MRD 11.17.99 11-22-1999

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	SSIONER OF PATENTS AND TE ATTACHED ORIGINAL DOCUME	ADEMARKS:	101205	5179
1. NAME OF CONVEYING PA	RTY(IES) (ASSIGNORS(S)):			
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7.	NAMES INC. DADTIVIED ATTACK	8.	1300	6)
` '	DNVEYING PARTY(IES) ATTACH	IED (TAE2 MINO	The section of the se	" /
2. PARTY(IES) (ASSIGNEE(S)			FAVEMARK OF THE	<u> </u>
NAME: Howard Hughes Medi	cal Institute			
ADDRESS: 4000 Jones Brid	lge Road, Chevy Chase, Marylan	d 20815		
ADDITIONAL NAME(S) & ADD	RESS(ES) ATTACHED? YES	S ⊠NO		
3. NATURE OF CONVEYANCE	E (DOCUMENT):			
	<u>locument</u> for recordation—multipl	e copies of same Assigi	nment signed by differ	ent inventors is one
document)				
⊠ASSIGNMENT OF		REST EXEC	DATE: September 24	4, 1999
□ORIGINAL	FACSIMILE/PHOTOCOPY			
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ASSIGNMENT DIFFER SEE A				
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A. PAT. APP. NO.(S) M# series code/serial no	1 st INVENTOR if not in item 1			
A. PAT. APP. NO.(S) series code/serial no 25481	1st INVENTOR if not in item 1	B. PATENT NO(S)	M#	
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FILE WITH PTO RETURN RECEIPT (PAT-103A)

Date:

November 17, 1999

FAX: (202) 822-0944

43180

Reg. No.

Atty/Sec: GRT/maf

TEL: (202) 861-3546

REEL: 010385 FRAME: 0500

RECORDATION FORM COVER SHEET PATENT APPLICATIONS & PATENTS ONLY							
TO THE ASSISTANT C					·		
SIR: PLEASE RECORD				EOF.			
NAME OF CONVEYING PARTY(IES) (ASSIGNORS(S)): Howard Hughes Medical Institute 2.							
· ·	lical Institute		2.				
3.			4.	1010	\		
5. 7.			6.	/ , ` <	[7]		
ADDITIONAL NAME(S) OF CONVEYING PARTY(IES) ATTACHED? ☐YES ☒NO 2. PARTY(IES) (ASSIGNEE(S)) RECEIVING INTEREST:							
NAME: Carnegie Institution of Washington							
ADDRESS: 1530 P Street, N.W., Washington, D.C. 20005							
ADDITIONAL NAME(S)	& ADDRESS(ES) AT	TACHED? YES	s ⊠no				
3. NATURE OF CONV							
(Submit herewith <u>on</u> document)	<u>ly one document</u> for r	ecordation—multiple	e copies of same Assign	nment signed by differe	ent inventors is one		
⊠ASSIGNMENT O	F \(\sum \text{WHOLE} \)	□PART INTE	REST EXEC	DATE: October 8, 19	99		
ORIGINAL	FACSIMI	LE/PHOTOCOPY					
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ASSIGNMENT DIFFER		ION II FIELD FIELD	WITH (NOTE: II DAT	LO ON BEOLANATIO	IV AIVE		
4.5 APPL. NO.(S) OR P		S ON ADDITIONAL	SHEET(S) attached? [YES NO			
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	M#	1st INVENTOR		M#	1st INVENTOR		
A. PAT. APP. NO.(S) series code/serial			B. PATENT NO(S)		1st INVENTOR if not in item 1		
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FILE WITH PTO RETURN RECEIPT (PAT-103A)

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ADDITIONAL NAME(S) OF CONVEYING PARTY(IES) ATTACHED? TYES NO (3)							
2. PARTY(IES) (ASSIGNEE(S)) RECEIVING INTEREST:							
NAME: Allan C. Spradling							
Tiranie. Talairo. opiao	NAIVIE: Alian C. Spradling						
ADDRESS: Dept. of	Embryology, 115 W.	University Parkway,	Baltimore, MD 21210				
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ADDITIONAL NAME(S)			S <u>M</u> NO				
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FILE WITH PTO RETURN RECEIPT (PAT-103A)

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PATENT REEL: 010385 FRAME: 0502

ASSIGNMENT

Assignment made , 1999, by Dr. Allan C. Spradling and Dr. Ting Xie (jointly referred to herein as "Inventors") to the Howard Hughes Medical Institute, a Delaware corporation (the "Institute").

Recitals

WHEREAS, Inventors are employees of the Institute and, as a condition of their employment, have signed the Agreement appended to the Institute's Policy on Intellectual Property (the "Intellectual Property Agreement");

WHEREAS, pursuant to the Intellectual Property Agreement, the Inventors have agreed (a) to assign to the Institute all rights they may acquire in any invention, discovery, improvements, or other intellectual property, whether or not patentable or copyrightable, developed directly or indirectly as a result of a program of research financed by Institute funds or by funds under the control of the Institute and (b) to execute any agreements that may be desired by the Institute in connection with such assignment;

WHEREAS, the Inventors have invented "Method for Maintenance and Propagation of Germline Stem Cells Using Members of the TGF-B Family of Growth Factors" as disclosed in U.S. Appln. No. 09/358,937 and International Appln. No. PCT/US99/16633, both filed on July 23, 1999, said invention being hereafter referred to as "The Invention";

WHEREAS, said Inventors seek to make a formal assignment of their interest in The Invention to the Institute, and the Institute desires the execution of a formal assignment of all of the Inventors' right, title, and interest in The Invention.

NOW, **THEREFORE**, in consideration of the promises contained in and the acts performed and to be performed pursuant to the Intellectual Property Agreement and of other good and valuable consideration, the receipt of which is hereby acknowledged by the Inventors, the Inventors agree as follows:

- 1. <u>Assignment</u>. Inventors hereby assign to the Institute their entire right, title, and interest in The Invention; any patent applications, including but not limited to, said United States and International patent applications and all corresponding foreign patent applications which are directed to The Invention and any and all patents issued therefrom; all United States or foreign continuation, division, reissue, and substitute applications based on any of the foregoing, and any and all patents issued therefrom, together with the right of priority under the International Convention for the Protection of Industrial Property, Inter-American Convention Relating to Patents, Designs and Industrial Models, and any other international agreements to which the United States of America adheres; and all claims which are directed to The Invention and which may be contained in continuation in-part applications or in patents which issue therefrom.
- 2. <u>Cooperation</u>. Inventors agree to execute upon request such further assignments, documents, and other instruments as may be necessary or desirable to assign Inventors' entire right, title and interests in The Invention to the Institute and to assist the Institute (or others at the direction of the Institute) in applying for, obtaining, and enforcing

PATENT REEL: 010385 FRAME: 0503 patents, copyrights, or other rights in the United States and in any foreign country with respect to The Invention.

- The terms and provisions of this Assignment shall inure to the 3. Parties. benefit of the Institute and its successors and assigns and shall be binding on Inventors and their heirs, personal representatives and assigns.
- 4 Inventors warrant and represent that they have not entered into Warranty. any assignment, contract, or understanding in conflict herewith, and that there is no other person or entity whose consent is required in order for the Inventors to make the assignment contained herein.

Inventor: ★ C S

There personally appeared before me the above-named inventors and acknowledged that they executed the foregoing instrument as their free act and deed this 24 day of Deptember, 1999.

Notary Public: Rucino Hundresson (printed name) Richard Hendeuson

My Commission expires 6 / 19 / 2001

(Seal)

ASSIGNMENT

WHEREAS, Howard Hughes Medical Institute ("Institute") is the owner of the entire right, title and interest in and to an invention entitled "Method for Maintenance and Propagation of Germline Stem Cells Using Members of the TGF-B Family of Growth Factors" as disclosed in U.S. Appln. No. 09/358,937 and International Appln. No. PCT/US99/16633, both filed on July 23, 1999, and to any and all U.S. and foreign patent applications and patents based thereon; and

WHEREAS, the Carnegie Institution of Washington ("Carnegie"), a non-profit corporation duly organized and existing under the laws of the District of Columbia and having its principal office and place of business at 1530 P Street, N.W., Washington, D.C. 20005, is desirous of obtaining all of the Institute's rights in and to said invention and patent applications and patents based thereon;

NOW, THEREFORE, in consideration of Ten Dollars (\$10.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Institute does hereby sell, assign and transfer unto Carnegie, its successors, assigns and legal representatives, the full and exclusive right, title and interest, in the United States and all foreign countries, to each invention as described in the aforesaid provisional application, and to the said application and to all subsequent U.S. and foreign applications based thereon including any and all continuations, divisions, reissues and substitutes of such subsequent applications, together with the right of priority under the International Convention for the Protection of Industrial Property, Inter-American Convention Relating to Patents, Designs and Industrial Models, and any other international agreements to which the United States of America adheres.

And Institute hereby agrees to execute any papers requested by Carnegie, its successors, assigns and legal representatives, deemed essential to Carnegie's full protection and title in and to each invention hereby transferred.

Institute furthermore agrees upon request of said Carnegie, and without further remuneration, to execute any and all papers desired by said Carnegie for the filing and granting of the aforesaid subsequent U.S. and of foreign applications and the perfecting of title thereto in said Carnegie.

Executed by the undersigned authorized agent for Institute on the date here indicated.

HOWARD HUGHES MEDICAL INSTITUTE

Dr. Allan Spradling

Authorized Agent

Date: * Elate 28 1999

PATENT REEL: 010385 FRAME: 0505

APPOINTMENT OF INVESTIGATOR AS AGENT

Appointment by the Howard Hughes Medical Institute ("Institute") of Dr. Allan C. Spradling, as investigator employed by the Institute, as its agent for the purpose of assigning certain rights to the Carnegie Institution of Washington ("Carnegie").

WHEREAS, the Institute and Carnegie collaborate in the active conduct of medical research pursuant to a Collaboration Agreement between them dated as of July 5, 1988, and revised as of July 12, 1995 (the "Collaboration Agreement");

WHEREAS, pursuant to the Collaboration Agreement, the Institute has agreed to assign to Carnegie the Institute's rights with respect to inventions, discoveries, improvements, and other intellectual property, whether patentable or copyrightable (each a "Subject Property"), conceived or reduced to practice in the course of the research program conducted under the Collaboration Agreement by employees of the Institute;

WHEREAS, research conducted pursuant to the Collaboration Agreement by Dr. Spradling and by Dr. Ting Xie, while employed by the Institute at Carnegie, has resulted in the invention of certain Subject Property entitled "Method for Maintenance" and Propagation of Germline Stem Cells Using Members of the TGF-β Family of Growth Factors" as described in U.S. Appln. No. 09/358,937 and International Appln. No. PCT/US99/16633, both filed on July 23, 1999; and

WHEREAS, the Institute wishes Dr. Spradling to act as its agent for the purpose of assigning to Carnegie all of the rights the Institute has in the Subject Property by reason of the research program conducted at Carnegie;

NOW, THEREFORE, the Institute hereby appoints Dr. Allan C. Spradling as its agent for the purpose of assigning the rights the Institute has in the Subject Property to Carnegie by reason of the research program conducted at Carnegie in accordance with and subject to the conditions of the Collaboration Agreement.

Executed: 4 Myran V. C. 21, 1999

HOWARD HUGHES MEDICAL INSTITUTE

W. Maxwell Cowan, M.D., Ph.D.
Vice President and Chief Scientific Officer

ATTESTED:

Vice President and General Counsel and Secretary

PATENT RECORDED: 11/17/1999 REEL: 010385 FRAME: 0506