

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
31 May 2001 (31.05.2001)

PCT

(10) International Publication Number
WO 01/38360 A3

(51) International Patent Classification⁷: **C07K 14/18**,
A61K 39/29, 39/295, C12N 15/51, 15/62, 15/85, 5/10,
1/19, C07K 16/08

Emeryville, CA 94608 (US). **HOUGHTON, Michael**
[GB/US]; Chiron Corporation, 4560 Horton Street, R-440,
Emeryville, CA 94608 (US).

(21) International Application Number: PCT/US00/32326

(74) Agents: **HARBIN, Alisa, A.**; Chiron Corporation, Intel-
lectual Property - R440, P.O. Box 8097, Emeryville, CA
94662-8097 et al. (US).

(22) International Filing Date:
22 November 2000 (22.11.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/167,502 24 November 1999 (24.11.1999) US

(63) Related by continuation (CON) or continuation-in-part
(CIP) to earlier application:
US 60/167,502 (CIP)
Filed on 24 November 1999 (24.11.1999)

(71) Applicant (for all designated States except US): **CHI-
RON CORPORATION** [US/US]; 4560 Horton Street,
Emeryville, CA 94608 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **COIT, Doris**
[US/US]; Chiron Corporation, 4560 Horton Street, R-440,
Emeryville, CA 94608 (US). **MEDINA-SELBY, Angel-
ica** [CL/US]; Chiron Corporation, 4560 Horton Street,
R-440, Emeryville, CA 94608 (US). **SELBY, Mark**
[US/US]; Chiron Corporation, 4560 Horton Street, R-440,

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ,
DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,
HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,
NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM,
TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF,
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

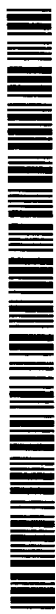
— with international search report

(88) Date of publication of the international search report:
7 March 2002

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: NOVEL HCV NON-STRUCTURAL POLYPEPTIDE

(57) Abstract: Polypeptides comprising a mutant non-structural Hepatitis C virus useful in diagnostic and/or immunogenic compositions are disclosed, in which the mutant is an N-terminal mutation that functionally disrupt the catalytic domain of NS3. Polynucleotides encoding these polypeptides, host cells transformed with polynucleotides and methods of using the polypeptides and polynucleotides are also disclosed.



WO 01/38360 A3

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/32326

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K14/18 A61K39/29 A61K39/295 C12N15/51 C12N15/62
C12N15/85 C12N5/10 C12N1/19 C07K16/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K A61K C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, BIOSIS, MEDLINE, CHEM ABS Data, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 696 640 A (BOEHRINGER MANNHEIM GMBH) 14 February 1996 (1996-02-14) claims 1-5,20 ---	1,2, 19-24, 26-30, 33-42
X	WO 95 25122 A (SCRIPPS RESEARCH INST) 21 September 1995 (1995-09-21) claim 12 --- -/--	1,2, 19-24, 26-30, 33-42



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

° Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

2 October 2001

Date of mailing of the international search report

16/10/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Lonnoy, 0

INTERNATIONAL SEARCH REPORT

In ational Application No

PCT/US 00/32326

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DIEPOLDER H ET AL: "Immunodominant CD4+ T-cell epitope within nonstructural protein 3 in acute hepatitis C virus infection" J VIROL., vol. 71, no. 8, August 1997 (1997-08), pages 6011-6019, XP002179125 table 5 ----	1,2
X	CHIEN DAVID Y ET AL: "Use of a novel hepatitis C virus (HCV) major-epitope chimeric polypeptide for diagnosis of HCV infection" JOURNAL OF CLINICAL MICROBIOLOGY, WASHINGTON, DC, US, vol. 37, no. 5, May 1999 (1999-05), pages 1393-1397, XP002155465 ISSN: 0095-1137 ----- figure 1	1-18,20, 24, 26-30, 33-40
A	----- figure 1	25,31,32
X	WO 93 09253 A (BAXTER DIAGNOSTICS INC) 13 May 1993 (1993-05-13) claim 1 -----	1,2
X	EP 0 450 931 A (CHIRON CORP) 9 October 1991 (1991-10-09) claim 3 -----	1,2
X	US 5 683 864 A (CHOO QUI-LIM ET AL) 4 November 1997 (1997-11-04) examples 1,6 -----	1,2
A	CLARKE B: "Molecular virology of hepatitis C virus" JOURNAL OF GENERAL VIROLOGY, SOCIETY FOR GENERAL MICROBIOLOGY, READING, GB, vol. 78, no. 10, 1997, pages 2397-2410, XP002172331 ISSN: 0022-1317 -----	
A	CHO J H ET AL: "Enhanced cellular immunity to hepatitis C virus nonstructural proteins by codelivery of granulocyte macrophage-colony stimulating factor gene in intramuscular DNA immunization" VACCINE, BUTTERWORTH SCIENTIFIC. GUILDFORD, GB, vol. 17, no. 9-10, 5 March 1999 (1999-03-05), pages 1136-1144, XP004158236 ISSN: 0264-410X ----- -/--	

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/32326

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 99 38880 A (GEN HOSPITAL CORP ; ENCKE JENS (US); WANDS JACK (US)) 5 August 1999 (1999-08-05) -----	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/32326

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0696640	A	14-02-1996	DE 4428705 A1	15-02-1996
			EP 0696640 A2	14-02-1996
			JP 8127592 A	21-05-1996
			US 6096319 A	01-08-2000
			US 6270960 B1	07-08-2001
WO 9525122	A	21-09-1995	US 5709995 A	20-01-1998
			AT 195953 T	15-09-2000
			CA 2184890 A1	21-09-1995
			DE 69518642 D1	05-10-2000
			DE 69518642 T2	03-05-2001
			EP 0759937 A1	05-03-1997
			WO 9525122 A1	21-09-1995
WO 9309253	A	13-05-1993	AU 3063992 A	07-06-1993
			CA 2099883 A1	08-05-1993
			EP 0573624 A1	15-12-1993
			JP 6505164 T	16-06-1994
			WO 9309253 A1	13-05-1993
			US 5747240 A	05-05-1998
EP 0450931	A	09-10-1991	AT 139343 T	15-06-1996
			AT 182684 T	15-08-1999
			AU 639560 B2	29-07-1993
			AU 7651091 A	30-10-1991
			BG 61291 B1	30-04-1997
			BR 9106309 A	20-04-1993
			CY 1881 A	05-04-1996
			DE 69120138 D1	18-07-1996
			DE 69120138 T2	14-11-1996
			DE 69131488 D1	02-09-1999
			DE 69131488 T2	18-11-1999
			DK 450931 T3	01-07-1996
			DK 693687 T3	29-11-1999
			EP 0450931 A1	09-10-1991
			EP 0693687 A1	24-01-1996
			ES 2088465 T3	16-08-1996
			ES 2134388 T3	01-10-1999
			FI 924349 A	28-09-1992
			GB 2257784 A ,B	20-01-1993
			GR 3020964 T3	31-12-1996
			GR 3031361 T3	31-01-2000
			HU 62706 A2	28-05-1993
			HU 217025 B	29-11-1999
			IE 911105 A1	09-10-1991
			JP 2733138 B2	30-03-1998
			KR 206150 B1	01-07-1999
			LT 1747 A ,B	25-07-1995
			LV 10344 A	20-10-1994
			LV 10344 B	20-02-1996
			NO 923839 A	19-11-1992
			PL 172133 B1	29-08-1997
			RO 109916 B1	28-07-1995
			RU 2130969 C1	27-05-1999
			WO 9115771 A1	17-10-1991
			US 5712087 A	27-01-1998
			US 5683864 A	04-11-1997

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/32326

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5683864	A	04-11-1997	US 5712087 A 27-01-1998
			AT 139343 T 15-06-1996
			AT 182684 T 15-08-1999
			AU 639560 B2 29-07-1993
			AU 7651091 A 30-10-1991
			BG 61291 B1 30-04-1997
			BR 9106309 A 20-04-1993
			CY 1881 A 05-04-1996
			DE 69120138 D1 18-07-1996
			DE 69120138 T2 14-11-1996
			DE 69131488 D1 02-09-1999
			DE 69131488 T2 18-11-1999
			DK 450931 T3 01-07-1996
			DK 693687 T3 29-11-1999
			EP 0450931 A1 09-10-1991
			EP 0693687 A1 24-01-1996
			ES 2088465 T3 16-08-1996
			ES 2134388 T3 01-10-1999
			FI 924349 A 28-09-1992
			GB 2257784 A ,B 20-01-1993
			GR 3020964 T3 31-12-1996
			GR 3031361 T3 31-01-2000
			HU 62706 A2 28-05-1993
			HU 217025 B 29-11-1999
			IE 911105 A1 09-10-1991
			JP 2733138 B2 30-03-1998
			KR 206150 B1 01-07-1999
			LT 1747 A ,B 25-07-1995
			LV 10344 A 20-10-1994
			LV 10344 B 20-02-1996
			NO 923839 A 19-11-1992
			PL 172133 B1 29-08-1997
			RO 109916 B1 28-07-1995
			RU 2130969 C1 27-05-1999
			WO 9115771 A1 17-10-1991
			AU 4750493 A 20-01-1994
			AU 666767 B2 22-02-1996
			AU 4750593 A 16-12-1993
			AU 666576 B2 15-02-1996
			AU 4750693 A 16-12-1993
			AU 640920 B2 09-09-1993
			AU 5278390 A 22-10-1990
			CA 2012482 A1 17-09-1990
			DE 388232 T1 02-05-1991
			EP 1034785 A2 13-09-2000
			EP 0388232 A1 19-09-1990
			FI 1062 B1
WO 9938880	A	05-08-1999	AU 2478699 A 16-08-1999
			BR 9908540 A 28-11-2000
			CN 1289339 T 28-03-2001
			EP 1056762 A1 06-12-2000
			WO 9938880 A1 05-08-1999