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- as to the identity of the inventor (Rule 4.17(i))
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

Published:

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(54) Title: IMMUNOSTIMULATORY OLIGO- AND POLYSACCHARIDES AND USES THEREOF

(57) Abstract: This invention relates to the use of an immunostimulant selected from the group consisting of mannan polysaccharides comprising β -1,2-linked chains, β -1,2-(D)-mannooligosaccharides, and any combination thereof for the preparation of a medicament for treating a mammal, including human, suffering from or susceptible to a condition which can be improved or prevented by inducing a Th1-type, and/or inhibiting a Th2-type immune response. This invention also relates to an immunostimulatory composition comprising at least one component selected from the group consisting of mannan polysaccharides comprising β -1,2-linked chains and β -1,2-(D)-mannooligosaccharides; and a carrier. This invention further relates to a food comprising at least one component selected from the group consisting of mannan polysaccharides comprising β -1,2-linked chains and β -1,2-(D)-mannooligosaccharides and use of mannan polysaccharides comprising β -1,2-linked chains and β -1,2-(D)-mannooligosaccharides as a food additive. This invention also relates to a method for inducing of Th1-type immune response comprising administering to a subject the composition of or the food of the invention in an amount effective to induce a Th1-type immune response and a method for inhibition of Th2-type immune response comprising administering to a subject the composition or the food of the invention in an amount effective to partially or completely inhibit development of Th2-type immune response.

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. A61K31/702 A61P37/00

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)

A61K A61P

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, WPI Data, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DROMER FRANCOISE ET AL: "Synthetic analogues of beta-1,2 oligomannosides prevent intestinal colonization by the pathogenic yeast Candida albicans" ANTIMICROBIAL AGENTS AND CHEMOTHERAPY, vol. 46, no. 12, December 2002 (2002-12), pages 3869-3876, XP002410370 ISSN: 0066-4804 abstract figure 5	1-22
X	WO 03/090787 A (BUNDLE DAVID R [CA]; NITZ MARK [US]; CUTLER JIM E [US]) 6 November 2003 (2003-11-06) claims 1-4 ----- -/--	1-22

☒ 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

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INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	APOSTOLOPOULOS V ET AL: "OXIDATIVE/REDUCTIVE CONJUGATION OF MANNAN TO ANTIGEN SELECTS FOR T1 OR T2 IMMUNE RESPONSES" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, NATIONAL ACADEMY OF SCIENCE, WASHINGTON, DC, US, vol. 92, 1 October 1995 (1995-10-01), pages 10128-10132, XP000601312 ISSN: 0027-8424 abstract	1-22
X	JOUAULT T ET AL: "Beta-1,2-linked oligomannosides from Candida albicans act as signals for tumor necrosis factor alpha production." INFECTION AND IMMUNITY. JUN 1995, vol. 63, no. 6, June 1995 (1995-06), pages 2378-2381, XP002410371 ISSN: 0019-9567 abstract figure 2	1-22
X	DAVIS W C ET AL: "USE OF THE MANNAN RECEPTOR TO SELECTIVELY TARGET VACCINE ANTIGENS FOR PROCESSING AND ANTIGEN PRESENTATION THROUGH THE MHC CLASS I AND CLASS II PATHWAYS" ANNALS OF THE NEW YORK ACADEMY OF SCIENCES, NEW YORK ACADEMY OF SCIENCES, NEW YORK, NY, US, vol. 969, October 2002 (2002-10), pages 119-125, XP009052421 ISSN: 0077-8923 abstract	1-22
X	CASSONE ANTONIO: "Immunogenic and immunomodulatory properties of mannoproteins from Candida albicans" CANADIAN JOURNAL OF BOTANY, vol. 73, no. SUPPL. 1 SECT. E-H, 1995, pages S1192-S1198, XP009075786 ISSN: 0008-4026 abstract page S1196, column 2, paragraphs 3,4	1-22
X	WO 00/57919 A2 (SAPIENTIA THERAPEUTICS LIMITED [CA]; AGENE RESEARCH INST [JP]; SUGIMOT) 5 October 2000 (2000-10-05) page 4, lines 15-28	1-22

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI2006/000256

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 17-22 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:

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.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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Patent document cited in search report		Publication date		Patent family member(s)		Publication date
WO 03090787	A	06-11-2003	AU EP	2003221573 A1 1524999 A1		10-11-2003 27-04-2005
WO 0057919	A2	05-10-2000	AU EP	3412500 A 1165142 A2		16-10-2000 02-01-2002