

PATENT ASSIGNMENT COVER SHEET

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| SUBMISSION TYPE: | NEW ASSIGNMENT |
| NATURE OF CONVEYANCE: | ASSIGNMENT |
| CONVEYING PARTY DATA | |
| Name | Execution Date |
| FENG ZHANG | 12/12/2014 |
| RECEIVING PARTY DATA | |
| Name: | THE BROAD INSTITUTE INC. |
| Street Address: | 415 MAIN STREET |
| City: | CAMBRIDGE |
| State/Country: | MASSACHUSETTS |
| Postal Code: | 02142 |
| Name: | MASSACHUSETTS INSTITUTE OF TECHNOLOGY |
| Street Address: | 77 MASSACHUSETTS AVE. |
| City: | CAMBRIDGE |
| State/Country: | MASSACHUSETTS |
| Postal Code: | 02139 |
| PROPERTY NUMBERS Total: 1 | |
| Property Type | Number |
| Application Number: | 15171141 |
| CORRESPONDENCE DATA | |
| Fax Number: | (212)407-7799 |
| <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> | |
| Phone: | 2124077700 |
| Email: | ipdocketny@vedderprice.com |
| Correspondent Name: | THOMAS J. KOWALSKI |
| Address Line 1: | 1633 BROADWAY |
| Address Line 2: | VEDDER PRICE P.C. |
| Address Line 4: | NEW YORK, NEW YORK 10019 |
| ATTORNEY DOCKET NUMBER: | 47627.02.2049 |
| NAME OF SUBMITTER: | JOSHUA HAMLET |
| SIGNATURE: | /joshua hamlet/ |
| DATE SIGNED: | 08/22/2016 |

Total Attachments: 2

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REEL: 039497 FRAME: 0249

ASSIGNMENT

I, Feng Zhang, residing at: 100 Pacific Street, Apt. 11, Cambridge, MA 02139 USA; being the inventor(s) of certain improvements in the international application entitled: **CRISPR-CAS SYSTEMS, CRYSTAL STRUCTURE AND USES THEREOF** for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, hereby assign unto **THE BROAD INSTITUTE INC.**, having a place of business at 415 Main Street, Cambridge, MA 02142, USA, and **MASSACHUSETTS INSTITUTE OF TECHNOLOGY**, having a place of business at 77 Massachusetts Ave., Cambridge, MA 02142, USA, its successors and assigns (1) the entire right, title and interest in all countries throughout the world in and to any and all of my inventions and discoveries in my United States Provisional Application Nos. 61/915,251 filed December 12, 2013 and 61/930,214 January 22, 2014 and a PCT International Application filed under the Patent Cooperation Treaty in the PCT United States Receiving Office (ROIUS) on 12/12/2014, identified as International Application No. PCT/US14/69925, and designating all PCT member countries/states, as well as in any renewals, revivals, reissues, reexaminations, extensions, continuations and divisions thereof, and any substitute applications therefore; (2) the full and complete right to file patent applications in the name of **THE BROAD INSTITUTE INC.**, and **MASSACHUSETTS INSTITUTE OF TECHNOLOGY**, or their designee's election, on the aforesaid inventions, discoveries and applications in all countries of the world; (3) the entire right title and interest in and to any Letters Patent which may issue on the aforesaid inventions, discoveries and applications in any country of the world and any renewals, revivals, reissues, reexaminations and extensions thereof, and any patents of confirmation, registration and importation of the same; and (4) the entire right, title and interest in and to all Convention and Treaty Rights of all kinds thereon, including without limitation all rights of priority in any country of the world, in and to the following application(s):

United States Provisional Application No. 61/915,251 filed December 12, 2013; and

United States Provisional Application No. 61/930,214, filed January 22, 2014, and all rights of priority in any country of the world deriving from the above-identified International Application.

I hereby authorize and request the competent authorities to grant and to issue any and all such Letters Patent in any country throughout the world to **THE BROAD INSTITUTE INC.**, and **MASSACHUSETTS INSTITUTE OF TECHNOLOGY** as the assignee of the entire

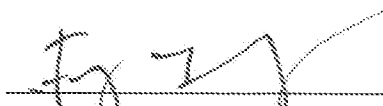
right, title and interest therein, as fully and entirely as the same would have been held and enjoyed by me had this assignment, sale and transfer not been made.


I agree, at any time, upon the request of **THE BROAD INSTITUTE INC.**, and **MASSACHUSETTS INSTITUTE OF TECHNOLOGY** to execute and to deliver to **THE BROAD INSTITUTE INC.**, and **MASSACHUSETTS INSTITUTE OF TECHNOLOGY** any additional applications for patents for said inventions and discoveries, or any part or parts thereof, and any applications for patents of confirmation, registration and importation based on any Letters Patent issuing on said inventions, discoveries or applications, and divisions, continuations, renewals, revivals, reissues, reexaminations and extensions thereof.

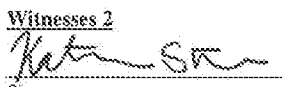
I further agree, at any time, upon request of **THE BROAD INSTITUTE INC.**, and **MASSACHUSETTS INSTITUTE OF TECHNOLOGY**, to execute and to deliver to **THE BROAD INSTITUTE INC.**, and **MASSACHUSETTS INSTITUTE OF TECHNOLOGY**, such additional documents, if any, as are necessary or desirable to secure patent protection on said inventions, discoveries and applications throughout all countries of the world, and otherwise to do what is necessary to give full effect to and to perfect any and all rights of **THE BROAD INSTITUTE INC.**, and **MASSACHUSETTS INSTITUTE OF TECHNOLOGY**, under this Assignment, including the execution, delivery and procurement of any and all further documents evidencing this assignment, transfer and sale as may be necessary or desirable.

In testimony of which I have hereupon affixed my signature it is my intention that this Assignment instrument be effective, and all rights transferred herein shall be considered to have vested in **THE BROAD INSTITUTE INC.**, and **MASSACHUSETTS INSTITUTE OF TECHNOLOGY** as from the December 12, 2013, the filing date of the first filed United States Provisional Application No. 61/915,251, from which priority is hereby claimed.

12-12-14
Date


Feng Zhang

Witnesses 1

Signature
ERIN BLACKWELL
Print name here

Witnesses 2

Signature
Katherine Stanton
Print name here