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Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))
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(88) Date of publication of the international search report:

28 February 2013

(54) Title: INFLUENZA VACCINES CONTAINING MODIFIED ADENOVIRUS VECTORS

(57) Abstract: This disclosure provides universal influenza vaccines which can provide extended protection for several years, provide improved protection to circulating influenza strains that were not predicted accurately for annual vaccine manufacturing, and provide protection against newly emerging strains of influenza virus which carry the potential for establishing global pandemics.



WO 2012/162342 A3

A. CLASSIFICATION OF SUBJECT MATTER

A61K 39/145(2006.01)i, A61K 38/17(2006.01)i, A61K 38/16(2006.01)i, A61K 48/00(2006.01)i, A61P 31/16(2006.01)i, A61P 31/12(2006.01)i

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 39/145; A61K 31/70; A61P 43/00; A61K 9/14; A61K 39/00; A61K 9/127; C12N 15/00

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 practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: adenovirus hexon protein, matrix protein ectodomain, influenza A virus, hypervariable region, fusion protein

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	WO 2011-014794 A1 (PAXVAX, INC.) 03 February 2011 See claims 30, 32, 36, 37, 40-42; example 6; figs. 10-13.	1-7 8-11
X A	DONGMING ZHOU et al. 'A universal influenza A vaccine based on adenovirus expressing matrix-2 ectodomain and nucleoprotein protects mice from lethal challenge' Molecular Therapy, 2010, Vol. 18, No. 12, pp. 2182-2189, ISSN 1525-0016. See abstract; figure 1.	8-11 1-7
X	US 2008-0003239 A1 (RICHARD C. DUKE et al.) 03 January 2008 See paragraphs [0292] and [0295].	8,9
X	US 2009-0196915 A1 (GARY VAN NEST et al.) 06 August 2009 See paragraphs [0063] and [0064]; claims 1, 2, and 6-8.	8,9



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 application or patent 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 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

21 DECEMBER 2012 (21.12.2012)

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2012/039051**Box No. 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.: 17-21
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 17-21 pertain to methods for treatment of the human body by therapy, and thus relate to a subject matter which this International Searching Authority is not required, under Article 17(2)(a)(i) of the PCT and Rule 39.1(iv) of the Regulations under the PCT, to search.
2. ☒ Claims Nos.: 14, 17, 18, 22, 23
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:
Claims 14, 17, 18, 22, and 23 are unclear, since they either directly or indirectly refer to one of claims which are not drafted in accordance with PCT Rule 6.4(a).
3. ☒ Claims Nos.: 12, 13, 15, 16, 19-21, 24
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. 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:

Group I, claims 1-7, 12 (in part), 13, 14-16 (in part), and 22-24 (in part), related to a modified adenovirus hexon protein comprising a matrix protein ectodomain (M2e) from a strain of influenza A virus inserted in a hypervariable region of the hexon protein.

Group II, claims 8-11, 12 (in part), 14-16 (in part), and 22-24 (in part), directed to a fusion protein comprising: three matrix protein ectodomains (M2es) from three different strains of influenza A virus.

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 and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/039051

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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