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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: CANCER SPECIFIC OLIGOSACCHARIDE SEQUENCES AND USE THEREOF

(57) Abstract: The present invention describes oligosaccharide sequences, which are specifically expressed by cancer cells. The present invention is related to a method of determining an cancer specific oligosaccharide sequence comprising LacdiNAc structure in a biological sample, the presence of said sequence in said sample being an indication of the presence of cancer. The present invention provides antigenic substances, diagnostic agents, pharmaceutical compositions and cancer vaccines comprising said oligosaccharide sequences or substances binding to said oligosaccharide sequences. The present invention is also related to methods for the treatment of cancer.

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INTERNATIONAL SEARCH REPORT

Intern al application No.

PCT/FI 02/00674

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: C07H 5/06, G01N 33/574, A61K 39/00, A61P 35/00
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)

IPC7: C07H, G01N, A61K, A61P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, BIOSIS, CA-PLUS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E,X	WO 02077649 A1 (PRIMUM K.K.), 3 October 2002 (03.10.02)	1-30
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X	EP 0919563 A2 (HEALTH RESEARCH, INC.), 2 June 1999 (02.06.99), see specially the claims	17,19-20
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X	Experimental Parasitology, Volume 96, 2000, A. Kwame Nyame et al, "Antibody Responses to the Fucosylated LacdiNAc Glycan Antigen in Schistosoma mansoni-Infected Mice and Expression of the Glycan among Schistosomes", pages 202-210	11,13,19-20
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☒ 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 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

"&" document member of the same patent family

Date of the actual completion of the international search

4 February 2003

Date of mailing of the international search report

05-02-2003

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 02/00674

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 0017654 A1 (CUMMINGS, RICHARD, D.), 30 March 2000 (30.03.00) --	11,13,19-20
X	EP 0565241 A1 (ELI LILLY AND COMPANY), 13 October 1993 (13.10.93), see specially the claims --	19-20
Y	Eur. J. Biochem., Volume 259, 1999, Juhani Saarinen et al: "N-Glycan structures of matrix metalloproteinase-1 derived from human fibroblasts and from HT-1080 fibrosarcoma cells", page 829 - page 840, see specially discussion page 839 --	1-30
Y	Biochemistry, Volume 33, 1994, Kazuo Yamamoto et al: "Interaction of Immobilized Recombinant Mouse C-Type Macrophage Lectin with Glycopeptides and Oligosaccharides", page 8159 - page 8166, see specially figure 1, Oligosaccharide C. --	1-30
Y	US 5660834 A (KJELDSEN ET AL), 26 August 1997 (26.08.97) --	1-30
Y	US 4904596 A (HAKOMORI), 27 February 1990 (27.02.90) --	1-30
Y	WO 9317033 A1 (THE BIOMEMBRANE INSTITUTE), 2 Sept 1993 (02.09.93) --	13-30
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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	Carbohydrate Letters, Volume 4, No. 2, 2001, Ekaterina V. Shipova et al, "Modified blood group a trisaccharide probes: Synthesis and Interaction with Antibodies", pages 85-90, see specially page 87 --	32
X	J. Exp. Med., Volume 150, 1979, William W. Young et al, "Production of monoclonal antibodies two distinct steric portions of the ganglio-N-triosylceramide (ASIALO GM2), pages 1008-1019 --	31-33
X	Bioorganic & Medicinal Chemistry Letters, Volume 8, 1998, Gabi Baisch et al, "On the preparative use of recombinant B(1-3)galactosyl-transferase", pages 751-754 --	31,33.
X	US 6187754 B1 (OEHRLEIN), 13 February 2001 (13.02.01) --	31,33
A	Carbohydrate Research, Volume 306, 1998, Rafael F. Sala et al, "UDP-N-trifluoroacetylglucosamine as an alternative substrate in N-acetylglucosaminyltransferase reactions", pages 127-136, see specially page 129 --	31-33
A	Current Opinion in Biotechnology, Volume 10, 1999, Monica M Palcic, "Biocatalytic synthesis of oligosaccharides", pages 616-624 --	31-33
A	Biochemical Society transactions, Volume 23, 1995, D. H. Van den Eijnden et al, "Novel glycosylation routes for glycoproteins: the lacdiNac pathway", pages 175-179 -- -----	31-33

INTERNATIONAL SEARCH REPORT

International application No.
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Box I Observations where certain claims were found unsearchable (Continuation of item 1 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.: 21-26
because they relate to subject matter not required to be searched by this Authority, namely:
see next sheet*
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 II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see next 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.:
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.

*

Claims 21-26 relate to methods of treatment of the human or animal body by therapy (Rule. 39.1.(iv)). Nevertheless, a search has been executed for these claims. The search has been based on the alleged effects of the compounds.

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The separate inventions are:

Invention A, claims 1-30, concerns a method for diagnosing cancer in a biological sample comprising determining the presence of a LacdiNac oligosaccharide sequence. It also concerns: diagnostic agents, pharmaceutical compositions, cancer vaccines and antigenic carbohydrate substances.

Invention B, claim 31 and 33, concerns a carbohydrate substance according to formula IV and a method for production of GalN derivatives according to formula III.

Invention C, claim 32, concerns a carbohydrate substance according to formula V.

Invention A relates mainly to methods for diagnosing and treatment of cancer. Invention B relates to a method for production of GalN derivatives and a carbohydrate substance. Invention C relates to a carbohydrate substance.

The only special technical feature these inventions have in common is Lacdinac oligosaccharide sequence or Lacdinac derivatives. Lacdinac or Lacdinac derivatives are well known to the art. The carbohydrate substances of claims 31 and 32 are so different from each other that no technical relationship or interaction is seen to be present so as to form a single general inventive concept. Therefore, these inventions are not so linked as to form a single general inventive concept as described in Rule 13.1 PCT. According to Article 34 (3) (a-c) and Rule 13.2, an international application shall relate to one invention only or to a group of inventions linked by one or more of the same or corresponding "special technical features", i.e. features that define a contribution which each of the inventions makes over the prior art.

INTERNATIONAL SEARCH REPORT

International application No.

30/12/02

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30/12/02

International application No.

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