FORM PTO-1619A Expires 06/30/99 OMB 06/51-0027	11-15-2000	U.S. Department of Commerce Patent and Trademark Office PATENT			
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Conveying Party(ies)	Mark if additional names of conve	eying parties attached Execution Date Month Day Year			
Name (line 1) William R. Jacobs, Jr.		09 23 99			
Name (line 2) Execution Date					
Second Party Name (line 1)		Month Day Year			
Name (line 2)					
Receiving Party Mark if additional names of receiving parties attached					
Name (line 1) HOWARD HUGHES MEDICAL INSTITUTE					
Name (line 2) receiving party is not States, an appointment					
Address (line 1) of a domestic representative is attached.					
Address (line 2) 4000 Jones Bridge Road		(Designation must be a separate document from Assignment.)			
Address (line 3) Chevy Chase	Maryland	20815-6789			
City State/Country Zip Code					
ļ	Enter for the first Rece				
Name Craig J. Arnold					
Address (line 1) Amster, Rothstein & Ebenstein					
Address (line 2) 90 Park Avenue					
Address (line 3) New York, New York 10016					
Address (line 4)					
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Corresponde	ent Name and Address	Area Code and Telephone Number	(212) 697-5995	
Name [Craig J. Arnold			
Address (line 1)	Amster, Rothstein & Ebenst	ein		
Address (line 2)	90 Park Avenue			
Address (line 3)	New York, New York 10016			
Address (line 4)		· · · · · · · · · · · · · · · · · · · ·		
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	being filed together with a <u>new</u> Patent t named executing inventor.	t Application, enter the date the patent applicatio	n was <u>Month Day Year</u>	
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	if a U.S. Application Number not been assigned.	РСТ РСТ	PCT	
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(Enter for payment by deposit account or if additional fees can be charged to the account.)				
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To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document. Charges to deposit account are authorized, as indicated herein.				
Craig	J. Arnold	I what I Clinolit	November 1, 2000	
Name o	of Person Signing	Sighature	Date	

96700/564

ASSIGNMENT

WHEREAS, William R. Jacobs, Jr. (hereinafter "the Assignor"), a citizen of the United States of America residing at 163 Fordham Street, City Island, New York 10464, together with co-inventor Stoyan S. Bardarov, has invented certain new and useful improvements in ONE STEP ALLELIC EXCHANGE IN MYCOBACTERIA USING IN VITRO GENERATED CONDITIONAL TRANSDUCING PHAGES, for which an application for United States Letters Patent was filed on July 8, 1999 and assigned U.S. Serial No. 09/350,048; and

WHEREAS, Howard Hughes Medical Institute, (hereinafter "the Assignee"), a corporation organized under the laws of the State of Maryland, having a principal place of business at 4000 Jones Bridge Road, Chevy Chase, Maryland 20815-6789 is desirous of acquiring the entire right, title and interest in and to said application and the invention described therein, and each and every patent that can be issued on said application and on said invention in the United States of America and in its territories and possessions, and in all countries foreign to the United States of America;

NOW, THEREFORE, TO ALL WHOM IT MAY CONCERN, be it known that for and in consideration of One Dollar (\$1.00), in hand paid, and other good and valuable consideration, the receipt of which is hereby acknowledged, the Assignor has sold, assigned and transferred, and by these presents do hereby sell, assign and transfer unto the Assignee the full and exclusive right, title and interest in and to the aforesaid application, the aforesaid invention, and each and every patent that may be issued on the aforesaid

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invention and application in the United States of America, and in its territories and possessions and also in all countries foreign to the United States of America, the same to be held and enjoyed by the Assignee for its own use and benefit, and for the use and benefit of its successors, assigns or other legal representatives to the end of the term or terms for which a patent or patents may be granted as fully and entirely as the same would have been held and enjoyed by Assignor if this Assignment had not been made.

Assignor hereby authorizes and requests the Commissioner of Patents and Trademarks to issue any and all Letters Patent on the aforesaid invention or resulting from the aforesaid application directly to the Assignee.

Assignor hereby authorizes the Assignee and its successors to apply for a patent or patents directly in its own name upon the aforesaid invention wherever the same is permitted by law, and also assigns, sells, transfers and sets over unto the Assignee and its successors all priority rights under the aforesaid application.

Assignor further covenants to execute all additional instruments and to do all things necessary to carry out the purpose of this instrument, at the expense of the Assignee and its successors. IN WITNESS WHEREOF, Assignor has hereunto set his hand and affixed his seal this 2^{3} day of S_{EFT} , 1999.

am R. Jacob

STATE OF NEW JUCK) COUNTY OF BRONK) ss.:

On this 23 day of SEFT., 1999, before me came William R. Jacobs, Jr., to me known and known to me to be the individual described in, and who executed the foregoing instrument, and he acknowledged to me that he had executed the same.

nma Conti

Notary Public

IMMA CONTI Notary Public, State of New York No. 03-4943451 Qualified in Bronx County Commission Expires

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RECORDED: 11/06/2000