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

(54) Title: NEISSERIA MENINGITIDIS VACCINES AND THEIR USE

(57) Abstract: Various polypeptides, or a variant or fragment thereof or a fusion of these are described which are useful in a vaccine. The polypeptide may be a polypeptide comprising the amino acid sequence selected from any one of SEQ ID Nos 2, 4, 6, 8, 10, 12, 14; or a fragment or variant thereof or a fusion of such a fragment or variant, and is useful in a vaccine against Neisseria meningitidis.



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INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2006/004877

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61K39/085 C07K14/22 A61P31/04

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)
A61K 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)

EPO-Internal, WPI Data, PAJ, BIOSIS, EMBASE, Sequence Search

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00/71725 A (CHIRON SPA [IT]; GIULIANI MARZIA MONICA [IT]; PIZZA MARIAGRAZIA [IT];) 30 November 2000 (2000-11-30) page 2, lines 1-14 page 55, paragraph 2 claims 1,2	1-5,7-9
X	TETTELIN H ET AL: "COMPLETE GENOME SEQUENCE OF NEISSERIA MENINGITIDIS SEROGROUP B STRAIN MC58" SCIENCE, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE,, US, vol. 287, 2000, pages 1809-1815, XP000914963 ISSN: 0036-8075 the whole document	1,2

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents :

<p>*A* document defining the general state of the art which is not considered to be of particular relevance</p> <p>*E* earlier document but published on or after the international filing date</p> <p>*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)</p> <p>*O* document referring to an oral disclosure, use, exhibition or other means</p> <p>*P* document published prior to the international filing date but later than the priority date claimed</p>	<p>*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</p> <p>*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</p> <p>*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.</p> <p>*Z* document member of the same patent family</p>
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Date of the actual completion of the international search	Date of mailing of the international search report
28 March 2007	13/07/2007

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 <p style="text-align: center;">Noë, Veerle</p>
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INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2006/004877

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 2005/060995 A2 (IMP COLLEGE INNOVATIONS LTD [GB]; TANG CHRISTOPH MARCEL [GB]; LI YANWE) 7 July 2005 (2005-07-07) cited in the application abstract example 2 claims 16-20,25-32 -----	1-9
P,X	WO 2006/067518 A (IMP COLLEGE INNOVATIONS LTD [GB]; TANG CHRISTOPH MARCEL [GB]; LI YANWE) 29 June 2006 (2006-06-29) the whole document -----	1-9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2006/004877

Box II Observations where certain claims were found unsearchable (Continuation of item 2 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:

Although claim 7 is 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 an extent that no meaningful International Search can be carried out, specifically:
3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

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

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; It is covered by claims Nos.:

1-9 (partially)

Remark on Protest

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

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-9 (partially)

Polypeptides, polynucleotides, methods for producing them, pharmaceutical compositions containing them and medical methods utilizing them insofar as they relate to SEQ ID No 2.

2. claims: 1-9 (partially)

Polypeptides, polynucleotides, methods for producing them, pharmaceutical compositions containing them and medical methods utilizing them insofar as they relate to SEQ ID No 4.

3. claims: 1-9 (partially)

Polypeptides, polynucleotides, methods for producing them, pharmaceutical compositions containing them and medical methods utilizing them insofar as they relate to SEQ ID No 6.

4. claims: 1-9 (partially)

Polypeptides, polynucleotides, methods for producing them, pharmaceutical compositions containing them and medical methods utilizing them insofar as they relate to SEQ ID No 8.

5. claims: 1-9 (partially)

Polypeptides, polynucleotides, methods for producing them, pharmaceutical compositions containing them and medical methods utilizing them insofar as they relate to SEQ ID No 10.

6. claims: 1-9 (partially)

Polypeptides, polynucleotides, methods for producing them, pharmaceutical compositions containing them and medical methods utilizing them insofar as they relate to SEQ ID No 12.

7. claims: 1-9 (partially)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Polypeptides, polynucleotides, methods for producing them,
pharmaceutical compositions containing them and medical
methods utilizing them insofar as they relate to SEQ ID No
14.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/GB2006/004877
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0071725 A	30-11-2000	AU 783894 B2	22-12-2005
		AU 5097700 A	12-12-2000
		BR 0010721 A	11-06-2002
		CA 2373236 A1	30-11-2000
		CN 1362992 A	07-08-2002
		EP 1179072 A2	13-02-2002
		JP 2003500420 T	07-01-2003
		MX PA01011867 A	06-05-2002
		NZ 515935 A	30-01-2004
		NZ 528254 A	29-07-2005
		NZ 536676 A	30-11-2006
		US 2005244436 A1	03-11-2005
		<hr style="border-top: 1px dashed black;"/>	
WO 2005060995 A2	07-07-2005	AU 2004305310 A1	07-07-2005
		CA 2550592 A1	07-07-2005
		CN 1925888 A	07-03-2007
		EP 1742708 A2	17-01-2007
		KR 20060131809 A	20-12-2006
<hr style="border-top: 1px dashed black;"/>			
WO 2006067518 A	29-06-2006	NONE	
<hr style="border-top: 1px dashed black;"/>			