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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: VACCINE

(57) **Abstract:** A polypeptide derived from the periplasmic space of *Yersinia pestis* or a fragment or a variant of said polypeptide for use as a medicament is described. Pharmaceutical compositions comprising such polypeptides, such as OppA from *Yersinia pestis*, are also described and claimed. In a preferred embodiment the pharmaceutical composition further comprises existing protective antigens from *Y. pestis* such as F1 and V antigens. Such compositions are protective in mice and may be used as a vaccine for the prophylactic or therapeutic treatment of plague.



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INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2006/004627A. CLASSIFICATION OF SUBJECT MATTER
INV. A61K39/02

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

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, BIOSIS, CHEM ABS Data, Sequence Search, MEDLINE, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/136075 A1 (MECSAS JOAN [US] ET AL) 23 June 2005 (2005-06-23) paragraph [0006]; claims 9-11,41	4-8,16
X	FLASHNER Y ET AL: "Generation of Yersinia pestis Attenuated Strains by Signature-Tagged Mutagenesis in Search of Novel Vaccine Candidates" INFECTION AND IMMUNITY, AMERICAN SOCIETY FOR MICROBIOLOGY. WASHINGTON, US, vol. 72, no. 2, 2004, pages 908-915, XP002365447 ISSN: 0019-9567 abstract page 913, column 1, last paragraph - column 2, paragraph 1; table 3 ----- -/--	4-8,16

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

& document member of the same patent family

Date of the actual completion of the international search

1 June 2007

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INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2006/004627

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	HILES I D ET AL: "PEPTIDE UPTAKE BY SALMONELLA-TYPHIMURIUM THE PERIPLASMIC OLIGOPEPTIDE-BINDING PROTEIN" EUROPEAN JOURNAL OF BIOCHEMISTRY, vol. 158, no. 3, 1986, pages 561-568, XP002435929 ISSN: 0014-2956 abstract	15
Y	GARMORY H S ET AL: "ATP-binding cassette transporters are targets for the development of antibacterial vaccines and therapies" INFECTION AND IMMUNITY, AMERICAN SOCIETY FOR MICROBIOLOGY. WASHINGTON, US, vol. 72, no. 12, December 2004 (2004-12), pages 6757-6763, XP002399895 ISSN: 0019-9567 the whole document	1-3,9-14
Y	LI BEI ET AL: "Protein Microarray for profiling antibody responses to Yersinia pestis live vaccine" INFECTION AND IMMUNITY, vol. 73, no. 6, June 2005 (2005-06), pages 3734-3739, XP002435930 ISSN: 0019-9567 abstract	1-3,9-14
A	PARKHILL J ET AL: "Genome sequence of Yersinia pestis, the causative agent of plague" NATURE, NATURE PUBLISHING GROUP, LONDON, GB, vol. 413, no. 6855, 4 October 2001 (2001-10-04), pages 523-527, XP002240957 ISSN: 0028-0836	
P,X	TANABE MIKIO ET AL: "The ABC transporter protein OppA provides protection against experimental Yersinia pestis infection" INFECTION AND IMMUNITY, vol. 74, no. 6, June 2006 (2006-06), pages 3687-3691, XP002435931 ISSN: 0019-9567 the whole document	1-16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2006/004627

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 claims 16 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 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:

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.:

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

International application No

PCT/GB2006/004627

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005136075	A1	23-06-2005	NONE