



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/US99/18016 (22) International Filing Date: 13 August 1999 (13.08.99) (30) Priority Data: 60/096,625 14 August 1998 (14.08.98) US (71) Applicant (for all designated States except US): CHIRON CORPORATION [US/US]; 4560 Horton Street, Emeryville, CA 94608 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): BUONAMASSI, Daniela, Tornese [IT/IT]; Chiron SpA, Via Fiorentina 1, I-53100 Siena (IT). GREER, Catherine, E. [US/US]; Chiron Corporation, 4560 Horton Street, Emeryville, CA 94608 (US). GALEOTTI, Cesira, L. [IT/IT]; Chiron SpA, Via Fiorentina 1, I-53100 Siena (IT). BENSI, Giuliano [IT/IT]; Chiron SpA, Via Fiorentina 1, I-53100 Siena (IT). PETRACCA, Roberto [IT/IT]; Chiron SpA, Via Fiorentina 1, I-53100 Siena (IT). (74) Agent: HARBIN, Alisa, A.; Chiron Corporation, Intellectual Property - R440, P.O. Box 8097, Emeryville, CA 94662-8097 (US).	(81) Designated States: CA, JP, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> (88) Date of publication of the international search report: 18 May 2000 (18.05.00)	
(54) Title: METHOD FOR PRODUCING YEAST EXPRESSED HPV TYPES 6 AND 16 CAPSID PROTEINS		
(57) Abstract <p>Mosaic VLPs of viral capsid proteins from different virus types are described, as are methods of making the same. Specifically, a diploid yeast strain that coexpresses the L1 and L2 capsid proteins of both HPV-6 and HPV-16 as mosaic VLPs is described. The mosaic VLPs induced the production conformational antibodies against both L1 proteins upon administration to mice.</p>		

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/18016

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 C12N15/37 C07K14/205 A61K39/12

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 C12N C07K

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 14564 A (LUDMERER STEVEN ;MERCK & CO INC (US)) 9 April 1998 (1998-04-09) examples 5,6	1-4,6,10
X	WO 96 05293 A (UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION ;BARALLE FRANCESCO) 22 February 1996 (1996-02-22) page 13, line 25 -page 17, line 10 --- -/--	1-3

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

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- "E" earlier document but published on or after the international filing date
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- "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.
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Date of the actual completion of the international search

11 February 2000

Date of mailing of the international search report

28/02/2000

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Cupido, M

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/18016

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>CHANG C ET AL: "Phenotypic mixing between different hepadnavirus nucleocapsid proteins reveals C protein dimerization to be cis preferential" JOURNAL OF VIROLOGY, vol. 68, no. 8, August 1994 (1994-08), pages 5225-5231, XP002130379 AMERICAN SOCIETY FOR MICROBIOLOGY US cited in the application page 5228, left-hand column, last paragraph -page 5229, right-hand column, paragraph 1</p>	1,2
A	<p>HOFMANN K J ET AL: "Sequence conservation within the major capsid protein of human papillomavirus (HPV) type 18 and formation of HPV-18 virus-like particles in Saccharomyces cerevisiae" JOURNAL OF GENERAL VIROLOGY, GB, SOCIETY FOR GENERAL MICROBIOLOGY, READING, vol. 77, no. 3, March 1996 (1996-03), pages 465-468, XP000604634 ISSN: 0022-1317 the whole document</p>	41-51

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 99/ 18016

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
Remark: Although claims 37-40
are directed to a method of treatment of the human/animal
body, the search has been carried out and based on the alleged
effects of the compound/composition.
2. Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such
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because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all
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2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment
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Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internat'l Application No PCT/US 99/18016

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9814564 A	09-04-1998	EP 0956349 A	17-11-1999
		US 5922588 A	13-07-1999
WO 9605293 A	22-02-1996	AT 402898 B	25-09-1997
		AT 154594 A	15-02-1997
		AU 3257495 A	07-03-1996
		EP 0775198 A	28-05-1997
		US 5932426 A	03-08-1999