

APATH GLOBAL IN-LICENSED HCV-HCVcc PATENT ESTATE – 2010

Washington University (Rice) HCV Patent Estate Licensed Exclusively to Apath

Ref. No.	Title	Country	Status	Filing Date	Expiration Date
56029-6836	Nucleic Acids Comprising a Highly Conserved Novel 3' Terminal Sequence Element of the Hepatitis C Virus	US 08/520,678	Issued 2/23/99 Pat. No. 5,874,565	8/29/95	8/29/2015
56029-1094	Methods for the Detection of a Novel Hepatitis C Virus (HCV) Terminal 3' Noncoding Region	US 08/897,126 Divisional of US 08/520,678	Issued 10/2/01 Pat. No. 6,297,003	7/18/97	8/29/2015
56029-33776	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic Uses Thereof	US 10/158,314 Continuation of US 08/520,678	Issued 9/13/05 Pat. No. 6,943,246	5/30/02	8/29/2015
56029-3608	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic Uses Thereof	CA 2,230,452 Claims Priority to US 08/520,678	Granted 10/21/08 U.S. Patent No. 2,230,452	8/28/96	8/28/2016
56029-3606	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic Uses Thereof	AU 713112 Claims Priority to US 08/520,678	Issued 3/9/00 Pat. No. 713112	8/28/96	8/28/2016
56029-3610	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic Uses Thereof	MX 223839 Claims Priority to US 08/520,678	Issued 10/29/04 Pat. No. 223,839	8/28/96	8/28/2016
56029-3611	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic Uses Thereof	IL 123465 Claims Priority to US 08/520,678	Issued 12/30/04 Pat. No. 123465	8/28/96	8/28/2016
56029-3609	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic Uses Thereof	JP 510618/1997 Based on PCT/US96/14033	Issued 2/2/07 Pat. No. 3911022	8/28/96	8/28/2016
56029-64365	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic Uses Thereof	JP 2006-333873 Divisional of JP 510618/1997	Issued 10/26/07 Pat. No. 4031511	8/28/96	8/28/2016
56029-64366	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic	JP 2006-333874 Divisional of 510618/1997	Issued 2/8/08 Patent No.	8/28/96	8/28/2016

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	Uses Thereof		4077016		
56029-3612	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic Uses Thereof	EP App. No. 96929843.9 Regional Phase Based on PCT/US1996/014033	Granted 4/3/02 Pat. No. 0856051	8/28/96	8/28/2016
56029-8801	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic Uses Thereof	Belgium	Designated	8/28/96	8/28/2016
56029-8802	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic Uses Thereof	Switzerland	Designated	8/28/96	8/28/2016
56029-8803	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic Uses Thereof	Germany	Designated	8/28/96	8/28/2016
56029-8804	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic Uses Thereof	Spain	Designated	8/28/96	8/28/2016
56029-8805	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic Uses Thereof	France	Designated	8/28/96	8/28/2016
56029-8806	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic Uses Thereof	United Kingdom	Designated	8/28/96	8/28/2016
56029-8807	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic Uses Thereof	Ireland	Designated	8/28/96	8/28/2016
56029-8808	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic Uses Thereof	Italy	Designated	8/28/96	8/28/2016
56029-8809	Novel 3' Terminal Sequence of Hepatitis C Virus Genome and Diagnostic and Therapeutic Uses Thereof	Netherlands	Designated	8/28/96	8/28/2016
56029-8810	Novel 3' Terminal Sequence of Hepatitis C	Portugal	Designated	8/28/96	8/28/2016

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	Virus Genome and Diagnostic and Therapeutic Uses Thereof				
56029-1174	Functional DNA Clone for Hepatitis C Virus (HCV) and Uses Thereof	US 08/811,566 Continuation of (Cont.) 08/520,678	Issued 10/3/00 Pat. No. 6,127,116	3/4/97	8/29/2015 TD Filed
56029-4831	Functional DNA Clone for Hepatitis C Virus (HCV) and Uses Thereof	US 09/034,756 Continuation of US 08/811,566	Issued 5/21/02 Pat. No. 6,392,028	3/4/98	4/2/2017 PTA: 29 Days
56029-32897	Functional DNA Clone for Hepatitis C Virus (HCV) and Uses Thereof	US 10/704,407 CIP of US 08/520,678	Issued 6/26/07 Pat. No. 7,235,394	11/6/03	7/15/2016 PTA: 321 Days
56029-3613	Functional DNA Clone for Hepatitis C Virus (HCV) and Uses Thereof	PCT/US98/04428 Claims Priority to US 08/811,566	National Phase	2/26/98	9/4/1999
56029-1176	Functional DNA Clone for Hepatitis C Virus (HCV) and Uses Thereof	AU 69386/98 Based on PCT/US98/04428	Issued 4/4/02 Pat. No. 742175	2/26/98	2/26/2018
56029-1178	Functional DNA Clone for Hepatitis C Virus (HCV) and Uses Thereof	CA 2,283,464 Based on PCT/US98/04428	Issued 9/26/06 Pat. No. 2,283,464	2/26/98	2/26/2018
56029-1180	Functional DNA Clone for Hepatitis C Virus (HCV) and Uses Thereof	IL 131688 Based on PCT/US98/04428	Issued 12/21/07 Pat. No. 131688	2/26/98	2/26/2018
56029-1181	Functional DNA Clone for Hepatitis C Virus (HCV) and Uses Thereof	JP 538854/1998 Based on PCT/US98/04428	Issued 3/14/08 Pat No. 4094679	2/26/98	2/26/2018
56029-73593	Functional DNA Clone for Hepatitis C Virus (HCV) and Uses Thereof	2007-339488 Divisional of JP 538854/1998	Issued 11/28/08 Pat. No. 4223068	2/26/98	2/26/2018
56029-55463	HCV Variants	US 11/173,792 CON of US 09/034756	Issued 8/5/08 Pat. No. 7,407,758	7/1/05	11/12/2018 PTA: 253 Days
56029-4356	HCV Variants	US -09/576,989 CIP of US 08/811,566	Issued 5/23/06 Pat. No. 7,049,428	5/23/00	3/4/2017
56029-7868	HCV Variants	PCT/US2001/016822 Based on U.S. 09/576,989	National Phase	5/23/01	11/22/2002

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56029-36602	HCV Variants	AU 2001263407 Based on PCT/US2001/016822	Issued 3/22/07 Pat. No. 2001263407	5/23/01	5/23/2021
56029-60826	HCV Variants	AU 2006202902 DIV of AU 2001263407	Issued 11/8/07 Pat. No. 2006202902	5/23/01	5/23/2021
56029-36603	HCV Variants	CA 2,409,873 Based on PCT/US2001/016822	Pending with Office Action – Response Due 5/13/2010	5/23/01	
56029-36604	HCV Variants	EP 01937697.9 Based on PCT/US2001/016822	Published 4/2/03 Pub # 1296998 Deadline to File Divisional: 6/18/11	5/23/01	
56029-36605	HCV Variants	IL 152671 Based on PCT/US2001/016822	Granted 12/2/09 Pub # 02/2009	5/23/01	5/23/2021
56029-60829	A METHOD FOR PRODUCING A CELL LINE MORE PERMISSIVE FOR HCV REPLICATION AND A CELL LINE PRODUCED BY SAID METHOD	IL Application No. 176731 Divisional of IL 152671	Pending; Notice of Acceptance published on December 24, 2009	5/23/01	
56029-36606	HCV Variants	JP 2001-585612 Based on PCT/US2001/016822	Issued 3/14/08 Pat. No. JP 4095303	5/23/01	5/23/2021
56029-37102	HCV Variants	US 10/276,051 Based on PCT/US2001/016822	Issued 3/4/08 Pat. No. 7,338,759	11/12/02	12-5-2018 PTA: 641 Days
56029-44976	Highly Permissive Cell Lines for Hepatitis C Virus RNA Replication	PCT/US03/36634 Claims Priority to 60/426,256	National Phase	11/13/03	5/13/05
56029-54474	Highly Permissive Cell Lines for Hepatitis C	US 10/534,571 Based on	Issued 11/25/08	5/11/05	7/4/2024

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	Virus RNA Replication	PCT/US2003/036634	Pat. No. 7,455,969		PTA: 234 Days
56029-72243	Cell Lines Permissive for HCV Replication	US 11/960,391 Based on Expired US 60/039,843	Published 9/4/08 Pub No. US-2008- 0213750-A1	12/19/07	
56029-7002	Infectious Sindbis Virus Vector	US 07/815,602, Continuation of US 07/296,454	Issued 6/8/93 US. Pat. No. 5,217,879	12/27/91	6/8/2010

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Ref. No.	Title	Country	Status	Filing Date	Expiration Date
48062-68465	Infectious, Recombinant Hepatitis C Virus, Methods of Producing the Same and Methods of Use Thereof	US 11/366,839 Claims priority to expired US 60/658187	Allowed	3/3/06	
48062-84468	Infectious, Recombinant Hepatitis C Virus, Methods of Producing the Same and Methods of Use Thereof	12/581,597 Continuation of US 11/366,839	Pending	10/19/09	
48062-68466	Infectious, Recombinant Hepatitis C Virus, Methods of Producing the Same and Methods of Use Thereof	PCT/US06/07454	National Phase	3/3/06	9/4/07
48062-71366	Infectious, Recombinant Hepatitis C Virus, Methods of Producing the Same and Methods of Use Thereof	AU 2006220887 National Phase of PCT/US06/07454	Pending	3/3/06	
48062-71367	Infectious, Recombinant Hepatitis C Virus, Methods of Producing the Same and Methods of Use Thereof	EP Appl. No. 06 736 723.5 Regional Phase of PCT/US06/07454	Published	3/3/06	
48062-71368	Infectious, Recombinant Hepatitis C Virus, Methods of Producing the Same and Methods of Use Thereof	CA 2,603,711 National Phase of PCT/US06/07454	Pending	3/3/06	
48062-68463	STRUCTURE OF THE HEPATITIS C VIRUS NS5A PROTEIN	PCT/US06/006847	National Phase	2/28/06	8/28/07
48062-71360	STRUCTURE OF THE HEPATITIS C VIRUS NS5A PROTEIN	GB 0718984.8 National Phase of PCT/US06/006847	Published 12/5/07	2/28/06	
48062-70245	STRUCTURE OF THE HEPATITIS C VIRUS NS5A	US 11/817,309 National Phase of	Published	8/28/07	

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	PROTEIN	PCT/US06/006847	1/1/098		
48062-68430	HCV CORECEPTOR AND METHODS OF USE THEREOF	PCT/US07/010958	National Phase	5/4/07	11/4/08
48062-79423	HCV CORECEPTOR AND METHODS OF USE THEREOF	US 12/299,439 National Phase of PCT/US07/010958	Published 4/16/09	11/3/08	
48062-79419	HCV CORECEPTOR AND METHODS OF USE THEREOF	AU 2007248493 National Phase of PCT/US07/010958	Pending	5/4/07	
48062-79420	HCV CORECEPTOR AND METHODS OF USE THEREOF	CA 2,649,962 National Phase of PCT/US07/010958	Pending	5/4/07	
48062-79424	HCV CORECEPTOR AND METHODS OF USE THEREOF	EP 2016100 Regional Phase of PCT/US07/010958	Published 1/21/09	5/4/07	
48062-68468	STRUCTURE OF THE HEPATITIS C VIRUS NS2 PROTEIN	PCT/US06/008535	National Phase	3/9/06	9/9/08
48062-70246	STRUCTURE OF THE HEPATITIS C VIRUS NS2 PROTEIN	US 11/817,782 National Phase of PCT/US06/008535	Published 9/17/09	9/4/07	
48062-84546	NEW HCV ENTRY FACTOR, OCCLUDIN	PCT/US09/059285 Claims Priority to Expired US 61/102,588	Pending	10/1/09	

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Toray (Wakita) HCV Patent Estate Licensed Co-Exclusively to Apath for Drug Discovery and Biologics Research

Title	Application Number	Status	Filing Date	Expiration Date
Genes of Fulminant Hepatitis C Virus Strain	JP 2000-367365 Publication No. 2002-171978	Published	6/18/02	
Nucleic Acid Construct Containing Hepatitis C Virus (HCV) of Genotype 2a Genome Origin Nucleic Acid and Cell Having the Nucleic Acid Construct Transferred Thereinto	Application No. JP 2003-148242		5/26/03	
Nucleic Acid Construct Containing Hepatitis C Virus (HCV) of Genotype 2a Genome Origin Nucleic Acid and Cell Having the Nucleic Acid Construct Transferred Thereinto	Application No. JP 2003-329115		9/19/03	
Nucleic Acid Construct Containing Hepatitis C Virus (HCV) of Genotype 2a Genome Origin Nucleic Acid and Cell Having the Nucleic Acid Construct Transferred Thereinto	No. PCT/JP200315038 (claims priority to JP 2003-148242 and JP 2003-329115) Publication No. WO2004104198 A1 Published 12/2/04	National Phase 11/25/05 AU, CA, CN, EP, and US	5/26/03	
Nucleic Acid Construct Containing a Nucleic Acid Derived From the Genome of Hepatitis C Virus (Hcv) of Genotype 2A, and a Cell Having Such Nucleic Acid Construct Introduced Therein	US 10/558,155 Publication No. US2008/032323 Published 2/7/08	Pending	11/23/05	
Nucleic Acid Construct Containing Hepatitis C Virus (HCV) of Genotype 2a Genome-Origin Nucleic Acid and Cell Having the Nucleic Acid Construct Transferred Thereinto	EP 03774223.6 Publication No. 1627917 Published 2/22/06	Intention to Grant Designated Countries: DE, ES, FR, GB, IT Renewal Fee Paid	11/25/03	

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		12/8/09		
A Nucleic Acid Construct Containing a Nucleic Acid Derived from the Genome of Hepatitis C Virus (HCV) of Genotype 2a, and a Cell Having Such Nucleic Acid Construct Introduced Therein	CA 2525698 Publication No. 2525698 Published on 12/2/04 Examination Requested 10/20/08	Pending	11/25/03	
Nucleic Acid Construct Containing Hepatitis C Virus (HCV) of Genotype 2a Genome-Origin Nucleic Acid and Cell Having the Nucleic Acid Construct Transferred Thereinto	AU 2003284689 Publication No. AU 2003284689 Published 12/13/04	Application Lapsed	11/25/03	Lapsed 2/9/06
Nucleic Acid and Gene Originating in Novel HCV Strain and Replicon-Replicating Cell Using the Gene	JP 2003-329082		9/19/03	
Nucleic Acid and Gene Originating in Novel HCV Strain and Replicon-Replicating Cell Using Said Gene	US NP 10/572,476 US Publication No. US2009035747 Published 2/5/09	Published Ready for Examination	7/10/08	
Nucleic Acid and Gene Originating in Novel HCV Strain and Replicon-Replicating Cell Using the Gene	EP 04773387.8 Publication No. 1666598 6/7/06	Pending Examination in Process 1/29/10 4/12/09 Reply to Examination Report	9/16/04	
Nucleic Acid and Gene Originating in Novel HCV Strain and Replicon-Replicating Cell Using the Gene	CA 2539457 Publication No. 2539457 Published 3/31/05	Published Examination Requested 6/25/09	9/16/04	
Nucleic Acid Construct Containing Full-Length Genome of Human Hepatitis C Virus, Recombinant Full-Length Virus Genome Replicative Cell Having the Nucleic Acid Construct	JP 2004-045489		2/20/04	

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Transferred Thereinto and Method of Constructing Hepatitis C Viral Particles				
Nucleic Acid Construct Containing Full-Length Genome of Human Hepatitis C Virus, Recombinant Full-Length Virus Genome Replicative Cell Having the Nucleic Acid Construct Transferred Thereinto and Method of Constructing Hepatitis C Viral Particles	Application No. PCT/JP2005/03232 (Priority JP20040045489, filed 2/20/04) Publication No. WO 2005080575 Published 9/1/05	US, EP, JP, CA, KR, DE, CN	2/21/05	
Nucleic Acid Construct Containing Full-Length Genome of Human Hepatitis C Virus, Recombinant Full-Length Virus Genome Replicative Cell Having the Nucleic Acid Construct Transferred Thereinto and Method of Constructing Hepatitis C Viral Particles	US 10/589,902 Publication No. US 2008-0220019 Published 9/11/08	Pending	8/17/06	
Nucleic Acid Construct Containing Full-Length Genome of Human Hepatitis C Virus, Recombinant Full-Length Virus Genome Replicative Cell Having the Nucleic Acid Construct Transferred Thereinto and Method of Constructing Hepatitis C Viral Particles	EP Application No. 05719575.2 Publication No. EP1721985 Published 11/15/06	Pending Examination Requested 11/15/06 First Examination Report 9/12/07	2/21/05	
Nucleic Acid Construct Containing Full-Length Genome of Human Hepatitis C Virus, Recombinant Full-Length Virus Genome Replicative Cell Having the Nucleic Acid Construct Transferred Thereinto and Method of Constructing Hepatitis C Viral Particles	CA Application No. 2558685 Publication No. CA 2558685 Published 9/1/05	Published Examination Requested 8/31/09	2/21/05	
Nucleic Acid Construct Containing Full-Length Genome of Human Hepatitis C Virus, Recombinant Full-Length Virus Genome Replicative Cell Having the Nucleic Acid Construct Transferred Thereinto and Method of Constructing Hepatitis C Viral Particles	CN Application No. CN20058011515 Publication No. CN 1942585; Published 4/4/07	Published Examination Requested 5/30/07	2/21/05	
Nucleic Acid Construct Containing Full-Length Genome of Human Hepatitis C Virus, Recombinant Full-Length Virus	KR Application No. KR20067018856	Published	2/21/05	

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Genome Replicative Cell Having the Nucleic Acid Construct Transferred Thereinto and Method of Constructing Hepatitis C Viral Particles	Publication No. KR 20070011310A Published 1/24/07			
Modified Human Hepatitis C Virus Genomic RNA Having Autonomous Replicative Competence	JP Application No. 2004-243975		8/24/04	
Modified Human Hepatitis C Virus Genomic RNA Having Autonomous Replicative Competence	JP Application No. 2004-290801		10/1/04	
Modified Human Hepatitis C Virus Genomic RNA Having Autonomous Replicative Competence	JP Application No. 2005-069725		11/3/04	
Modified Human Hepatitis C Virus Genomic RNA Having Autonomous Replicative Competence	JP Application No. 2005-069527		11/3/05	
Modified Human Hepatitis C Virus Genomic RNA Having Autonomous Replicative Competence	Application No. PCT/JP2005/015833 Priority to JP2004-243975, filed 8/24/04 JP2004-290801, filed 10/1/04 JP2005-069725, filed 11/3/04 and JP 2005-069527, filed 11/3/05 Publication No. WO2006022422 Published 3/2/06	AU, CA, CN, EP, KR and US	8/24/05	
Modified Human Hepatitis C Virus Genomic RNA Having Autonomous Replicative Competence	US Application No. 11/660,794 (Based on PCT/JP2005/015833) Publication No. US2009176200 Published 7/9/09	Published Non Final Office Action Mailed 1/29/10	2/22/07	
Modified Human Hepatitis C Virus Genomic RNA Having Autonomous Replicative Competence	EP Application No. 05781421.2 Publication No. EP1801209,	Intention to Grant Patent Payment of Fees	8/24/05	

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	Published 6/27/07	(grant and printing) 1/20/10		
Modified Human Hepatitis C Virus Genomic RNA Having Autonomous Replicative Competence	AU Application No. 2005275713 Publication No. AU2005275713 Published 3/2/06	Published	8/24/05	
MODIFIED HUMAN HEPATITIS C VIRUS GENOMIC RNA THAT CAN BE AUTONOMOUSLY REPLICATED	CA Application No. 2578021 Publication No. CA 2578021 Published 3/2/06	Published	8/24/05	

APATH GLOBAL IN-LICENSED HCV-HCVcc PATENT ESTATE – 2010

US Public Health Service (Yanagi) HCV Patent Estate Licensed Non-Exclusively to Apath for Drug Discovery

Cloned Genome of Infectious Hepatitis C Virus of Genotype 2A and Uses Thereof	US 60/137,693	Abandoned	6/4/99	
Cloned Genome of Infectious Hepatitis C Virus of Genotype 2A and Uses Thereof	PCT/US00/15446 (Priority to US 60/137,693) Publication No. WO/2000/075338 Publication Date 12/14/2000	EP, US, AU	6/2/00	
Cloned Genome of Infectious Hepatitis C Virus of Genotype 2A and Uses Thereof	US 09/980,559 (Based on PCT/US00/15446) Publication No. US2007141668 Published 6/21/07	Issued 8/1/06 Pat. No. 7,084,266	5/14/02	2/6/2020
Cloned Genome of Infectious Hepatitis C Virus of Genotype 2A and Uses Thereof	US (Cont.) Application No. 11/451,212 (Continuation of US 09/980,559) Publication No. US 2007- 0141668, Published 6/21/07	Abandoned 1/22/10	6/12/06	
Cloned Genomes of Infectious Hepatitis C Viruses and Uses Thereof	US (Div.)11/784,809 Claims Priority to U.S. Patents 7,201,911 and 6,153,421 and U.S. Provisional No. 60,053,062 Publication No. US 2008- 0014212 Publication Date 1/17/08	Published	4/9/07	
Cloned Genome of Infectious Hepatitis C Virus of Genotype 2A and Uses Thereof	EP Appl. No. 00938146.8	Issued EP No. 1185664 Granted 12/14/2000 (No oppositions Filed); Validations Lapsed:	6/2/00	6/4/2019

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		AT (5/16/07); CY (5/16/07); DK (5/16/07); FI (5/16/07); NL (5/16/07); LU (5/16/07); MC (5/16/07); SE (5/16/07); GR (5/16/07); ES (5/16/07); PT (5/16/07); Validations: DE		

Tectra (Bukh) HCV Patent Estate Licensed Exclusively to Apath for Drug Discovery and Biologics Research

P&V reference	Genotype/ isolate	Priority (application no./priority or application date)	Subject matter covered in the description of the most recent application	Subject matter covered in the claims of the most recent application
43355EP01/DK 01	1a/H77C 1b/J4	EP 07123825.7 (20-12-2007) DK PA 2008 01377	<ul style="list-style-type: none"> - 1a/H77C, 1a/TN and 1b/J4 with adaptive mutations. - Genotype 3a/DBN with adaptive mutations. - Concept of moving adaptive mutations from one genotype, subtype, isolate to another. 	<ul style="list-style-type: none"> - 1a/H77C, 1a/TN and 1b/J4 with adaptive mutations. - Anti-HCV screening of 1a and 1b.

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		(01-10-2008)	<ul style="list-style-type: none"> - Neutralization studies (1a, 4a and 5a serum against 1a, 1b, 2a, 2b, 3a, 4a, 5a, 6a and 7a virus). - Antiviral screening with interferon (1a, 1b, 2a, 2b, 6a). - CD81 and SRBI role in entry of genotypes with adaptive mutations. - Confocal image based viral protein quantification and co-localization studies (genotype 1, 2 and 6) 	
43500EP01	2b/J8	EP 08162466.0 (15-08-2008)	<ul style="list-style-type: none"> - 2b/J8 (with one putative adaptive mutation). - CD81 and SRBI role in entry of genotypes withput (2a and 2b virus) and with (1a, 1b, 6a virus) adaptive mutations. - Antiviral screening with interferon, ribavirin and amantadine (1a, 1b, 2a, 2b, 6a). - Quantification of HCV Core and HCV NS5A antigen, intracellular lipid amount, co-localization of Core or NS5A with lipids (genotype 1a, 1b, 2a, 2b and 6a). - Neutralization studies (1a, 4a and 5a serum against 1a, 1b, 2a, 2b, 3a, 4a, 5a, 6a and 7a 	<ul style="list-style-type: none"> - Genotype 2b/J8 (with one putative adaptive mutation), - Anti-HCV screening of 2b/J8.

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			virus).	
41728PC01/DK 01/DK02	3a/S52	PCT/DK2008/050083 (11-04-2008) DK PA 2007 00544 (13-04-2007) DK PA 2007 01100 (27-07-2007)	<ul style="list-style-type: none"> - 3a/S52 with adaptive mutations. - Antiviral screening with interferon (3a) 	<ul style="list-style-type: none"> - 3a/S52 with adaptive mutations. - Anti-HCV screening of 3a/S52.
42341PC01/DK 01/DK02	4a/ED43, α , β , γ	PCT/DK2008/050085 (11-04-2008) DK PA 2007 00545 (13-04-2007) DK PA 2007 01841 (20-12-2007)	<ul style="list-style-type: none"> - 4a/ED43, α, β and γ with adaptive mutations. - Neutralization studies (1a, 4a and 5a serum against 1a, 2a, 3a, 4a, 5a and 6a virus). - Antiviral screening (4a). - Importance of CD81 (4a). 	<ul style="list-style-type: none"> - 4a/JFH1, 4a/ED43 with adaptive mutations. - Anti-HCV screening of 4a/JFH1.
	5a/SA13	PCT/DK2008/050113	<ul style="list-style-type: none"> - 5a/SA13 with adaptive mutations. 	<ul style="list-style-type: none"> - 5a/SA13 with adaptive mutations.

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<p>42445PC01/DK 01</p>		<p>(19-05-2008) DK PA 2007 00739 (18-05-2007)</p>	<ul style="list-style-type: none"> - Antiviral screening (5a).Neutralization studies (with gt. 5a sera: 5a/SA1, 5a/SA3, 5a/SA13 against 1a, 2a, 3a, 4a, 5a and 6a virus), (purified IgG of gt. 1a and 5a sera against 5a virus) and (1a, 4a serum against 1a, 2a, 3a, 4a, 5a and 6a virus). - Cell culture treatment study (with 5a sera) - Importance of CD81 and SRBI (5a). 	<ul style="list-style-type: none"> - Anti-HCV screening of 5a/JFH1.
<p>43449EP01</p>	<p>6a/HK6a</p>	<p>EP 07123851.3 (20-12-2007)</p>	<ul style="list-style-type: none"> - 6a/HK6a with adaptive mutations. - Antiviral screening with interferon, ribavirin and amantadine (1a, 1b, 2a, 2b, 6a). - CD81 and SRBI role in entry of genotypes without (2a and 2b virus) and with (1a, 1b, 6a virus) adaptive mutations. - Neutralization studies (1a, 4a and 5a serum against 1a, 1b, 2a, 2b, 3a, 4a, 5a, 6a and 7a 	<ul style="list-style-type: none"> - 6a/HK6a with adaptive mutation. - Anti-HCV screening of 6a/HK6a.

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			<p>virus).</p> <ul style="list-style-type: none"> - Quantification of HCV Core and HCV NS5A antigen, intracellular lipid amount, co-localization of Core or NS5A with lipids (genotype 1a, 1b, 2a, 2b and 6a). 	
44620EP01	7a/QC69	<p>EP 08162472.8 (15-08-2008)</p>	<ul style="list-style-type: none"> - 7a/QC69 with adaptive mutations. - CD81 and SRBI role in entry of genotypes without (2a) and with (7a) adaptive mutations. - Neutralization studies (1a, 4a and 5a serum against 1a, 1b, 2a, 2b, 3a, 4a, 5a, 6a and 7a virus). 	<ul style="list-style-type: none"> - 7a/QC69 with adaptive mutations. - Anti-HCV screening of 7a/QC69.
44701EP01/DK 01	ΔHVR/all/all	<p>EP 08163289.5 (29-08-2008)</p> <p>DK PA 2008 01186 (28-08-2008)</p> <p>DK PA 2009 00307 (06-03-2009)</p>	<ul style="list-style-type: none"> - ΔHVR1 for all genotypes (1a, 1b, 2b, 3a, 4a, 5a, 6a, 7a) and strains (H77, J4, J8, S52, ED43, SA13, HK6a and QC69). - Antiviral screening. - Neutralization studies (1a, 4a and 5a). 	<ul style="list-style-type: none"> - RNA with E2 and a deletion of at least part of HVR. (all strains and all adaptive mutations). - Anti-HCV screening.
44834US01	ΔGFP/all/all	US 61/102,772	<ul style="list-style-type: none"> - ΔGFP for all genotypes (1a, 	<ul style="list-style-type: none"> - reporter gene constructs (all

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		(03-10-2008)	<p>1b, 2a, 2b, 3a, 4a, 5a, 6a, 7a) and strains (H77, J4, J8, S52, ED43, SA13, HK6a and QC69, in update probably also TN).</p> <ul style="list-style-type: none"> - ΔLuc (2a, in update probably all gt). - J6/JFH1Δ - Antiviral screening. <ul style="list-style-type: none"> - 5' UTR 	<p>NS2 subtypes) with deletion in NS5A and adaptive mutations.</p> <ul style="list-style-type: none"> - Anti-HCV screening.
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P&V reference	Title	Genotype	Priority (application no./priority or application date)
46052DK01	JFH-1 based HCV Cell Culture Systems for NS5A of Genotypes 1-7	Genotype 1-7 expressing genotype specific NS5A	PA 2009 70142 (10.02.2009)

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University of Georgia Research Foundation/Millipore Renilla Luciferase Patent Estate
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Cloning and Expressions of Renilla Luciferase	US Cont. Application No. 08/079,700 (Continuation of Abandoned U.S. Continuation Application 07/933,017 filed 8/20/92 that is a continuation of Abandoned 07/458,952 filed 12/29/89)	Issued 3/8/94 Pat. No. 5,292,658	6/17/93	3/8/2011
Isolated Renilla Luciferase and Method of Use Thereof	US Cont. Divisional No. 08/167,650 (Divisional of U.S. 08/079,70 (Patent 5,292,658) that is a continuation of Abandoned 07/933,017 that is a continuation of Abandoned application 07/458,952))	Issued 5/23/95 Pat. No. 5,418,155	12/14/93	5/23/2012

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Promega Renilla Luciferase Patent Estate
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Synthetic Nucleic Acid Molecule Compositions and Methods of Preparation	US 09/645,706	Pending Final Rejection Mailed	8/24/00	
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RENILLA RENIFORMIS FLUORESCENT PROTEINS, NUCLEIC ACIDS ENCODING THE FLUORESCENT PROTEINS AND THE USE THEREOF IN DIAGNOSTICS, HIGH THROUGHPUT SCREENING AND NOVELTY ITEMS	US 7,109,315	Issued 9/19/06	3/15/2001	12/6/2026 PTA: 78 Days
LUCIFERASES, FLUORESCENT PROTEINS, NUCLEIC ACIDS ENCODING THE LUCIFERASES AND FLUORESCENT PROTEINS AND THE USE THEREOF IN DIAGNOSTICS, HIGH THROUGHPUT SCREENING AND NOVELTY ITEMS	US 6,232,107	Issued 5/15/01	3/26/1999	5/15/2021
LUCIFERASES, FLUORESCENT PROTEINS, NUCLEIC ACIDS ENCODING THE LUCIFERASES AND FLUORESCENT PROTEINS AND THE USE THEREOF IN DIAGNOSTICS, HIGH THROUGHPUT SCREENING AND NOVELTY ITEMS	US 6,436,682	Issued 08/20/2002	6/30/2000	10/28/2022 PTA: 69 Days
SYNTHETIC DNA ENCODING AN ORANGE SEAPEN-DERIVED GREEN FLUORESCENT PROTEIN WITH CODON PREFERENCE OF MAMMALIAN EXPRESSION SYSTEMS AND BIOSENSORS	US 6,780,974	Issued 8/24/2004	10/15/2001	6/11/2025 PTA: 291 Days
LUCIFERASES, FLUORESCENT PROTEINS, NUCLEIC ACIDS ENCODING THE LUCIFERASES AND FLUORESCENT PROTEINS AND THE USE THEREOF IN DIAGNOSTICS, HIGH THROUGHPUT SCREENING AND NOVELTY ITEMS	PCT/US/1999/06698 (Based on 60/079,624, filed 3/27/98; 60/089,367, filed 6/15/98 and 60/102,939, filed 10/1/98) Publication No. WO1999/49019 Publication Date 9/30/99	EP,	3/26/99	