

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT5974774

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT
CONVEYING PARTY DATA	
Name	Execution Date
MERCK SHARP & DOHME CORP.	03/24/2014
RECEIVING PARTY DATA	
Name:	SIRNA THERAPEUTICS, INC
Street Address:	300 THIRD STREET
Internal Address:	3RD FLOOR
City:	CAMBRIDGE
State/Country:	MASSACHUSETTS
Postal Code:	02142
PROPERTY NUMBERS Total: 1	
Property Type	Number
Application Number:	16750083
CORRESPONDENCE DATA	
Fax Number:	
<i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i>	
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Address Line 1:	265 FRANKLIN STREET
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ATTORNEY DOCKET NUMBER:	121301-01505
NAME OF SUBMITTER:	DEBORAH L. NAGLE, PH.D.
SIGNATURE:	/Deborah L. Nagle/
DATE SIGNED:	02/21/2020
Total Attachments: 17	
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Exhibit A

Patent Assignment

This Patent Assignment, effective as of March 5, 2014, is by and between Merck Sharp & Dohme Corp., a corporation organized and existing under the laws of the State of New Jersey, with an address at One Merck Drive, P.O. Box 100, Whitehouse Station, New Jersey 08889-0100 ("ASSIGNOR") and Sirna Therapeutics, Inc., a corporation organized and existing under the laws of the State of Delaware, with offices at 300 Third Street, Cambridge, Massachusetts 02142.

1. For good and valuable consideration, the receipt and sufficiency of which is hereby expressly acknowledged, ASSIGNOR hereby assigns, sells, transfers and conveys to ASSIGNEE, and ASSIGNEE hereby accepts from ASSIGNOR, (a) the entire right, title and interest in the United States and in all countries, in and to any and all inventions, discoveries and applications which are disclosed in the patents and applications for Letters Patent set forth on "Schedule 1" attached herewith, which were filed with the United States Patent and Trademark Office or other relevant patent office in other applicable jurisdictions, including any renewals, revivals, reissues, reexaminations, extensions, continuations and divisions thereof and any substitute applications therefore; (b) the full and complete right to file patent applications in the name of ASSIGNEE, its designee, or [in my/our names at ASSIGNEE], or its designee's election, on the aforesaid inventions, discoveries and applications in all countries of the world; (3) the entire right, title and interest in and to any Letters Patent which may issue thereon in the United States or in any country, and any renewals, revivals, reissues, reexaminations and extensions thereof, and any patents of confirmation, registration and importation of the same; and (4) the entire right, title and interest in all Convention and Treaty Rights of all kinds thereon, including all rights of priority in any country of the world, in and to the above inventions, discoveries and applications.
2. ASSIGNOR hereby authorizes and requests the competent authorities to grant and to issue any and all such Letters Patent in the United States and throughout the world to ASSIGNEE of the entire right, title and interest therein, as fully and entirely as the same would have been held and enjoyed by ASSIGNOR had this assignment, sale and transfer not been made.
3. ASSIGNOR agrees at any time, upon the reasonable request of ASSIGNEE, to execute and to deliver to ASSIGNEE, at ASSIGNEE's expense, any additional applications for patents for said inventions and discoveries, or any part or parts thereof, and any applications for patents of confirmation, registration and importation based on any Letters Patent issuing on said inventions, discoveries, or applications and divisions, continuations, renewals, revivals, reissues, reexaminations and extensions thereof.
4. ASSIGNOR agrees at any time to execute and to deliver upon the reasonable request of ASSIGNEE, and at ASSIGNEE's expense, such additional documents, if any, as may be reasonably necessary or desirable to secure patent protection on said inventions, discoveries and applications throughout all countries of the world, and otherwise to use

commercially reasonable efforts to take such actions as may be reasonably necessary to give full effect to and to perfect the rights of the ASSIGNEE under this Patent Assignment, including the execution, delivery and procurement of any and all further documents evidencing this assignment, transfer and sale as may be reasonably necessary or desirable.

5. ASSIGNOR hereby covenants that no assignment, sale, agreement or encumbrance has been or will be made or entered into which would conflict with this assignment.
6. ASSIGNOR further covenants that ASSIGNEE will, upon its reasonable request, be provided promptly with all pertinent facts and documents relating to said invention and said Letters Patent and legal equivalents as may be known and accessible to ASSIGNOR and will, at ASSIGNEE's expense, testify as to the same in any interference, litigation or proceeding related thereto and will promptly execute and deliver to ASSIGNEE or its legal representatives, at ASSIGNEE's expense, any and all papers, instruments or affidavits required to apply for, obtain, maintain, issue and enforce said application, said invention and said Letters Patent and said equivalents thereof which may be reasonably necessary or desirable to carry out the purposes thereof.

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IN TESTIMONY WHEREOF, WE have hereunto set our hand(s) to this Patent Assignment:

Executed this 24th day of March,
at Rahway New Jersey.

Merck Sharp & Dohme Corp.

By: [Signature]

Name:

Title:

State of New Jersey

County of Union

Before me personally appeared said Iain Dukes
and acknowledged the foregoing instrument to be his/her free act
and deed this 24 day of March, 2014.

Seal

[Signature]

Notary Public

GARLEEN SHAMUS
NOTARY PUBLIC OF NEW JERSEY
COMMISSION EXPIRES DECEMBER 17, 2017

THIS PATENT ASSIGNMENT IS ACKNOWLEDGED AND AGREED TO AS OF THE DATE FIRST SET FORTH ABOVE:

Sirna Therapeutics, Inc.

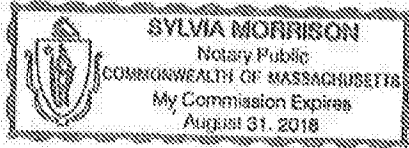
By: [Signature]
Name: Steven H. Boscorp
Title: Director, Vice President Intellectual Property

State of Massachusetts
County of Middlesex

Before me personally appeared said Steven Boscorp
and acknowledged the foregoing instrument to be his/her free act
and deed this 25th day of March, 2014.

[Signature]
Notary Public

Seal



Schedule 1

Patent and Applications

<u>Merck Case No.</u>	<u>Country</u>	<u>Status</u>	<u>Application/Patent No.</u>	<u>Filing date</u>	<u>Expiration Date (for granted patents)</u>	<u>Owner of Record</u>
Title: RNA Interference Mediated Inhibition of Gene Expression Using Chemically Modified Short Interfering Nucleic Acid (siNA)						
00001SIRMIS	US	Granted	8268986	05/11/2011	02/20/2023	Merck Sharp & Dohme Corp.
00001SIRMIS	US	Granted	8236944	04/06/2011	02/20/2023	Merck Sharp & Dohme Corp.
00001SIRMIS	US	Granted	8273866	11/03/2003	09/19/2028	Merck Sharp & Dohme Corp.
00001SIRMIS	US	Granted	8242257	04/06/2011	02/20/2023	Merck Sharp & Dohme Corp.
00001SIRMIS	US	Pending	13/471857	05/15/2012		Merck Sharp & Dohme Corp.
00001SIRMIS	US	Granted	8618277	05/25/2012	2/20/2023	Merck Sharp & Dohme Corp.
00001SIRMIS	US	Pending	14/083525	11/19/2013		Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Platelet Derived Endothelial Cell Growth Factor (ECGF1) Gene Expression Using Short Interfering Nucleic Acid (siNA)						
00002SIRMIS	US	granted	7678897	09/04/2008	02/20/2023	Merck Sharp & Dohme Corp.
00002SIRMIS	US	granted	7897755	01/19/2010	02/20/2023	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Protein Tyrosine Phosphate-1B (PTP-1B) Gene Expression Using Short Interfering Nucleic Acid (siNA)						
00006SIRMIS	US	Granted	7897757	2/25/2010	7/26/2022	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Treatment of Alzheimer's Disease using Short Interfering Nucleic Acid (siNA)						
00007SIRMIS	US	Granted	8017765	12/17/2009	08/15/2021	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Nogo and Nogo Receptor Gene Expression Using Short Interfering Nucleic Acid (siNA)						
00016SIRMIS	US	Granted	7897756	01/26/2010	02/20/2023	Merck Sharp & Dohme Corp.
00016SIRMIS	US	Granted	7691999	07/16/2008	02/20/2023	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Interleukin (and Interleukin Receptor) Gene Expression Using Short Interfering						

<u>Merck Case No.</u>	<u>Country</u>	<u>Status</u>	<u>Application/Patent No.</u>	<u>Filing date</u>	<u>Expiration Date (for granted patents)</u>	<u>Owner of Record</u>
Nucleic Acid						
00017SIRMIS	US	Granted	7923549	01/07/2010	02/14/2023	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Polycomb Group Protein EZH2 Gene Expression Using Short Interfering Nucleic Acid (siNA)						
00022SIRMIS	US	Granted	7928218	07/02/2008	02/13/2023	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Matrix Metalloproteinase 13 (MMP13) Gene Expression Using Short Interfering Nucleic Acid (siNA)						
00024SIRMIS	US	Granted	8013146	12/17/2009	02/20/2023	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of HIV Gene Expression Using Short Interfering Nucleic Acid (siNA)						
00029SIRMIS	US	Granted	8008472	05/11/2010	05/29/2022	Merck Sharp & Dohme Corp.
00029SIRMIS	US	Pending	13/179785	07/11/2011		Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Hepatitis C Virus (HCV) Gene Expression Using Short Interfering RNA						
00039SIRMIS	US	Granted	7915400	06/11/2008	03/26/2022	Merck Sharp & Dohme Corp.
00039SIRMIS	US	Granted	7935812	04/03/2009	03/26/2022	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Cyclin D1 Gene Expression Using Short Interfering Nucleic Acid (siNA)						
00041SIRMIS	US	Granted	8067575	08/28/2008	05/17/2022	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Stearoyl-CoA Desaturase (SCD) Gene Expression Using Short Interfering Nucleic Acid (siNA)						
00042SIRMIS	US	Granted	8017761	08/15/2008	07/19/2023	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Platelet Derived Growth Factor (PDGF) and Platelet Derived Growth Factor Receptor (PDGFR) Gene Expression Using Short Interfering Nucleic Acid (siNA)						
00046SIRMIS	US	Granted	7985853	05/11/2010	02/05/2023	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Severe Acute Respiratory Syndrome (SARS) Virus Gene Expression Using Short Interfering Nucleic Acid (siNA)						
00051SIRMIS	US	Granted	7928219	07/10/2008	02/20/2023	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Hypoxia Inducible Factor 1 (HIF1) Gene Expression using Short Interfering						

<u>Merck Case No.</u>	<u>Country</u>	<u>Status</u>	<u>Application/Patent No.</u>	<u>Filing date</u>	<u>Expiration Date (for granted patents)</u>	<u>Owner of Record</u>
Nucleic Acid (siNA)						
00052SIRMIS	US	Granted	7795422	07/17/2008	02/20/2023	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Stromal Cell-Derived Factor-1 (SDF-1) Gene Expression using Short Interfering Nucleic Acid (siNA)						
00055SIRMIS	US	Granted	7928220	03/16/2010	02/20/2023	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Muscarinic Cholinergic Receptor Gene Expression using Short Interfering Nucleic Acid (siNA)						
00057SIRMIS	US	Granted	7858771	12/10/2009	05/17/2022	Merck Sharp & Dohme Corp.
00057SIRMIS	US	Granted	8076472	11/19/2010	05/17/2022	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Vascular Cell Adhesion Molecule (VCAM) Gene Expression using Short Interfering Nucleic Acid (siNA)						
00059SIRMIS	US	Granted	8153778	01/26/2010	07/29/2023	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of CXCR4 Gene Expression using Short Interfering Nucleic Acid (siNA)						
00061SIRMIS	US	Granted	8013143	12/12/2008	02/20/2023	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of High Affinity IgE Receptor Alpha Chain (FC Epsilon R1 Alpha) Gene Expression using Short Interfering Nucleic Acid (siNA)						
00080SIRMIS	PCT	Expired	PCT/US10/028687	03/25/2010	N/A	Merck Sharp & Dohme Corp.
00080SIRMIS	US	Expired	61/164275	03/27/2009	N/A	Merck Sharp & Dohme Corp.
00080SIRMIS	US	Granted	8426581	03/25/2010	03/25/2030	Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of the Intracellular Adhesion Molecule 1 (ICAM-1) Gene Expression using Short Interfering Nucleic Acid (siNA)						
00084SIRMIS	PCT	Expired	PCT/US10/028674	03/25/2010	N/A	Merck Sharp & Dohme Corp.
00084SIRMIS	US	Expired	61/164314	03/27/2009	N/A	Merck Sharp & Dohme Corp.
00084SIRMIS	US	Pending	13/256170	03/25/2010		Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Isocitrate Dehydrogenase (IDH1) Gene Expression using Short Interfering Nucleic Acid (siNA)						

<u>Merck Case No.</u>	<u>Country</u>	<u>Status</u>	<u>Application/Patent No.</u>	<u>Filing date</u>	<u>Expiration Date (for granted patents)</u>	<u>Owner of Record</u>
00004SIRONC	AU	Pending	2012268619	06/01/2012		Merck Sharp & Dohme Corp.
00004SIRONC	CA	Pending	Not yet available	06/01/2012		Merck Sharp & Dohme Corp.
00004SIRONC	EPO	Pending	12796872.5	06/01/2012		Merck Sharp & Dohme Corp.
00004SIRONC	JP	Pending	Not yet available	06/01/2012		Merck Sharp & Dohme Corp.
00004SIRONC	PCT	Expired	PCT/US12/040332	06/01/2012	N/A	Merck Sharp & Dohme Corp.
00004SIRONC	US	Expired	61/493570	06/06/2011	N/A	Merck Sharp & Dohme Corp.
00004SIRONC	US	Pending	14/123822	06/01/2012		Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Poly Hydroxylase Domain 2 (PHD2) Gene Expression using Short Interfering Nucleic Acid (siNA)						
00002SIRBRE	EPO	Pending	11820590.5	08/24/2011		Merck Sharp & Dohme Corp.
00002SIRBRE	PCT	Expired	PCT/US11/048957	08/24/2011	N/A	Merck Sharp & Dohme Corp.
00002SIRBRE	US	Expired	61/377409	08/26/2010	N/A	Merck Sharp & Dohme Corp.
00002SIRBRE	US	Pending	13/818310	08/24/2011		Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Proyl Hydroxylase Domain 2 (PHD2) Gene Expression Using Short Interfering Nucleic Acid (siNA)						
00002SIRBRE	EPO	Pending	11820590.5	08/24/2011		Merck Sharp & Dohme Corp.
00002SIRBRE	PCT	Expired	PCT/US11/048957	08/24/2011	N/A	Merck Sharp & Dohme Corp.
00002SIRBRE	US	Expired	61/377409	08/26/2010	N/A	Merck Sharp & Dohme Corp.
00002SIRBRE	US	Pending	13/818310	08/24/2011		Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Hepatitis Virus (HBV) Gene Expression Using Short Interfering Nucleic Acid (siNA)						
00001SIRIFD	AU	Pending	2011292261	08/12/2011		Merck Sharp & Dohme Corp.

<u>Merck Case No.</u>	<u>Country</u>	<u>Status</u>	<u>Application/Patent No.</u>	<u>Filing date</u>	<u>Expiration Date (for granted patents)</u>	<u>Owner of Record</u>
00001SIRIFD	CA	Pending	2807307	08/12/2011		Merck Sharp & Dohme Corp.
00001SIRIFD	CN	Pending	201180050143.8	08/12/2011		Merck Sharp & Dohme Corp.
00001SIRIFD	EPO	Pending	11818592.5	08/12/2011		Merck Sharp & Dohme Corp.
00001SIRIFD	ID	Pending	W00201300513	08/12/2011		Merck Sharp & Dohme Corp.
00001SIRIFD	IN	Pending	761/CHENP/2013	08/12/2011		Merck Sharp & Dohme Corp.
00001SIRIFD	JP	Pending	2013-524886	08/12/2011		Merck Sharp & Dohme Corp.
00001SIRIFD	KR	Pending	10-2013-7006656	08/12/2011		Merck Sharp & Dohme Corp.
00001SIRIFD	PCT	Expired	PCT/US11/047512	08/12/2011	N/A	Merck Sharp & Dohme Corp.
00001SIRIFD	RU	Pending	2013111850	08/12/2011		Merck Sharp & Dohme Corp.
00001SIRIFD	TH	Pending	1301000702	08/12/2011		Merck Sharp & Dohme Corp.
00001SIRIFD	US	Expired	61/374555	08/17/2010	N/A	Merck Sharp & Dohme Corp.
00001SIRIFD	US	Pending	13/817152	08/12/2011		Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Catenin (Cadherin-Associated Protein), Beta 1 (CTNNB1) Gene Expression Using Short Interfering Nucleic Acid (siNA)						
00002SIRONC	AU	Pending	2011285909	08/02/2011		Merck Sharp & Dohme Corp.
00002SIRONC	CA	Pending	2805265	08/02/2011		Merck Sharp & Dohme Corp.
00002SIRONC	CN	Pending	201180037499.8	08/02/2011		Merck Sharp & Dohme Corp.
00002SIRONC	EPO	Pending	11815150.5	08/02/2011		Merck Sharp & Dohme Corp.
00002SIRONC	IN	Pending	142/CHENP/2013	08/02/2011		Merck Sharp & Dohme Corp.
00002SIRONC	JP	Pending	2013-523255	08/02/2011		Merck Sharp & Dohme Corp.

<u>Merck Case No.</u>	<u>Country</u>	<u>Status</u>	<u>Application/Patent No.</u>	<u>Filing date</u>	<u>Expiration Date (for granted patents)</u>	<u>Owner of Record</u>
00002SIRONC	PCT	Expired	PCT/US11/046178	08/02/2011	N/A	Merck Sharp & Dohme Corp.
00002SIRONC	US	Pending	13/937412	08/06/2013		Merck Sharp & Dohme Corp.
00002SIRONC	US	Expired	61/370064	08/02/2010	N/A	Merck Sharp & Dohme Corp.
00002SIRONC	US	Granted	8,518,907	08/02/2011	08/02/2031	Merck Sharp & Dohme Corp.
Title: Novel Cationic Lipids with Various Head Groups for Oligonucleotide Delivery						
00013MRLMIS	EPO	Pending	10810531.3	08/18/2010		Merck Sharp & Dohme Corp.
00013MRLMIS	PCT	Expired	PCT/US10/045854	08/18/2010	N/A	Merck Sharp & Dohme Corp.
00013MRLMIS	US	Expired	61/235476	08/20/2009	N/A	Merck Sharp & Dohme Corp.
00013MRLMIS	US	Expired	61/345754	05/18/2010	N/A	Merck Sharp & Dohme Corp.
00013MRLMIS	US	Pending	13/390702	08/18/2010		Merck Sharp & Dohme Corp.
Title: Novel Cationic Lipids for Oligonucleotide Delivery						
00022MRLMIS	PCT	Expired	PCT/US11/021619	01/19/2011	N/A	Merck Sharp & Dohme Corp.
00022MRLMIS	US	Expired	61/298022	01/25/2010	N/A	Merck Sharp & Dohme Corp.
00022MRLMIS	US	Pending	13/574315	01/19/2011		Merck Sharp & Dohme Corp.
Title: Preparation of Lipid Nanoparticles						
00024MRLMIS	EPO	Pending	11766711.3	04/07/2011		Merck Sharp & Dohme Corp. and Princeton University
00024MRLMIS	PCT	Expired	PCT/US11/031540	04/07/2011	N/A	Merck Sharp & Dohme Corp. and Princeton University
00024MRLMIS	US	Expired	61/322054	04/08/2010	N/A	Merck Sharp & Dohme Corp. and Princeton University

<u>Merck Case No.</u>	<u>Country</u>	<u>Status</u>	<u>Application/Patent No.</u>	<u>Filing date</u>	<u>Expiration Date (for granted patents)</u>	<u>Owner of Record</u>
00024MRLMIS	US	Pending	13/639628	04/07/2011		Merck Sharp & Dohme Corp. and Princeton University
Title: Novel Amino Alcohol Cationic Lipids for Oligonucleotide Delivery						
00032MRLMIS	PCT	Expired	PCT/US11/036944	05/18/2011	N/A	Merck Sharp & Dohme Corp.
00032MRLMIS	US	Expired	61/347640	05/24/2010	N/A	Merck Sharp & Dohme Corp.
00032MRLMIS	US	Pending	13/699451	05/18/2011		Merck Sharp & Dohme Corp.
Title: Novel Low Molecular Weight Cationic Lipids for Oligonucleotide Delivery						
00035MRLMIS	EPO	Pending	11790268.4	05/31/2011		Merck Sharp & Dohme Corp.
00035MRLMIS	JP	Pending	2013-513262	05/31/2011		Merck Sharp & Dohme Corp.
00035MRLMIS	PCT	Expired	PCT/US11/038490	05/31/2011	N/A	Merck Sharp & Dohme Corp.
00035MRLMIS	US	Expired	61/351373	06/04/2010	N/A	Merck Sharp & Dohme Corp.
00035MRLMIS	US	Expired	61/382067	09/13/2010	N/A	Merck Sharp & Dohme Corp.
00035MRLMIS	US	Pending	13/701636	05/31/2011		Merck Sharp & Dohme Corp.
Title: Novel Low Molecular Weight Cationic Lipids for Oligonucleotide Delivery						
00044MRLMIS	AU	Pending	2011305617	09/20/2011		Merck Sharp & Dohme Corp.
00044MRLMIS	BR	Pending	BR112013004585-0	09/20/2011		Merck Sharp & Dohme Corp.
00044MRLMIS	CA	Pending	2809858	09/20/2011		Merck Sharp & Dohme Corp.
00044MRLMIS	CN	Pending	201180045234.2	09/20/2011		Merck Sharp & Dohme Corp.
00044MRLMIS	EPO	Pending	11827342.4	09/20/2011		Merck Sharp & Dohme Corp.
00044MRLMIS	IN	Pending	1238/CHENP/2013	09/20/2011		Merck Sharp & Dohme Corp.

<u>Merck Case No.</u>	<u>Country</u>	<u>Status</u>	<u>Application/Patent No.</u>	<u>Filing date</u>	<u>Expiration Date (for granted patents)</u>	<u>Owner of Record</u>
00044MRLMIS	JP	Pending	2013-529412	09/20/2011		Merck Sharp & Dohme Corp.
00044MRLMIS	KR	Pending	10-2013-7006919	09/20/2011		Merck Sharp & Dohme Corp.
00044MRLMIS	MX	Pending	MX/A/2013/003084	09/20/2011		Merck Sharp & Dohme Corp.
00044MRLMIS	PCT	Expired	PCT/US11/052328	09/20/2011	N/A	Merck Sharp & Dohme Corp.
00044MRLMIS	RU	Pending	2013118224	09/20/2011		Merck Sharp & Dohme Corp.
00044MRLMIS	US	Expired	61/384486	09/20/2010	N/A	Merck Sharp & Dohme Corp.
00044MRLMIS	US	Expired	61/514270	08/02/2011	N/A	Merck Sharp & Dohme Corp.
00044MRLMIS	US	Pending	13/823830	09/20/2011		Merck Sharp & Dohme Corp.
Title: Low Molecular Weight Cationic Lipids for Oligonucleotide Delivery						
00045MRLMIS	EPO	Pending	11829806.6	09/28/2011		Merck Sharp & Dohme Corp.
00045MRLMIS	PCT	Expired	PCT/US11/053556	09/28/2011	N/A	Merck Sharp & Dohme Corp.
00045MRLMIS	US	Expired	61/388201	09/30/2010	N/A	Merck Sharp & Dohme Corp.
00045MRLMIS	US	Pending	13/876528	09/28/2011		Merck Sharp & Dohme Corp.
Title: Novel Low Molecular Weight Cationic Lipids for Oligonucleotide Delivery						
00046MRLMIS	EPO	Pending	11834914.1	10/17/2011		Merck Sharp & Dohme Corp.
00046MRLMIS	PCT	Expired	PCT/US11/056502	10/17/2011	N/A	Merck Sharp & Dohme Corp.
00046MRLMIS	US	Expired	61/405413	10/21/2010	N/A	Merck Sharp & Dohme Corp.
00046MRLMIS	US	Pending	13/880254	10/17/2011		Merck Sharp & Dohme Corp.
Title: Novel Low Molecular Weight Cationic Lipids for Oligonucleotide Delivery						
00047MRLMIS	EPO	Pending	11838596.2	10/31/2011		Merck Sharp & Dohme Corp.

<u>Merck Case No.</u>	<u>Country</u>	<u>Status</u>	<u>Application/Patent No.</u>	<u>Filing date</u>	<u>Expiration Date (for granted patents)</u>	<u>Owner of Record</u>
00047MRLMIS	PCT	Expired	PCT/US11/058498	10/31/2011	N/A	Merck Sharp & Dohme Corp.
00047MRLMIS	US	Expired	61/410472	11/05/2010	N/A	Merck Sharp & Dohme Corp.
00047MRLMIS	US	Pending	13/883487	10/31/2011		Merck Sharp & Dohme Corp.
Title: Diether Based Biodegradable Cationic Lipids for siRNA Delivery						
23206	PCT	Pending	PCT/US13/033641	03/25/2013		Merck Sharp & Dohme Corp.
23206	US	Expired	61/615982	03/27/2012	N/A	Merck Sharp & Dohme Corp.
Title: Novel Diester and Triester Based Low Molecular Weight, Biodegradable Cationic Lipids for Oligonucleotide Delivery						
23222	PCT	Pending	PCT/US13/036682	04/16/2013		Merck Sharp & Dohme Corp.
23222	US	Expired	61/635494	04/19/2012	N/A	Merck Sharp & Dohme Corp.
Title: Novel Single Chemical Entities and Methods for Delivery of Oligonucleotides						
00023MRLMIS	EPO	Pending	11766550.5	04/04/2011		Merck Sharp & Dohme Corp.
00023MRLMIS	PCT	Expired	PCT/US11/031080	04/04/2011	N/A	Merck Sharp & Dohme Corp.
00023MRLMIS	US	Expired	61/322422	04/09/2010	N/A	Merck Sharp & Dohme Corp.
00023MRLMIS	US	Pending	13/639952	04/04/2011		Merck Sharp & Dohme Corp.
Title: Novel Single Chemical Entities and Methods for Delivery of Oligonucleotides						
00039MRLMIS	EPO	Pending	11822416.1	08/29/2011		Merck Sharp & Dohme Corp.
00039MRLMIS	PCT	Expired	PCT/US11/049479	08/29/2011	N/A	Merck Sharp & Dohme Corp.
00039MRLMIS	US	Expired	61/378609	08/31/2010	N/A	Merck Sharp & Dohme Corp.
00039MRLMIS	US	Pending	13/819578	08/29/2011		Merck Sharp & Dohme Corp.
Title: Novel TetraGalNAc Containing Conjugates and Methods for Delivery of Oligonucleotides						
23227	AR	Pending	P130101481	04/30/2013		Merck Sharp & Dohme Corp.

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23227	PCT	Pending	PCT/US13/039025	05/01/2013		Merck Sharp & Dohme Corp.
23227	TW	Pending	102115516	04/30/2013		Merck Sharp & Dohme Corp.
23227	US	Expired	61/641761	05/02/2012	N/A	Merck Sharp & Dohme Corp.
23227	VE	Pending	2013-00508	05/02/2013		Merck Sharp & Dohme Corp.
Title: Novel TetraGalNAc and Peptide Containing Conjugates and Methods for Delivery of Oligonucleotides						
23228	AR	Pending	P130101480	04/30/2013		Merck Sharp & Dohme Corp.
23228	PCT	Pending	PCT/US13/039072	05/01/2013		Merck Sharp & Dohme Corp.
23228	TW	Pending	102115798	05/02/2013		Merck Sharp & Dohme Corp.
23228	US	Expired	61/641741	05/02/2012	N/A	Merck Sharp & Dohme Corp.
23228	VE	Pending	2013-00509	05/02/2013		Merck Sharp & Dohme Corp.
Title: Conjugates and Compositions for Cellular Delivery						
00003SIRMIS	US	Granted	7,833,992	04/30/2003	06/04/2026	Merck Sharp & Dohme Corp.
Title: Novel pH Switchable Peptides for Membrane Insertion and Pore Formation						
23433	US	Pending	61/765097	2/15/2013		Merck Sharp & Dohme Corp. and The University of Pennsylvania
Title: Endosomolytic Poly (Amidoamine) Disulfide Polymers for the Delivery of Oligonucleotides						
00025MRLMIS	PCT	Expired	PCT/US11/028260	03/14/2011	N/A	Merck Sharp & Dohme Corp.
00025MRLMIS	US	Expired	61/315223	03/18/2010	N/A	Merck Sharp & Dohme Corp.
00025MRLMIS	US	Pending	13/634579	03/14/2011		Merck Sharp & Dohme Corp.
Title: Poly(amide) Polymers for the Delivery of Oligonucleotides						
00042MRLMIS	EPO	Pending	11841433.3	11/16/2011		Merck Sharp &

<u>Merck Case No.</u>	<u>Country</u>	<u>Status</u>	<u>Application/Patent No.</u>	<u>Filing date</u>	<u>Expiration Date (for granted patents)</u>	<u>Owner of Record</u>
						Dohme Corp.
00042MRLMIS	PCT	Expired	PCT/US11/060893	11/16/2011	N/A	Merck Sharp & Dohme Corp.
00042MRLMIS	US	Expired	61/415546	11/19/2010	N/A	Merck Sharp & Dohme Corp.
00042MRLMIS	US	Pending	13/885737	11/16/2011		Merck Sharp & Dohme Corp.
Title: Membrane Lytic Poly(Amidoamine) for the Delivery of Oligonucleotides						
00043MRLMIS	PCT	Expired	PCT/US11/064308	12/12/2011	N/A	Merck Sharp & Dohme Corp.
00043MRLMIS	US	Expired	61/424216	12/17/2010	N/A	Merck Sharp & Dohme Corp.
00043MRLMIS	US	Pending	13/993698	12/12/2011		Merck Sharp & Dohme Corp.
Title: A Method for Rapidly Evaluating Performance of Short Interfering RNA with Novel Chemical Modifications						
00020MRLMIS	EPO	Pending	10842465.6	12/09/2010		Merck Sharp & Dohme Corp.
00020MRLMIS	PCT	Expired	PCT/US10/059696	12/09/2010	N/A	Merck Sharp & Dohme Corp.
00020MRLMIS	US	Expired	61/287452	12/17/2009	N/A	Merck Sharp & Dohme Corp.
00020MRLMIS	US	Pending	13/515454	12/09/2010		Merck Sharp & Dohme Corp.
Title: Post Synthetic Chemical Modification of RNA at the 2'-Position of the Ribose Ring Via Click Chemistry						
00028MRLMIS	EPO	Pending	11735064.5	01/19/2011		Merck Sharp & Dohme Corp.
00028MRLMIS	PCT	Expired	PCT/US11/021629	01/19/2011	N/A	Merck Sharp & Dohme Corp.
00028MRLMIS	US	Expired	61/297377	01/22/2010	N/A	Merck Sharp & Dohme Corp.
00028MRLMIS	US	Expired	61/325908	04/20/2010	N/A	Merck Sharp & Dohme Corp.
00028MRLMIS	US	Pending	13/574136	01/19/2011		Merck Sharp & Dohme Corp.
Title: Post Synthetic Chemical Modification of RNA at the 2'-Position of the Ribose Ring Via Alkyne, Aldehyde, and Amine Chemistry						
00034MRLMIS	PCT	Expired	PCT/US11/050903	09/09/2011	N/A	Merck Sharp &

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						Dohme Corp.
00034MRLMIS	US	Expired	61/383779	09/17/2010	N/A	Merck Sharp & Dohme Corp.
00034MRLMIS	US	Pending	13/821120	09/09/2011		Merck Sharp & Dohme Corp.
Title: Method of Predicting the Probability of Modulation of Transcript Levels in RNAi Compounds						
00088SIRMIS	PCT	Expired	PCT/US10/036463	05/27/2010	N/A	Merck Sharp & Dohme Corp.
00088SIRMIS	US	Expired	61/182605	05/29/2009	N/A	Merck Sharp & Dohme Corp.
00088SIRMIS	US	Pending	13/322931	05/27/2010		Merck Sharp & Dohme Corp.
00088SIRMIS	US	Pending	14/091459	11/27/2013		Merck Sharp & Dohme Corp.
Title: Segmented miRNA Mimetics						
00131SIRMIS	PCT	Expired	PCT/US10/046551	08/24/2010	N/A	Merck Sharp & Dohme Corp.
00131SIRMIS	US	Expired	61/236486	08/24/2009	N/A	Merck Sharp & Dohme Corp.
00131SIRMIS	US	Pending	13/391703	08/24/2010		Merck Sharp & Dohme Corp.
Title: Single-stranded RNAi Agents containing an internal, Non-Nucleic Acid Spacer						
00133SIRMIS	EPO	Pending	11820420.5	08/19/2011		Merck Sharp & Dohme Corp.
00133SIRMIS	JP	Pending	2013-526032	08/19/2011		Merck Sharp & Dohme Corp.
00133SIRMIS	PCT	Expired	PCT/US11/048338	08/19/2011	N/A	Merck Sharp & Dohme Corp.
00133SIRMIS	US	Expired	61/376471	08/24/2010	N/A	Merck Sharp & Dohme Corp.
00133SIRMIS	US	Pending	13/818306	08/19/2011		Merck Sharp & Dohme Corp.
Title: RNA Interference Mediated Inhibition of Gene Expression using Short Interfering Nucleic Acid (siNA)						
00134SIRMIS	EPO	Pending	11836946.1	10/25/2011		Merck Sharp & Dohme Corp.
00134SIRMIS	PCT	Expired	PCT/US11/057663	10/25/2011	N/A	Merck Sharp & Dohme Corp.

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00134SIRMIS	US	Expired	61/408428	10/29/2010	N/A	Merck Sharp & Dohme Corp.
00134SIRMIS	US	Pending	13/881415	10/25/2011		Merck Sharp & Dohme Corp.
Title: Short Interfering Mediated Inhibition of Gene Expression using Short Interfering Nucleic Acid (siNA)						
23225	PCT	Pending	PCT/US13/038305	04/26/2013		Merck Sharp & Dohme Corp.
23225	US	Expired	61/641626	05/02/2012	N/A	Merck Sharp & Dohme Corp.
Title: Short Interfering Nucleic Acid (siNA) molecules containing 2' Internucleoside Linkage (3dT)						
23441	US	Pending	61/767837	02/22/2013		Merck Sharp & Dohme Corp.
Title: Post Synthetic Orthogonal Amidation plus Metal Catalyzed Azide-Alkyne Cycloaddition Click Chemistry on siRNA						
23389	US	Expired	61/740083	12/20/2012		Merck Sharp & Dohme Corp.
23389	PCT	Pending	PCT/US13/07594	12/18/2013		Merck Sharp & Dohme Corp.
Title: Systemic delivery of Myostatin Short Interfering Nucleic Acids (siNA) conjugated to a Lipophilic Moiety						
23640	US	Pending	61/902358	11/11/2013		Merck Sharp & Dohme Corp.
Title: Membrane Translocation Assay for siRNA						
23659	US	Pending	61/911080	12/03/2013		Merck Sharp & Dohme Corp.