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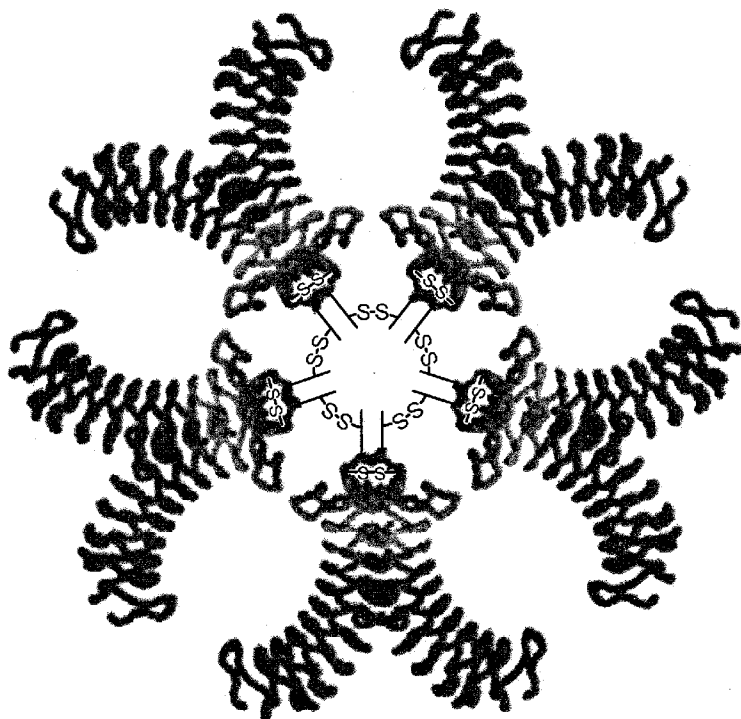
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[Continued on next page]

(54) Title: METHODS AND COMPOSITIONS RELATED TO SOLUBLE MONOCLONAL VARIABLE LYMPHOCYTE RECEPTORS OF DEFINED ANTIGEN SPECIFICITY



(57) Abstract: Disclosed are compositions and methods related to variable lymphocyte receptors (VLRs). More particularly, disclosed are a variety of antigen specific polypeptides, including soluble, monoclonal, and multivalent forms, as well as methods of using the polypeptides, antibodies that bind the antigen specific polypeptides, and nucleic acids, vectors and expression systems that encode the polypeptides. Antigen specific polypeptides that selectively bind pathogens, like anthrax, and carbohydrates, like blood group determinants, are specifically disclosed.

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European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

- with international search report
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A. CLASSIFICATION OF SUBJECT MATTER*C07K 14/00(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)

IPC 8 C07K 14/00, C12N 15/12, A61K 67/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility Models and Applications for Utility Models since 1975

Japanese Utility Models and Applications for Utility Models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS, WPI, USPTO, PAJ, NCBI, CAPLUS(STN), INSPECT "variable lymphocyte receptor, antigen specific, monoclonal, antigen, MHC, clone, transfection, polypeptide, culture, rearrangement, receptor, immunoglobulin, etc."

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- A	Science. Vol.310(5756):1970-1973. (Alder, M.N., et al., US) 23 Dec 2005 "Diversity and function of adaptive immune receptors in a jawless vertebrate." - see abstract; p.1970, the middle col., the 2nd paragraph ~ p.1971, the 1st paragraph; p.1972, the right col., the 2nd paragraph ~ p.1973; and Figs. 1 & 2 - see Methods and Materials available as supporting material on Science Online.	1-5,9-14,21,26,27,31-34,41,45-49 ----- 7,8,18-20,28,29,39
A	Proc Natl Acad Sci U S A. Vol.102(26):9224-9229. (Pancer, Z., et al., US) 28 Jun 2005 "Variable lymphocyte receptors in hagfish." - see abstract; and Figs. 3 & 4	1-5,7-14,18-21,26-29,31-34,39,41,45-49
A	Cell. Vol.124(4):815-822. (Cooper, M.D., et al., US) 24 Feb 2006 "The evolution of adaptive immune systems." - see abstract; p.817, the right col., the 2nd paragraph ~ p.819, the right col., the 1st paragraph; and Fig.2	1-5,7-14,18-21,26-29,31-34,39,41,45-49
A	Trends Immunol. Vol.25(12):640-644. (Flajnik, M.F., US) Dec 2004 "Evolution of innate and adaptive immunity: can we draw a line?" - see the whole document	1-5,7-14,18-21,26-29,31-34,39,41,45-49

 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

08 JANUARY 2008 (08.01.2008)

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2007/074620

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Trends Immunol. Vol.25(2):105-111. (Kasahara, M., et al., JP) Feb 2004 "On the origins of the adaptive immune system: novel insights from invertebrates and cold-blooded vertebrates." - see the whole document	1-5,7-14,18-21,26-29, 31-34,39,41,45-49
A	Semin Immunol. Vol.16(4):215-226. (Eason, D.D., et al., US) Aug 2004 "Mechanisms of antigen receptor evolution." - see the whole document	1-5,7-14,18-21,26-29, 31-34,39,41,45-49
A	Nat Rev Immunol. Vol.5(11):866-879. (Litman, G.W., et al., US) Nov 2005 "Reconstructing immune phylogeny: new perspectives." - see the whole document	1-5,7-14,18-21,26-29, 31-34,39,41,45-49
A	US 6903201 B2 (Padigaru, M., US) 07 Jun 2005 - see the whole document	1-5,7-14,18-21,26-29, 31-34,39,41,45-49
A	US 6521448 B1 (Edge, A.S.B., et al., US) 18 Feb 2003 - see the whole document	1-5,7-14,18-21,26-29, 31-34,39,41,45-49

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.: 30 & 40
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 30 & 40 are directed to a method of reducing pathogenicity comprising administering to the subject the antigen specific polypeptide. Said Method, therefore, falls into the category of methods for treatment of the human body or animal body by surgery or therapy as well as diagnostic methods. [Article 17(2)(a)(i), Rule 39.1(iv) PCT]
2. Claims Nos.: 6,15-17,22-25,35-38 & 42-44
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 6,15-17,22-25,35-38 & 42-44 are directed or referred to an antigen specific polypeptide without limiting the sequence and are considered too broad and so inadequately supported by the description that no meaningful search could be made.
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:

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/US2007/074620

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6903201 B2	07.06.2005	CA 2433782 A1	11.07.2002
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		EP 01007675 A1	14.06.2000
		US 6521448 B1	18.02.2003
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