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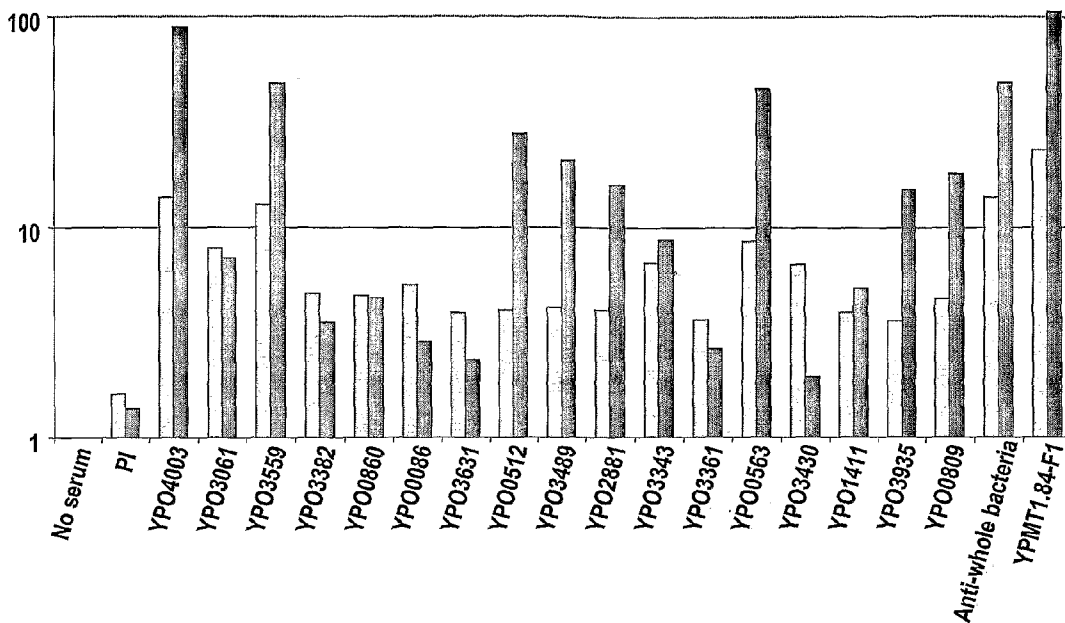
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[Continued on next page]

(54) Title: COMPOSITIONS COMPRISING YERSINIA PESTIS ANTIGENS



(57) Abstract: Disclosed are several *Y.pestis* antigens that are particularly suitable for immunisation purposes, particularly when used in combinations.

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3 January 2008

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.

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2006/003843

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61K39/02 A61P31/04 C12N1/20

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 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, BIOSIS, EMBASE, Sequence Search, 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	FLASHNER YEHUDA ET AL: "Generation of Yersinia pestis attenuated strains by signature-tagged mutagenesis in search of novel vaccine candidates." INFECTION AND IMMUNITY FEB 2004, vol. 72, no. 2, February 2004 (2004-02), pages 908-915, XP002441453 ISSN: 0019-9567 abstract	1, 2, 4, 5, 24-29, 36
A	LI BEI ET AL: "Protein microarray for profiling antibody responses to Yersinia pestis live vaccine." INFECTION AND IMMUNITY JUN 2005, vol. 73, no. 6, June 2005 (2005-06), pages 3734-3739, XP002441454 ISSN: 0019-9567 the whole document	1, 2, 4, 5, 24-29, 36-40

 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

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INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2006/003843

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	TITBALL R W ET AL: "YERSINIA PESTIS (PLAGUE) VACCINES" EXPERT OPINION ON BIOLOGICAL THERAPY, ASHLEY, LONDON, GB, vol. 4, no. 6, June 2004 (2004-06), pages 965-973, XP009062833 ISSN: 1471-2598 the whole document	1,2,4,5, 24-29, 36-40
A	ZHOU ET AL: "Transcriptome analysis of the Mg ²⁺ -responsive PhoP regulator in Yersinia pestis" FEMS MICROBIOLOGY LETTERS, AMSTERDAM, NL, vol. 250, no. 1, 1 September 2005 (2005-09-01), pages 85-95, XP005021271 ISSN: 0378-1097 the whole document	1,2,4,5, 24-29, 36-40
A	CHAIN P S G ET AL: "Insights into the evolution of Yersinia pestis through whole-genome comparison with Yersinia pseudotuberculosis." PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 21 SEP 2004, vol. 101, no. 38, 21 September 2004 (2004-09-21), pages 13826-13831, XP002441455 ISSN: 0027-8424 abstract	1,2,4,5, 24-29, 36-40
A	DENG W ET AL: "Genome Sequence of Yersinia pestis KIM" JOURNAL OF BACTERIOLOGY, WASHINGTON, DC, US, vol. 184, no. 16, August 2002 (2002-08), pages 4601-4611, XP003005391 ISSN: 0021-9193 the whole document	1,2,4,5, 24-29, 36-40
A	PARKHILL J ET AL: "Genome sequence of Yersinia pestis, the causative agent of plague" NATURE (LONDON), vol. 413, no. 6855, 4 October 2001 (2001-10-04), pages 523-527, XP002441456 ISSN: 0028-0836 the whole document	1,2,4,5, 24-29, 36-40

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INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2006/003843

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>SONG Y ET AL: "Complete genome sequence of Yersinia pestis strain 91001, an isolate avirulent to humans" DNA RESEARCH 2004 JAPAN, vol. 11, no. 3, 2004, pages 179-197, XP002441457 ISSN: 1340-2838 the whole document</p>	1,2,4,5, 24-29, 36-40
A	<p>GRANDI GUIDO ET AL: "The impact of genomics in vaccine discovery: achievements and lessons." EXPERT REVIEW OF VACCINES DEC 2004, vol. 3, no. 6, December 2004 (2004-12), pages 621-623, XP009086130 ISSN: 1744-8395 the whole document</p>	1,2,4,5, 24-29, 36-40
A	<p>ANISIMOV ANDREY P ET AL: "Intraspecific diversity of Yersinia pestis." CLINICAL MICROBIOLOGY REVIEWS, vol. 17, no. 2, April 2004 (2004-04), pages 434-464, XP002441458 ISSN: 0893-8512 the whole document</p>	1,2,4,5, 24-29, 36-40
A	<p>SERRUTO D ET AL: "Biotechnology and vaccines: application of functional genomics to Neisseria meningitidis and other bacterial pathogens" JOURNAL OF BIOTECHNOLOGY, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 113, no. 1-3, 30 September 2004 (2004-09-30), pages 15-32, XP004569596 ISSN: 0168-1656 the whole document</p>	1,2,4,5, 24-29, 36-40
A	<p>CAPECCHI BARBARA ET AL: "The genome revolution in vaccine research" CURRENT ISSUES IN MOLECULAR BIOLOGY, vol. 6, 2004, pages 17-27, XP002441459 ISSN: 1467-3037</p>	1,2,4,5, 24-29, 36-40

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2006/003843

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 36 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, 2, 4, 5, 24-29, 36-40 (all in part)

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, 2, 4, 5, 24-29, 36-40 (all in part)

An immunogenic composition comprising a combination of Y. pestis antigens, said combination comprising at least antigen YP04003, its therapeutic use, anti-YP04003 Ab and a Y. pestis bacterium in which expression of said Ag has been knocked out

2. claims: 1, 2, 4, 5, 24-29, 36-40 (all in part)

An immunogenic composition comprising a combination of Y. pestis antigens, said combination comprising at least antigen YP01604, its therapeutic use, anti-YP01604 Ab and a Y. pestis bacterium in which expression of said Ag has been knocked out

3. claims: 1-5, 24-29, 36-40 (all in part)

An immunogenic composition comprising a combination of Y. pestis antigens, said combination comprising at least antigen YP03489, its therapeutic use, anti-YP03489 Ab and a Y. pestis bacterium in which expression of said Ag has been knocked out

4. claims: 1, 2, 7, 24-27, 32, 33, 36-40 (all in part)

An immunogenic composition comprising a combination of Y. pestis antigens, said combination comprising at least antigen YP00499, its therapeutic use, anti-YP00499 Ab and a Y. pestis bacterium in which expression of said Ag has been knocked out

5. claims: 1, 2, 5, 7, 24-29, 32, 33, 36-40 (all in part)

An immunogenic composition comprising a combination of Y. pestis antigens, said combination comprising at least antigen YP00065, its therapeutic use, anti-YP00065 Ab and a Y. pestis bacterium in which expression of said Ag has been knocked out

6. claims: invention 6-84: claims 2-40 (all in part)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

inventions 6-84:

An immunogenic composition comprising a combination of Y. pestis antigens, said combination comprising at least one antigen, its therapeutic use, specific Ab and a Y. pestis bacterium in which expression of said Ag has been knocked out;

wherein the antigen is selected from:

YPMT1.42, YP00015, YP00086, YP00195, YP00203, YP00216,
YP00233, YP00351, YP00457, YP00468, YP00494, YP00496,
YP00500, YP00501, YP00502, YP00503, YP00505, YP00506,
YP00508, YP00509, YP00512, YP00514, YP00560, YP00563,
YP00570, YP00663, YP00694, YP00805, YP00809, YP00819,
YP00982, YP01002, YP01052, YP01053, YP01070, YP01123,
YP01222, YP01224, YP01354, YP01405, YP01411, YP01435,
YP01507, YP01746, YP01792, YP01906, YP02292, YP02342,
YP02506, YP02615, YP02674, YP02713, YP02881, YP02905,
YP02950, YP03026, YP03050, YP03061, YP03065, YP03343,
YP03361, YP03375, YP03382, YP03417, YP03430, YP03536,
YP03551, YP03559, YP03579, YP03631, YP03643, YP03644,
YP03646, YP03935, YP03982, YP04040, YP04070, YP04111,
YPPCP1.07
