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- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
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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:**
21 March 2013

(54) **Title:** ANTI-EMR1 ANTIBODIES

(57) **Abstract:** The invention provides anti-EMR1 antibodies and methods of using such antibodies to treat EMR1-related diseases.



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 12/39717

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61K 39/00; A61K 39/395 (2012.01)

USPC - 424/133.1

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)

IPC(8) - A61K 39/00, A61K 39/395 (2012.01)

USPC - 424/133.1

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

USPC - 424/139.1, 141.1 (text search, see terms below)

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

PatBase; PubWEST(PGPB,USPT,EPAB,JPAB); Google Scholar (text search, see terms below)

Search Terms: Anti-EMR*, EMR*, EGF like module containing mucin like, antibod*, domain 6, ELD-6, ELD6, epidermal growth factor like motif, epidermal growth factor like domain, antigenic determinant, epitope, binding site, A10, mAb, Ab, EMR1, 19-1E7, 1E7

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- A	Abnova Datasheet entitled EMR1 purified MaxPab mouse polyclonal antibody (B01P), 19 May 2010 [online]. [Retrieved on 21 August 2012]. Retrieved from the internet: <URL: www.abnova.com/PDFServer/outputs/H00002015-B01P.pdf >	1-4 ----- 5-8, 11-14
A	WO 2007/064919 A2 (BIRTALAN et al.) 07 June 2007 (07.06.2007); SEQ ID NO:647 in Figure 14C; (page 34, ln 14-16)	5-8
A	US 2006/0002923 A1 (UEDE et al.) 05 January 2006 (05.01.2006); SEQ ID NO:26, Abstract, para [0277]	11-14

☐ 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

11 December 2012 (11.12.2012)

Date of mailing of the international search report

10 JAN 2013

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 12/39717

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.: 21-28, 34-41, 46-50
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:

--- Please see extra 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 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.: 1-20, limited to SEQ ID NOS: 39, 45, 51, 58, 64, 78 (namely claims 1-8 and 11-14)

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/US 12/39717

Continuation of Box No III Observations where unity of invention is lacking

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I+: Claims 1-20, drawn to an antibody that selectively binds to the epidermal growth factor-like domain-6 (ELD-6). The first named invention that will be search without an additional fee is an antibody comprising
a VH CDR3 sequence IYYRGFDQ (SEQ ID NO:39),
a VH CDR1 sequence DFGMH (SEQ ID NO:45),
a VH CDR2 sequence VIWSGGSTDY ADSVKG (SEQ ID NO:51),
a VL CDR3 sequence FQGVHVPLT (SEQ ID NO:58),
a VL CDR1 sequence RSSQSIVHSNGNNYLE (SEQ ID NO:64), and
a VL CDR2 sequence RVSNRAS (SEQ ID NO:78).

Applicant may have additional sequences searched for a fee and applicant must specify the additional sequence(s) to be searched. For example, the election of an antibody comprising a VH CDR3 sequence IYYRGFDS (SEQ ID NO:40) for search would require payment of a fee. Each unique antibody sequence constitutes an inventive concept. Please note that claims directed to a "sequence set forth in Figure 1" (i.e. SEQ ID NOs:1-22) are not included in the first named invention, as they comprise sequences that are not included in the first named invention. For example SEQ ID NO:1 would require search of VH CDR1 sequence DFGIH (SEQ ID NO:46) instead of sequence DFGMH (SEQ ID NO:45) of the first named invention. A search of SEQ ID NOs:1-22 of Figure 1 therefore would require payment of additional fees.

Group II: Claims 29-33, 42-45, drawn to methods of depleting eosinophils and methods of identifying a patient as a candidate for treatment with an agent that depletes eosinophils

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 shared technical feature of the inventions listed as Groups I+ and II is an anti-EMR1 antibody. This shared technical feature fails to provide a contribution over the prior art, as evidenced by the Abnova datasheet entitled "EMR1 purified MaxPab mouse polyclonal antibody (B01P)" (dated May 19, 2010 from <http://www.abnova.com/PDFServer/outputs/H00002015-B01P.pdf>; hereinafter 'Abnova'). Abnova discloses an isolated polyclonal anti-EMR1 antibody (p 1). In the absence of a contribution over the prior art, the shared technical feature is not a shared special technical feature.

The shared technical feature of the inventions listed as Groups I+ is the isolated antibody of claim 1. This shared technical feature fails to provide a contribution over Abnova, which discloses an isolated anti-EMR1 antibody comprising a heavy chain and a light chain (p 1 - polyclonal antibody against EMR1). Although Abnova does not expressly recite that the antibody selectively binds to the epidermal growth factor-like domain-6 (ELD-6) of EMR1, Abnova does disclose that the antibody is a polyclonal anti-EMR1 antibody which was raised against a full-length human EMR1 protein (p 1), including the EMR1 sequence RDIDECRQDPSTCGPNSI as set forth in applicant's claim 4 (p 1, sequence, line 6). Since polyclonal antibodies comprise a collection of immunoglobulins that bind to different epitopes of the target protein, the polyclonal antibody of Abnova comprises immunoglobulins that bind to different epitopes of the full length EMR1, including the epidermal growth factor-like domain-6 (ELD-6) of EMR1. An additional technical feature of each of the inventions listed as Group I+ is the specific polypeptide sequence recited therein, however no significant structural similarities can readily be ascertained. In the absence of a shared special technical feature, the inventions lack unity with one another.

Furthermore, the special technical feature of the inventions listed as Group II is the method or agent that depletes eosinophils. This special technical feature is not shared by the inventions of Groups I+.

The inventions of Groups I+ and II fail to share the same or corresponding special technical features and therefore lack unity with one another.