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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))

- (88) **Date of publication of the international search report:**
22 July 2010



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(54) **Title:** HUMANIZED ANTI-IL-6 ANTIBODIES

(57) **Abstract:** The present invention relates to novel chimeric, humanized or CDR-grafted anti-IL-6 antibodies, including isolated nucleic acids that encode at least one such anti-IL-6 antibody, vectors, host cells, transgenic animals or plants, and methods of making and using thereof, including therapeutic compositions, methods and devices.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 09/64321A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - A61K 39/395; C07K 16/00 (2010.01)
USPC - 424/145.1; 530/388.23

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)
USPC: 424/145.1; 530/388.23Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 424/130.1(keywords below)Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWEST(USPT, PGPB, EPAB, JPAB), Google Patents/Scholar: IL-6 antibody, humanized, engineered, affinity maturation, CDR, phage display.
GenCore 6.3: SEQ ID NO: 1, 3, 5, 7, 9, 11, 13,15,17,19,21,23,25,27,29,31,68,71-72,75-76,80,88,134,140-141,144,147,149,152-153, 156

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2006/0257407 A1 (Chen et al.) 16 November 2006 (16.11.2006) para [0006], [0038], [0041], SEQ ID NOs: 93 and 95	1-38
A	US 2003/0229208 A1 (Queen et al.) 11 December 2003 (11.12.2003) para [0009], SEQ ID NO: 18	1-38
A	US 2004/0081651 A1 (Karpusas et al.) 29 April 2004 (29.04.2004) para [0011], SEQ ID NO: 54	1, 3-38
A, P	US 2009/0317402 A1 (Rajpal et al.) 24 December 2009 (24.12.2009) para [0681]	1-38
A, P	US 2009/0297513 A1 (Garcia-Martinez et al.) 03 December 2009 (03.12.2009) para [0219]	1-38

 Further documents are listed in the continuation of Box C.

* 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 another 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

23 May 2010 (23.05.2010)

Date of mailing of the international search report

01 JUN 2010

Name and mailing address of the ISA/US

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 09/64321

Box No. 1 Nucleotide and/or amino acid sequence(s) (Continuation of item 1.c of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of a sequence listing filed or furnished:

a. (means)

on paper

in electronic form

b. (time)

in the international application as filed

together with the international application in electronic form

subsequently to this Authority for the purposes of search

2. In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

3. Additional comments:

GenCore 6.3: SEQ ID NO: 3, 7, 11, 15, 19, 23, 27, 31, 134, 140, 141, 144, 147, 149, 152, 153, 156; SEQ ID NO: 1, 5, 9, 13, 17, 21, 25, 29, 68, 71, 72, 75, 76, 80, and 88

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 09/64321

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:

Group I: claims 1, 3-38, drawn to an isolated antibody or antibody fragment that binds to human IL-6, comprising a heavy chain variable region and a light chain variable region of specific SEQ ID NOs, a method of using and preparing said antibody.

Group II, claims 2, drawn to an isolated antibody comprising a heavy chain and light chain complementarity determining regions (CDRs) derived from the variable regions from one or more of BA399, BA436, BA802, BA808, BA840, BA848, BA890 and BA939, and a constant region derived from one or more human antibodies.

- Please see extra sheet for continuation -

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 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.:

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.

***** Supplemental Box *****

Continuation of: Box NO III. Observations where unity of invention is lacking

The inventions listed as Groups I-II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The inventions of Group II do not include the inventive concept of an anti-IL-6 antibody comprising specific heavy and light chain variable regions of specific SEQ ID NOs, as required by Group I.

The inventions of Groups I-II share the technical feature of an isolated anti-IL-6 antibody. However, this shared technical feature does not represent a contribution over the prior art of US 2006/0257407 A1 to Chen, et al. that discloses anti-IL-6 Antibodies (abstract). As said anti-IL-6 antibody was known at the time of the invention, this cannot be considered a special technical feature that would otherwise unify the groups.

Groups I-II therefore lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.