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(54) Title: PAPILLOMAVIRUS PSEUDOVIRUSES FOR DETECTION AND THERAPY OF TUMORS

(57) Abstract: Disclosed herein are methods of detecting tumors, monitoring cancer therapy, and selectively inhibiting the proliferation and/or killing of cancer cells utilizing a papilloma pseudovirus or a papilloma virus-like particle (VLP)



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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2008/062296

A. CLASSIFICATION OF SUBJECT MATTER

INV. G01N33/574 G01N33/569 A61K48/00

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)

G01N A61K

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 practical, search terms used)

EPO-Internal, BIOSIS, EMBASE, COMPENDEX, INSPEC, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	NIELAND J D ET AL: "CHIMERIC PAPILLOMAVIRUS VIRUS-LIKE PARTICLES INDUCE A MURINE SELF-ANTIGEN-SPECIFIC PROTECTIVE AND THERAPEUTIC ANTITUMOR IMMUNE RESPONSE" JOURNAL OF CELLULAR BIOCHEMISTRY, WILEY-LISS INC, US, vol. 73, no. 2, 1 May 1999 (1999-05-01), pages 145-152, XP000953286 ISSN: 0730-2312 p.149, section "Immunotherapy with cVLPs". abstract ----- -/--	13-21

☒ 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 document 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 another 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.

G document member of the same patent family

Date of the actual completion of the international search

24 October 2008

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2008/062296

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SCHILLER J T ET AL: "PAPILLOMAVIRUS-LIKE PARTICLE BASED VACCINES: CERVICAL CANCER AND BEYOND" EXPERT OPINION ON BIOLOGICAL THERAPY, ASHLEY, LONDON, GB, vol. 1, no. 4, 1 July 2001 (2001-07-01), pages 571-581, XP008028179 ISSN: 1471-2598 p.574, section 3 abstract -----	13-21
X	CHO CHEONG-WEON ET AL: "Improvement of gene transfer to cervical cancer cell lines using non-viral agents" CANCER LETTERS, vol. 162, no. 1, 10 January 2001 (2001-01-10), pages 75-85, XP002500796 ISSN: 0304-3835 abstract p.78, section 3.3; p.80, section 3.4; p.82 to 83, section "discussion", especially p.83, right-hand column, last 5 lines. -----	1-29
A	TOUZE A ET AL: "In vitro gene transfer using human papillomavirus -like particles" NUCLEIC ACIDS RESEARCH, OXFORD UNIVERSITY PRESS, SURREY, GB, vol. 5, no. 26, 1 March 1998 (1998-03-01), pages 1317-1323, XP002076559 ISSN: 0305-1048 the whole document -----	1-29
A	US 2005/142115 A1 (QIAO LIANG [US] ET AL) 30 June 2005 (2005-06-30) the whole document -----	1-29
A	DA SILVA DIANE M ET AL: "Physical interaction of human papillomavirus virus-like particles with immune cells" INTERNATIONAL IMMUNOLOGY, vol. 13, no. 5, May 2001 (2001-05), pages 633-641, XP002500797 ISSN: 0953-8178 the whole document -----	1-29

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2008/062296

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 and necessary to the claimed invention, the international search was carried out on the basis of:
 - a. type of material
 - ☒ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material
 - ☒ on paper
 - ☒ in electronic form
 - c. time of filing/furnishing
 - ☒ contained in the international application as filed
 - ☒ filed together with the international application in electronic form
 - ☐ furnished subsequently to this Authority for the purpose of search
2. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto 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

International application No.
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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.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claims 1, 7 and 24 comprise a step falling under the concept of a method of treatment of the human/animal body by surgery and although claim 13 is directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
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:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search reportcovers 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.:

see additional sheet(s)

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-29

Method of detecting the presence of cancer cells, method for evaluating a cancer therapy, method for inhibiting the proliferation of cancer cells, method of detecting the presence of cervical cancer using a papilloma pseudovirus or a papilloma VLP.

2. claims: 30-33

A nucleic acid comprising an oligo T domain of at least 10 and less than or equal to 200 consecutive T residues.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2008/062296

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005142115	A1	30-06-2005	NONE