504359170 05/09/2017

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2 EPAS ID: PAT4405861

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
BENEDICT MCKEEVER	05/02/2017
LOUIS JOSEPH DIORAZIO	05/02/2017
MARTIN FRANCIS JONES	05/02/2017
SOPHIE LAURE MARIE JANBON	05/02/2017
LEIGH FERRIS	05/02/2017
PAWEL STANISLAW SIEDLECKI	05/02/2017
GWYDION HUW CHURCHILL	05/02/2017
PETER ALAN CRAFTS	05/02/2017

RECEIVING PARTY DATA

Name:	ASTRAZENECA UK LIMITED
Street Address:	1 FRANCIS CRICK AVENUE
Internal Address:	CAMBRIDGE BIOMEDICAL CAMPUS
City:	CAMBRIDGE
State/Country:	UNITED KINGDOM

PROPERTY NUMBERS Total: 1

Property Type	Number
Application Number:	15178967

CORRESPONDENCE DATA

Fax Number: (312)913-0002

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: 312-913-0001 Email: neth@mbhb.com

Correspondent Name: MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP

Address Line 1: 300 SOUTH WACKER DRIVE Address Line 4: CHICAGO, ILLINOIS 60606

ATTORNEY DOCKET NUMBER:	13-1820-US-DIV
NAME OF SUBMITTER:	MICHAEL S. GREENFIELD
SIGNATURE:	/Michael S. Greenfield/

PATENT 504359170 REEL: 042434 FRAME: 0568

DATE SIGNED: 05/09/2017 **Total Attachments: 27** source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page1.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page2.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page3.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page4.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page5.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page6.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page7.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page8.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page9.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page10.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page11.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page12.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page13.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page14.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page15.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK Llmited#page16.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page17.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page18.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page19.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK Llmited#page20.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page21.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page22.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page23.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK Llmited#page24.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page25.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page26.tif source=13-1820-US-DIV - Inventor Assignment to AstraZeneca UK LImited#page27.tif

> PATENT REEL: 042434 FRAME: 0569

THIS DEED is made the

2nd

N408439EP KMF day of MAY 2017 2016 78

BETWEEN:

- BENEDICT MCKEEVER; LOUIS JOSEPH DIORAZIO; MARTIN FRANCIS (1)JONES; LEIGH FERRIS; SOPHIE LAURE MARIE JANBON; PAWEL STANISLAW SIEDLECKI; GWYDION HUW CHURCHILL; and PETER ALAN CRAFTS, all c/o Astra Zeneca, Charter Way, Macclesfield, Cheshire, SK10 2NA, United Kingdom (hereinafter collectively called "the Inventors" which expression where the context so allows shall include their personal representatives and assigns); PETER ALAN CRAFTS, of Hoghillock, Dromoak, Banchory, Aberdenshire, AB31 5HQ
 - ASTRAZENECA UK LIMITED, a company incorporated under the laws of England (2) and Wales and having its registered office at 1 Francis Crick Avenue, Cambridge Biomedical Campus, Cambridge, United Kingdom (hereinafter called "AstraZeneca UK" which expression where the context so allows shall include its successors and assigns);
 - ASTRAZENECA AB, a corporation incorporated under the laws of Sweden and (3) having its registered office at SE-151 85, Sodertalje, Sweden (hereinafter called "AstraZeneca AB" which expression where the context so allows shall includes it successors and assigns); and
 - RIGEL PHARMACUETICALS, INC., a corporation incorporated under the laws of (4) the state of Delaware, United States of America and having its principal place of

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business at 1180 Veterans Boulevard, South San Francisco, California 94080, United States of America (hereinafter called "Rigel" which expression where the context so allows shall include its successors and assigns).

WHEREAS:-

- (A) The Inventors claim to be the inventors of an invention relating to "Pharmaceutical Process and Intermediates" ("the Invention") which is the subject of one or more applications for patent protection initially as identified in the Schedule hereto. The Invention is the subject matter of US Patent Application No. 61 919 671 filed on 20 December 2013 in the name of each of the Inventors ("the US Priority Application").
- (B) The Inventors made their contribution to the Invention while in the employment of AstraZeneca UK and in the course of their normal duties or in the course of duties falling outside their normal duties but specifically assigned to them and the circumstances were such that an invention might reasonably be expected to result from the carrying out of their duties and accordingly all their right, title, share and interest in and to the Invention is to be taken (as between the Inventors and AstraZeneca UK) to belong to AstraZeneca UK for the purposes of the Patents Act 1977 and for all other purposes of whatsoever nature. Furthermore by a Confirmatory Assignment effective 20 December 2013 the Inventors assigned to AstraZeneca UK all their right, title, share and interest in and to all intellectual property rights relating to the Invention including the US Priority Application.

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PATENT REEL: 042434 FRAME: 0571

- (C) By an Assignment of Patent Rights effective 20 December 2013 between AstraZeneca UK of the one part and AstraZeneca AB of the other part AstraZeneca UK assigned to AstraZeneca AB all its right, title and interest in and to all intellectual property rights relating to the Invention including the US Priority Application.
- (D) By a Patent Assignment dated 20 February 2014 between AstraZeneca AB of the one part and Rigel of the other part AstraZeneca AB assigned to Rigel all its right, title and interest in and to all intellectual property rights relating to the Invention including the US Priority Application.
- (E) The Assignment of Patent Rights effective 20 December 2013 and the Patent Assignment dated 20 February 2014 both refer to the US Priority Application as "US Patent Application No. 60/919 672". The parties agree and confirm that this was a typographical error and the intention was to assign US Patent Application No. 61/919 671.
- (F) The Inventors acknowledge that the US Priority Application was subject to the rights of AstraZeneca UK as set out in Recital (B) and that the right to claim priority vested in AstraZeneca UK by operation of law, in particular Section 39 of the UK patents Act 1977. Furthermore the Inventors acknowledge that all AstraZeneca UK's right title and interest in and to the US Priority Application, including the right to claim priority, vested in AstraZeneca AB as set out in Recital (C). Furthermore the Inventors acknowledge that all AstraZeneca AB's right title and interest in and to the US Priority Application, including the right to claim priority, vested in Rigel as set

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out in Recital (D).

(G) The parties have agreed to execute this Deed on the terms herein contained.

NOW THIS DEED WITNESSES as follows:-

1. In pursuance of the said agreements and in consideration of the premises the

Inventors, AstraZeneca UK and AstraZeneca AB HEREBY JOINTLY and

SEVERALLY and to the extent of their respective shares and interests therein

ASSIGN and CONFIRM unto Rigel ALL THOSE their respective rights titles shares

and interests in and to the Invention and the patent applications identified in the

Schedule hereto and all patents granted thereon AND the full and exclusive benefit

thereof TOGETHER WITH all rights of action and powers accruing or belonging to

the Inventors, AstraZeneca UK or AstraZeneca AB AND the full right to apply for

and obtain a patent or patents or other similar forms of protection in respect of the

Invention in all countries of the world in the name of Rigel alone or as Rigel may

from time to time otherwise elect or the relevant law may require including the benefit

of any priority date and the right to make applications whether under any national law

or under the International Convention for the Protection of Industrial Property or

under any other applicable convention or treaty TO HOLD the same unto Rigel

absolutely.

2. This document shall be governed by and construed in accordance with English law.

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PATENT REEL: 042434 FRAME: 0573 <u>IN WITNESS</u> whereof this Instrument has been executed by the parties as a Deed in the presence of the persons mentioned below the day and year first before written.

SCHEDULE

Patent Application	Application Number	Application Date	grant date or number
US	61 919 671	20 December 2013	
International	PCT/US14/071613	19 December 2014	
Europe	14828102.5	19 December 2014	

\underline{SIGNED} and $\underline{DELIVERED}$ as his Deed)
by the said BENEDICT MCKEEVER)
in the presence of:-)

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Witness Signature Freunt	
Witness' name CRAIG STEWART	
Address 4 ADSHEAD COURT	
BOLLINGTON	
MACCLESFIELD	
Occupation RESEARCH CHEMIS	7

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SIGNED and DELIVERED as his Deed)	
by the said LOUIS JOSEPH DIORAZIO)	
in the presence of:-		
Witness Signature Place	L.J. Dioraio	۴
Witness' name PETER & Moone		
Address 8 Marrino Ro		
CHORLTON		
MANCHESTER M21 9J)	K	
Occupation RESERVEH CHEMIST		

SIGNED and DELIVERED as his Deed)		
by the said MARTIN FRANCIS JONES)		
in the presence of:-)		
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		1 mgm	×
Witness Signature			
Witness' name RACHTL MUNDAY			
Address 142 GRONT TON ROAD			
MACCLECFIELD.			
SKI (8EH UK :			
Occupation SENIOR SCIENTIST.			

SIGNED and DELIVERED as her Deed)
by the said SOPHIE LAURE MARIE)
JANBON in the presence of:-)
	Fred x
Witness Signature PETER R MUURA Address & ALDERFIELD RO CHURLTON	Ē
MANCINETIES M21 91x	5
Occupation RESEARCH CHEMIS	τ

SIGNED and DELIVERED as his Deed)		
by the said LEIGH FERRIS)		
in the presence of:-)		
	•••••	L. Ferris.	×
Witness Signature ETB razie			
Witness' name MLS EVE JOANNE BRA	KZ1€R		
Address & REGENCY DRIVE			
STOCKTON BRODY STOKE-ON-			
TRENT, ST99LG, ENGLAND			
Occupation Suffey CHAIN STUDY MAN	URGER		

SIGNED and DELIVERED as his Deed)	
by the said PAWEL STANISLAW)	
SIEDLECKI in the presence of:-)	
	Pdieren	
Witness Signature @ Okonenes Wcwll Witness' name Anno O'KENRNEY - MCMI	an	
	CCAN	
Address & CUMBERCAND ORIVE		
BOLLINGTON		
MACCLESFIECD, SKID SBR		
Occupation CHEMIST		

SIGNED and DELIVERED as his Deed)
by the said GWYDION HUW)
CHURCHILL in the presence of:-)
	* Gn Chmolyll *
Witness Signature	
Witness' name VETER DOYLE	
Address 119 NOEW MILLS ROF	D .
HAYFIELD	
DEPOSYSHITE SK222E	>
Occupation SCIENDIST	

SIGNED and DELIVERED as his Deed)
by the said PETER ALAN CRAFTS)
in the presence of:-)
	lefer Coff.
Witness Signature Witness' name Louis Finany Address & REED CRESCENT LARRESTEIC RR AB30 IEF Occupation SARRY Elist GROW MA	in Accall

SIGNED and DELIVERED as a Deed

by ASTRAZENECA UK LIMITED acting

by a Director in the presence of:
Witness Signature

Witness' Name

JAMES GAVIN

Address

7. MURIESTON RD

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COLEGIRE

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) Lice Todact
Title: SENIAR PATENT DRECTOR
OT)

	Travis Young, Ph.D., J.D. Title:
territory in which it is incorporated	
company in accordance with the laws of the)
person acting under the authority of such)
RIGEL PHARMACUETICALS, INC. by a)
SIGNED and DELIVERED as a Deed by)

THIS CONFIRMATORY ASSIGNMENT is made as of the 20th day of December 2013 (the "Effective Date")

BY AND BETWEEN

Benedict McKeever, Louis Joseph Diorazio, Martin Francis Jones, Leigh Ferris, Sophie Laure Marie Janbon, Pawel Stanislaw Siedlecki all of Macclesfield, Cheshire, and Peter Alan Crafts of Aberdeen (collectively, the "Inventor(s)")

AND

ASTRAZENECA UK LIMITED, a company incorporated in England and Wales under No. 3674842 with registered office address at 2 Kingdom Street, London, England W2 6BD ("AstraZeneca")

Recitals

WHEREAS

- A. The Inventor(s) has/have made certain inventions (the "Inventions") in respect of which U.S. patent application number 60/919,671 was filed on the 20 day of December 2013 (the "Patent Application").
- B. The Inventor(s) was/were at all times an employee of AstraZeneca

NOW THEREFORE IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the amounts paid to the Inventor(s) pursuant to their contract of employment with AstraZeneca, the Inventor hereby confirms that by virtue of his employment with AstraZeneca, he has assigned and does hereby assign, with full title guarantee, free from all and any charges or other third party rights, to AstraZeneca absolutely all his right, title and interest in and to the Inventions, the Patent Application and any Patents; any divisions, continuations and continuations-in-part of the Patent Application; any re-issues, re-examinations, or extensions of any and all Patents; the right to file patent applications directly in the name of AstraZeneca or an affiliated company of AstraZeneca (in countries or regions where such filings are permissible); and the right to claim priority rights deriving from the Patent Application (collectively, the "Rights"), whether now existing or hereafter arising, and in so far as there may be any outstanding Rights that have not been assigned to AstraZeneca, the Inventor(s) hereby assigns all right, title and interest in such outstanding Rights to AstraZeneca. Inventor(s) warrants that the Rights are unencumbered. The Inventor(s) acknowledges that AstraZeneca shall have the rights to further assign or otherwise transfer any or all of the Rights to any third party and the Inventor(s) waives any right of first refusal that they may have for acquiring such Rights.

Page 1 of 6

- 2. The Inventor(s) each hereby agree with AstraZeneca that their assignment to AstraZeneca includes, but is not limited to, any and all causes of action, claims, demands or other rights, occasioned from or because of any and all past and future infringement of any of the Patent Application, including all rights to recover damages, profits and injunctive relief for infringement of any of the Patent Application, and the right to file a patent application anywhere in the world claiming convention priority.
- 3. The Inventor(s) each hereby agree with AstraZeneca that they will execute such further documents and give such assistance at the expense of AstraZeneca as AstraZeneca may require:
 - a) to secure the vesting in AstraZeneca of all rights in the Patent Application and in such parties to whom AstraZeneca may assign its rights in the Patent Application;
 - b) to defeat any challenge to the validity of and resolve any questions concerning the Patent Application; and
 - c) to apply for, prosecute and obtain patent or similar protection in the United States and all other countries of the world for an invention embodied by the Patent Application, including the right to claim convention priority from such Application and including, without limitation, cooperating in any proceedings involving examinations, re-examinations, reissues, opposition and cancellation proceedings, interferences, infringement proceedings, court actions and the like.
- 4. The Inventor(s) each hereby agree with AstraZeneca that they shall, at the expense of AstraZeneca, execute and sign all such instruments, applications and documents and do all such acts and things as may reasonably be required by AstraZeneca to enable AstraZeneca or its nominee to enjoy the full benefit of the rights assigned by this agreement.
- 5. AstraZeneca accepts the above assignment.
- 6. This assignment shall be governed by and construed in accordance with the laws of England and Wales and the parties hereby submit to the exclusive jurisdiction of the English courts.

Any attorney of record is authorized and requested by the execution of this assignment to insert into this assignment any further information necessary for recordation of this document.

This agreement has been entered into on the date stated at the beginning of it.

Signed at: Macclesfield, Cheshire

Witnessed by:

Signed at: Macclesfield, Cheshire

Date: 27th JAN 2014

L.J. Die. avis
Louis Joseph Diorazio

TEREMY PARKER Name:

Signed at: Macclesfield, Cheshire

Date: 30 Tm 2014

L. FeWS.
Leigh Ferris

Witnessed by:

Name: The POWELL

Signed at: Macclesfield, Cheshire

Date: 27th JAN 2014

Sophie Laure Marie Janbon

Witnessed by:

Signed at: Macclesfield, Cheshire

Date: 27/1/14

S- MORTON

Witnessed by:

Date: 21 Summy 2014
Martin Francis Jones
Witnessed by:
Name: STEPHEN SMITH,
Signed at: Macclesfield, Cheshire
Date: 27 JAN 2014
Pawel Stanislaw Siedlecki
Witnessed by:

Signed at: Macclesfield, Cheshire

Signed at: Aberdeen, Scotland		
Date:		
Peter Alan Crafts		
Witnessed by:		
Name:		

Page 5 of 6

Signed at: Alderley Park, Cheshire

Date: 17-FEB-2014

Signed for and on behalf of ASTRAZENECA UK LIMITED

Name: Lucy PADGET Title: Authorised Signatory

Witnessed by: Yournal Scar.
Name: RAYMOND S. GAIRYS

Page 6 of 6

THIS CONFIRMATORY ASSIGNMENT is made as of the 20^{th} day of December 2013 (the "Effective Date")

BY AND BETWEEN

Benedict McKeever, Louis Joseph Diorazio, Martin Francis Jones, Leigh Ferris, Sophie Laure Marie Janbon, Pawel Stanislaw Siedlecki all of Macclesfield, Cheshire, and Peter Alan Crafts of Aberdeen (collectively, the "Inventor(s)")

AND

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- B. The Inventor(s) was/were at all times an employee of AstraZeneca

NOW THEREFORE IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the amounts paid to the Inventor(s) pursuant to their contract of employment with AstraZeneca, the Inventor hereby confirms that by virtue of his employment with AstraZeneca, he has assigned and does hereby assign, with full title guarantee, free from all and any charges or other third party rights, to AstraZeneca absolutely all his right, title and interest in and to the Inventions, the Patent Application and any Patents; any divisions, continuations and continuations-in-part of the Patent Application; any re-issues, re-examinations, or extensions of any and all Patents; the right to file patent applications directly in the name of AstraZeneca or an affiliated company of AstraZeneca (in countries or regions where such filings are permissible); and the right to claim priority rights deriving from the Patent Application (collectively, the "Rights"), whether now existing or hereafter arising, and in so far as there may be any outstanding Rights that have not been assigned to AstraZeneca, the Inventor(s) hereby assigns all right, title and interest in such outstanding Rights to AstraZeneca. Inventor(s) warrants that the Rights are unencumbered. The Inventor(s) acknowledges that AstraZeneca shall have the rights to further assign or otherwise transfer any or all of the Rights to any third party and the Inventor(s) waives any right of first refusal that they may have for acquiring such Rights.

Page 1 of 6

- 2. The Inventor(s) each hereby agree with AstraZeneca that their assignment to AstraZeneca includes, but is not limited to, any and all causes of action, claims, demands or other rights, occasioned from or because of any and all past and future infringement of any of the Patent Application, including all rights to recover damages, profits and injunctive relief for infringement of any of the Patent Application, and the right to file a patent application anywhere in the world claiming convention priority.
- 3. The Inventor(s) each hereby agree with AstraZeneca that they will execute such further documents and give such assistance at the expense of AstraZeneca as AstraZeneca may require:
 - a) to secure the vesting in AstraZeneca of all rights in the Patent Application and in such parties to whom AstraZeneca may assign its rights in the Patent Application;
 - b) to defeat any challenge to the validity of and resolve any questions concerning the Patent Application; and
 - c) to apply for, prosecute and obtain patent or similar protection in the United States and all other countries of the world for an invention embodied by the Patent Application, including the right to claim convention priority from such Application and including, without limitation, cooperating in any proceedings involving examinations, re-examinations, reissues, opposition and cancellation proceedings, interferences, infringement proceedings, court actions and the like.
- 4. The Inventor(s) each hereby agree with AstraZeneca that they shall, at the expense of AstraZeneca, execute and sign all such instruments, applications and documents and do all such acts and things as may reasonably be required by AstraZeneca to enable AstraZeneca or its nominee to enjoy the full benefit of the rights assigned by this agreement.
- 5. AstraZeneca accepts the above assignment.
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Any attorney of record is authorized and requested by the execution of this assignment to insert into this assignment any further information necessary for recordation of this document.

Signed at: Macclesfield, Cheshire	Signed at: Macclesfield, Cheshire	
Date:	Date:	
Gwydion Huw Churchill	Louis Joseph Diorazio	
Witnessed by:	Witnessed by:	
Name:	Name:	
Signed at: Macclesfield, Cheshire	Signed at: Macclesfield, Cheshire	
Date:	Date:	
Leigh Ferris	Sophie Laure Marie Janbon	
Witnessed by:	Witnessed by:	
Name:	Name:	

Signed at: Macclesfield, Cheshire	Signed at: Macclesfield, Cheshire	
Date:	Date:	
Martin Francis Jones	Benedict McKeever	
Witnessed by:	Witnessed by:	
Name:	Name:	
Signed at: Macclesfield, Cheshire		
Date:		
Pawel Stanislaw Siedlecki		
Witnessed by:		
Name:		

Signed at: Aberdeen, Scotland

Date: 7th February 2014

Peter Alan Crafts

Witnessed by:

Name: NEW C. RENTON 7/02/14

Signed at: Alderley Park, Cheshire

Date: 17-FEB-2014

Signed for and on behalf of ASTRAZENECA UK LIMITED

Name: Lucy PADGET Title: Authorised Signatory

Witnessed by:

Name:

Jo S. GAIRN

Page 6 of 6

PATENT REEL: 042434 FRAME: 0596

RECORDED: 05/09/2017