



(51) International Patent Classification:

*A61K 31/44* (2006.01)      *A61K 31/335* (2006.01)  
*A61K 31/472* (2006.01)      *A61K 31/336* (2006.01)  
*A61K 31/47* (2006.01)      *A61P 35/00* (2006.01)

(21) International Application Number:

PCT/US2012/024140

(22) International Filing Date:

7 February 2012 (07.02.2012)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/440,224      7 February 2011 (07.02.2011)      US

(71) Applicant (*for all designated States except US*): **CORNELL UNIVERSITY** [US/US]; Cornell Center for Technology, Enterprise & Commercialization (CCTC), 395 Pine Tree Road, Suite 310, Ithaca, New York 14850 (US).

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): **GLIMCHER, Laurie H.** [US/US]; 51 Hampshire Street, West Newton, MA 02465 (US).

(74) Agents: **MILASINCIC, Debra J.** et al.; Nelson Mullins Riley & Scarborough LLP, One Post Office Square, Boston, MA 02109-2127 (US).

(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.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, 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, RS, SE, SI, SK, SM, 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))*

(88) Date of publication of the international search report:

1 November 2012

(54) Title: METHODS FOR INCREASING IMMUNE RESPONSES USING AGENTS THAT DIRECTLY BIND TO AND ACTIVATE IRE-1

(57) Abstract: The invention provides, e.g., compositions and methods for increasing activation of immune cells.



WO 2012/109238 A3

## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/US2012/024140****A. CLASSIFICATION OF SUBJECT MATTER****A61K 31/44(2006.01)i, A61K 31/472(2006.01)i, A61K 31/47(2006.01)i, A61K 31/335(2006.01)i, A61K 31/336(2006.01)i, A61P 35/00(2006.01)i**

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)

A61K 31/44; A61K 39/395; C07D 265/30; A61K 31/5355; A61K 49/00; G01N 33/543; A61K 31/7088; A61P 35/00

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)

eKOMPASS (KIPO internal), NCBI (PubMed, MeSH), Google

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                                             | Relevant to claim No. |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| X         | WO 2010-031056 A2 (THE REGENTS OF THE UNIVERSITY OF CALIFORNIA)<br>18 March 2010                                                                               | 23                    |
| A         | See paragraphs [0126]–[0130]; claims 27–34 and 48; abstract.                                                                                                   | 24–30                 |
| A         | US 2004-0170622 A1 (LAURIE H. GLIMCHER et al.) 02 September 2004<br>See paragraphs [0252], [0303]–[0304] and [0306]; claims 19–32, 34–36, 43 and 46; abstract. | 23–30                 |
| A         | US 2009-0186893 A1 (JOHN B. PATTERSON et al.) 23 July 2009<br>See paragraphs [0003] and [0013]; claim 13; abstract.                                            | 23–30                 |
| A         | US 2009-0232738 A1 (LAURIE H. GLIMCHER et al.) 17 September 2009<br>See paragraphs [0040], [0218]–[0222] and [0230]; claims 6–10, 12, 16 and 23; abstract.     | 23–30                 |

☐ 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 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 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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

14 AUGUST 2012 (14.08.2012)

Date of mailing of the international search report

**17 AUGUST 2012 (17.08.2012)**

Name and mailing address of the ISA/KR

Korean Intellectual Property Office  
189 Cheongsu-ro, Seo-gu, Daejeon Metropolitan  
City, 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

SUNG Sun Young

Telephone No. 82-42-481-8405



**INTERNATIONAL SEARCH REPORT**

International application No.

**PCT/US2012/024140****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.: 1-22  
because they relate to subject matter not required to be searched by this Authority, namely:  
The claims 1-22 pertain to methods for treatment of the human body by therapy, and thus relate to a subject matter which this International Searching Authority is not required, under Article 17(2)(a)(I) of the PCT and Rule 39.1(iv) of the Regulations under the PCT, to search.
2. ☒ Claims Nos.: 31  
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:  
Claim 31 is unsearchable because the subject matter which protection is sought is not clearly defined.
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:

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 fee, this Authority did not invite payment of any additional fee.
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**

Information on patent family members

International application No.

**PCT/US2012/024140**

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s)                                                                                                                                                                                  | Publication<br>date                                                                                                                                    |
|-------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| WO 2010-031056 A2                         | 18.03.2010          | AU 2009-290617 A1<br>CA 2737388 A1<br>CN 102264728 A<br>EP 2340248 A2<br>JP 2012-502916 A<br>US 2011-319436 A1                                                                                              | 18.03.2010<br>18.03.2010<br>30.11.2011<br>06.07.2011<br>02.02.2012<br>29.12.2011                                                                       |
| US 2004-0170622 A1                        | 02.09.2004          | AU 2003-268356 A1<br>CA 2496897 A1<br>CA 2496897 C<br>EP 1572944 A2<br>EP 1572944 A4<br>JP 2006-515163 A<br>WO 2004-020610 A2<br>WO 2004-020610 A3                                                          | 19.03.2004<br>11.03.2004<br>31.01.2012<br>14.09.2005<br>26.12.2007<br>25.05.2006<br>11.03.2004<br>22.12.2005                                           |
| US 2009-0186893 A1                        | 23.07.2009          | CA 2690913 A1<br>CN 102015606 A<br>EP 2155643 A1<br>JP 04827986 B2<br>JP 2010-529147 A<br>JP 2011-121964 A<br>JP 4827986 B2<br>MX 2009013332 A<br>US 07858666 B2<br>US 2011-0065162 A1<br>WO 2008-154484 A1 | 18.12.2008<br>13.04.2011<br>24.02.2010<br>22.09.2011<br>26.08.2010<br>23.06.2011<br>30.11.2011<br>25.01.2010<br>28.12.2010<br>17.03.2011<br>18.12.2008 |
| US 2009-0232738 A1                        | 17.09.2009          | US 08227184 B2<br>US 2011-0052669 A1<br>WO 2009-091815 A2<br>WO 2009-091815 A3                                                                                                                              | 24.07.2012<br>03.03.2011<br>23.07.2009<br>11.09.2009                                                                                                   |