foregoing instrument, and acknowledged that he
(Seal)	
	Notary Public
Executed this day of	, 2016.
Giocanda V. Gallo-Etienne	
ACKNOWLEDGEMENT	
State of New Jersey) s.s.:	
County of Union)	
known, and known by me to be the same pe	, 2016, personally appeared before me Gioconda V. Gallo-Etienne to me erson described in and who executed the foregoing instrument, and ame, 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 known by me to be the same person describe (she) executed the same, of his (her) own free	, 2016, personally appeared before me Heping Wu to me known, and d in and who executed the foregoing instrument, and acknowledged that he 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 known by me to be the same person describe (she) executed the same, of his (her) own free	, 2016, personally appeared before me Ying-Duo Gao to me known, and d in and who executed the foregoing instrument, and acknowledged that he 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 known, and known by me to be the same perso	, 2016, personally appeared before me Andrew W. Stamford to me on described in and who executed the foregoing instrument, and e, 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 known by me to be the same person described (she) executed the same, of his (her) own free	, 2016, personally appeared before me Younong Yu to me known, and in and who executed the foregoing instrument, and acknowledged that he will for the purpose set forth.
(Seal)	
	Notary Public

Executed this day of	, 2016.
Nancy J. Kevin	
ACKNOWLEDGEMENT	
State of New Jersey) s.s.:	
On this day of known by me to be the same person described in (she) executed the same, of his (her) own free w	_, 2016, personally appeared before me Nancy J. Kevin to me known, and n and who executed the foregoing instrument, and acknowledged that he will for the purpose set forth
(Seal)	in for the purpose section.
	Notary Public
Executed this day of	, 2016.
Rajan Anand	
ACKNOWLEDGEMENT	
State of New Jersey)) s.s.:	
County of Union)	
On this day of known by me to be the same person described i (she) executed the same, of his (her) own free w	_ , 2016, personally appeared before me Rajan Anand to me known, and n and who executed the foregoing instrument, and acknowledged that he <i>i</i> ill for the purpose set forth.
(Seal)	
	Notary Public

Executed this day of _		, 2016.
Deyou Sha		
ACKNOWLEDGEMENT		
State of Pennsylvania).	
County of Montgomery)) s.s)	
On this day known by me to be the sam (she) executed the same, o	of ne person described i f his (her) own free v	_ , 2016, personally appeared before me Deyou Sha to me known, and n and who executed the foregoing instrument, and acknowledged that he vill for the purpose set forth.
(Seal)		
		Notary Public
Executed this day of		, 2016.
Santhosh F. Neelamkavil		
ACKNOWLEDGEMENT		
State of New Jersey)		
County of Union)	s.s.:	
On this day known, and known by me to acknowledged that he (she	o be the same perso	_ , 2016, personally appeared before me Santhosh F. Neelamkavil to me n described in and who executed the foregoing instrument, and , of his (her) own free will for the purpose set forth.
(Seal)		
		Notary Public

Page 9 of 12
Computer Generated Template "Assignment-Blank Multiple Assignees Worldwide" (Assignment) Merck Sharp & Dohme Corp. 11/04/2010

Executed this day	of	2016.
Zahid Hussain		
ACKNOWLEDGEMENT	г	
State of New Jersey)) s.s.:	
County of Union) s.s.:)	
known by me to be the	same person described ir	, 2016, personally appeared before me Zahid Hussain to me known, and and who executed the foregoing instrument, and acknowledged that he ll for the purpose set forth.
(Seal)		
		Notary Public
Executed this day	of	, 2016.
Puneet Kumar		
ACKNOWLEDGEMEN	Γ ,	
State of New Jersey)) s.s.:	
County of Union)	
known by me to be the	same person described ir	, , 2016, personally appeared before me Puneet Kumar to me known, and and who executed the foregoing instrument, and acknowledged that he ill 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)	
County of Union)	
On this day of and known by me to be the same person descri he (she) executed the same, of his (her) own fre	, 2016, personally appeared before me Remond Moningka to me known bed in and who executed the foregoing instrument, and acknowledged that see will for the purpose set forth.
(Seal)	
	Notary Public
Executed this day of	_ , 2016.
Joseph L. Duffy	
ACKNOWLEDGEMENT	
State of New Jersey)	
State of New Jersey)) s.s.: County of Union)	
On this day of and known by me to be the same person descri he (she) executed the same, of his (her) own fre	_, 2016, personally appeared before me Joseph L. Duffy to me known, bed in and who executed the foregoing instrument, and acknowledged that see 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 known by me to be the same person described in he (she) executed the same, of his (her) own free	and who exec	uted the foregoing instrumer	yi Xu to me known, and nt, and acknowledged that
(Seal)			
		Notary Public	
		•	
Executed this 22 day of	2016.		
Yu Jiang	_		
ACKNOWLEDGEMENT			
On this day of known, and known by me to be the same person acknowledged that he (she) executed the same, of	described in ar of his (her) own	2016, personally appeared b nd who executed the foregoin free will for the purpose set	pefore me Yu Jiang to me ng instrument, and forth.
Witness 1:		`	
Zhang Wenjuan 3 Print Name	KZOA	Signature Signature	
Witness 2:		,	
Chen Xiaoqin 元	暖勤	强聪勤	_
Print Name		Signature	

Page 12 of 12

Computer Generated Template "Assignment-Blank Multiple Assignees Worldwide" (Assignment) Merck Sharp & Dohme Corp. 11/04/201

RECORDED: 10/20/2016