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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.

(54) Title: SYNTHETIC ANTIBODY PHAGE LIBRARIES

(57) Abstract: The invention provides comprising variant amino acids in CDRs of antibody variable domains. These polypeptides provide a source of great sequence diversity that can be used as a source for identifying novel antigen binding polypeptides. The invention also provides these polypeptides as fusion polypeptides to heterologous polypeptides such as at least a portion of phage or viral coat proteins, tags, and linkers. Libraries comprising a plurality of these polypeptides are also provided. In addition, methods of and compositions for generating and using these polypeptides and libraries are provided.

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**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US03/17545

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : C07K 16/00; C07H 21/04; C12N 15/00, 7/00; A61K 39/395  
 US CL : 530/387.1, 387.3; 536/23.53; 435/69.1, 69.6, 235.1, 320.1; 424/130.1, 133.1, 135.1.

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)  
 U.S. : 530/387.1, 387.3; 536/23.53; 435/69.1, 69.6, 235.1, 320.1; 424/130.1, 133.1, 135.1.

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)  
 Please See Continuation Sheet

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,965,371 A (MARASCO et al) 12 October 1999 (12.10.1999), see columns 30-33.	1-8, 10-12, 16.
X	WU et al. Stepwise in vitro Affinity Maturation of Vitaxin, an alphaVbeta3-specific humanized antibody. Proc. Natl. Acad. Sci. USA. May 1998, Vol. 95, pages 6037-6042, see entire document, particularly page 6038, left column and Table 2.	1-2, 5, 8, 10-12, 14, 16-17, 34-35, 52-53, 67-68, 73-74.
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Y		39-40.

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent published on or after the international filing date	"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
"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)	"&" document member of the same patent family
"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	

Date of the actual completion of the international search

08 July 2004 (08.07.2004)

Date of mailing of the international search report

27 JUL 2004

Name and mailing address of the ISA/US

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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/17545

## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claim Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claim Nos.: 71  
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:  
Claim 71 is missing.
  
3.  Claim Nos.: 19-33, 36-38, 41-51 and 54-66  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of Item 2 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.  
 No protest accompanied the payment of additional search fees.

**INTERNATIONAL SEARCH REPORT**

PCT/US03/17545

**Continuation of B. FIELDS SEARCHED Item 3:**

WEST, Medline, EMBASE, Biosis, CAPLUS.

Search terms: CDR3, KSG, DVK, DSG, NVT, NNS, XYZ, NNK codon, antibody, combinatorial library, CDR, antibody 4D5, inventor search.