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Published:

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— *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:
7 November 2013

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(54) Title: ANTI-CXCR3 ANTIBODIES

(57) Abstract: The present disclosure provides anti-CXCR3 antibodies and methods of using the antibodies to diagnose and/or treat CXCR3-associated disorders such as diabetes mellitus type I (T1D), particularly new-onset T1D. In certain embodiments, disclosed herein are CXCR3 neutralizing antibodies.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2013/022280

A. CLASSIFICATION OF SUBJECT MATTER
INV. C07K16/28
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)
C07K

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, WPI Data, BIOSIS, EMBASE, FSTA, CHEM ABS Data, EMBL

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2005/030793 A2 (MILLENNIUM PHARM INC [US]; QIN SHIXIN [US]; KASSAM NASIM [US]; NEWMAN) 7 April 2005 (2005-04-07) the whole document	1-52
X	WO 01/72334 A2 (CORIXA CORP [US]; ARIMILLI SUBHASHINI [US]; FERLIN WALTER [FR]; DESHPA) 4 October 2001 (2001-10-04) the whole document	1-52
X	WO 2008/094942 A2 (COGENESYS INC [US]; SMITH RODGER [US]; KANAKARAJ PALANISAMY [US]; ROSC) 7 August 2008 (2008-08-07) the whole document	1-52

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[X] Further documents are listed in the continuation of Box C.

[X] 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 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	Date of mailing of the international search report
11 September 2013	23/09/2013

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/022280

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.:

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

International application No
PCT/US2013/022280

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 184 358 B1 (LOETSCHER MARCEL [CH] ET AL) 6 February 2001 (2001-02-06) cited in the application the whole document	1-52
Y	I. CLARK-LEWIS: "Structure-Function Relationship between the Human Chemokine Receptor CXCR3 and Its Ligands", JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 278, no. 1, 27 December 2002 (2002-12-27), pages 289-295, XP55009694, ISSN: 0021-9258, DOI: 10.1074/jbc.M209470200 the whole document	1-52
Y	US 6 686 175 B1 (LOETSCHER MARCEL [CH] ET AL) 3 February 2004 (2004-02-03) the whole document	1-52
Y	WO 2010/103517 A1 (RAPPAPORT FAMILY INST FOR RES [IL]; KARIN NATHAN [IL]; WILDBAUM GIZI [] 16 September 2010 (2010-09-16) the whole document	1-52
Y	WO 2009/032661 A1 (SANOFI AVENTIS [FR]; LEE RENATA [US]; MIKOL VINCENT [FR]; ALLEN ELIZAB) 12 March 2009 (2009-03-12) cited in the application the whole document	1-52

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2013/022280

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2005030793 A2	07-04-2005	EP 1631315 A2	08-03-2006
		US 2005112119 A1	26-05-2005
		US 2009285835 A1	19-11-2009
		US 2011280875 A1	17-11-2011
		WO 2005030793 A2	07-04-2005
WO 0172334 A2	04-10-2001	AU 4954601 A	08-10-2001
		WO 0172334 A2	04-10-2001
WO 2008094942 A2	07-08-2008	AU 2008210589 A1	07-08-2008
		CA 2677163 A1	07-08-2008
		CN 101796073 A	04-08-2010
		EP 2115006 A2	11-11-2009
		JP 2010517531 A	27-05-2010
		KR 20100014869 A	11-02-2010
		US 2010047238 A1	25-02-2010
		WO 2008094942 A2	07-08-2008
US 6184358 B1	06-02-2001	JP 4955040 B2	20-06-2012
		JP 2009278990 A	03-12-2009
		US 6140064 A	31-10-2000
		US 6184358 B1	06-02-2001
		US 6686175 B1	03-02-2004
		US 6833439 B1	21-12-2004
		US 7029862 B1	18-04-2006
		US 2003158392 A1	21-08-2003
		US 2010061983 A1	11-03-2010
US 6686175 B1	03-02-2004	JP 4955040 B2	20-06-2012
		JP 2009278990 A	03-12-2009
		US 6140064 A	31-10-2000
		US 6184358 B1	06-02-2001
		US 6686175 B1	03-02-2004
		US 6833439 B1	21-12-2004
		US 7029862 B1	18-04-2006
		US 2003158392 A1	21-08-2003
		US 2010061983 A1	11-03-2010
WO 2010103517 A1	16-09-2010	NONE	
WO 2009032661 A1	12-03-2009	AR 068354 A1	11-11-2009
		AU 2008296538 A1	12-03-2009
		CA 2698203 A1	12-03-2009
		CN 101842115 A	22-09-2010
		CO 6270238 A2	20-04-2011
		CR 11293 A	23-03-2010
		DO P2010000069 A	31-03-2010
		EC SP109985 A	31-03-2010
		EP 2195023 A1	16-06-2010
		JP 2010537636 A	09-12-2010
		KR 20100061815 A	09-06-2010
		MA 31821 B1	01-11-2010
		NZ 583605 A	26-10-2012
		PA 8794201 A1	23-07-2009
		PE 09932009 A1	08-07-2009
		RU 2010111751 A	10-10-2011
		SV 2010003494 A	25-01-2011
		TW 200918558 A	01-05-2009

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2013/022280

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 2011027266 A1	03-02-2011
		UY 31309 A1	31-03-2009
		WO 2009032661 A1	12-03-2009

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-52(partially)

An antibody or antigen binding fragment capable of binding to CXCR3 as defined in claim 1 a): i.e. comprising the 3 CDRs of SEQ ID NO: 2 and the three CDRs of SEQ ID NO: 3. The DNA encoding said antibody. Vectors comprising said DNA. A method of producing said antibody. Pharmaceutical compositions comprising the antibody or the corresponding DNA. Methods of treatment or diagnosis involving the use of said antibody.

2-5. claims: 1-52(partially)

As subject 1 but for the groups defined in claim 1b), corresponding to group of inventions 2; claim 1c) , corresponding to group of inventions 3; claim 1d), corresponding to group of inventions 4; claim 1e) , corresponding to group of inventions 5.
