

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT4303365

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
J. Keith Joung	04/15/2016
Benjamin Kleinstiver	04/13/2016
Vikram Pattanayak	04/12/2016
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	THE GENERAL HOSPITAL CORPORATION
<b>Street Address:</b>	55 FRUIT STREET
<b>City:</b>	BOSTON
<b>State/Country:</b>	MASSACHUSETTS
<b>Postal Code:</b>	02114
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	15369533
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(877)769-7945
<i>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.</i>	
<b>Phone:</b>	(617) 956-5925
<b>Email:</b>	apsi@fr.com
<b>Correspondent Name:</b>	JASMINE DECOCK
<b>Address Line 1:</b>	FISH & RICHARDSON P.C.
<b>Address Line 2:</b>	P.O.BOX 1022
<b>Address Line 4:</b>	MINNEAPOLIS, MINNESOTA 55440-1022
<b>ATTORNEY DOCKET NUMBER:</b>	40174-0015003
<b>NAME OF SUBMITTER:</b>	CHRISTINE M. GRACE
<b>SIGNATURE:</b>	/Christine M. Grace/
<b>DATE SIGNED:</b>	03/06/2017
<b>Total Attachments: 12</b>	
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ASSIGNMENT

For valuable consideration, the receipt of which we acknowledge, and intending to be bound legally, we, J. KEITH JOUNG, BENJAMIN KLEINSTIVER, and VIKRAM PATTANAYAK, each individually assign to THE GENERAL HOSPITAL CORPORATION, a corporation formed under the laws of Massachusetts and having a principal place of business at 55 Fruit Street, Boston, MA 02114, and its successors, transferees, and assignees (collectively the "Assignee"), all of our individual and joint right, title, and interest throughout the world in the subject matter (the "Subject Matter") of a patent application that names us as inventors, is titled "ENGINEERED CRISPR-CAS9 NUCLEASES," and was filed in the United States Patent and Trademark Office on February 4, 2016, as application 15/015,947 (the "Application").

This Assignment assigns (a) the Application and all other applications that may be made for, and all patents, utility models, design registrations, and other rights of exclusion and inventors' certificates for, any of the Subject Matter (collectively the "Applications and Granted Rights") in every country or region, (b) the right to claim priority based on and the benefit of the filing date of any of the Applications and Granted Rights under the International Convention for the Protection of Industrial Property, the Patent Cooperation Treaty, the European Patent Convention, and all other applicable treaties or conventions, and (c) the right to pursue, collect, and retain in the Assignee's name or otherwise, damages and any other remedies arising from any past, present, or future infringement of the Subject Matter, the Applications and Granted Rights, and any other rights assigned by this Assignment.

We authorize the Assignee to apply for and pursue protection for any or all of the Subject Matter, the Applications and Granted Rights, and any other rights assigned by this Assignment in all countries, regions, and territories of the world, in our names or in the Assignee's name.


We represent and warrant that we have the right and power to make this Assignment and that we have not made and will not make any other assignment that conflicts with this Assignment.

We will communicate to the Assignee (or at the request of the Assignee to other parties) all known facts in any form relating to the Subject Matter, will execute and provide all oaths and declarations, statements, testimony, assignments, powers of attorney, applications, and

documents, and will perform all other lawful acts necessary or desirable to secure fully to the Assignee the rights, titles, and interests assigned by this Assignment.

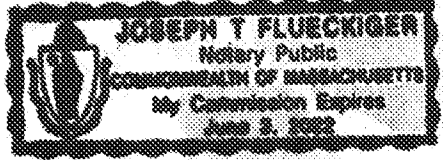
[Signature] DATE: 4/15/16  
J. Keith Joung

The Commonwealth of Massachusetts

Norfolk ss. 

On this 15 day of April, 2016 before me, the undersigned notary public, personally appeared Joe Keith Joung, proved to me through satisfactory evidence of identification, which were MDL # 595797383, to be the person(s) whose name(s) is/are signed on the preceding or attached document, and acknowledged to me that Joe Keith signed it voluntarily for its stated purpose.

[Signature] 4/3/2022  
Notary Public

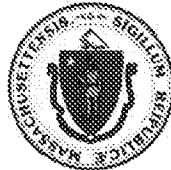


Ben Kleinstiver  
Benjamin Kleinstiver

DATE: April 13<sup>th</sup>, 2016

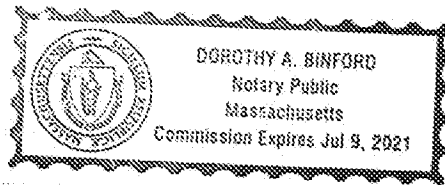
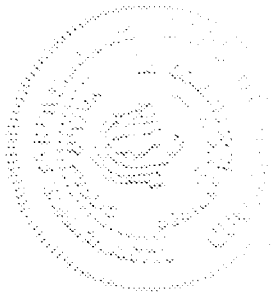
The Commonwealth of Massachusetts

Suffolk ss.



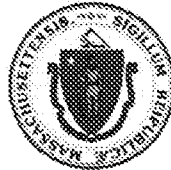
On this 13<sup>th</sup> day of April, 2016, before me, the undersigned notary public, personally appeared BENJAMIN KLEINSTIVER, proved to me through satisfactory evidence of identification, which were MA DRIVER'S LICENSE, to be the person(s) whose name(s) is/are signed on the preceding or attached document, and acknowledged to me that BK signed it voluntarily for its stated purpose.

Dorothy A. Binford  
Notary Public



\_\_\_\_\_  
DATE: \_\_\_\_\_  
Vikram Pattanayak

The Commonwealth of Massachusetts



\_\_\_\_\_ ss.

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned notary public, personally appeared \_\_\_\_\_, proved to me through satisfactory evidence of identification, which were \_\_\_\_\_, to be the person(s) whose name(s) is/are signed on the preceding or attached document, and acknowledged to me that \_\_\_\_\_ signed it voluntarily for its stated purpose.

\_\_\_\_\_  
Notary Public

The Assignee hereby acknowledges and accepts the foregoing assignment.

Assignee: THE GENERAL HOSPITAL CORPORATION

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

**The Commonwealth of Massachusetts**

\_\_\_\_\_ ss.



On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned notary public, personally appeared \_\_\_\_\_, proved to me through satisfactory evidence of identification, which were \_\_\_\_\_, to be the person(s) whose name(s) is/are signed on the preceding or attached document, and acknowledged to me that \_\_\_\_\_ signed it voluntarily for its stated purpose.

\_\_\_\_\_  
Notary Public

ASSIGNMENT

For valuable consideration, the receipt of which we acknowledge, and intending to be bound legally, we, J. KEITH JOUNG, BENJAMIN KLEINSTIVER, and VIKRAM PATTANAYAK, each individually assign to THE GENERAL HOSPITAL CORPORATION, a corporation formed under the laws of Massachusetts and having a principal place of business at 55 Fruit Street, Boston, MA 02114, and its successors, transferees, and assignees (collectively the “Assignee”), all of our individual and joint right, title, and interest throughout the world in the subject matter (the “Subject Matter”) of a patent application that names us as inventors, is titled “ENGINEERED CRISPR-CAS9 NUCLEASES,” and was filed in the United States Patent and Trademark Office on February 4, 2016, as application 15/015,947 (the “Application”).

This Assignment assigns (a) the Application and all other applications that may be made for, and all patents, utility models, design registrations, and other rights of exclusion and inventors’ certificates for, any of the Subject Matter (collectively the “Applications and Granted Rights”) in every country or region, (b) the right to claim priority based on and the benefit of the filing date of any of the Applications and Granted Rights under the International Convention for the Protection of Industrial Property, the Patent Cooperation Treaty, the European Patent Convention, and all other applicable treaties or conventions, and (c) the right to pursue, collect, and retain in the Assignee’s name or otherwise, damages and any other remedies arising from any past, present, or future infringement of the Subject Matter, the Applications and Granted Rights, and any other rights assigned by this Assignment.

We authorize the Assignee to apply for and pursue protection for any or all of the Subject Matter, the Applications and Granted Rights, and any other rights assigned by this Assignment in all countries, regions, and territories of the world, in our names or in the Assignee’s name.

We represent and warrant that we have the right and power to make this Assignment and that we have not made and will not make any other assignment that conflicts with this Assignment.

We will communicate to the Assignee (or at the request of the Assignee to other parties) all known facts in any form relating to the Subject Matter, will execute and provide all oaths and declarations, statements, testimony, assignments, powers of attorney, applications, and



documents, and will perform all other lawful acts necessary or desirable to secure fully to the Assignee the rights, titles, and interests assigned by this Assignment.

\_\_\_\_\_  
J. Keith Joung

DATE: \_\_\_\_\_

**The Commonwealth of Massachusetts**

\_\_\_\_\_ ss.



On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned notary public, personally appeared \_\_\_\_\_, proved to me through satisfactory evidence of identification, which were \_\_\_\_\_, to be the person(s) whose name(s) is/are signed on the preceding or attached document, and acknowledged to me that \_\_\_\_\_ signed it voluntarily for its stated purpose.

\_\_\_\_\_  
Notary Public

\_\_\_\_\_  
Benjamin Kleinstiver

DATE: \_\_\_\_\_


**The Commonwealth of Massachusetts**

\_\_\_\_\_ ss.



On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned notary public, personally appeared \_\_\_\_\_, proved to me through satisfactory evidence of identification, which were \_\_\_\_\_, to be the person(s) whose name(s) is/are signed on the preceding or attached document, and acknowledged to me that \_\_\_\_\_ signed it voluntarily for its stated purpose.

\_\_\_\_\_  
Notary Public

  
\_\_\_\_\_  
Vikram Pattanayak

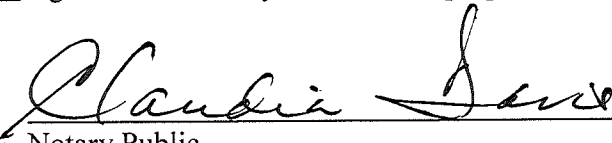
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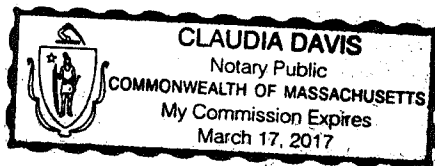
The Commonwealth of Massachusetts

\_\_\_\_\_  
SS.



On this 12 day of April, 2016, before me, the undersigned notary public, personally appeared VIKRAM PATTANAYAK, proved to me through satisfactory evidence of identification, which were MASS DRIVERS LICENCE, to be the person(s) whose name(s) is/are signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

  
\_\_\_\_\_  
Notary Public



The Assignee hereby acknowledges and accepts the foregoing assignment.

Assignee: THE GENERAL HOSPITAL CORPORATION

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

**The Commonwealth of Massachusetts**

\_\_\_\_\_ ss.



On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned notary public, personally appeared \_\_\_\_\_, proved to me through satisfactory evidence of identification, which were \_\_\_\_\_, to be the person(s) whose name(s) is/are signed on the preceding or attached document, and acknowledged to me that \_\_\_\_\_ signed it voluntarily for its stated purpose.

\_\_\_\_\_  
Notary Public

23496147.doc

ASSIGNMENT

For valuable consideration, the receipt of which we acknowledge, and intending to be bound legally, we, J. KEITH JOUNG, BENJAMIN KLEINSTIVER, and VIKRAM PATTANAYAK, each individually assign to THE GENERAL HOSPITAL CORPORATION, a corporation formed under the laws of Massachusetts and having a principal place of business at 55 Fruit Street, Boston, MA 02114, and its successors, transferees, and assignees (collectively the "Assignee"), all of our individual and joint right, title, and interest throughout the world in the subject matter (the "Subject Matter") of a patent application that names us as inventors, is titled "ENGINEERED CRISPR-CAS9 NUCLEASES," and was filed in the United States Patent and Trademark Office on February 4, 2016, as application 15/015,947 (the "Application").

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The Assignee hereby acknowledges and accepts the foregoing assignment.

Assignee: THE GENERAL HOSPITAL CORPORATION

Signature: B Tedeschi Date: 4/14/16

Name: Bruce Tedeschi Bruce W. Tedeschi, PhD, JD

Title: Director of IP Director, Innovation  
The General Hospital Corporation

The Commonwealth of Massachusetts

[Signature]

ss.



On this 14th day of April, 2016 before me, the undersigned notary public, personally appeared Bruce Tedeschi, proved to me through satisfactory evidence of identification, which were RI Driver's License, to be the person(s) whose name(s) is/are signed on the preceding or attached document, and acknowledged to me that He signed it voluntarily for its stated purpose.

[Signature]  
Notary Public

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