503621026 12/21/2015

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 EPAS ID: PAT3667657 Stylesheet Version v1.2

 SUBMISSION TYPE:
 NEW ASSIGNMENT

 NATURE OF CONVEYANCE:
 ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
HENRY YU	02/21/2014
THOMAS E. RICHARDSON	02/24/2014
MARIANNE DONNELLY	02/21/2014
NGAN NGUYEN	02/21/2014
XULIANG JIANG	02/20/2014

RECEIVING PARTY DATA

Name:	Merck Patent GmbH
Street Address:	Frankfurter Strasse 250
City:	Darmstadt
State/Country:	GERMANY
Postal Code:	64293

PROPERTY NUMBERS Total: 1

Property Type	Number
Application Number:	14900215

CORRESPONDENCE DATA

Fax Number: (781)681-2946

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: (978)-294-1573

Email: ipus@emdserono.com

Correspondent Name: DWIGHT D. KIM

Address Line 1: ONE TECHNOLOGY PLACE

Address Line 4: ROCKLAND, MASSACHUSETTS 02370

ATTORNEY DOCKET NUMBER: P 13/094 US PCT

NAME OF SUBMITTER: DWIGHT D. KIM

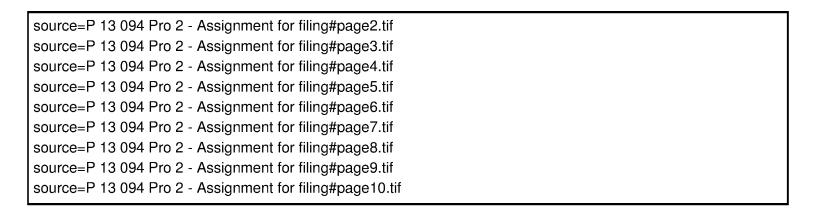
SIGNATURE: /Dwight D. Kim/

DATE SIGNED: 12/21/2015

Total Attachments: 10

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PATENT 503621026 REEL: 037340 FRAME: 0414



WHEREAS, Yu, Henry, a citizen of CANADA, residing at 25 Burke Lane, WELLESLEY, MA 02481 (UNITED STATES OF AMERICA) (hereinafter, "Assignor") has invented certain new and useful improvements relating to IMIDAZOLE COMPOUNDS AS MODULATORS OF FSHR AND USES THEREOF (hereinafter, the "Invention") as described in U.S. Provisional Patent Application No. 61/898,611, filed on NOV/01/2013 (hereinafter, the "Application"); and

WHEREAS, Merck Patent GmbH, an entity organized and existing under the laws of the State of GERMANY having a place of business in Frankfurter Strasse 250, 64293 Darmstadt (GERMANY), together with any successors, assigns and legal representatives thereof (hereinafter, called the "Assignee") is desirous of acquiring the entire right, title and interest, for all countries, in and to said Invention and Application.

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, each Assignor hereby sells, assigns, transfers and conveys unto Assignee the entire right, title and interest of such Assignor in and to said Invention and Application, and all divisions, renewals and continuations thereof, and any and all Letters Patent of the United States which may be granted thereon, and all reissues, reexaminations, and extensions thereof, and all priority rights under all available international agreements, treaties and conventions for the protection of intellectual property in its various forms in every participating country, and all applications for Letters Patent or other grants of protection of proprietary rights including, but not limited to, inventor's certificate, utility model, utility certificate, patent of importation, registration of patent and industrial design registration which may be filed, and which may be granted, upon said inventions in any countries or regions foreign to the United States, and all reissues, renewals and extensions thereof; and each Assignor hereby authorizes and requests the Commissioner for Patents and Trademarks of the United States, and all officials of countries or regions foreign to the United States having authority so to do, to issue all such Letters Patent or other grants of protection upon said inventions to the Assignee or to such nominees as it may designate;

AND each Assignor hereby authorizes and empowers the Assignee or nominees to invoke and claim for any application for such Letters Patent or other grants of protection for said inventions filed by it or them, the benefit of the right of priority provided by the International Convention for the Protection of Industrial Property, as amended, or by a convention which may henceforth be substituted for it, and to invoke and claim such right of priority without further written or oral authorization from such Assignor;

AND each Assignor hereby consents that a copy of this Assignment shall be deemed a full and formal equivalent of any assignment, consent to file or like document which may be required in any country or region for any purpose and more particularly in proof of the right of the Assignee or nominees to claim the aforesaid benefit of the right of priority provided by the International Convention for the Protection of Industrial Property, as amended, or by any convention which may henceforth be substituted for it;

AND each Assignor hereby covenants that such Assignor has the full right to convey the right, title and interest herein assigned and that such Assignor has not executed and will not execute any agreement in conflict herewith:

AND each Assignor hereby covenants and agrees that such Assignor will communicate to Assignee or nominees all facts known to such Assignor pertaining to the Invention, and testify in all legal proceedings, sign all lawful papers, execute all divisional, continuation, substitute and reissue applications, make all rightful oaths and declarations and in general perform all lawful acts necessary or proper to aid Assignee or nominee in obtaining, maintaining and enforcing all lawful patent or other grants of protection of the Invention in any and all countries and regions.

[remainder of page intentionally left blank]

IN TESTIMONY WHEREOF, this Assignment is executed by Assignor on the date opposite the signature of Assignor:

State of _

County of Middlesux

On this 21 day of +ebruay, 2014, before me personally appeared Yu, Henry, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person named in and who executed the foregoing instrument and thereupon acknowledged to me that they executed the same of their own free will for the purposes set forth, and for a valuable consideration.

Notary Public

MONA BIELER Notary Public
COMMONWEALTH OF MASSACHUSETTS My Commission Expires June 26, 2020

[SIGNATURE PAGE TO ASSIGNMENT]

WHEREAS, Richardson, Thomas E., a citizen of UNITED STATES OF AMERICA, residing at 60 Oakwood Drive, DURHAM, NC 27517 (UNITED STATES OF AMERICA) (hereinafter, "Assignor") has invented certain new and useful improvements relating to IMIDAZOLE COMPOUNDS AS MODULATORS OF FSHR AND USES THEREOF (hereinafter, the "Invention") as described in U.S. Provisional Patent Application No. 61/898,611, filed on NOV/01/2013(hereinafter, the "Application"); and

WHEREAS, Merck Patent GmbH, an entity organized and existing under the laws of the State of GERMANY having a place of business in Frankfurter Strasse 250, 64293 Darmstadt (GERMANY), together with any successors, assigns and legal representatives thereof (hereinafter, called the "Assignee") is desirous of acquiring the entire right, title and interest, for all countries, in and to said Invention and Application.

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, each Assignor hereby sells, assigns, transfers and conveys unto Assignee the entire right, title and interest of such Assignor in and to said Invention and Application, and all divisions, renewals and continuations thereof, and any and all Letters Patent of the United States which may be granted thereon, and all reissues, reexaminations, and extensions thereof, and all priority rights under all available international agreements, treaties and conventions for the protection of intellectual property in its various forms in every participating country, and all applications for Letters Patent or other grants of protection of proprietary rights including, but not limited to, inventor's certificate, utility model, utility certificate, patent of importation, registration of patent and industrial design registration which may be filed, and which may be granted, upon said inventions in any countries or regions foreign to the United States, and all reissues, renewals and extensions thereof; and each Assignor hereby authorizes and requests the Commissioner for Patents and Trademarks of the United States, and all officials of countries or regions foreign to the United States having authority so to do, to issue all such Letters Patent or other grants of protection upon said inventions to the Assignee or to such nominees as it may designate;

AND each Assignor hereby authorizes and empowers the Assignee or nominees to invoke and claim for any application for such Letters Patent or other grants of protection for said inventions filed by it or them, the benefit of the right of priority provided by the International Convention for the Protection of Industrial Property, as amended, or by a convention which may henceforth be substituted for it, and to invoke and claim such right of priority without further written or oral authorization from such Assignor;

AND each Assignor hereby consents that a copy of this Assignment shall be deemed a full and formal equivalent of any assignment, consent to file or like document which may be required in any country or region for any purpose and more particularly in proof of the right of the Assignee or nominees to claim the aforesaid benefit of the right of priority provided by the International Convention for the Protection of Industrial Property, as amended, or by any convention which may henceforth be substituted for it;

AND each Assignor hereby covenants that such Assignor has the full right to convey the right, title and interest herein assigned and that such Assignor has not executed and will not execute any agreement in conflict herewith;

AND each Assignor hereby covenants and agrees that such Assignor will communicate to Assignee or nominees all facts known to such Assignor pertaining to the Invention, and testify in all legal proceedings, sign all lawful papers, execute all divisional, continuation, substitute and reissue applications, make all rightful oaths and declarations and in general perform all lawful acts necessary or proper to aid Assignee or nominee in obtaining, maintaining and enforcing all lawful patent or other grants of protection of the Invention in any and all countries and regions.

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IN TESTIMONY WHEREOF, this Assignment is executed by Assignor on the date opposite the signature of Assignor.

State of North Carolina _ _ss: Julianna L Royer

County of Durheum

On this 24 day of February, 2014, before me personally appeared Richardson, Thomas E., personally known to me (or proved to me on the basis of satisfactory evidence) to be the person named in and who executed the foregoing instrument and thereupon acknowledged to me that they executed the same of their own free will for the purposes set forth, and for a valuable consideration.

WHEREAS, Donnelly, Marianne, a citizen of FRANCE, residing at 123 Lowell Street, READING, MA 01867 (UNITED STATES OF AMERICA) (hereinafter, "Assignor") has invented certain new and useful improvements relating to IMIDAZOLE COMPOUNDS AS MODULATORS OF FSHR AND USES THEREOF (hereinafter, the "Invention") as described in U.S. Provisional Patent Application No. 61/898,611, filed on NOV/01/2013(hereinafter, the "Application"); and

WHEREAS, Merck Patent GmbH, an entity organized and existing under the laws of the State of GERMANY having a place of business in Frankfurter Strasse 250, 64293 Darmstadt (GERMANY), together with any successors, assigns and legal representatives thereof (hereinafter, called the "Assignee") is desirous of acquiring the entire right, title and interest, for all countries, in and to said Invention and Application.

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, each Assignor hereby sells, assigns, transfers and conveys unto Assignee the entire right, title and interest of such Assignor in and to said Invention and Application, and all divisions, renewals and continuations thereof, and any and all Letters Patent of the United States which may be granted thereon, and all reissues, reexaminations, and extensions thereof, and all priority rights under all available international agreements, treaties and conventions for the protection of intellectual property in its various forms in every participating country, and all applications for Letters Patent or other grants of protection of proprietary rights including, but not limited to, inventor's certificate, utility model, utility certificate, patent of importation, registration of patent and industrial design registration which may be filed, and which may be granted, upon said inventions in any countries or regions foreign to the United States, and all reissues, renewals and extensions thereof; and each Assignor hereby authorizes and requests the Commissioner for Patents and Trademarks of the United States, and all officials of countries or regions foreign to the United States having authority so to do, to issue all such Letters Patent or other grants of protection upon said inventions to the Assignee or to such nominees as it may designate;

AND each Assignor hereby authorizes and empowers the Assignee or nominees to invoke and claim for any application for such Letters Patent or other grants of protection for said inventions filed by it or them, the benefit of the right of priority provided by the International Convention for the Protection of Industrial Property, as amended, or by a convention which may henceforth be substituted for it, and to invoke and claim such right of priority without further written or oral authorization from such Assignor;

AND each Assignor hereby consents that a copy of this Assignment shall be deemed a full and formal equivalent of any assignment, consent to file or like document which may be required in any country or region for any purpose and more particularly in proof of the right of the Assignee or nominees to claim the aforesaid benefit of the right of priority provided by the International Convention for the Protection of Industrial Property, as amended, or by any convention which may henceforth be substituted for it;

AND each Assignor hereby covenants that such Assignor has the full right to convey the right, title and interest herein assigned and that such Assignor has not executed and will not execute any agreement in conflict herewith:

AND each Assignor hereby covenants and agrees that such Assignor will communicate to Assignee or nominees all facts known to such Assignor pertaining to the Invention, and testify in all legal proceedings, sign all lawful papers, execute all divisional, continuation, substitute and reissue applications, make all rightful oaths and declarations and in general perform all lawful acts necessary or proper to aid Assignee or nominee in obtaining, maintaining and enforcing all lawful patent or other grants of protection of the Invention in any and all countries and regions.

[remainder of page intentionally left blank]

MONA BIELER
Notary Public
COMMONWEALTH OF MASSACHUSETT
My Commission Expires
June 26, 2020

IN TESTIMONY WHEREOF, this Assignment is executed by Assignor on the date opposite the signature of Assignor.

Donnelly, Marianne

State of Massachusetts

County of Meddlesus SS:

On this 1 day of february, 20 19, before me personally appeared Donnelly,

Marianne, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person named in and who executed the foregoing instrument and thereupon acknowledged to me that they executed the same of their own free will for the purposes set forth, and for a valuable consideration.

Notary Public

[SIGNATURE PAGE TO ASSIGNMENT]

WHEREAS, Nguyen, Ngan, a citizen of VIETNAM, residing at 63 Marshall Street, Unit 1F, SOMERVILLE, MA 02145 (hereinafter, "Assignor") has invented certain new and useful improvements relating to IMIDAZOLE COMPOUNDS AS MODULATORS OF FSHR AND USES THEREOF (hereinafter, the "Invention") as described in U.S. Provisional Patent Application No. 61/898,611, filed on NOV/01/2013 (hereinafter, the "Application"); and

WHEREAS, Merck Patent GmbH, an entity organized and existing under the laws of the State of GERMANY having a place of business in Frankfurter Strasse 250, 64293 Darmstadt (GERMANY), together with any successors, assigns and legal representatives thereof (hereinafter, called the "Assignee") is desirous of acquiring the entire right, title and interest, for all countries, in and to said Invention and Application.

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, each Assignor hereby sells, assigns, transfers and conveys unto Assignee the entire right, title and interest of such Assignor in and to said Invention and Application, and all divisions, renewals and continuations thereof, and any and all Letters Patent of the United States which may be granted thereon, and all reissues, reexaminations, and extensions thereof, and all priority rights under all available international agreements, treaties and conventions for the protection of intellectual property in its various forms in every participating country, and all applications for Letters Patent or other grants of protection of proprietary rights including, but not limited to, inventor's certificate, utility model, utility certificate, patent of importation, registration of patent and industrial design registration which may be filed, and which may be granted, upon said inventions in any countries or regions foreign to the United States, and all reissues, renewals and extensions thereof; and each Assignor hereby authorizes and requests the Commissioner for Patents and Trademarks of the United States, and all officials of countries or regions foreign to the United States having authority so to do, to issue all such Letters Patent or other grants of protection upon said inventions to the Assignee or to such nominees as it may designate;

AND each Assignor hereby authorizes and empowers the Assignee or nominees to invoke and claim for any application for such Letters Patent or other grants of protection for said inventions filed by it or them, the benefit of the right of priority provided by the International Convention for the Protection of Industrial Property, as amended, or by a convention which may henceforth be substituted for it, and to invoke and claim such right of priority without further written or oral authorization from such Assignor;

AND each Assignor hereby consents that a copy of this Assignment shall be deemed a full and formal equivalent of any assignment, consent to file or like document which may be required in any country or region for any purpose and more particularly in proof of the right of the Assignee or nominees to claim the aforesaid benefit of the right of priority provided by the International Convention for the Protection of Industrial Property, as amended, or by any convention which may henceforth be substituted for it;

AND each Assignor hereby covenants that such Assignor has the full right to convey the right, title and interest herein assigned and that such Assignor has not executed and will not execute any agreement in conflict herewith;

AND each Assignor hereby covenants and agrees that such Assignor will communicate to Assignee or nominees all facts known to such Assignor pertaining to the Invention, and testify in all legal proceedings, sign all lawful papers, execute all divisional, continuation, substitute and reissue applications, make all rightful oaths and declarations and in general perform all lawful acts necessary or proper to aid Assignee or nominee in obtaining, maintaining and enforcing all lawful patent or other grants of protection of the Invention in any and all countries and regions.

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State of Nguyen, Ngan
State of MGSGChusetts

County of Middlesux

SS:

On this 2 day of brown, 2019 before me personally appeared Nguyen, Ngan, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person named in and who executed the foregoing instrument and thereupon acknowledged to me that they executed the same of their own free will for the purposes set forth, and for a valuable consideration.

Notary Public

Notary Public

IN TESTIMONY WHEREOF, this Assignment is executed by Assignor on the date opposite the signature of

Assignor.

[SIGNATURE PAGE TO ASSIGNMENT]

WHEREAS, Jiang, Xuliang, a citizen of UNITED STATES OF AMERICA, residing at 73 Kelley Drive, BRAINTREE, MA 02184 (UNITED STATES OF AMERICA) (hereinafter, "Assignor") has invented certain new and useful improvements relating to IMIDAZOLE COMPOUNDS AS MODULATORS OF FSHR AND USES THEREOF (hereinafter, the "Invention") as described in U.S. Provisional Patent Application No. 61/898,611, filed on NOV/01/2013 (hereinafter, the "Application"); and

WHEREAS, Merck Patent GmbH, an entity organized and existing under the laws of the State of GERMANY having a place of business in Frankfurter Strasse 250, 64293 Darmstadt (GERMANY), together with any successors, assigns and legal representatives thereof (hereinafter, called the "Assignee") is desirous of acquiring the entire right, title and interest, for all countries, in and to said Invention and Application.

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, each Assignor hereby sells, assigns, transfers and conveys unto Assignee the entire right, title and interest of such Assignor in and to said Invention and Application, and all divisions, renewals and continuations thereof, and any and all Letters Patent of the United States which may be granted thereon, and all reissues, reexaminations, and extensions thereof, and all priority rights under all available international agreements, treaties and conventions for the protection of intellectual property in its various forms in every participating country, and all applications for Letters Patent or other grants of protection of proprietary rights including, but not limited to, inventor's certificate, utility model, utility certificate, patent of importation, registration of patent and industrial design registration which may be filed, and which may be granted, upon said inventions in any countries or regions foreign to the United States, and all reissues, renewals and extensions thereof; and each Assignor hereby authorizes and requests the Commissioner for Patents and Trademarks of the United States, and all officials of countries or regions foreign to the United States having authority so to do, to issue all such Letters Patent or other grants of protection upon said inventions to the Assignee or to such nominees as it may designate;

AND each Assignor hereby authorizes and empowers the Assignee or nominees to invoke and claim for any application for such Letters Patent or other grants of protection for said inventions filed by it or them, the benefit of the right of priority provided by the International Convention for the Protection of Industrial Property, as amended, or by a convention which may henceforth be substituted for it, and to invoke and claim such right of priority without further written or oral authorization from such Assignor;

AND each Assignor hereby consents that a copy of this Assignment shall be deemed a full and formal equivalent of any assignment, consent to file or like document which may be required in any country or region for any purpose and more particularly in proof of the right of the Assignee or nominees to claim the aforesaid benefit of the right of priority provided by the International Convention for the Protection of Industrial Property, as amended, or by any convention which may henceforth be substituted for it;

AND each Assignor hereby covenants that such Assignor has the full right to convey the right, title and interest herein assigned and that such Assignor has not executed and will not execute any agreement in conflict herewith:

AND each Assignor hereby covenants and agrees that such Assignor will communicate to Assignee or nominees all facts known to such Assignor pertaining to the Invention, and testify in all legal proceedings, sign all lawful papers, execute all divisional, continuation, substitute and reissue applications, make all rightful oaths and declarations and in general perform all lawful acts necessary or proper to aid Assignee or nominee in obtaining, maintaining and enforcing all lawful patent or other grants of protection of the Invention in any and all countries and regions.

[remainder of page intentionally left blank]

IN TESTIMONY WHEREOF, this Assignment is executed by Assignor on the date opposite the signature of Assignor.

Jiang, Xuliang

State of Massachusetts

County of Minddlessa

On this <u>JO</u> day of <u>tebruary</u>, 20 14_, before me personally appeared **Jiang**, **Xuliang**, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person named in and who executed the foregoing instrument and thereupon acknowledged to me that they executed the same of their own-free will for the purposes set forth, and for a valuable consideration.

Notary Public

MONA BIELER
Notary Public
COMMUNICATION OF MASSACHUSETTS
My Commission Expires
June 26, 2020

[SIGNATURE PAGE TO ASSIGNMENT]

PATENT REEL: 037340 FRAME: 0425

RECORDED: 12/21/2015