

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
24 January 2008 (24.01.2008)

PCT

(10) International Publication Number
WO 2008/010902 A3

(51) International Patent Classification:
C07K 14/00 (2006.01)

(21) International Application Number:
PCT/US2007/015105

(22) International Filing Date: 29 June 2007 (29.06.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/818,801 6 July 2006 (06.07.2006) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, 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, 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, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, 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
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
21 August 2008

(54) Title: REGULATION OF TLR SIGNALING BY COMPLEMENT

(57) Abstract: This invention provides methods of inducing the production of pro-inflammatory cytokines by activating a Toll like Receptor (TLR) and the complement system. This invention further provides vaccines that contain compounds that activate a Toll like Receptor (TLR) and the complement system.



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/15105

A. CLASSIFICATION OF SUBJECT MATTER

IPC: C07K 14/00(2006.01)

USPC: 514/2;530/300

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. : 514/2; 530/300

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)
EAST, Dialog

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	Mulligan et al. Requirement and role of C5a in acute lung inflammatory injury in rats. J. Clinical Investigation Vol. 98, No. 2, pages 503-512.	1-4, 8-10

☐ Further documents are listed in the continuation of Box C.

☐ 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 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
30 May 2008 (30.05.2008)

Date of mailing of the international search report

16 JUN 2008

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/15105

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:
Please See Continuation 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 any 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.: 1-4 and 8-10

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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International application No.
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BOX 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 1, claim(s) 1-4, 8-10, drawn to a method for inducing proinflammatory cytokines via activating anaphylatoxin receptors via C3a or C5a.

Group 2, claim(s) 1, 4, 5, drawn to a method for inducing proinflammatory cytokines via activating anaphylatoxin receptors via cobra venom factor.

Group 3, claim(s) 1, 4, 6, 7, drawn to a method for inducing proinflammatory cytokines via activating anaphylatoxin receptors via decay accelerating factor.

Group 4, claim(s) 1, 10, 11, drawn to a method for inducing proinflammatory cytokines via activating anaphylatoxin receptors via LPS.

Group 5, claim(s) 12-20, drawn to a method for preventing Toll-like receptor dependent inflammation via inhibiting anaphylatoxin receptor via C3a and C5a antagonists.

Group 6, claim(s) 21-26 and 30-32, drawn to a method for inducing immune response via activating anaphylatoxin receptors via C5a or C3a.

Group 7, claim(s) 21, 26, 27, drawn to a method for inducing immune response via activating anaphylatoxin receptors via cobra venom factor.

Group 8, claim(s) 21, 28, 29, drawn to a method for inducing immune response via activating anaphylatoxin receptors via decay accelerating factor.

Group 9, claim(s) 21, 32, 33, drawn to a method for inducing immune response via activating anaphylatoxin receptors via LPS.

Group 10, claim(s) 34-40, drawn to a method for inhibiting immune response via activating anaphylatoxin receptors via C5a or C3a.

Group 11, claim(s) 41-46, drawn to a method for treating TL17 mediated diseases via C5a antagonist.

Group 12, claim(s) 47-57, drawn to a vaccine.

The inventions listed as Groups 1-12 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 listed as Groups 1-12 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: Group 1 is obvious over Mulligan et al. (1996; Requirement and role of C5a in acute Form PCT/ISA/210 (extra sheet) (April 2007)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/15105

lung inflammatory injury in rats. J. Clinical Investigation 98(2): 503-512) who teach the C5a to induces cytokine production. Therefore, the claims lack a special technical feature and unity of invention is broken.