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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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22 December 2011

(54) Title: NONVIRAL GENE DELIVERY VECTOR IOPAMIDOL, PROTAMINE, ETHIODIZED OIL REAGENT (VIPER)

(57) Abstract: Embodiments are related to nonviral gene delivery vectors using only FDA-approved components: iopamidol, protamine, and ethiodized oil.



WO 2011/112902 A3

A. CLASSIFICATION OF SUBJECT MATTER*C12N 15/86(2006.01)i, A61K 48/00(2006.01)i, C12N 15/113(2010.01)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)

C12N 15/86

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: nonviral vector, ethiodized oil, iopamidol, protamine, gene delivery

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KIM et al. "Intraarterial gene delivery in rabbit hepatic tumors: transfection with nonviral vector by using iodized oil emulsion". Radiology. Sep 2006, Vol.240, No.3, pp.771-777. - See the whole document, especially abstract; introduction; materials and methods.	1-5,20
Y	LI et al. "Gene therapy progress and prospects: non-viral gene therapy by systemic delivery". Gene Ther. Sep 2006, Vol.13, No.18, pp.1313-1319. - See the whole document, especially abstract; pages 1314, 1315; table 1.	1-5,20
A	BREWER et al. "Protamine-induced condensation and decondensation of the same DNA molecule". Science. 01 Oct 1999, Vol.286, No.5437, pp.120-123. - See the whole document.	1-5,20
A	HUNTER et al. "Molecular hurdles in polyfectin design and mechanistic background to polycation induced cytotoxicity". Adv Drug Deliv Rev. 01 Dec 2006, Vol.58, No.14, pp.1523-1531. - See the whole document.	1-5,20
A	SORGI et al. "Protamine sulfate enhances lipid-mediated gene transfer". Gene Ther. Sep 1997, Vol.4, No.9, pp.961-968. - See the whole document.	1-5,20



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

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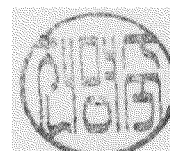
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2011/028047

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	COLLINS et al. "Nuclear localisation and pDNA condensation in non-viral gene delivery". J Gene Med. Apr 2007, Vol.9, No.4, pp.265-274. - See the whole document.	1-5,20

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/028047Patent document
cited in search reportPublication
datePatent family
member(s)Publication
date

None

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2011/028047**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.: 14-19
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 14-19 are directed to 'a process for administering the vector to mammalian cells'. Said method is thus considered a method for treatment of the human body by (a) surgery or therapy or diagnostic method practiced on the human body [Article 17(2)(a)(i), Rule 39.1(iv) PCT].
2. ☒ Claims Nos.: 15,16
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 subject matter of claims 15 and 16 is so unclear and indefinite that no meaningful search could be made, because these claims are drafted in reference to multiple dependent claim such as claim 14 (see the category Box No. II-3 below).
3. ☒ Claims Nos.: 6-14,17-19
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.