



(51) International Patent Classification:

A61K 38/17 (2006.01) A61K 31/711 (2006.01)
A61K 38/18 (2006.01) C12N 15/867 (2006.01)
A61K 31/7105 (2006.01) A61P 27/02 (2006.01)

(21) International Application Number:

PCT/US2011/045933

(22) International Filing Date:

29 July 2011 (29.07.2011)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/368,931 29 July 2010 (29.07.2010) US
61/441,501 10 February 2011 (10.02.2011) US
61/445,430 22 February 2011 (22.02.2011) US
61/480,082 28 April 2011 (28.04.2011) US

(71) Applicant (for all designated States except US): **TUFTS UNIVERSITY** [US/US]; 136 Harrison Avenue, Boston, Massachusetts 02110 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KUMAR-SINGH, Rajendra** [US/US]; 1 Nassau Street, Unit 2205, Boston, Massachusetts 02111 (US). **CASHMAN, Siobhan M.** [IE/US]; 4 Emerson Place, #403, Boston, Massachusetts

02114 (US). **SWEIGARD, John Harry** [US/US]; 37 Saxton Street, Unit 1, Dorchester, Massachusetts 02125 (US).

(74) Agents: **GUTERMAN, Sonia K.** et al.; Lawson & Weitzen, LLP, 88 Black Falcon Avenue, Suite 345, Boston, Massachusetts 02210 (US).

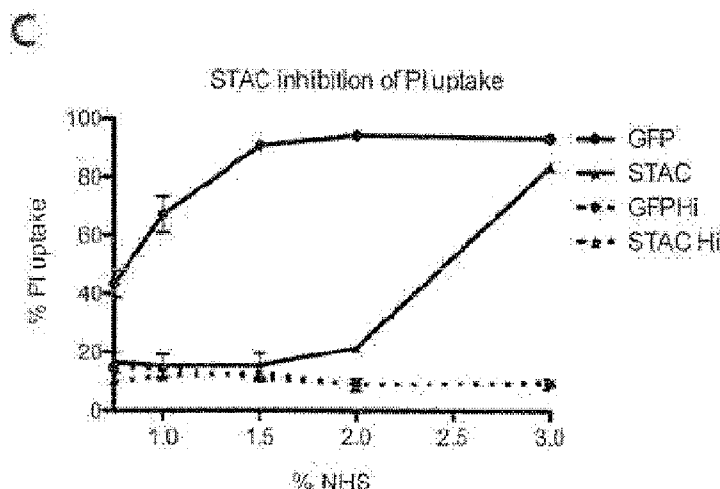
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, 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, RO, RS, RU, 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, 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).

[Continued on next page]

(54) Title: COMPOSITIONS, METHODS AND KITS FOR MODELING, DIAGNOSING, AND TREATING COMPLEMENT DISORDERS

Figure 23



(57) Abstract: Systems, compositions, methods, and kits for identifying potential therapeutic agents for treatment of complement based ocular diseases are provided herein. The methods and kits include a complement component 3 (C3) protein or derivative that is contacted to ocular cells or tissue. Another embodiment of the invention herein provides for diagnosis and/or prognosis of a complement-associated ocular disease. Compositions, methods and kits for regulating or treating a complement-related condition using at least one of CD46 protein, CD55 protein, and a recombinant chimeric soluble terminator of activated complement (STAC) protein or source of the STAC protein. The STAC protein includes an amino acid sequence including at least two of an amino acid sequence of a CD59 protein, an amino acid sequence derived from a CD46 protein, and an amino acid sequence derived from a CD55 protein, optionally further comprising a linker to connect amino acid sequences.



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:
24 May 2012

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/045933**A. CLASSIFICATION OF SUBJECT MATTER****A61K 38/17(2006.01)i, A61K 38/18(2006.01)i, A61K 31/7105(2006.01)i, A61K 31/711(2006.01)i, C12N 15/867(2006.01)i, A61P 27/02(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 38/17; A61P 27/02; A61P 9/10; A61K 48/00; A61K 38/16

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal), PubMed, Google

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	WO 2009-102488 A2 (TUFTS UNIVERSITY et al.) 20 August 2009 See abstract; claims.	64, 67, 87, 89, 90 8-10, 55-57, 63, 65 , 66, 76-79, 83-85, 88 , 101-103, 109 , 114-117, 122-127 , 133-135, 137 , 139-141
X A	US 2010-0120665 A1 (MICHAEL KALEKO et al.) 13 May 2010 See claims 48, 70, 74; Paragraph [0463].	76-79 8-10, 55-57, 63-67 , 83-85, 87-90 , 101-103, 109 , 114-117, 122-127 , 133-135, 137 , 139-141

☒ 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

"&" document member of the same patent family

Date of the actual completion of the international search

26 MARCH 2012 (26.03.2012)

Date of mailing of the international search report

27 MARCH 2012 (27.03.2012)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 189 Cheongsa-ro,
Seo-gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

PARK, JEONG UNG

Telephone No. 82-42-481-8131



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2011/045933

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2010-0130413 A1 (HENRY C. MARSH et al.) 27 May 2010 See abstract; claims.	8-10,55-57,63-67 ,76-79,83-85,87-90 ,101-103,109 ,114-117,122-127 ,133-135,137 ,139-141
A	RAMO, K. et al. `Evaluation of Adenovirus-Delivered Human CD59 as a Potential Therapy for AMD in a Model of Human Membrane Attack Complex Formation on Murine RPE` Investigative Ophthalmology & Visual Science. September 2008, Vol. 49(9), pp. 4126 - 4136 See Page 4126, lines 27 - 30; page 4129, lines 33 - 35.	8-10,55-57,63-67 ,76-79,83-85,87-90 ,101-103,109 ,114-117,122-127 ,133-135,137 ,139-141

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2011/045933**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.: 1-7,35-54,74,75,112,113
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 1-7,35-54,74,75,112,113 pertain to methods for treatment of the human by therapy, as well as a diagnostic method 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.: 24,29,32,44,59,73,107,108,119,121
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:
The scope of claims 24,29,32,44,59,73,107,108,119,121 are unclear, since they refer to claims which are not searchable due to not being drafted in accordance with the third sentences of PCT Rule 6.4(a).
3. ☒ Claims Nos.: See Extra sheet.
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.

Box No. II

The scope of claims 7, 11-23, 25-28, 30, 31, 33, 34, 38-43, 45-54, 58, 60-62, 68-72, 80-82, 86, 91-100, 104-106, 110, 111, 118, 120, 128-132, 136, 138, 142, 143 do not comply with the third sentence of PCT Rule 6.4(a) because multiple dependent claims should not serve as a basis for any other multiple dependent claim.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2011/045933

Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.b of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of :

a. a sequence listing filed or furnished

☐

on paper

☒

in electronic form

b. time of filing or furnishing

☒

contained in the international application as filed

☐

filed together with the international application in electronic form

☐

furnished subsequently to this Authority for the purposes of search

2. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

3. Additional comments:

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/045933

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2009-102488 A2	20.08.2009	AU 2009-215118 A1 CA 2715373 A1 EP 2252317 A2 JP 2011-514329 A JP 2011-514329 T US 2011-0015136 A1 WO 2009-102488 A3	20.08.2009 20.08.2009 24.11.2010 06.05.2011 06.05.2011 20.01.2011 20.08.2009
US 2010-0120665 A1	13.05.2010	AU 2008-221287 A1 CA 2678774 A1 CN 101657097 A EP 2134173 A2 EP 2134173 A4 IL 200368 D0 JP 2010-520224 A JP 2010-520224 T KR 10-2009-0122465 A MX 2009009200 A WO 2008-106644 A2 WO 2008-106644 A3	04.09.2008 04.09.2008 24.02.2010 23.12.2009 10.11.2010 29.04.2010 10.06.2010 10.06.2010 30.11.2009 28.10.2009 04.09.2008 20.11.2008
US 2010-0130413 A1	27.05.2010	CA 2666843 A1 EP 2083841 A2 EP 2083841 A4 WO 2008-048675 A2 WO 2008-048675 A3	24.04.2008 05.08.2009 07.09.2011 24.04.2008 24.04.2008