

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
22 October 2009 (22.10.2009)

PCT

(10) International Publication Number
WO 2009/128949 A3

(51) International Patent Classification:

C12N 15/62 (2006.01) C07K 14/24 (2006.01)
C07K 14/18 (2006.01) C07K 14/32 (2006.01)
C07K 14/21 (2006.01) A61K 39/12 (2006.01)

(21) International Application Number:

PCT/US2009/002427

(22) International Filing Date:

17 April 2009 (17.04.2009)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/124,617	18 April 2008 (18.04.2008)	US
61/124,604	18 April 2008 (18.04.2008)	US
61/124,670	18 April 2008 (18.04.2008)	US
61/125,660	25 April 2008 (25.04.2008)	US
61/126,993	8 May 2008 (08.05.2008)	US
61/126,978	8 May 2008 (08.05.2008)	US
61/132,594	20 June 2008 (20.06.2008)	US
61/137,840	4 August 2008 (04.08.2008)	US
61/199,793	19 November 2008 (19.11.2008)	US
61/200,354	26 November 2008 (26.11.2008)	US

(71) Applicant (for all designated States except US): **VAXIN-NATE CORPORATION** [US/US]; 3 Cedar Brook Drive, Cranbury, NJ 08512 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **MCDONALD, William** [US/US]; 8121 Avalon Way, Shrewsbury, MA 01545 (US). **POWELL, Thomas, J.** [US/US]; 154 Dorset Lane, Madison, CT 06443 (US). **PRICE, Albert, E.** [US/US]; 494 Whitney Avenue, Unit 4B, New Haven, CT 06511 (US). **BECKER, Robert, S.** [US/US]; 4618 Ash Drive, Nazareth, NJ 18064 (US).

(74) Agents: **MURRAY, Mary, K.** et al.; Hamilton, Brook, Smith & Reynolds, P.C., 530 Virginia Road, P.O. Box 9133, Concord, MA 01742-9133 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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))

(88) Date of publication of the international search report:

11 March 2010

(54) Title: COMPOSITIONS OF DENGUE VIRAL PROTEINS AND METHODS OF USE

(57) Abstract: Compositions that include Dengue virus antigens and Toll-like Receptor agonists, optionally associated with particles, can be employed in methods that stimulate an immune response in a subject, in particular, a protective immune response in a subject. Compositions can further include an adjuvant and a carrier protein.



WO 2009/128949 A3

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2009/002427

A. CLASSIFICATION OF SUBJECT MATTER
 INV. C12N15/62 C07K14/18 C07K14/21 C07K14/24 C07K14/32
 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)
 C12N C07K 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, WPI Data, 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 2007/103322 A (VAXINNATE CORP [US]; SONG LANGZHOU [US]; NAKAAR VALERIAN [US]; PRICE A) 13 September 2007 (2007-09-13) page 286, line 21 - page 287, line 10 claims 74,84,117 Sequences: 500,623-627,693-696,699-702,763,765,767,769,810,841	1-29
X	WO 2007/031034 A (CT INGENIERIA GENETICA BIOTECH [CU]; LAZO VAZQUEZ LAURA [CU]; HERMIDA) 22 March 2007 (2007-03-22) sequence 24	1

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	"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
"E" earlier document but published on or after the international filing date	"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
"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)	"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.
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 1 October 2009	Date of mailing of the international search report 25/01/2010
--	---

Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Tudor, Mark
--	--

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/002427

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.:
because they relate to subject matter not required to be searched by this Authority, namely:

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 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:

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 fees, this Authority did not invite payment of additional fees.

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.:

see additional sheet(s)

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-29 (all partially)

Compositions comprising at least a portion of the Dengue virus antigens defined by SEQ ID Nos: 339, 343, 345, 347, 351-355, 371, 381-384, 387-390, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656 and 658 and the Toll-like Receptor 5 agonist defined by SEQ ID No: 28; methods of stimulating an immune response in a subject comprising administering said composition to said subject.

2. claims: 1-29 (all partially)

Idem as invention 1 but wherein the Toll-like Receptor 5 agonist is defined by SEQ ID No: 29.

3. claims: 1-29 (all partially)

Idem as invention 1 but wherein the Toll-like Receptor 5 agonist is defined by SEQ ID No: 30.

4. claims: 1-29 (all partially)

Idem as invention 1 but wherein the Toll-like Receptor 5 agonist is defined by SEQ ID No: 31.

5. claims: 1-29 (all partially)

Idem as invention 1 but wherein the Toll-like Receptor 5 agonist is defined by SEQ ID No: 32.

6. claims: 1-29 (all partially)

Idem as invention 1 but wherein the Toll-like Receptor 5 agonist is defined by SEQ ID No: 33.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2009/002427

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2007103322 A	13-09-2007	AR 059772 A1	30-04-2008
		AU 2007224034 A1	13-09-2007
		CA 2638760 A1	13-09-2007
		EP 1991264 A2	19-11-2008
WO 2007031034 A	22-03-2007	AR 058049 A1	23-01-2008
		AU 2006291863 A1	22-03-2007
		CA 2622827 A1	22-03-2007
		CN 101304760 A	12-11-2008
		EP 1944038 A1	16-07-2008
		JP 2009507864 T	26-02-2009
		KR 20080048068 A	30-05-2008
		US 2008311157 A1	18-12-2008
ZA 200802740 A	31-12-2008		