PATENT ASSIGNMENT

Electronic Version v1.1 Stylesheet Version v1.1

| SUBMISSION TYPE: | NEW ASSIGNMENT |
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| NATURE OF CONVEYANCE: | ASSIGNMENT |

CONVEYING PARTY DATA

| Name | Execution Date |
|--------------------------|----------------|
| Saskia Maria Brachmann | 02/01/2008 |
| Peter Finan | 02/12/2008 |
| Christine Fritsch | 02/01/2008 |
| Carlos Garcia-Echeverria | 02/04/2008 |
| Sauveur-Michel Maira | 02/01/2008 |
| Leon Murphy | 02/11/2008 |
| Paul Leslie Nicklin | 08/15/2008 |

RECEIVING PARTY DATA

| Name: | NOVARTIS AG |
|-----------------|-----------------|
| Street Address: | Lichtstrasse 35 |
| City: | Basel |
| State/Country: | SWITZERLAND |
| Postal Code: | 4056 |

PROPERTY NUMBERS Total: 1

| Property Type | Number |
|---------------------|----------|
| Application Number: | 12525333 |

CORRESPONDENCE DATA

Fax Number: (973)781-8064

Correspondence will be sent via US Mail when the fax attempt is unsuccessful.

Phone: 862-778-8462

Email: linda.adams@novartis.com

Correspondent Name: Linda Adams

Address Line 1: Novartis Pharmaceuticals Corp.

Address Line 2: One Health Plaza

Address Line 4: East Hanover, NEW JERSEY 07936

ATTORNEY DOCKET NUMBER: 50634-US-PCT

501080967 PATENT REEL: 023875 FRAME: 0949

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| NAME OF SUBMITTER: | Linda Adams |
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| Total Attachments: 17 | |
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ASSIGNMENT

For good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, we

- (1) <u>Saskia Maria BRACHMANN</u> (2) <u>Peter FINAN</u> (3) <u>Christine FRITSCH</u> (4) <u>Carlos GARCIA-ECHEVERRIA</u> (5) <u>Sauveur-Michel MAIRA</u> (6) <u>Leon MURPHY</u> and (7) <u>Paul Leslie NICKLIN</u>, respectively residing at
- (1) Almannengasse 35, CH-4058 Basel, Switzerland
- (2) 82 Village Street, Marblehead MA 01945 USA
- (3) 20B, rue de Bâle, 68730 Ranspach-Le-Bas, France
- (4) Engelgasse 126, 4052 Basel, Switzerland
- (5) 3c, rue de Hombourg, 68440 Habsheim, France
- (6) 207 Mason Terrace, Apt. 1, Brookline MA 02446, USA and
- (7) Tanglewood, West End Lane, Henfield, West Sussex BN5 9RE, Great Britain

do hereby sell, assign and transfer to Novartis AG, a company organized under the laws of the Swiss Confederation, of Lichtstrasse 35, 4056 Basel, Switzerland, and its successors, assigns and legal representatives, all of our right, title and interest for all countries of the world (Novartis AG hereinafter referred to as the "ASSIGNEE") in and to (1) all of our inventions and discoveries described in the patent application(s) titled

Imidazoquinolines as dual lipid kinase and mTOR inhibitors

20 and accorded and filed in the United States Patent and Trademark Office on ___ * and/or filed in the RO/US on 19 Take 1200 and Application Number ___ accorded International Patent Application Number () 16 20 20 (2014) the patent application(s) identified in (1), (3) all national stages of any international patent application identified in (1), (4) all other patent applications in all countries and regions claiming the priority of the provisional or non-provisional patent application filed in the United States Patent and Trademark Office on 20 February 2007 and accorded Application Number 60/890,641, (5) for all patent applications, all rights of priority based upon the United States patent application identified in (4) in all countries and regions under the Paris Convention for the Protection of Industrial Property, the Inter-American Convention relating to Inventions, Patents, Designs, and Industrial Models and all other international agreements to which the United States now is or hereafter becomes a signatory and, if the United States patent application identified in (4) is a provisional patent application, under 35 USC 119(e) (including the right to file patent applications on said inventions and discoveries in the names of ASSIGNEE or their designees or in our names, at their election and in accordance with applicable law in all countries and regions), (6) all continuations and divisions of any United States patent application or international patent application designating the United States identified in (1). any national stages of any international application identified in (1) and any patent applications within the scope of (4) (including further continuations and divisions such as, but not limited to, continuations of continuations and continuations of divisions), ((2)-(4) and (6) hereinafter referred to collectively as "patent applications"), (7) all patents that are granted on any of said patent applications, (8) all registrations and confirmations of, and importation certificates based upon, one or more of said patents and applications for such registrations, confirmations and importation certificates and (9) all reissues, renewals and extensions of said patents, registrations, confirmations and importation certificates, reexamination certificates issued for said patents and supplementary protection certificates based upon said patents and applications for such reissues, renewals, extensions, reexamination certificates and supplementary protection certificates, the same to be held and enjoyed by said ASSIGNEE and their successors, assigns and legal representatives to

Page 2

(joint) Patent Case 50634

the full ends of the terms for which said patents, registrations, confirmations, importation certificates, reexamination certificates, supplementary protection certificates, reissues, renewals and extensions may be granted, as fully and entirely as the same would have been held and enjoyed by us if this sale, assignment and transfer had not been made.

*We hereby authorize ASSIGNEE and their representatives to insert in this Assignment the filing date(s) and Application Number(s) of said patent application(s) when notified thereof.

And we hereby covenant and agree that we will, at any time. (i) upon the request, but at the expense, of ASSIGNEE or their successors, assigns or legal representatives execute and deliver all documents that may be necessary or desirable to perfect the title to the foregoing inventions and discoveries, patent applications, patents, registrations, confirmations, importation certificates, reissues, renewals, extensions, reexamination certificates, supplementary protection certificates and applications within the scope of (8) and (9) in ASSIGNEE or their successors, assigns or legal representatives, including the execution and procurement of all further documents evidencing this sale, assignment and transfer as may be necessary or desirable for recording the same in the patent office or other intellectual property office, agency or the like of any country or region, (ii) upon the request, but at the expense, of ASSIGNEE or their successors, assigns or legal representatives execute all additional patent applications within the scope of (3), (4) and (6) and all applications within the scope of (8) or (9) and (iii) make all rightful oaths and declarations and do all lawful acts requisite for procuring the same or for aiding therein, without further compensation, but at the expense of ASSIGNEE or their successors, assigns or legal representatives.

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| Saskia Maria E | IRACHMANN | I | ······································ | | |
| ACKNOWLEDG | EMENT | | | | |
| State of | |) | | | |
| | |) s.s.: | | | |
| County of | ······ |) | | | |
| On this | day of | | | , personally appeared before me Saskia Maria | |
| BRACHMANN, | to me known a | and known l | by me to | be the same person described in and who execute | d th |
| foregoing Assign purpose set forth | | owledged ti | nat (s)he | executed the same of his (her) own free will for the | ₹ |
| (Seal) | | | | | |
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| Executed this /2 day of /2 20 | 8 |
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| ANTENNATION LS. | |
| Peter FINAN | |
| ACKNOWLEDGEMENT | |
| Commonwealth of Massachusetts) | |
| County of Albania) s.s.: | |
| On this day of ?20 \(\triangle \) person known and known by me to be the same person described and acknowledged that (s)he executed the same of his (her | n and who executed the foregoing Assignment |
| (Seal) | Ollian Slan Notary Public |
| Executed this day of, 20 | ALLISON BLAKE NOTARY PUBLIC Commonwealth of Massachusett My Commission Expires on October 17, 2014 |
| Christine FRITSCH | |
| ACKNOWLEDGEMENT | |
| State of) s.s.: | |
| County of) | |
| On this day of, 20, person FRITSCH, to me known and known by me to be the same foregoing Assignment and acknowledged that (s)he execute purpose set forth. | person described in and who executed the |
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| _ | Notary Public |

| Executed this | day of | 20 |
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| | | L.S. |
| Carlos GARCIA-I | ECHEVERRIA | |
| ACKNOWLEDGE | тиент | |
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| ECHEVERRIA, to | me known and known by | , 20 personally appeared before me, Carlos GARCIA- me to be the same person described in and who executed the at (s)he executed the same of his (her) own free will for the |
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| Sauveur-Miche | I MAIRA | 4.0. |
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| | nent and acknowledged th | be the same person described in and who executed the at (s)he executed the same of his (her) own free will for the |
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| Leon MURPHY | | _L.S. | |
| ACKNOWLEDGEMENT | | | |
| Commonwealth of Massac | husetts) | | |
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| On this day o me known and known by n Assignment and acknowle forth. | ne to be the same po | erson described in ar | opeared before me Leon MURPHY , to nd who executed the foregoing (her) own free will for the purpose set |
| (Seal) | | | Notary Public |
| Executed this | day of | 20 | ALLISON BLAXE NOTARY PUBLIC Commonwealth of Massachusett My Commission Expires on October 17, 2014 |
| Paul Leslie NICKLIN | | _LS | |
| ACKNOWLEDGEMENT | | | |
| State of |) s.s.: | | |
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| NICKLIN, to me known a | nd known by me to b | be the same person of | opeared before me Paul Lestie described in and who executed the ame of his (her) own free will for the |
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ASSIGNMENT

For good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, we

- (1) Saskia Maria BRACHMANN (2) Peter FINAN (3) Christine FRITSCH (4) Carlos GARCIA-ECHEVERRIA (5) Sauveur-Michel MAIRA (6) Leon MURPHY and (7) Paul Leslie NICKLIN, respectively residing at
- (1) Almannengasse 35, CH-4058 Basel, Switzerland
- (2) 82 Village Street, Marbiehead MA 01945 USA
- (3) 20B, rue de Bâle, 68730 Ranspach-Le-Bas, France
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- (5) 3c, rue de Hombourg, 68440 Habsheim, France
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do hereby sell, assign and transfer to Novartis AG, a company organized under the laws of the Swiss Confederation, of Lichtstrasse 35, 4056 Basel, Switzerland, and its successors, assigns and legal representatives, all of our right, title and interest for all countries of the world (Novartis AG hereinafter referred to as the "ASSIGNEE") in and to (1) all of our inventions and discoveries described in the patent application(s) titled

Imidazoquinolines as dual lipid kinase and mTOR inhibitors

* and/or filed in the RO/US on It television reconstructions and Application Number accorded International Patent Application Number (C/IuS208/e59236*, (2) the patent application(s) identified in (1), (3) all national stages of any international patent application identified in (1), (4) all other patent applications in all countries and regions claiming the priority of the provisional or non-provisional patent application filed in the United States Patent and Trademark Office on 20 February 2007 and accorded Application Number 60/890,641, (5) for all patent applications, all rights of priority based upon the United States patent application identified in (4) in all countries and regions under the Paris Convention for the Protection of Industrial Property, the Inter-American Convention relating to Inventions, Patents, Designs, and Industrial Models and all other international agreements to which the United States now is or hereafter becomes a signatory and, if the United States patent application identified in (4) is a provisional patent application, under 35 USC 119(e) (including the right to file patent applications on said inventions and discoveries in the names of ASSIGNEE or their designees or in our names, at their election and in accordance with applicable law in all countries and regions), (6) all continuations and divisions of any United States patent application or international patent application designating the United States identified in (1), any national stages of any international application identified in (1) and any patent applications within the scope of (4) (including further continuations and divisions such as, but not limited to, continuations of continuations and continuations of divisions), ((2)-(4) and (6) hereinafter referred to collectively as "patent applications"), (7) all patents that are granted on any of said patent applications, (8) all registrations and confirmations of, and importation certificates based upon, one or more of said patents and applications for such registrations, confirmations and importation certificates and (9) all reissues, renewals and extensions of said patents, registrations, confirmations and importation certificates, reexamination certificates issued for said patents and supplementary protection certificates based upon said patents and applications for such reissues, renewals, extensions, reexamination certificates and supplementary protection certificates, the same to be held and enjoyed by said ASSIGNEE and their successors, assigns and legal representatives to REEL: 023875 FRAME: 0956

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(joint)

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the full ends of the terms for which said patents, registrations, confirmations, importation certificates, reexamination certificates, supplementary protection certificates, reissues, renewals and extensions may be granted, as fully and entirely as the same would have been held and enjoyed by us if this sale, assignment and transfer had not been made.

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| BRACHMANN, to | o me known a | and known b | , 20, personally appeared before me Saskia Maria by me to be the same person described in and who executed the hat (s)he executed the same of his (her) own free will for the |
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Patent Case 50634

| Executed this | day of | <u></u> t | 20 |
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| Peter FINAN | | and the same of th | |
| ACKNOWLEDGEME | ENT | | |
| Commonwealth of M | assachusetts) | | |
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| known and known by | me to be the same | e person descr | personally appeared before me Peter FINAN , to me ibed in and who executed the foregoing Assignment (her) own free will for the purpose set forth. |
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| Christine FRITSCI | H _i | L,&; | |
| ACKNOWLEDGEME | ENT | | |
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| | | | C.S. |
| Carlos GARCIA-E | CHEVERRIA | | |
| ACKNOWLEDGE! | IENT | | |
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| COHEVEDDIA to | me known and | known by m | _, 20, personally appeared before me, Carlos GARCIA- ne to be the same person described in and who executed the t (s)he executed the same of his (her) own free will for the |
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| Sauveur-Michel | MAIRA | | Ĺ.s. |
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| MAIRA to me kn | own and knowr nent and ackno | by me to be | , 20, personally appeared before me Sauveur-Michel be the same person described in and who executed the at (s)he executed the same of his (her) own free will for the |
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Patent Case 50634

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| ACKNOWLEDGEMENT | | |
| Commonwealth of Massac | chusetts) | |
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| ne known and known by r | ne to be the same | , 20, personally appeared before me Leon MURPHY, to person described in and who executed the foregoing (ecuted the same of his (her) own free will for the purpose set |
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| IICKLIN, to me known ar | nd known by me to | , 20, personally appeared before me Paul Leslie to be the same person described in and who executed the lat (s)he executed the same of his (her) own free will for the |
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Notary Public PATENT REEL: 023875 FRAME: 0960

Attestation

I, the undersigned notary public of Basel, Switzerland, Dr. Andreas C. Albrecht, certify herewith the authenticity of the signature of **Mr. Paul Leslie Nicklin**, born on the 17th (seventeenth) day of January 1967 (nineteen hundred sixty-seven), British citizen, with business address at Novartis Horsham Research Centre, Wimblehurst Road, Horsham, West Sussex RH12 5AB, Great Britain.

The authenticity of the signature was established by comparison.

BASEL, Switzerland, this 21st (twenty-first) day of August 2008 (twothousandandeight)

Leg. Prot. Nr. 427 /2008

PATENT REEL: 023875 FRAME: 0961

A. Albrecht, Notar

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ASSIGNMENT

For good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, we

- (1) Saskia Maria BRACHMANN (2) Peter FINAN (3) Christine FRITSCH (4) Carlos GARCIA-ECHEVERRIA (5) Sauveur-Michel MAIRA (6) Leon MURPHY and (7) Paul Leslie NICKLIN, respectively residing at
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and filed in the United States Patent and Trademark Office on ______, 20__ and accorded Application Number __* and/or filed in the RO/<u>US</u> on 19 february 2005 and accorded International Patent Application Number PCTuS2w8/0.14236(2) the patent application(s) identified in (1), (3) all national stages of any international patent application identified in (1), (4) all other patent applications in all countries and regions claiming the priority of the provisional or non-provisional patent application filed in the United States Patent and Trademark Office on 20 February 2007 and accorded Application Number 60/890,641. (5) for all patent applications, all rights of priority based upon the United States patent application identified in (4) in all countries and regions under the Paris Convention for the Protection of Industrial Property, the Inter-American Convention relating to Inventions, Patents, Designs, and Industrial Models and all other international agreements to which the United States now is or hereafter becomes a signatory and, if the United States patent application identified in (4) is a provisional patent application, under 35 USC 119(e) (including the right to file patent applications on said inventions and discoveries in the names of ASSIGNEE or their designees or in our names, at their election and in accordance with applicable law in all countries and regions), (6) all continuations and divisions of any United States patent application or international patent application designating the United States identified in (1), any national stages of any international application identified in (1) and any patent applications within the scope of (4) (including further continuations and divisions such as, but not limited to, continuations of continuations and continuations of divisions), ((2)-(4) and (6) hereinafter referred to collectively as "patent applications"), (7) all patents that are granted on any of said patent applications, (8) all registrations and confirmations of, and importation certificates based upon, one or more of said patents and applications for such registrations, confirmations and importation certificates and (9) all reissues, renewals and extensions of said patents, registrations, confirmations and importation certificates, reexamination certificates issued for said patents and supplementary protection certificates based upon said patents and applications for such reissues, renewals, extensions, reexamination certificates and supplementary protection certificates, the same to be held and enjoyed by said ASSIGNEE and their successors, assigns and legal representatives to

REEL: 023875 FRAME: 0962

Page 2

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| Saskja Maria β | RACHMANN | | | | | |
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| Executed this | UITS day o | n <u>teamu</u> | 2050 | | | |
| Ž. | 11/14 | | _ L.S. | | | |
| Sauveur-Mich | el MAIRA | | | | | |
| ACKNOWLEDG | EMENT | | | | | |
| State of | | *) | | | | |
| County of | |) s.s.:) | | | | |
| | | , | | | | |
| MAIRA, to me l | known and know | vn by me to be | the same per | son describe | d in and who e | Sauveur-Michel executed the |
| foregoing Assigr purpose set forti | | owledged that | (s)ne execute | u the same C | n ms (ner) owr | indown with the |
| (Seal) | | | | | | |
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Notary Pu**PATENT**REEL: 023875 FRAME: 0965

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Patent Case 50634

| Executed this day of 20 | |
|---|-------|
| 1. S | |
| Leon MURPHY | |
| ACKNOWLEDGEMENT | |
| Commonwealth of Massachusetts) | |
| County of | |
| On this day of, 20, personally appeared before me Leon Mt me known and known by me to be the same person described in and who executed the foregoin Assignment and acknowledged that (s)he executed the same of his (her) own free will for the put forth. | 9 |
| (Seal) | |
| Notary Public | |
| Executed this day of 20 | |
| L.S. Paul Leslie NICKLIN | |
| ACKNOWLEDGEMENT | |
| State of) | |
| County of) s.s.; | |
| On this day of, 20, personally appeared before me Paul Les NICKLIN , to me known and known by me to be the same person described in and who execute foregoing Assignment and acknowledged that (s)he executed the same of his (her) own free will purpose set forth. | d the |
| (Seal) | |
| Notary Public | |

Attestation

I, Dr. Thomas Gelzer, the undersigned notary public of Basel, Switzerland, certify herewith the authenticity of the signatures of Ms. Saskia Maria Brachmann, German citizen, residing in Basel, Switzerland, of Ms. Christine Fritsch, French citizen, residing in Ranspach-Le-Bas, France, of Mr. Carlos Garcia-Echeverria, Spanish citizen, residing in Basel, Switzerland, and of Mr. Sauveur-Michel Maira, French citizen, residing in Habsheim, France.

The authenticity of the signatures was established by means of comparison.

BASEL, Switzerland, this 2nd (second) day of April 2008 (twothousandandeight).

7. M. W.

Dr. Th. Gelzer

RECORDED: 02/01/2010

PATENT

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