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(54) **Title:** VACCINE COMPOSITIONS COMPRISING AN ANTIGEN CONJUGATED OR FUSED TO A TOXIN AND A FUR-
THER ANTIGEN

(57) **Abstract:** An immunogenic composition comprising i) a first antigen; and ii) a second antigen linked to a toxin, wherein the
composition is capable of eliciting an immune response to the first antigen when administered to a human or non-human animal.
Uses of the immunogenic composition, and a pharmaceutical composition or a kit comprising the immunogenic composition.



INTERNATIONAL SEARCH REPORT

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PCT/GB2012/050802

A. CLASSIFICATION OF SUBJECT MATTER

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ADD.

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 practicable, search terms used)

EPO-Internal, BIOSIS, EMBASE, PAJ, 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 2010/196451 A1 (GARCON NATHALIE MARIE-JOSEPHE [BE] ET AL) 5 August 2010 (2010-08-05) claims 1, 7, 8, 9, 18-21 -----	1-16
X	US 2003/194411 A1 (RUBINSTEIN ARYE [US] ET AL) 16 October 2003 (2003-10-16) the whole document -----	1-16
X	WO 2007/062831 A1 (GLAXOSMITHKLINE BIOLOG SA [BE]; GARCON NATHALIE MARIE-JOSEPHE [BE]; HA) 7 June 2007 (2007-06-07) the whole document -----	1-16
X	WO 96/40242 A1 (SMITHKLINE BEECHAM BIOLOG [BE]; SLAOUI MONCEF MOHAMED [BE]; HAUSER PIE) 19 December 1996 (1996-12-19) the whole document ----- -/--	1-16



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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	STOCKER ET AL: "Antigen-specific targeting and elimination of EBV-transformed B cells by allergen toxins", JOURNAL OF ALLERGY AND CLINICAL IMMUNOLOGY, MOSBY, INC, US, vol. 116, no. 4, 1 October 2005 (2005-10-01), pages 910-915, XP005094487, ISSN: 0091-6749, DOI: 10.1016/J.JACI.2005.07.022 the whole document	1-16
A	----- NACHREINER T ET AL: "Depletion of autoreactive B-lymphocytes by a recombinant myelin oligodendrocyte glycoprotein-based immunotoxin", JOURNAL OF NEUROIMMUNOLOGY, ELSEVIER SCIENCE PUBLISHERS BV, XX, vol. 195, no. 1-2, 1 March 2008 (2008-03-01), pages 28-35, XP022612044, ISSN: 0165-5728, DOI: 10.1016/J.JNEUROIM.2008.01.001 [retrieved on 2008-02-15] the whole document -----	1-16

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2010196451 A1	05-08-2010	CA 2630547 A1 EP 1957105 A2 JP 2009517422 A US 2010196451 A1 WO 2007062832 A2	07-06-2007 20-08-2008 30-04-2009 05-08-2010 07-06-2007
US 2003194411 A1	16-10-2003	AU 1067599 A US 6139843 A US 6447778 B1 US 2003194411 A1 WO 9917789 A1	27-04-1999 31-10-2000 10-09-2002 16-10-2003 15-04-1999
WO 2007062831 A1	07-06-2007	CA 2630429 A1 EP 1951295 A1 JP 2009517421 A US 2010266672 A1 WO 2007062831 A1	07-06-2007 06-08-2008 30-04-2009 21-10-2010 07-06-2007
WO 9640242 A1	19-12-1996	AT 205724 T AT 400295 T AU 695720 B2 BR 9608612 A CZ 9703902 A3 DE 69615362 D1 DE 69615362 T2 DK 1090642 T3 EP 0831901 A1 EP 1090642 A2 ES 2164251 T3 ES 2308962 T3 HU 9802199 A2 JP 4233113 B2 JP 4653131 B2 JP H11507026 A JP 2007186524 A NO 975555 A NZ 311000 A PT 1090642 E SI 1090642 T1 TR 9701547 T1 WO 9640242 A1	15-10-2001 15-07-2008 20-08-1998 04-05-1999 13-05-1998 25-10-2001 13-06-2002 22-09-2008 01-04-1998 11-04-2001 16-02-2002 16-12-2008 28-01-1999 04-03-2009 16-03-2011 22-06-1999 26-07-2007 09-01-1998 29-04-1999 09-09-2008 31-12-2008 21-03-1998 19-12-1996