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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))

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19 May 2011

(54) Title: OPHTHALMIC FORMULATIONS OF REVERSED LIQUID CRYSTALLINE PHASE MATERIALS AND METHODS OF USING

(57) Abstract: The eye is effectively treated by providing it with formulations including uncoated cationically charged microparticles of reversed cubic phase or reversed hexagonal phase material. The treatment methods are effective for a variety of diseases and conditions including dry eye. The structure, charge and components of the microparticles in dispersion, with or without an active ingredient, provide mucoadhesion, layering, protection and prolonged duration of ophthalmic action.



WO 2011/006079 A3

A. CLASSIFICATION OF SUBJECT MATTER*A61K 9/08(2006.01)i, A61K 38/13(2006.01)i, A61K 31/335(2006.01)i, A61K 31/34(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 9/08; C11D 1/00; A61K 9/14; A61K 35/78; B32B 15/02

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, Google

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005-0077497 A1 (DAVID ANDERSON) 14 April 2005 See abstract, Figures, paragraphs [0013]-[0015], [0026], [0064], [0127], [0131]-[0132], examples, claims	24-33
A	SHAH, J. C. et al. Cubic phase gels as drug delivery systems. Advanced Drug Delivery Reviews. 2001, vol. 47, pp. 229-250, ISSN: 0169-409X See the whole document	24-33
A	SAGALOWICZ, L. et al. Investigating reversed liquid crystalline mesophases. Current Opinion in Colloid & Interface Science. 2006, vol. 11, pp. 224-229, ISSN: 1359-0394 See the whole document	24-33
A	Müller-Goymann, C.C. Physicochemical characterization of colloidal drug delivery systems such as reverse micelles, vesicles, liquid crystal and nanoparticles for topical administration. European Journal of Pharmaceutics and Biopharmaceutics. 2004, vol. 58, pp. 343-356, ISSN: 0939-6411 See the whole document	24-33
A	US 6638621 B2 (ANDERSON; DAVID) 28 October 2003 See the whole document	24-33



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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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2010/041546**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.: 1-23, 34-37
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 1-23, 34-37 pertain to methods for treatment of the human by therapy, as well as diagnostic methods, 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.:
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

International application No.

PCT/US2010/041546

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 03-000236 A1 (LYOTROPIC THERAPEUTICS, INC) 03 January 2003 See the whole document	24-33

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

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