

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
29 October 2009 (29.10.2009)

PCT

(10) International Publication Number  
**WO 2009/132130 A3**

(51) International Patent Classification:  
*G01N 33/48* (2006.01)

(21) International Application Number:  
PCT/US2009/041441

(22) International Filing Date:  
22 April 2009 (22.04.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
61/046,847 22 April 2008 (22.04.2008) US  
61/097,344 16 September 2008 (16.09.2008) US

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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, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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))
- with sequence listing part of description (Rule 5.2(a))

(88) Date of publication of the international search report:  
17 December 2009

(54) Title: METHODS OF IDENTIFYING ANTI-INFLAMMATORY COMPOUNDS

(57) Abstract: A mammalian C-type lectin receptor type is identified which is shown to bind IgG antibodies or Fc fragments, thus inducing IVIG-related reversal of inflammation associated with various immune disorders. The identification of a DC-SIGN receptor type which interacts with IgG to promote a biological response reducing inflammation associated with immune disorders provides for methods of screening and selecting compounds which may be useful in treating various immune disorders by acting to modulate a DC-SIGN1+1 cell to signal a second effector macrophage, causing an increase in expression of the FcγRIIB receptor and in turn inhibiting a cellular-mediated inflammatory response.



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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 09/41441

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC(8) - G01N 33/48 (2009.01) USPC - 435/7.2 According to International Patent Classification (IPC) or to both national classification and IPC													
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) USPC: 435/7.2  Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched USPC: 435/7.2, 435/4 (text search)													
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Electronic data bases: (EPAB, JPAB, PGPB, USPT); Google Scholar Search Terms: IVIG, anti-inflammatory, Fc receptor, sialylated IgG Fc, DC-SIGN (CD209), DC-SIGNR, SIGN-R, SIGN-R1 (CD209a), CLEC4M,													
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>													
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<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/>													
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"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 3 October 2009 (03.10.2009)	Date of mailing of the international search report <b>21 OCT 2009</b>												
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young  PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774												

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US 09/41441

**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.: 3, 9, 12, 17, 23, 24  
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:

*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, 2, 4-8, 10, 11, 13-16, and 18-22, directed to a method of identifying a test compound useful to activate or suppress anti-inflammatory activity associated with IgG autoantibody-mediated inflammation

Group II: claims 25-32, directed to a method of treating an immune disorder comprising administering a compound that binds to and activates a DC-SIGN receptor type or a member of the signal transduction pathway thereof and mediates anti-inflammatory activity, with the proviso that the compound is not IVIG.

- 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.:  
1, 2, 4-8, 10, 11, 13-16, and 18-22

- 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.

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Continuation of Box III: Lack of Unity of Invention

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 special technical feature of the Group I claims is a method of identifying a test compound useful to activate or suppress anti-inflammatory activity associated with IgG autoantibody-mediated inflammation - not required by the claims of Group II. The special technical feature of the Group II claims is a method of treating an immune disorder comprising administering a compound that binds to and activates a DC-SIGN receptor type or a member of the signal transduction pathway thereof and mediates anti-inflammatory activity, with the proviso that the compound is not IVIG - not required by the claims of Group I. Neither of these special technical features is common to the other group, nor do they correspond to a special technical feature in the other group.

The only common technical element shared by the above groups is that they are related to modulation of DC-SIGN to alter anti-inflammatory activity in a subject. This common technical element does not represent an improvement over the prior art of US 2006/0269540 A1 to Robert et al. (see abstract; para [0015] - [0017], [0077], [0083], [0088]). Therefore, the inventions of Group I and Group II lack unity of invention under PCT Rule 13 because they do not share a same or corresponding special technical feature.