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PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2 EPAS ID: PAT4545219

SUBMISSION TYPE:			NEW ASSIGNMENT		
NATURE OF CONVEYANCE:			ASSIGNMENT		
CONVEYING PARTY DA	ATA				
			Name		Execution Date
MUTHIAH MANOHARAN	١				08/01/2011
MUTHUSAMY JAYARAMAN					08/15/2011
KALLANTHOTTATHIL G	i. RAJE	EV			08/08/2011
LAXMAN ELTEPU					08/15/2011
STEVEN ANSELL					08/18/2011
JIANXIN CHEN					08/04/2011
RECEIVING PARTY DA	ТА				
Name:	ALNYL	AM P	HARMACEUTICALS, INC.		
Street Address:	300 THIRD STREET				
City:	CAMBRIDGE				
State/Country:	MASSACHUSETTS				
Postal Code:	02142				
	-				
PROPERTY NUMBERS	Total: 1			_	
Property Type			Number		
Application Number: 156 ⁻		1561	7520		
CORRESPONDENCE D	ΑΤΑ				
Fax Number:		• /	876-4098		
			e-mail address first; if that is un hat is unsuccessful. it will be se		
Phone:	<i>Ising a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i> Phone: 952-876-4086				
Email:	moconnor@vhpmlaw.com				
Correspondent Name: VIKSNINS HARRIS PADYS MALEN LLP					
Address Line 1: 7851 METRO PARKWAY					
Address Line 2: SUI7		SUIT	TE 325		
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ATTORNEY DOCKET NU	JMBER:		08050.007US3		
NAME OF SUBMITTER:			YANG LI		
SIGNATURE:			/Yang Li/		

08/10/2017

DATE SIGNED:

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THIS ASSIGNMENT by Muthiah MANOHARAN; Muthusamy JAYARAMAN; Kallanthottathil G. RAJEEV; Laxman ELTEPU, Steven ANSELL; and Jianxin CHEN (hereinafter referred to as Assignors), each located at 300 Third Street, Cambridge, Massachusetts 02142;

WHEREAS, Assignors have invented certain new and useful improvements in NOVEL LIPIDS AND COMPOSITIONS FOR THE DELIVERY OF THERAPEUTICS, set forth in U.S. Patent Application No. 13/128,283, filed on May 9, 2011, and International Patent Application No. PCT/US09/63927, filed on November 10, 2009;

WHEREAS, ALNYLAM PHARMACEUTICALS, INC., a company organized under and pursuant to the laws of Delaware having its principal place of business at 300 Third Street, Cambridge, Massachusetts 02142 (hereinafter referred to as Assignee), is desirous of acquiring the entire right, title and interest in and to said inventions and said Application for Letters Patent of the United States and all foreign countries, and in and to any Letters Patent of the United States and all foreign countries to be obtained therefore and thereon.

NOW, THEREFORE, in consideration of One Dollar (\$1.00) and other good and sufficient consideration, the receipt of which is hereby acknowledged, Assignors have sold, assigned, transferred and set over, and by these presents do sell, assign, transfer and set over, unto Assignee, its successors, legal representatives and assigns, the entire right, title and interest in and to the above-mentioned inventions and application for Letters Patent, and in and to any and all direct and indirect divisions, continuations and continuations-in-part of said application, and any and all Letters Patent in the United States and all foreign countries which may be granted therefor and thereon, and reissues, reexaminations and extensions of said Letters Patent, and all rights under the International Convention for the Protection of Industrial Property, the same to be held and enjoyed by Assignee, for its own use and benefit and the use and benefit of its successors, legal representatives and assigns, to the full end of the term or terms for which Letters Patent may be granted and/or extended, as fully and entirely as the same would have been held and enjoyed by Assignors, had this sale and assignment not been made.

135399.02500/7027964v.1

PATENT REEL: 048262 FRAME: 0393

AND for the same consideration, Assignors hereby represent and warrant to Assignee, its successors, legal representatives and assigns, that, at the time of execution and delivery of these presents, except for any rights, titles and/or interests that have arisen to Assignee under law or that have already been transferred to Assignee, Assignors are the sole and lawful owners of the entire right, title and interest in and to the said inventions and application for Letters Patent above-mentioned, and that the same are unencumbered and that Assignors have good and full right and lawful authority to sell and convey the same in the manner herein set forth.

AND for the same consideration, Assignors hereby covenant and agree to and with Assignee, its successors, legal representatives and assigns, that Assignors will sign all papers and documents, take all lawful oaths and do all acts necessary or required to be done for the procurement, maintenance, enforcement and defense of any Letters Patent and applications for Letters Patent for said inventions, without charge to Assignee, its successors, legal representatives and assigns, whenever counsel of Assignee, or counsel of its successors, legal representatives and assigns, shall advise: that any proceeding in connection with said inventions, or said Patent application for Letters Patent, or any proceeding in connection with any Letters Patent or applications for Letters Patent for said inventions in any country, including but not limited to interference proceedings, is lawful and desirable; or, that any division, continuation or continuation-in-part of any application for Letters Patent, or any reissue, reexamination or extension of any Letters Patent, to be obtained thereon, is lawful and desirable.

AND Assignors hereby request the Commissioner of Patent and Trademarks to issue said Letters Patent of the United States to Assignee, as Assignee of said inventions and the Letters Patent to be issued thereon, for the sole use and benefit of Assignee, its successors, legal representatives and assigns.

AND Assignors acknowledge an obligation of assignment of this invention to Assignee at the time the invention was made.

135399.02500/7027964v.1

Date:	8/11/2011	Signature:	Muthiah MANOHARAN
Date:	Aug. 15,201	Signature:	Muthusamy JAYARAMAN
Date:	868/2011	Signature:	Kallanthottathil G. RAJEEV
Date:	· · · · · · · · · · · · · · · · · · ·	Signature:	Laxman ELTEPU
Date:		Signature:	Steven ANSELL
Date:		Signature:	Jianxin CHEN

THIS ASSIGNMENT by Muthiah MANOHARAN; Muthusamy JAYARAMAN; Kallanthottathil G. RAJEEV; Laxman ELTEPU, Steven ANSELL; and Jianxin CHEN (hereinafter referred to as Assignors), each located at 300 Third Street, Cambridge, Massachusetts 02142;

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NOW, THEREFORE, in consideration of One Dollar (\$1.00) and other good and sufficient consideration, the receipt of which is hereby acknowledged, Assignors have sold, assigned, transferred and set over, and by these presents do sell, assign, transfer and set over, unto Assignee, its successors, legal representatives and assigns, the entire right, title and interest in and to the above-mentioned inventions and application for Letters Patent, and in and to any and all direct and indirect divisions, continuations and continuations-in-part of said application, and any and all Letters Patent in the United States and all foreign countries which may be granted therefor and thereon, and reissues, reexaminations and extensions of said Letters Patent, and all rights under the International Convention for the Protection of Industrial Property, the same to be held and enjoyed by Assignee, for its own use and benefit and the use and benefit of its auccessors, legal representatives and assigns, to the full end of the term or terms for which Letters Patent may be granted and/or extended, as fully and entirely as the same would have been held and enjoyed by Assignors, had this sale and assignment not been made.

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PATENT REEL: 048262 FRAME: 0408

AND for the same consideration, Assignors hereby represent and warrant to Assignee, its successors, legal representatives and assigns, that, at the time of execution and delivery of these presents, except for any rights, titles and/or interests that have arisen to Assignee under law or that have already been transferred to Assignee, Assignors are the sole and lawful owners of the entire right, title and interest in and to the said inventions and application for Letters Patent above-mentioned, and that the same are unencumbered and that Assignors have good and full right and lawful authority to sell and convey the same in the manner herein set forth.

AND for the same consideration, Assignors hereby covenant and agree to and with Assignee, its successors, legal representatives and assigns, that Assignors will sign all papers and documents, take all lawful oaths and do all acts necessary or required to be done for the procurement, maintenance, enforcement and defense of any Letters Patent and applications for Letters Patent for said inventions, without charge to Assignee, its successors, legal representatives and assigns, whenever counsel of Assignce, or counsel of its successors, legal representatives and assigns, shall advise: that any proceeding in connection with said inventions, or said Patent application for Letters Patent, or any proceeding in connection with any Letters Patent or applications for Letters Patent for said inventions in any country, including but not limited to interference proceedings, is lawful and desirable; or, that any division, continuation or continuation-in-part of any application for Letters Patent, or any reissue, reexamination or extension of any Letters Patent, to be obtained thereon, is lawful and desirable.

AND Assignors hereby request the Commissioner of Patent and Trademarks to issue said Letters Patent of the United States to Assignee, as Assignee of said inventions and the Letters Patent to be issued thereon, for the sole use and benefit of Assignee, its successors, legal representatives and assigns.

AND Assignors acknowledge an obligation of assignment of this invention to Assignce at the time the invention was made.

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REEL: 048262 FRAME: 0409

PATENT

Date:	· · ·	Signature:	
		j	Muthiah MANOHARAN
Date:		Signature:	Muthusamy JAYARAMAN
Date:	,	Signature:	Kallanthottathil G. RAJEEV
	A		1. Parassi MA
Date:	Aug 15, 2011	Signature:	Laxman ELTEPU
Dater		Simotum	
an 14390		orguature,	Steven ANSELL
Date:		Signature:	
		· · · ·	Jianxin CHEN

THIS ASSIGNMENT by Muthiah MANOHARAN; Muthusamy JAYARAMAN; Kallanthottathil G. RAJEEV; Laxman ELTEPU, Steven ANSELL; and Jianxin CHEN (hereinafter referred to as Assignors), each located at 300 Third Street, Cambridge, Massachusetts 02142;

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NOW, THEREFORE, in consideration of One Dollar (\$1.00) and other good and sufficient consideration, the receipt of which is hereby acknowledged, Assignors have sold, assigned, transferred and set over, and by these presents do sell, assign, transfer and set over, unto Assignee, its successors, legal representatives and assigns, the entire right, title and interest in and to the above-mentioned inventions and application for Letters Patent, and in and to any and all direct and indirect divisions, continuations and continuations-in-part of said application, and any and all Letters Patent in the United States and all foreign countries which may be granted therefor and thereon, and reissues, reexaminations and extensions of said Letters Patent, and all rights under the International Convention for the Protection of Industrial Property, the same to be held and enjoyed by Assignee, for its own use and benefit and the use and benefit of its successors, legal representatives and assigns, to the full end of the term or terms for which Letters Patent may be granted and/or extended, as fully and entirely as the same would have been held and enjoyed by Assignors, had this sale and assignment not been made.

135399.02500/7027964v.1

PATENT REEL: 048262 FRAME: 0403

AND for the same consideration, Assignors hereby represent and warrant to Assignee, its successors, legal representatives and assigns, that, at the time of execution and delivery of these presents, except for any rights, titles and/or interests that have arisen to Assignee under law or that have already been transferred to Assignee, Assignors are the sole and lawful owners of the entire right, title and interest in and to the said inventions and application for Letters Patent above-mentioned, and that the same are unencumbered and that Assignors have good and full right and lawful authority to sell and convey the same in the manner herein set forth.

AND for the same consideration, Assignors hereby covenant and agree to and with Assignee, its successors, legal representatives and assigns, that Assignors will sign all papers and documents, take all lawful oaths and do all acts necessary or required to be done for the procurement, maintenance, enforcement and defense of any Letters Patent and applications for Letters Patent for said inventions, without charge to Assignee, its successors, legal representatives and assigns, whenever counsel of Assignee, or counsel of its successors, legal representatives and assigns, shall advise: that any proceeding in connection with said inventions, or said Patent application for Letters Patent, or any proceeding in connection with any Letters Patent or applications for Letters Patent for said inventions in any country, including but not limited to interference proceedings, is lawful and desirable; or, that any division, continuation or continuation-in-part of any application for Letters Patent, or any reissue, reexamination or extension of any Letters Patent, to be obtained thereon, is lawful and desirable.

AND Assignors hereby request the Commissioner of Patent and Trademarks to issue said Letters Patent of the United States to Assignee, as Assignee of said inventions and the Letters Patent to be issued thereon, for the sole use and benefit of Assignee, its successors, legal representatives and assigns.

AND Assignors acknowledge an obligation of assignment of this invention to Assignee at the time the invention was made.

135399.02500/7027964v.1

PATENT REEL: 048262 FRAME: 0404

Date:	Signature: Muthiah MANOHARAN	
Date:	Signature:	
Date:	Signature: Kallanthottathil G. RAJEEV	
Date:	Signature:Laxman ELTEPU	
Date: <u>/אַ אַטַרָּאַ</u>	57 2011 Signature: <u>/). //</u> Steven ANSELL	
Date:	Signature: Jianxin CHEN	

THIS ASSIGNMENT by Muthiah MANOHARAN; Muthusamy JAYARAMAN; Kallaothettathal 33, 22 AJEEV; Laxman ELTEPU, Steven ANSELL; and Jianxin CHEN (hereinafter reterred to as Assignors), each located at 300 Third Street, Cambridge, Massachuseuts 123 43;

WHENE VS. Assignors have invented certain new and useful improvements in NOVEL J. PUMAARD COMPOSITIONS FOR THE DELIVERY OF THERAPEUTICS, set forth in U.S. Paume Application No. 13/128,283, filed on May 9, 2011, and International Patent Application No. 2017/US09/63927, filed on November 10, 2009;

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MONG THUREFORE, in consideration of One Dollar (\$1.00) and other good and sufficient consideration, the receipt of which is hereby acknowledged, Assignors have sold, assigned, iterationed and set over, and by these presents do sell, assign, transfer and set over, unto Assigned, iterationed and set over, and by these presents do sell, assign, transfer and set over, unto Assigned, its successors, legal representatives and assigns, the entire right, title and interest in used some above-mentioned inventions and application for Letters Patent, and in and to any and all direct and indirect divisions, continuations and continuations-in-part of said application, and sog and all tetters Patent in the United States and all foreign countries which may be got and therefor and thereon, and reissues, reexaminations and extensions of said Letters Patent, and enjoyed by Assigned, for its own use and benefit and the use and benefit of its statistics, legal representatives and assigns, to the full end of the term or terms for which is added to the and enjoyed by Assigner, had this sale and assignment not been made.

PATENT REEL: 048262 FRAME: 0406

AND Frome same consideration, Assignors hereby represent and warrant to Assigned, its successors, legal representatives and assigns, that, at the time of execution and delivery of these proceeds, except for any rights, titles and/or interests that have arisen to Assigned under two of that have already been transferred to Assignee, Assignors are the sole and lawful owners of the entire right, title and interest in and to the said inventions and application for these Patent above-mentioned, and that the same are unencumbered and that Assignor, back good and full right and lawful authority to sell and convey the same in the mumor bords of forth.

A \$10 for the same consideration, Assignors hereby covenant and agree to and with Assignce, its successors, legal representatives and assigns, that Assignors will sign all papers and documents, solve sill lawful oaths and do all acts necessary or required to be done for the procurement, to interference, enforcement and defense of any Letters Patent and applications for Letters Patent social inventions, without charge to Assignee, its successors, legal representatives cost ensigns, shall advise: that any proceeding in connection with said inventions, or any proceeding in connection with said inventions for Letters Patent, or any proceeding in connection with any Letters Patent splications for Letters Patent of said inventions for Letters Patent, or any proceeding in connection with any Letters Patent upplications for Letters Patent for said inventions in any country, including but not funded to interference proceedings, is lawful and desirable; or, that any reissue, rookney which or extension of any Letters Patent, to be obtained thereon, is lawful and desirable.

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ANTS ANTIGATES acknowledge an obligation of assignment of this invention to Assignce of the out of the invention was made.

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PATENT REEL: 028868 FRAME: 0483

Date:	na aya sananan	Signature:	Muthiah MANOHARAN
Dete:	a de la constanti di segundo y	Signature:	Muthusamy JAYARAMAN
Diste:	o – somet v 194 ministrationisti	Signature:	Kallanthottathil G. RAJEEV
Osses:	n an	Signature:	Laxman ELTEPU
Doffer and a	1999 - <u>199</u> 9	Signature:	Steven ANSELL
Dawi Ay	g.4,2011	Signature:	Janxin CHEN

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RECORDED: 08/00/2017

PATENT REEL: 048262 FRAME: 0408