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(54) Title: METHODS TO ELICIT, ENHANCE AND SUSTAIN IMMUNE RESPONSES AGAINST MHC CLASS I-RESTRICTED EPITOPES, FOR PROPHYLACTIC OR THERAPEUTIC PURPOSES

(57) Abstract: Embodiments relate to methods and compositions for eliciting, enhancing, and sustaining immune responses, preferably against MHC class I-restricted epitopes. The methods and compositions can be used for prophylactic or therapeutic purposes.



WO 2005/002621 A3

## INTERNATIONAL SEARCH REPORT

PCT/US2004/019546

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
IPC 7 A61K39/00 A61P35/00 A61P37/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols)		
IPC 7 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, WPI Data, PAJ, EMBASE, FSTA		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>WO 01/30382 A1 (AVENTIS PASTEUR LIMITED; BERINSTEIN, NEIL; TARTAGLIA, JAMES; MOINGEON,) 3 May 2001 (2001-05-03)</p> <p>abstract  page 5, lines 8-10  page 5, line 20 - page 6, line 14  page 6, line 23 - page 15, line 19  page 21, lines 6-20  page 20, line 19 - line 30  page 24, lines 1-9  example 1; table 1</p> <p style="text-align: center;">----- -/--</p>	<p>1, 2, 4-8,  10-16,  18-21,  26, 27,  30, 31,  33, 34,  36-38,  41, 43,  65-84</p>
<input checked="" type="checkbox"/>	Further documents are listed in the continuation of box C.	<input checked="" type="checkbox"/> Patent family members are listed in annex.
° Special categories of cited documents :		
<p>*A* document defining the general state of the art which is not considered to be of particular relevance</p> <p>*E* earlier document but published on or after the international filing date</p> <p>*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)</p> <p>*O* document referring to an oral disclosure, use, exhibition or other means</p> <p>*P* document published prior to the international filing date but later than the priority date claimed</p>		<p>*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</p> <p>*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</p> <p>*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.</p> <p>*&amp;* document member of the same patent family</p>
Date of the actual completion of the international search		Date of mailing of the international search report
22 April 2005		08.06.2005
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer  Noë, V

## INTERNATIONAL SEARCH REPORT

PCT/US2004/019546

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>WO 02/28429 A2 (ALLECURE CORPORATION; UNIVERSITY OF ZURICH; KUNDIG, THOMAS, M; MCCORMA) 11 April 2002 (2002-04-11) abstract page 8, lines 21-23 page 10, lines 17-20 page 11, lines 25-29 page 12, lines 24-30</p> <p>-----</p>	
A	<p>WO 98/58956 A2 (LUDWIG INSTITUTE FOR CANCER RESEARCH) 30 December 1998 (1998-12-30) abstract page 8, line 11 - page 9, line 6 page 10, lines 19-24 page 12, line 17 - page 13, line 10 page 15, lines 12-31 page 31, lines 20-22</p> <p>-----</p>	
X	<p>WO 03/011331 A (ISIS INNOVATION LIMITED; CERUNDOLO, VINCENZO; PALMOWSKI, MICHAEL, J; M) 13 February 2003 (2003-02-13) page 6, lines 4-19 page 12, line 19 - page 13, line 6 page 13, lines 11-15 page 15, lines 1-7 page 17, lines 9-14 page 18, lines 12-19 page 22, line 24 - page 23, line 6 claims 9,11-16,26,31,32</p> <p>-----</p>	65,66, 68-74, 76-80
A	<p>DHODAPKAR MADHAV V ET AL: "Mature dendritic cells boost functionally superior CD8+ T-cell in humans without foreign helper epitopes" JOURNAL OF CLINICAL INVESTIGATION, vol. 105, no. 6, March 2000 (2000-03), pages R9-R14, XP002325729 ISSN: 0021-9738 the whole document</p> <p>-----</p>	
E	<p>WO 2004/110485 A (PALMOWSKI, MICHAEL, J; LOPES, LUCIEN; IKEDA, YASUHIRO; CERUNDOLO, VINC) 23 December 2004 (2004-12-23) abstract page 3, lines 20-32 page 5, lines 18-25 page 6, lines 24-28 page 8, lines 7-19 page 8, line 31 - page 9, line 29 page 13, line 22 - page 14, line 2 claims 19-21</p> <p>-----</p>	65-84

## INTERNATIONAL SEARCH REPORT

PCT/US2004/019546

**Box 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 1-44 are 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 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 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.:  

1-44, 65-84
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.
- 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: 1-44 (completely) and 65-84(partially)

A method for immunization comprising :  
(a) delivering a first composition comprising an immunogen or a nucleic acid encoding an antigen or an immunogenic fragment  
(b) administering a second composition comprising a peptide directly to a lymphatic system wherein the peptide corresponds to an epitope of the first antigen.  
and set of immunogenic compositions for use in the method.  
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2. claims: 45-49

Method for augmenting an existing antigen-specific immune response comprising administering a peptide composition directly to a lymphatic system.  
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3. claims: 50-52

A method for immunization comprising :  
(a) delivering a first composition comprising a first and a second antigen or a nucleic acid encoding an antigen or an immunogenic fragment of the first and the second antigen  
(b) administering a second composition comprising a first peptide and a third composition comprising a second peptide directly to a lymphatic system wherein the first peptide corresponds to an epitope of the first antigen and the second peptide corresponds to an epitope of the second antigen.  
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4. claims: 53-58

A method of generating an antigen-specific tolerogenic or regulatory immune response comprising periodically administering an adjuvant free composition comprising a peptide corresponding with an epitope of the antigen  
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5. claims: 59-64 (completely), 65-84 (partially)

A method for immunization comprising :  
administering a series of immunogenic doses directly into the lymphatic system wherein the series comprises at least 1 entraining dose, comprising a nucleic acid encoding an immunogen and at least 1 amplifying dose free of virus, viral vector or replication competent vector.  
Set for use in this method  
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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

6. claims: 65-84 (partially)

Set of immunogenic compositions for inducing an immune response comprising 1-6 entraining doses and at least one amplifying dose, insofar not specifically for use in the method of subject 1 or 5.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

PCT/US2004/019546

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