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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:

10 May 2012

(54) Title: COMPOSITIONS AND METHODS FOR INDUCING IMMUNE TOLERANCE

(57) Abstract: The present invention provides liposomal compositions for inducing immune tolerance. The compounds typically comprise a liposome displaying a specific antigen and also a binding moiety for a sialic acid binding Ig-like lectin (Siglec) expressed on B cells. The invention also provides methods for inducing tolerance to a protein or polypeptide antigen (e.g., a protein antigen) in a subject. The methods involve administering to the subject a pharmaceutical composition that co-presents both the antigen and a glycan ligand for a Siglec expressed on B lymphocytes.



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A. CLASSIFICATION OF SUBJECT MATTER*A61K 9/127(2006.01)i, A61K 47/48(2006.01)i, A61K 39/35(2006.01)i, A61P 29/00(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 9/127; A61K 39/39; A61K 9/50; A61K 39/00; A61K 48/00

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) & Keywords: liposomr, glycan ligand, siglec, antigen, immune tolerance, nanoparticle, CD22, lymphocyte

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	M. K. O'REILLY et al., "Siglecs as targets for therapy in immune-cell-mediated disease", Trends in Pharmacological Sciences, Vol. 30, No. 5, pp. 240-248, 2009.05 (2009.04.07: online available) See abstract, lines 16-27 in left-handed column in p. 242, lines 17-19 in left-handed column and lines 3-9 in right-handed column in p. 243 and lines 22-69 in right-handed column in p. 245.	1-5,7-10
A		6
X	US 2010-0129392 A1 (J. SHI et al.) 27 May 2010	1,3-5,7-10
A	See abstract, paragraphs [0068], [0070], [0071], [0627], and claims 10-12.	2,6
A	WO 2010-085509 A1 (NORTHWESTERN UNIVERSITY et al.) 29 July 2010	1-10
A	See abstract, paragraph [0066], and claims 1, 2, 10, 15.	
A	US 2003-0118659 A1 (T. J. AUGUST et al.) 26 June 2003	1-10
A	See abstract and claims 1, 22, 23.	

 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

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Name and mailing address of the ISA/KR

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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.: 11-25
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 11-25 are directed to a treatment method of the human body by therapy and thus relate to a subject matter which this International Searching Authority is not required to search under Article 17(2)(a)(i) of the PCT and Rule 39.1(iv) of the Regulations under the PCT.
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:

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/US2011/001343

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