505769554 11/12/2019

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2 EPAS ID: PAT5816370

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
HOWARD HUGHES MEDICAL INSTITUTE	07/13/2012
JEANNIE T LEE	05/14/2013

RECEIVING PARTY DATA

Name:	THE GENERAL HOSPITAL CORPORATION D/B/A MASSACHUSETTS GENERAL HOSPITAL
Street Address:	55 FRUIT STREET
City:	BOSTON
State/Country:	MASSACHUSETTS
Postal Code:	02114

PROPERTY NUMBERS Total: 1

Property Type	Number
Application Number:	15872684

CORRESPONDENCE DATA

Fax Number: (617)646-8646

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.

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Email: patents CristinB@wolfgreenfield.com

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Address Line 4: BOSTON, MASSACHUSETTS 02210

ATTORNEY DOCKET NUMBER:	R0693.70050US00
NAME OF SUBMITTER:	CRISTIN BERKEY
SIGNATURE:	/Cristin Berkey/
DATE SIGNED:	11/12/2019

Total Attachments: 36

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PATENT REEL: 050992 FRAME: 0377

For good and valuable consideration, the receipt of which is hereby acknowledged, I, the undersigned Assignor, hereby:

- Sell, assign and transfer to The General Hospital Corporation d/b/a Massachusetts General Hospital, having a place of business at 55 Fruit Street; Boston, Massachusetts 02114, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, my entire right, title and interest for the United States and all foreign countries, in and to any and all inventions and designs which are disclosed in the provisional application filed in the United States Patent and Trademark Office on May 16, 2012 under No. 61/647,858, bearing Attorney Docket No. R0693.70001US00, and entitled COMPOSITIONS AND METHODS FOR MODULATING SMN GENE FAMILY EXPRESSION, provisional application filed in the United States Patent and Trademark Office on October 27, 2012 under No. 61/719,394, bearing Attorney Docket No. R0693.70001US01, and entitled COMPOSITIONS AND METHODS FOR MODULATING SMN GENE FAMILY EXPRESSION, and provisional application United States Letters Patent filed in the United States Patent and Trademark Office on March 14, 2013 under No. 61/785,529, bearing Attorney Docket No. R0693.70001US02, and entitled COMPOSITIONS AND METHODS FOR MODULATING SMN GENE FAMILY EXPRESSION, and in and to the applications and all corresponding provisional, non-provisional, divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent, utility models, industrial designs or similar intellectual property rights which have been or shall be filed in the United States, internationally, and in any foreign country, including but not limited to China, Japan and Korea, on any of the inventions; and in and to all original and reissued patents which have been or shall be issued in the United States or any other jurisdiction on the inventions, including the right to apply for patent rights in each foreign country and all rights to priority, including the right to claim priority for China, Japan and Korea;
- 2. Agree that the Assignee may apply for and receive Letters Patent and utility model and industrial design registrations for the inventions in its own name; and when requested, without charge to but at the expense of the Assignee, I agree to carry out in good faith the intent and purpose of this assignment, by executing all non-provisional, divisional, continuing, substitute, renewal, reissue, and all other patent, utility model and industrial design applications on any and all the inventions, by executing all rightful oaths, assignments, powers of attorney and other papers, by communicating to the Assignee all facts known to me relating to the inventions and the history thereof, and generally by doing everything reasonably possible which the Assignee shall consider desirable for aiding in securing and maintaining proper protection for the inventions and for vesting title to the inventions and all applications for patents and all patents on the inventions, in the Assignee;
- 3. Request the Director of the United States Patent and Trademark Office to issue the Letters Patent to the Assignee;
- 4. Authorize and request Wolf, Greenfield & Sacks, P.C. to supply any missing patent/application identification information or correct any errors in the patent/application identification information provided above, whether discovered prior to or after recordation;
- 5. Covenant with the Assignee that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been made to others by me and that full right to convey the same as herein expressed is possessed by me; and
- 6. Appoint Assignee, through its designee, my attorney-in-fact to execute, in my name and on my behalf, any and all documents required to effectuate this Assignment, specifically including, but not limited to, those documents specified above and any necessary corrective assignments.

This instrument is executed under seal and signed under the pains and penalties of perjury under the laws of the United States of America.

Attorney Docket No. R0693.70001US00, US01, US02

Page 1 of 2

The second secon		
Date	Inventor:	Jeannie T. Lee for herself and as agent for the Howard Hughes Medical Institute
	Address:	
		Boston, Massachusetts 02114
Ci	tizenship:	US
COMMONWEALTH OF MASSACHUSETTS		
COUNTY OF Suffolk		
On this 114 day of MAN	. 20	13, before me, the undersigned notary public, proved to me through satisfactory evidence of
personally appeared Jeannie T. Le		, proved to me through satisfactory evidence of
identification, which were MA Driver's		
		document in my presence and swore or affirmed
to me that the contents of the document are to		
and belief and acknowledged to me that (he)	(she) signe	ed it voluntarily for its stated purpose.
SEAL	~~~~~~~~~~~	Dili
Notary P	ublic	
My commission expires: Sept.	26,	2014
the state of the s		
		ny Padde HONALU

Attorney Docket No. R0693,70001US00, US01, US02

Page 2 of 2

For good and valuable consideration, the receipt of which is hereby acknowledged, I, the undersigned Assignor, hereby:

- Sell, assign and transfer to The General Hospital Corporation d/b/a Massachusetts General Hospital, having a place of business at 55 Fruit Street; Boston, Massachusetts 02114, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, my entire right, title and interest for the United States and all foreign countries, in and to any and all inventions and designs which are disclosed in the provisional application filed in the United States Patent and Trademark Office on May 16, 2012 under No. 61/647,886, bearing Attorney Docket No. R0693.70002US00, and entitled COMPOSITIONS AND METHODS FOR MODULATING UTRN EXPRESSION, and in and to the application and all corresponding provisional, non-provisional, divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent, utility models, industrial designs or similar intellectual property rights which have been or shall be filed in the United States, internationally, and in any foreign country, including but not limited to China, Japan and Korea, on any of the inventions; and in and to all original and reissued patents which have been or shall be issued in the United States or any other jurisdiction on the inventions, including the right to apply for patent rights in each foreign country and all rights to priority, including the right to claim priority for China, Japan and Korea:
- 2. Agree that the Assignee may apply for and receive Letters Patent and utility model and industrial design registrations for the inventions in its own name; and when requested, without charge to but at the expense of the Assignee, I agree to carry out in good faith the intent and purpose of this assignment, by executing all non-provisional, divisional, continuing, substitute, renewal, reissue, and all other patent, utility model and industrial design applications on any and all the inventions, by executing all rightful oaths, assignments, powers of attorney and other papers, by communicating to the Assignee all facts known to me relating to the inventions and the history thereof, and generally by doing everything reasonably possible which the Assignee shall consider desirable for aiding in securing and maintaining proper protection for the inventions and for vesting title to the inventions and all applications for patents and all patents on the inventions, in the Assignee;
- 3. Request the Director of the United States Patent and Trademark Office to issue the Letters Patent to the Assignee;
- 4. Authorize and request Wolf, Greenfield & Sacks, P.C. to supply any missing patent/application identification information or correct any errors in the patent/application identification information provided above, whether discovered prior to or after recordation;
- 5. Covenant with the Assignee that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been made to others by me and that full right to convey the same as herein expressed is possessed by me; and
- 6. Appoint Assignee, through its designee, my attorney-in-fact to execute, in my name and on my behalf, any and all documents required to effectuate this Assignment, specifically including, but not limited to, those documents specified above and any necessary corrective assignments.

This instrument is executed under seal and signed under the pains and penalties of perjury under the laws of the United States of America.

Attorney Docket No. R0693.70002US00

Page 1 of 2

		The state of the s
Date	Inventor:	Jeannie T. Lee for herselfjand as agent for the Howard Hughes Medical Institute
	Address:	
		Boston, Massachusetts 02114
	Citizenship:	US
COMMONWEALTH OF MASSACHUSE	TTS	
COUNTY OF Suffalk		
On this 14 day of Ma	14 ,20	♣ hefore me, the undersigned notary public,
	T. Lee	, proved to me through satisfactory evidence of
	verts Liven	GE,
		document in my presence and swore or affirmed
		accurate to the best of (his) (her) knowledge
and belief and acknowledged to me that	t (he) (she) signe	ed it voluntarily for its stated purpose.
SEAL	Section of the sectio	and the second s
****	tary Public	
	*	N = 11 f
My commission expires:	Pt. 26	<u>.2</u> 014
		
		.
I A TANK	States:	8

Attorney Docket No. R0693,70002US00

Page 2 of 2

For good and valuable consideration, the receipt of which is hereby acknowledged, I, the undersigned Assignor, hereby:

- Sell, assign and transfer to The General Hospital Corporation d/b/a Massachusetts General Hospital, having a place of business at 55 Fruit Street; Boston, Massachusetts 02114, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, my entire right, title and interest for the United States and all foreign countries, in and to any and all inventions and designs which are disclosed in the provisional application filed in the United States Patent and Trademark Office on May 16, 2012 under No. 61/647,901, bearing Attorney Docket No. R0693.70003US00, and entitled COMPOSITIONS AND METHODS FOR MODULATING HEMOGLOBIN GENE FAMILY EXPRESSION and the provisional application filed in the United States Patent and Trademark Office on March 14, 2013 under No. 61/785,956, bearing Attorney Docket No. R0693.70003US01, and entitled COMPOSITIONS AND METHODS FOR MODULATING HEMOGLOBIN GENE FAMILY EXPRESSION, and in and to the applications and all corresponding provisional, non-provisional, divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent, utility models, industrial designs or similar intellectual property rights which have been or shall be filed in the United States, internationally, and in any foreign country, including but not limited to China, Japan and Korea, on any of the inventions; and in and to all original and reissued patents which have been or shall be issued in the United States or any other jurisdiction on the inventions, including the right to apply for patent rights in each foreign country and all rights to priority, including the right to claim priority for China, Japan and Korea;
- 2. Agree that the Assignee may apply for and receive Letters Patent and utility model and industrial design registrations for the inventions in its own name; and when requested, without charge to but at the expense of the Assignee, I agree to carry out in good faith the intent and purpose of this assignment, by executing all non-provisional, divisional, continuing, substitute, renewal, reissue, and all other patent, utility model and industrial design applications on any and all the inventions, by executing all rightful oaths, assignments, powers of attorney and other papers, by communicating to the Assignee all facts known to me relating to the inventions and the history thereof, and generally by doing everything reasonably possible which the Assignee shall consider desirable for aiding in securing and maintaining proper protection for the inventions and for vesting title to the inventions and all applications for patents and all patents on the inventions, in the Assignee;
- 3. Request the Director of the United States Patent and Trademark Office to issue the Letters Patent to the Assignee;
- 4. Authorize and request Wolf, Greenfield & Sacks, P.C. to supply any missing patent/application identification information or correct any errors in the patent/application identification information provided above, whether discovered prior to or after recordation:
- 5. Covenant with the Assignee that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been made to others by me and that full right to convey the same as herein expressed is possessed by me; and
- 6. Appoint Assignee, through its designee, my attorney-in-fact to execute, in my name and on my behalf, any and all documents required to effectuate this Assignment, specifically including, but not limited to, those documents specified above and any necessary corrective assignments.

This instrument is executed under seal and signed under the pains and penalties of perjury under the laws of the United States of America.

Attorney Docket No. R0693.70003US00, US01

Page 1 of 2

for herself and as agent for the Howard Hughes Medical Institute Address: 185 Cambridge Street Boston, Massachusetts 02114 Citizenship: US COMMONWEALTH OF MASSACHUSETTS. Suffelk COUNTY OF , 2013, before me, the undersigned notary public,
e , proved to me through satisfactory evidence of On this personally appeared identification, which were MR briver's License. to be the person who signed the preceding or attached document in my presence and swore or affirmed to me that the contents of the document are truthful and accurate to the best of (his) (her) knowledge and belief and acknowledged to me that (he) (she) signed it voluntarily for its stated purpose. SEAL My commission expires:

Inventor: Jeannie/T. Lee

Attorney Docket No. R0693.70003US00, US01

5/14/13 Date

Page 2 of 2

Notary Public

For good and valuable consideration, the receipt of which is hereby acknowledged, I, the undersigned Assignor, hereby:

- 1. Sell, assign and transfer to The General Hospital Corporation d/b/a Massachusetts General Hospital, having a place of business at 55 Fruit Street; Boston, Massachusetts 02114, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, my entire right, title and interest for the United States and all foreign countries, in and to any and all inventions and designs which are disclosed in the provisional application filed in the United States Patent and Trademark Office on May 16, 2012 under No. 61/647,915, bearing Attorney Docket No. R0693.70004US00, and entitled COMPOSITIONS AND METHODS FOR MODULATING CFTR EXPRESSION, and in and to the application and all corresponding provisional, non-provisional, divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent, utility models, industrial designs or similar intellectual property rights which have been or shall be filed in the United States, internationally, and in any foreign country, including but not limited to China, Japan and Korea, on any of the inventions; and in and to all original and reissued patents which have been or shall be issued in the United States or any other jurisdiction on the inventions, including the right to apply for patent rights in each foreign country and all rights to priority, including the right to claim priority for China, Japan and Korea:
- 2. Agree that the Assignee may apply for and receive Letters Patent and utility model and industrial design registrations for the inventions in its own name; and when requested, without charge to but at the expense of the Assignee, I agree to carry out in good faith the intent and purpose of this assignment, by executing all non-provisional, divisional, continuing, substitute, renewal, reissue, and all other patent, utility model and industrial design applications on any and all the inventions, by executing all rightful oaths, assignments, powers of attorney and other papers, by communicating to the Assignee all facts known to me relating to the inventions and the history thereof, and generally by doing everything reasonably possible which the Assignee shall consider desirable for aiding in securing and maintaining proper protection for the inventions and for vesting title to the inventions and all applications for patents and all patents on the inventions, in the Assignee;
- 3. Request the Director of the United States Patent and Trademark Office to issue the Letters Patent to the Assignee;
- 4. Authorize and request Wolf, Greenfield & Sacks, P.C. to supply any missing patent/application identification information or correct any errors in the patent/application identification information provided above, whether discovered prior to or after recordation;
- 5. Covenant with the Assignee that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been made to others by me and that full right to convey the same as herein expressed is possessed by me; and
- 6. Appoint Assignee, through its designee, my attorney-in-fact to execute, in my name and on my behalf, any and all documents required to effectuate this Assignment, specifically including, but not limited to, those documents specified above and any necessary corrective assignments.

This instrument is executed under seal and signed under the pains and penalties of perjury under the laws of the United States of America.

5/14/13 Date Inventor: Jeannie T. Lee Address: 185 Cambridge Street Citizenship: US

On this 14 day of May personally appeared Jeannie T. Lee , 2013, before me, the undersigned notary public, proved to me through satisfactory evidence of identification, which were MA Driver's License to be the person who signed the preceding or attached document in my presence and swore or affirmed to me that the contents of the document are truthful and accurate to the best of (his) (her) knowledge and belief and acknowledged to me that (he) (she) signed it voluntarily for its stated purpose. SEAL Notary Public My commission expires: CHIA-CHIA LU

Notary Public Commonwealth of Massachusetts Commission Expires Sep 26, 2014

for herself and as agent for the Howard Hughes

Medical Institute

Boston, Massachusetts 02114

For good and valuable consideration, the receipt of which is hereby acknowledged, I, the undersigned Assignor, hereby:

- Sell, assign and transfer to The General Hospital Corporation d/b/a Massachusetts General Hospital, having a place of business at 55 Fruit Street; Boston, Massachusetts 02114, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, my entire right, title and interest for the United States and all foreign countries, in and to any and all inventions and designs which are disclosed in the provisional application filed in the United States Patent and Trademark Office on May 16, 2012 under No. 61/647,925, bearing Attorney Docket No. R0693.70005US00, and entitled COMPOSITIONS AND METHODS FOR MODULATING ATP2A2 EXPRESSION and the provisional application filed in the United States Patent and Trademark Office on March 14, 2013 under No. 61/785,832, bearing Attorney Docket No. R0693.70005US01, and entitled COMPOSITIONS AND METHODS FOR MODULATING ATP2A2 EXPRESSION and in and to the applications and all corresponding provisional, non-provisional, divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent, utility models, industrial designs or similar intellectual property rights which have been or shall be filed in the United States, internationally, and in any foreign country, including but not limited to China, Japan and Korea, on any of the inventions; and in and to all original and reissued patents which have been or shall be issued in the United States or any other jurisdiction on the inventions, including the right to apply for patent rights in each foreign country and all rights to priority, including the right to claim priority for China, Japan and Korea:
- 2. Agree that the Assignee may apply for and receive Letters Patent and utility model and industrial design registrations for the inventions in its own name; and when requested, without charge to but at the expense of the Assignee, I agree to carry out in good faith the intent and purpose of this assignment, by executing all non-provisional, divisional, continuing, substitute, renewal, reissue, and all other patent, utility model and industrial design applications on any and all the inventions, by executing all rightful oaths, assignments, powers of attorney and other papers, by communicating to the Assignee all facts known to me relating to the inventions and the history thereof, and generally by doing everything reasonably possible which the Assignee shall consider desirable for aiding in securing and maintaining proper protection for the inventions and for vesting title to the inventions and all applications for patents and all patents on the inventions, in the Assignee;
- 3. Request the Director of the United States Patent and Trademark Office to issue the Letters Patent to the Assignee;
- 4. Authorize and request Wolf, Greenfield & Sacks, P.C. to supply any missing patent/application identification information or correct any errors in the patent/application identification information provided above, whether discovered prior to or after recordation;
- 5. Covenant with the Assignee that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been made to others by me and that full right to convey the same as herein expressed is possessed by me; and
- 6. Appoint Assignee, through its designee, my attorney-in-fact to execute, in my name and on my behalf, any and all documents required to effectuate this Assignment, specifically including, but not limited to, those documents specified above and any necessary corrective assignments.

This instrument is executed under seal and signed under the pains and penalties of perjury under the laws of the United States of America.

Attorney Docket No. R0693,70005US00, US01

Page 1 of 2

Inventor: Jeannie T. Lee for herself and as agent for the Howard Hughes Medical Institute
Address: 185 Cambridge Street

Boston, Massachusetts 02114

Citizenship: US

COMMONWEALTH OF MASSACHUSETTS COUNTY OF SUFFORE
On this $\frac{1}{4}$ day of $\frac{1}{2}$ day
identification, which were (M) Driver's Disease. to be the person who signed the preceding or attached document in my presence and swore or affirmed
to me that the contents of the document are truthful and accurate to the best of (his) (her) knowledge
and belief and acknowledged to me that (he) (she) signed it voluntarily for its stated purpose.
SEAL
Notary Public
My commission expires: Sept 26, 2014
4 12 € 50 CHA-CHAID \$

Attorney Docket No. R0693,70905US00, US01

Page 2 of 2

For good and valuable consideration, the receipt of which is hereby acknowledged, I, the undersigned Assignor, hereby:

- Sell, assign and transfer to The General Hospital Corporation d/b/a Massachusetts General Hospital, having a place of business at 55 Fruit Street; Boston, Massachusetts 02114, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, my entire right, title and interest for the United States and all foreign countries, in and to any and all inventions and designs which are disclosed in the provisional application filed in the United States Patent and Trademark Office on May 16, 2012 under No. 61/647,938, bearing Attorney Docket No. R0693.70006US00, and entitled COMPOSITIONS AND METHODS FOR MODULATING PAH EXPRESSION, and in and to the application and all corresponding provisional, non-provisional, divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent, utility models, industrial designs or similar intellectual property rights which have been or shall be filed in the United States, internationally, and in any foreign country, including but not limited to China, Japan and Korea, on any of the inventions; and in and to all original and reissued patents which have been or shall be issued in the United States or any other jurisdiction on the inventions, including the right to apply for patent rights in each foreign country and all rights to priority, including the right to claim priority for China, Japan and Korea:
- 2. Agree that the Assignee may apply for and receive Letters Patent and utility model and industrial design registrations for the inventions in its own name; and when requested, without charge to but at the expense of the Assignee, I agree to carry out in good faith the intent and purpose of this assignment, by executing all non-provisional, divisional, continuing, substitute, renewal, reissue, and all other patent, utility model and industrial design applications on any and all the inventions, by executing all rightful oaths, assignments, powers of attorney and other papers, by communicating to the Assignee all facts known to me relating to the inventions and the history thereof, and generally by doing everything reasonably possible which the Assignee shall consider desirable for aiding in securing and maintaining proper protection for the inventions and for vesting title to the inventions and all applications for patents and all patents on the inventions, in the Assignee;
- 3. Request the Director of the United States Patent and Trademark Office to issue the Letters Patent to the Assignee;
- 4. Authorize and request Wolf, Greenfield & Sacks, P.C. to supply any missing patent/application identification information or correct any errors in the patent/application identification information provided above, whether discovered prior to or after recordation;
- 5. Covenant with the Assignee that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been made to others by me and that full right to convey the same as herein expressed is possessed by me; and
- 6. Appoint Assignee, through its designee, my attorney-in-fact to execute, in my name and on my behalf, any and all documents required to effectuate this Assignment, specifically including, but not limited to, those documents specified above and any necessary corrective assignments.

This instrument is executed under seal and signed under the pains and penalties of perjury under the laws of the United States of America.

Attorney Docket No. R0693.70006US00

Page 1 of 2

Date	Inventor:	for herself and as agent for the Howard Hughes Medical Institute
	Address:	
		Boston, Massachusetts 02114
	Citizenship:	US
COMMONWEALTH OF MASSACH	HUSETTS	
COUNTY OF Suffolk		
		s Z, before me, the undersigned notary public, proved to me through satisfactory evidence of
identification, which were MA.		
	•	document in my presence and swore or affirmed daccurate to the best of (his) (her) knowledge
		ed it voluntarily for its stated purpose.
•		, ,
OFAL		
SEAL		The second secon
	Notary Public	
My commission expires:	ept. 26	2014
) (T.S.	Notal	CHIA LU ry Public

Attorney Docket No. R0693.70006US00

Page 2 of 2

For good and valuable consideration, the receipt of which is hereby acknowledged, I, the undersigned Assignor, hereby:

- Sell, assign and transfer to The General Hospital Corporation d/b/a Massachusetts General Hospital, having a place of business at 55 Fruit Street; Boston, Massachusetts 02114, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, my entire right, title and interest for the United States and all foreign countries, in and to any and all inventions and designs which are disclosed in the application for United States Letters Patent filed in the provisional application filed in the United States Patent and Trademark Office on May 16, 2012 under No. 61/647,949, bearing Attorney Docket No. R0693.70007US00, and entitled COMPOSITIONS AND METHODS FOR MODULATING APOA1 AND ABCA1 EXPRESSION, and in the provisional application filed in the United States Patent and Trademark Office on March 14, 2013 under No. 61/785,778, bearing Attorney Docket No. R0693.70007US01, and entitled COMPOSITIONS AND METHODS FOR MODULATING APOA1 AND ABCA1 EXPRESSION, and in and to the applications and all corresponding provisional, non-provisional, divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent, utility models, industrial designs or similar intellectual property rights which have been or shall be filed in the United States, internationally, and in any foreign country, including but not limited to China, Japan and Korea, on any of the inventions; and in and to all original and reissued patents which have been or shall be issued in the United States or any other jurisdiction on the inventions, including the right to apply for patent rights in each foreign country and all rights to priority, including the right to claim priority for China, Japan and Korea;
- 2. Agree that the Assignee may apply for and receive Letters Patent and utility model and industrial design registrations for the inventions in its own name; and when requested, without charge to but at the expense of the Assignee, I agree to carry out in good faith the intent and purpose of this assignment, by executing all non-provisional, divisional, continuing, substitute, renewal, reissue, and all other patent, utility model and industrial design applications on any and all the inventions, by executing all rightful oaths, assignments, powers of attorney and other papers, by communicating to the Assignee all facts known to me relating to the inventions and the history thereof, and generally by doing everything reasonably possible which the Assignee shall consider desirable for aiding in securing and maintaining proper protection for the inventions and for vesting title to the inventions and all applications for patents and all patents on the inventions, in the Assignee;
- 3. Request the Director of the United States Patent and Trademark Office to issue the Letters Patent to the Assignee;
- 4. Authorize and request Wolf, Greenfield & Sacks, P.C. to supply any missing patent/application identification information or correct any errors in the patent/application identification information provided above, whether discovered prior to or after recordation;
- 5. Covenant with the Assignee that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been made to others by me and that full right to convey the same as herein expressed is possessed by me; and
- 6. Appoint Assignee, through its designee, my attorney-in-fact to execute, in my name and on my behalf, any and all documents required to effectuate this Assignment, specifically including, but not limited to, those documents specified above and any necessary corrective assignments.

This instrument is executed under seal and signed under the pains and penalties of perjury under the laws of the United States of America.

Attorney Docket No. R0693.70007US00, US01

Page 1 of 2

5/14/13	- Quide-
Date Inventor:	Jeannie T. Les for herself and as agent for the Howard Hughes Medical Institute
Address:	185 Cambridge Street
	Boston, Massachusetts 02114
Citizenship:	US
COMMONWEALTH OF MASSACHUSETTS COUNTY OF	o ~ >
On this L day of W a . 20 personally appeared Jeannie T. Lee identification, which were the Driver's L)ce to be the person who signed the preceding or attached to me that the contents of the document are truthful and and belief and acknowledged to me that (he) (she) signed	document in my presence and swore or affirmed laccurate to the best of (his) (her) knowledge
SEAL	and the same of th
Notary Public	
My commission expires: Sept. 26,	2014
CH No Commonwes	IA-CHIA LU tary Public III of Massachusetts n Expires Sec 26 7014

Attorney Docket No. R0693,70007US00, US01

Page 2 of 2

For good and valuable consideration, the receipt of which is hereby acknowledged, I, the undersigned Assignor, hereby:

- Sell, assign and transfer to The General Hospital Corporation d/b/a Massachusetts General Hospital, having a place of business at 55 Fruit Street; Boston, Massachusetts 02114, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, my entire right, title and interest for the United States and all foreign countries, in and to any and all inventions and designs which are disclosed in provisional application filed in the United States Patent and Trademark Office on May 16, 2012 under No. 61/648,030, bearing Attorney Docket No. R0693.70008US00, and entitled COMPOSITIONS AND METHODS FOR MODULATING CEP290 EXPRESSION, and in and to the application and all corresponding provisional, non-provisional, divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent, utility models, industrial designs or similar intellectual property rights which have been or shall be filed in the United States, internationally, and in any foreign country, including but not limited to China, Japan and Korea, on any of the inventions; and in and to all original and reissued patents which have been or shall be issued in the United States or any other jurisdiction on the inventions, including the right to apply for patent rights in each foreign country and all rights to priority, including the right to claim priority for China, Japan and Korea;
- 2. Agree that the Assignee may apply for and receive Letters Patent and utility model and industrial design registrations for the inventions in its own name; and when requested, without charge to but at the expense of the Assignee, I agree to carry out in good faith the intent and purpose of this assignment, by executing all non-provisional, divisional, continuing, substitute, renewal, reissue, and all other patent, utility model and industrial design applications on any and all the inventions, by executing all rightful oaths, assignments, powers of attorney and other papers, by communicating to the Assignee all facts known to me relating to the inventions and the history thereof, and generally by doing everything reasonably possible which the Assignee shall consider desirable for aiding in securing and maintaining proper protection for the inventions and for vesting title to the inventions and all applications for patents and all patents on the inventions, in the Assignee:
- 3. Request the Director of the United States Patent and Trademark Office to issue the Letters Patent to the Assignee;
- 4. Authorize and request Wolf, Greenfield & Sacks, P.C. to supply any missing patent/application identification information or correct any errors in the patent/application identification information provided above, whether discovered prior to or after recordation;
- 5. Covenant with the Assignee that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been made to others by me and that full right to convey the same as herein expressed is possessed by me; and
- 6. Appoint Assignee, through its designee, my attorney-in-fact to execute, in my name and on my behalf, any and all documents required to effectuate this Assignment, specifically including, but not limited to, those documents specified above and any necessary corrective assignments.

This instrument is executed under seal and signed under the pains and penalties of perjury under the laws of the United States of America.

Attorney Docket No. R0693.70008US00

Page 1 of 2

5/14/13 Date for herself and as agent for the Howard Hughes Medical Institute Address: 185 Cambridge Street Boston, Massachusetts 02114 Citizenship: US COMMONWEALTH OF MASSACHUSETTS COUNTY OF day of May Jeannie T. Lee , 2v/3 , before me, the undersigned notary public, proved to me through satisfactory evidence of On this personally appeared identification, which were MA. Driver's Liense to be the person who signed the preceding or attached document in my presence and swore or affirmed to me that the contents of the document are truthful and accurate to the best of (his) (her) knowledge and belief and acknowledged to me that (he) (she) signed it voluntarily for its stated purpose. SEAL My commission expires:

Inventor: Jeannie T. Lee

Page 2 of 2

Attorney Docket No. R0693.70008US00

For good and valuable consideration, the receipt of which is hereby acknowledged, I, the undersigned Assignor, hereby:

- Sell, assign and transfer to The General Hospital Corporation d/b/a Massachusetts General Hospital, having a place of business at 55 Fruit Street; Boston, Massachusetts 02114, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, my entire right, title and interest for the United States and all foreign countries, in and to any and all inventions and designs which are disclosed in the provisional application filed in the United States Patent and Trademark Office on May 16, 2012 under No. 61/648,041, bearing Attorney Docket No. R0693.70009US00, and entitled COMPOSITIONS AND METHODS FOR MODULATING PTEN EXPRESSION, and the provisional application filed in the United States Patent and Trademark Office on March 14, 2013 under No. 61/785,885, bearing Attorney Docket No. R0693.70009US01, and entitled COMPOSITIONS AND METHODS FOR MODULATING PTEN EXPRESSION, and in and to the applications and all corresponding provisional, non-provisional, divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent, utility models, industrial designs or similar intellectual property rights which have been or shall be filed in the United States, internationally, and in any foreign country, including but not limited to China, Japan and Korea, on any of the inventions; and in and to all original and reissued patents which have been or shall be issued in the United States or any other jurisdiction on the inventions, including the right to apply for patent rights in each foreign country and all rights to priority, including the right to claim priority for China, Japan and Korea;
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- 3. Request the Director of the United States Patent and Trademark Office to issue the Letters Patent to the Assignee:
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- 5. Covenant with the Assignee that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been made to others by me and that full right to convey the same as herein expressed is possessed by me; and
- 6. Appoint Assignee, through its designee, my attorney-in-fact to execute, in my name and on my behalf, any and all documents required to effectuate this Assignment, specifically including, but not limited to, those documents specified above and any necessary corrective assignments.

This instrument is executed under seal and signed under the pains and penalties of perjury under the laws of the United States of America.

Attorney Docket No. R0693.70009US00, US01

Page 1 of 2

Citizenship: US
STATE/COMMONWEALTH OF WAS A GOOD TO STATE
STATE/COMMONWEALTH OF WASSANG
On this 14 day of 17 a.u., 2013, before me, the undersigned notary public, personally appeared Jeannie T. Lee , proved to me through satisfactory evidence of identification, which were 1/14 - 12-14-5 Live S.E.
personally appeared Jeannie T. Lee , proved to me through satisfactory evidence of
identification, which were MA Driver's Dewse
to be the person who signed the preceding or attached document in my presence and swore or affirmed to me that the contents of the document are truthful and accurate to the best of (his) (her) knowledge
and belief and acknowledged to me that (he) (she) signed it voluntarily for its stated purpose.
() () () () () () () () () ()
SEAL
Notary Public
My commission expires: Sept. 26, 20(4
· · · · · · · · · · · · · · · · · · ·
CHA-CHIA-LU
Motory Public

Inventor: Jeannie T. Lee

Address: 185 Cambridge Street

for herself and as agent for the Howard Hughes Medical Institute

Boston, Massachusetts 02114

Attorney Docket No. R0693,70009US00, US01

Page 2 of 2

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- 1. Sell, assign and transfer to The General Hospital Corporation d/b/a Massachusetts General Hospital, having a place of business at 55 Fruit Street; Boston, Massachusetts 02114, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, my entire right, title and interest for the United States and all foreign countries, in and to any and all inventions and designs which are disclosed in the provisional application filed in the United States Patent and Trademark Office on May 16, 2012 under No. 61/648,058, bearing Attorney Docket No. R0693.70010US00, and entitled COMPOSITIONS AND METHODS FOR MODULATING BDNF EXPRESSION, and in and to the application and all corresponding provisional, non-provisional, divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent, utility models, industrial designs or similar intellectual property rights which have been or shall be filed in the United States, internationally, and in any foreign country, including but not limited to China, Japan and Korea, on any of the inventions; and in and to all original and reissued patents which have been or shall be issued in the United States or any other jurisdiction on the inventions, including the right to apply for patent rights in each foreign country and all rights to priority, including the right to claim priority for China, Japan and Korea:
- 2. Agree that the Assignee may apply for and receive Letters Patent and utility model and industrial design registrations for the inventions in its own name; and when requested, without charge to but at the expense of the Assignee, I agree to carry out in good faith the intent and purpose of this assignment, by executing all non-provisional, divisional, continuing, substitute, renewal, reissue, and all other patent, utility model and industrial design applications on any and all the inventions, by executing all rightful oaths, assignments, powers of attorney and other papers, by communicating to the Assignee all facts known to me relating to the inventions and the history thereof, and generally by doing everything reasonably possible which the Assignee shall consider desirable for aiding in securing and maintaining proper protection for the inventions and for vesting title to the inventions and all applications for patents and all patents on the inventions, in the Assignee:
- 3. Request the Director of the United States Patent and Trademark Office to issue the Letters Patent to the Assignee;
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- 5. Covenant with the Assignee that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been made to others by me and that full right to convey the same as herein expressed is possessed by me; and
- 6. Appoint Assignee, through its designee, my attorney-in-fact to execute, in my name and on my behalf, any and all documents required to effectuate this Assignment, specifically including, but not limited to, those documents specified above and any necessary corrective assignments.

This instrument is executed under seal and signed under the pains and penalties of perjury under the laws of the United States of America.

Attorney Docket No. R0693.70010US00

Page 1 of 2

Citizenship: US				
STATE/COMMONWEALTH OF MASSACHUS Etts				
COUNTY OF SUMME :				
On this 14 day of May, 2013, before me, the undersigned notary public,				
personally appeared Jeannie T. Lee , proved to me through satisfactory evidence of				
identification, which were MA Driver's Liceuse				
to be the person who signed the preceding or attached document in my presence and swore or affirmed				
to me that the contents of the document are truthful and accurate to the best of (his) (her) knowledge				
and belief and acknowledged to me that (he) (she) signed it voluntarily for its stated purpose.				
SEAL				
Notary Public				
My commission expires: South 26, 26146				
CONTRACTOR OF THE CONTRACTOR O				
Notary Public				
# (3, % % / 2 b) Commonwealth of Massachusetta &				

Inventor: Jeannie 7, Lee for herself and as agent for the Howard Hughes Medical Institute

Address: 185 Cambridge Street

Boston, Massachusetts 02114

PATENT REEL: 050992 FRAME: 0397

For good and valuable consideration, the receipt of which is hereby acknowledged, I, the undersigned Assignor, hereby:

- Sell, assign and transfer to The General Hospital Corporation d/b/a Massachusetts General Hospital, having a place of business at 55 Fruit Street; Boston, Massachusetts 02114, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, my entire right, title and interest for the United States and all foreign countries, in and to any and all inventions and designs which are disclosed in the provisional application filed in the United States Patent and Trademark Office on May 16, 2012 under No. 61/648,045, bearing Attorney Docket No. R0693.70011US00, and entitled COMPOSITIONS AND METHODS FOR MODULATING ADIPOQ EXPRESSION, and in and to the application and all corresponding provisional, non-provisional, divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent, utility models, industrial designs or similar intellectual property rights which have been or shall be filed in the United States, internationally, and in any foreign country, including but not limited to China, Japan and Korea, on any of the inventions; and in and to all original and reissued patents which have been or shall be issued in the United States or any other jurisdiction on the inventions, including the right to apply for patent rights in each foreign country and all rights to priority, including the right to claim priority for China, Japan and Korea;
- 2. Agree that the Assignee may apply for and receive Letters Patent and utility model and industrial design registrations for the inventions in its own name; and when requested, without charge to but at the expense of the Assignee, I agree to carry out in good faith the intent and purpose of this assignment, by executing all non-provisional, divisional, continuing, substitute, renewal, reissue, and all other patent, utility model and industrial design applications on any and all the inventions, by executing all rightful oaths, assignments, powers of attorney and other papers, by communicating to the Assignee all facts known to me relating to the inventions and the history thereof, and generally by doing everything reasonably possible which the Assignee shall consider desirable for aiding in securing and maintaining proper protection for the inventions and for vesting title to the inventions and all applications for patents and all patents on the inventions, in the Assignee;
- 3. Request the Director of the United States Patent and Trademark Office to issue the Letters Patent to the Assignee;
- 4. Authorize and request Wolf, Greenfield & Sacks, P.C. to supply any missing patent/application identification information or correct any errors in the patent/application identification information provided above, whether discovered prior to or after recordation;
- 5. Covenant with the Assignee that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been made to others by me and that full right to convey the same as herein expressed is possessed by me; and
- 6. Appoint Assignee, through its designee, my attorney-in-fact to execute, in my name and on my behalf, any and all documents required to effectuate this Assignment, specifically including, but not limited to, those documents specified above and any necessary corrective assignments.

This instrument is executed under seal and signed under the pains and penalties of perjury under the laws of the United States of America.

Attorney Docket No. R0693.70011US00

Page 1 of 2

Inventor: Jeannie,T./Lee

Medical/Instituté
Address: 185 Cambridge Street

Boston, Massachusetts 02114

for herself and as agent for the Howard Hughes

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This instrument is executed under seal and signed under the pains and penalties of perjury under the laws of the United States of America.

Attorney Docket No. R0693.70012US00

Page 1 of 2

		P. Martin and A.
Date	Inventor:	Jeannie T. Lee () for herself and as agent for the Howard Hughes Medical Institute
	Address:	185 Cambridge Street
		Boston, Massachusetts 02114
	Citizenship:	US
STATE/COMMONWEAL	thor Massachus	Settle Stranger
COUNTY OF SWA	Ble .	
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~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		before me, the undersigned notary public,
personally appeared	Jeannie T. Lee	, proved to me through satisfactory evidence of
identification, which were		ver's License
	The second secon	document in my presence and swore or affirmed
		accurate to the best of (his) (her) knowledge
and benefatio acknowled	iden to the that (he) (zule) sidne	ed it voluntarily for its stated purpose.
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•	Notary Public	
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My commission expir	es: <u>South 36</u>	2014
		Ohja-Chia Lu

Attorney Docket No. F10693,70012US00

Page 2 of 2

For good and valuable consideration, the receipt of which is hereby acknowledged, I, the undersigned Assignor, hereby:

- 1. Sell, assign and transfer to The General Hospital Corporation d/b/a Massachusetts General Hospital, having a place of business at 55 Fruit Street; Boston, Massachusetts 02114, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, my entire right, title and interest for the United States and all foreign countries, in and to any and all inventions and designs which are disclosed in the provisional application filed in the United States Patent and Trademark Office on May 16, 2012 under No. 61/648,052, bearing Attorney Docket No. R0693.70013US00, and entitled COMPOSITIONS AND METHODS FOR MODULATING CD274 EXPRESSION, and in and to the application and all corresponding provisional, non-provisional, divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent, utility models, industrial designs or similar intellectual property rights which have been or shall be filed in the United States, internationally, and in any foreign country, including but not limited to China, Japan and Korea, on any of the inventions; and in and to all original and reissued patents which have been or shall be issued in the United States or any other jurisdiction on the inventions, including the right to claim priority for China, Japan and Korea;
- 2. Agree that the Assignee may apply for and receive Letters Patent and utility model and industrial design registrations for the inventions in its own name; and when requested, without charge to but at the expense of the Assignee, I agree to carry out in good faith the intent and purpose of this assignment, by executing all non-provisional, divisional, continuing, substitute, renewal, reissue, and all other patent, utility model and industrial design applications on any and all the inventions, by executing all rightful oaths, assignments, powers of attorney and other papers, by communicating to the Assignee all facts known to me relating to the inventions and the history thereof, and generally by doing everything reasonably possible which the Assignee shall consider desirable for aiding in securing and maintaining proper protection for the inventions and for vesting title to the inventions and all applications for patents and all patents on the inventions, in the Assignee;
- 3. Request the Director of the United States Patent and Trademark Office to issue the Letters Patent to the Assignee;
- 4. Authorize and request Wolf, Greenfield & Sacks, P.C. to supply any missing patent/application identification information or correct any errors in the patent/application identification information provided above, whether discovered prior to or after recordation;
- 5. Covenant with the Assignee that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been made to others by me and that full right to convey the same as herein expressed is possessed by me; and
- 6. Appoint Assignee, through its designee, my attorney-in-fact to execute, in my name and on my behalf, any and all documents required to effectuate this Assignment, specifically including, but not limited to, those documents specified above and any necessary corrective assignments.

This instrument is executed under seal and signed under the pains and penalties of perjury under the laws of the United States of America.

Attorney Docket No. R0693.70013US00

Page 1 of 2

STATE/COMMONWEALTH OF Massachusetts COUNTY OF Suffolk				
On this 14 day of 17 49, 2013, before me, the undersigned notary public, personally appeared Jeannie T. Lee , proved to me through satisfactory evidence of identification, which were MA. Drivers License				
to be the person who signed the preceding or attached document in my presence and swore or affirmed to me that the contents of the document are truthful and accurate to the best of (his) (her) knowledge and belief and acknowledged to me that (he) (she) signed it voluntarily for its stated purpose.				
SEAL				
Notary Public  My commission expires: Sept. 26 2014				
CHIA-CHIA-LU				

Citizenship: US

Inventor: Jeannie T/Lee for herself and as agent for the Howard Hughes Medical Institute

Boston, Massachusetts 02114

Address: 185 Cambridge Street

For good and valuable consideration, the receipt of which is hereby acknowledged, I, the undersigned Assignor, hereby:

- Sell, assign and transfer to The General Hospital Corporation d/b/a Massachusetts General Hospital, having a place of business at 55 Fruit Street; Boston, Massachusetts 02114, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, my entire right, title and interest for the United States and all foreign countries, in and to any and all inventions and designs which are disclosed in the provisional application filed in the United States Patent and Trademark Office on May 16, 2012 under No. 61/648,069, bearing Attorney Docket No. R0693.70014US00, and entitled COMPOSITIONS AND METHODS FOR MODULATING GENE EXPRESSION, and the provisional application filed in the United States Patent and Trademark Office on March 14, 2013 under No. 61/786,095, bearing Attorney Docket No. R0693.70014US01, and entitled COMPOSITIONS AND METHODS FOR MODULATING GENE EXPRESSION, and in and to the applications and all corresponding provisional, non-provisional, divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent, utility models, industrial designs or similar intellectual property rights which have been or shall be filed in the United States, internationally, and in any foreign country, including but not limited to China, Japan and Korea, on any of the inventions; and in and to all original and reissued patents which have been or shall be issued in the United States or any other jurisdiction on the inventions, including the right to apply for patent rights in each foreign country and all rights to priority, including the right to claim priority for China, Japan and Korea:
- 2. Agree that the Assignee may apply for and receive Letters Patent and utility model and industrial design registrations for the inventions in its own name; and when requested, without charge to but at the expense of the Assignee, I agree to carry out in good faith the intent and purpose of this assignment, by executing all non-provisional, divisional, continuing, substitute, renewal, reissue, and all other patent, utility model and industrial design applications on any and all the inventions, by executing all rightful oaths, assignments, powers of attorney and other papers, by communicating to the Assignee all facts known to me relating to the inventions and the history thereof, and generally by doing everything reasonably possible which the Assignee shall consider desirable for aiding in securing and maintaining proper protection for the inventions and for vesting title to the inventions and all applications for patents and all patents on the inventions, in the Assignee;
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- 6. Appoint Assignee, through its designee, my attorney-in-fact to execute, in my name and on my behalf, any and all documents required to effectuate this Assignment, specifically including, but not limited to, those documents specified above and any necessary corrective assignments.

This instrument is executed under seal and signed under the pains and penalties of perjury under the laws of the United States of America.

Attorney Docket No. R0693.70014US00, US01

Page 1 of 2

3057727 1

Date Inventor:	for herself and as agent for the Howard Hughes
Address	Medical Instituté 185 Cambridge Street
	Boston, Massachusetts 02114
Citizenship.	: US
STATE/COMMONWEALTH OF MASSAC	wsetts
COUNTY OF SILHOIC	
On this 14 day of May , 21	513, before me, the undersigned notary public,
personally appeared Jeannie T. Lee	, proved to me through satisfactory evidence of
	YIVEVS LICENSO
to be the person who signed the preceding or attached	
to me that the contents of the document are truthful and	
and belief and acknowledged to me that (he) (she) sign	ned it voluntarily for its stated purpose.
SEAL	The state of the s
Notary Public	
My commission expires: Sept. 26	2014
	IA-CHIA LU
8 ASS 26A VC)	tary Public
8 (98 30 864 30 30-)	ith of Massachusetts
A Vision Commission	n Expires Sep 26, 2014

Attorney Docket No. R0693.70014US00, US01

Page 2 of 2

For good and valuable consideration, the receipt of which is hereby acknowledged, I, the undersigned Assignor, hereby:

- 1. Sell, assign and transfer to The General Hospital Corporation d/b/a Massachusetts General Hospital, having a place of business at 55 Fruit Street; Boston, Massachusetts 02114, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, my entire right, title and interest for the United States and all foreign countries, in and to any and all inventions and designs which are disclosed in the provisional application filed in the United States Patent and Trademark Office on May 16, 2012 under No. 61/648,077, bearing Attorney Docket No. R0693.70015US00, and entitled COMPOSITIONS AND METHODS FOR MODULATING GENE EXPRESSION, and in and to the application and all corresponding provisional, non-provisional, divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent, utility models, industrial designs or similar intellectual property rights which have been or shall be filed in the United States, internationally, and in any foreign country, including but not limited to China, Japan and Korea, on any of the inventions; and in and to all original and reissued patents which have been or shall be issued in the United States or any other jurisdiction on the inventions, including the right to apply for patent rights in each foreign country and all rights to priority, including the right to claim priority for China, Japan and Korea:
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This instrument is executed under seal and signed under the pains and penalties of perjury under the laws of the United States of America.

Attorney Docket No. R0693.70015US00

Page 1 of 2

	Boston, Massachusetts 02114
Citizenship:	US:
STATE/COMMONWEALTH OF Ma 450 chu	8:6HS
COUNTY OF Suffalk:	
On this 14 day of May , 201	3. before me, the undersigned notary public.
On this ) L( day of May , 20 i personally appeared Jeannie T. Lee	, proved to me through satisfactory evidence of
identification, which were MA Drive	ex liveuse
to be the person who signed the preceding or attached do	
to me that the contents of the document are truthful and a	accurate to the best of (his) (her) knowledge
and belief and acknowledged to me that (he) (she) signed	d it voluntarily for its stated purpose.
SEAL	
Notary Public	Control of the Contro
the state of the s	~
My commission expires: しゃん ユし	,2014
	CHARU
	<b>X</b>

Inventor: Jeannie T. Lee / for herself and as agent for the Howard Hughes Medical Institute
Address: 185 Cambridge Street

Attorney Docket No. R0693.70015US00

Page 2 of 2

For good and valuable consideration, the receipt of which is hereby acknowledged, I, the undersigned Assignor, hereby:

- Sell, assign and transfer to The General Hospital Corporation d/b/a Massachusetts General Hospital, having a place of business at 55 Fruit Street; Boston, Massachusetts 02114, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, my entire right, title and interest for the United States and all foreign countries, in and to any and all inventions and designs which are disclosed in the provisional application filed in the United States Patent and Trademark Office on May 16, 2012 under No. 61/648,016, bearing Attorney Docket No. R0693.70016US00, and entitled COMPOSITIONS AND METHODS FOR MODULATING GENE EXPRESSION, and the provisional application filed in the United States Patent and Trademark Office on March 14, 2013 under No. 61/786,232, bearing Attorney Docket No. R0693.70016US01, and entitled COMPOSITIONS AND METHODS FOR MODULATING GENE EXPRESSION, and in and to the applications and all corresponding provisional, non-provisional, divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent, utility models, industrial designs or similar intellectual property rights which have been or shall be filed in the United States, internationally, and in any foreign country, including but not limited to China, Japan and Korea, on any of the inventions, and in and to all original and reissued patents which have been or shall be issued in the United States or any other jurisdiction on the inventions, including the right to apply for patent rights in each foreign country and all rights to priority, including the right to claim priority for China, Japan and Korea;
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Attorney Docket No. R0693.70016US00, US01

Page 1 of 2

Citizenship: US				
STATE/COMMONWEALTH OF Massachusetts				
COUNTY OF Suffalk				
On this 14 day of Way, 2013, before me, the undersigned notary public, personally appeared Jeannie T. Lee , proved to me through satisfactory evidence of				
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identification, which were MA \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\				
to me that the contents of the document are truthful and accurate to the best of (his) (her) knowledge				
and belief and acknowledged to me that (he) (she) signed it voluntarily for its stated purpose.				
SEAL				
Notary Public				
My commission expires: Sept 26, 2014				
Sandhandhadhadhadhadhadhadhadhadhadhadhadhadhad				
CHIA-CHIA LU				
Notary Public  Commonwealth of Messachusetts				

Inventor: Jeannie T. Lee

for herself and as agent for the Howard Hughes Medical Institute Address: 185 Cambridge Street

Boston, Massachusetts 02114

Attorney Docket No. R0693,70016US00, US01

Page 2 of 2

For good and valuable consideration, the receipt of which is hereby acknowledged, I, the undersigned Assignor, hereby:

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Attorney Docket No. R0693.70017US00

Page 1 of 2

Citizenship: US				
state/commonwealth of Massachusetts country of Suffolk:				
COUNTY OF SUHFORK				
On this 14 day of May , 2013, before me, the undersigned notary public,				
On this $144$ day of $150$ day				
identification, which were MA. Driver's Licuse				
to be the person who signed the preceding or attached document in my presence and swore or affirmed				
to me that the contents of the document are truthful and accurate to the best of (his) (her) knowledge and belief and acknowledged to me that (he) (she) signed it voluntarily for its stated purpose.				
OF AL				
SEAL NAME OF THE PROPERTY OF T				
Notary Public				
My commission expires: Sept. 26, 2014				
CHIA-CHIA LU				
Notary Public				

Inventor: Jeannie T. Lee for herself and as agent for the Howard Hughes Medical Institute

Address: 185 Cambridge Street

Boston, Massachusetts 02114

Attorney Docket No. R0693.70017US00, US01

Page 2 of 2

# APPOINTMENT OF INVESTIGATOR AS AGENT

Appointment by the Howard Hughes Medical Institute ("HHMI") of Jeannie T. Lee. MD, PhD, an employee of HHMI, as its agent for the purpose of assigning certain rights to The General Hospital Corporation, doing business as the Massachusetts General Hospital ("Institution").

WHEREAS, HHMI and Institution collaborate in the active conduct of medical research pursuant to an Agreement between them dated as of November 16, 1987 (the "Agreement");

WHEREAS, pursuant to the Agreement, HHMI has agreed to assign to Institution HHMI's rights with respect to intellectual property resulting from research by HHMI employees, alone or with others, at the Institution during the term of the Agreement, whether or not patentable or copyrightable, and whether funded in whole or in part by HHMI (each a "Subject Property");

WHEREAS, research conducted pursuant to the Agreement by Jeannie T. Lee, MD, PhD while employed by HHMI at Institution has resulted in the inventions covered by the patent applications listed on Exhibit A attached hereto (collectively, the "Inventions"), and the Inventions are Subject Property; and

WHEREAS, HHMI wishes Jeannie T. Lee, MD, PhD to act as its agent for the purpose of assigning to Institution the rights HHMI has in the Inventions by reason of the research program conducted at Institution.

NOW THEREFORE, HHMI hereby appoints Jeannie T. Lee, MD, PhD as its agent for the purpose of assigning the rights HHMI has or may acquire in the Inventions by reason of the research program conducted at Institution to Institution in accordance with and subject to the conditions of the Agreement.

Executed: July 13, 2012

HOWARD HUGHES MEDICAL INSTITUTE

By:

Jack E. Dixan Jack E. Dixon, PhD Vice President and Chief Scientific Officer

ATTESTED:

Craig A Alexander Vice President and General Counsel

MGH 21708 HHMI 05189

# Exhibit A

Title	Senai Number - F	ling Sate
COMPOSITIONS AND METHODS FOR MODULATING FXN EXPRESSION	61/647,786	5/16/2012
COMPOSITIONS AND METHODS FOR MODULATING SMN GENE FAMILY EXPRESSION	61/647,858	5/16/2012
COMPOSITIONS AND METHODS FOR MODULATING UTRN EXPRESSION	61/647,886	5/16/2012
COMPOSITIONS AND METHODS FOR MODULATING HEMOGLOBIN GENE FAMILY EXPRESSION	61/647,901	5/16/2012
COMPOSITIONS AND METHODS FOR MODULATING CFTR EXPRESSION	61/647,915	5/16/2012
COMPOSITIONS AND METHODS FOR MODULATING ATP2A2 EXPRESSION	61/647,925	5/16/2012
COMPOSITIONS AND METHODS FOR MODULATING PAH EXPRESSION	61/647,938	\$/16/2012
COMPOSITIONS AND METHODS FOR MODULATING APOA1/ABCA1 EXPRESSION	61/647,949	5/16/2012
COMPOSITIONS AND METHODS FOR MODULATING CEP290 EXPRESSION	61/648,030	5/16/2012
COMPOSITIONS AND METHODS FOR MODULATING PTEN EXPRESSION	61/648,041	5/16/2012
COMPOSITIONS AND METHODS FOR MODULATING BDNF EXPRESSION	61/648,058	5/16/2012
COMPOSITIONS AND METHODS FOR MODULATING ADIPOQ EXPRESSION	61/648,045	5/16/2012
COMPOSITIONS AND METHODS FOR MODULATING MECP2 EXPRESSION	61/648,051	\$/16/2012
COMPOSITIONS AND METHODS FOR MODULATING CD274 EXPRESSION	61/648,052	5/16/2012
COMPOSITIONS AND METHODS FOR MODULATING GENE EXPRESSION	61/648,069	5/16/2012
COMPOSITIONS AND METHODS FOR MODULATING GENE EXPRESSION	61/648,077	5/16/2012
COMPOSITIONS AND METHODS FOR MODULATING GENE EXPRESSION	61/648,016	5/16/2012
COMPOSITIONS AND METHODS FOR MODULATING GENE EXPRESSION	61/648,021	5/16/2012

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