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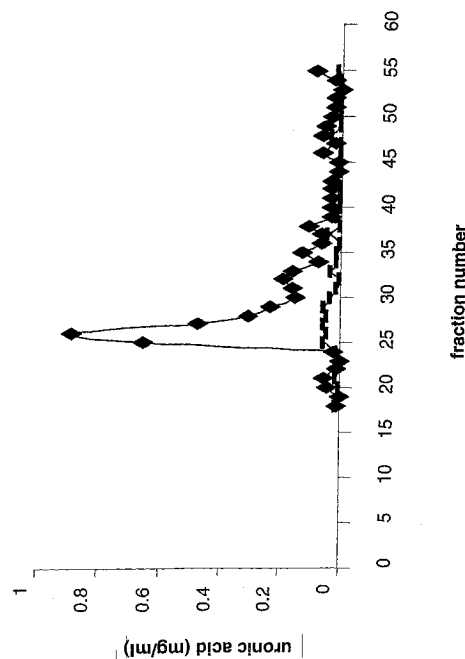
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(54) **Oligosaccharide biomarkers for mucopolysaccharidoses and other related disorders**

(57) The present invention is related to methods for diagnosing mucopolysaccharidoses ('MPS') and related diseases. This invention pertains to methods for identifying and quantitating biochemical markers ('biomarkers') that are present in biological fluids or tissues of a patient having a MPS or related disorder. One aspect of the method comprises determining a target quantity of a target MPS biomarker oligosaccharide from a target biological sample taken from the target animal, and then comparing the target quantity to a reference quantity of a reference MPS biomarker oligosaccharide for the diagnosis, characterization, monitoring, and clinical management of MPS and related disease. This invention also describes a kit comprising an oligosaccharide derivatization solution; an acid solution; an internal standard; a solid phase extraction column; a solid phase extraction column wash solution; an oligosaccharide elution solution; and a set of instructions for using the kit to diagnose a MPS or related disease.

Figure 1



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**PARTIAL EUROPEAN SEARCH REPORT**

Application Number

which under Rule 63 of the European Patent Convention EP 09 15 6934 shall be considered, for the purposes of subsequent proceedings, as the European search report

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 5 310 646 A (WHITLEY ET AL) 10 May 1994 (1994-05-10) * the whole document * In particular: col.1, l. 13-28; col. 2, l. 14-62; col. 5, l. 39-63; col. 6, l. 48-68; claims 1-10; figure 1. -----	1-61	INV. G01N33/48
X	LEISTNER SANDRA ET AL: "A useful routine for biochemical detection and diagnosis of mucopolysaccharidoses" GENETICS AND MOLECULAR BIOLOGY, [Online] vol. 21, no. 1, March 1998 (1998-03), XP002386981 ISSN: 1415-4757 Retrieved from the Internet: URL:www.scielo.br/scielo.php?script=sci_arttext&pid=S1415-47571998000100028> [retrieved on 2006-06-23] * the whole document * ----- -/--	1-61	
			TECHNICAL FIELDS SEARCHED (IPC)
			G01N
INCOMPLETE SEARCH			
<p>The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC to such an extent that a meaningful search into the state of the art cannot be carried out, or can only be carried out partially, for these claims.</p> <p>Claims searched completely :</p> <p>Claims searched incompletely :</p> <p>Claims not searched :</p> <p>Reason for the limitation of the search: see sheet C</p>			
Place of search		Date of completion of the search	Examiner
The Hague		9 June 2009	C.F. Angioni
CATEGORY OF CITED DOCUMENTS		<p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... &amp; : member of the same patent family, corresponding document</p>	
<p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p>			

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EPO FORM 1503 03 82 (P04E07)



## PARTIAL EUROPEAN SEARCH REPORT

Application Number  
EP 09 15 6934

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	<p>YANG HYUN OK ET AL: "Preparation and structural determination of dermatan sulfate-derived oligosaccharides" GLYCOBIOLOGY, vol. 10, no. 10, October 2000 (2000-10), pages 1033-1040, XP002386984 ISSN: 0959-6658 * the whole document *</p> <p>-----</p>	1-61	
Y	<p>DASGUPTA F ET AL: "Synthesis of 7-0-(2-deoxy-2-sulfamido-alpha-d-glucoopyranosyl)-4-methylcoumarin sodium salt: a fluorogenic substrate for sulfamidase" CARBOHYDRATE RESEARCH, ELSEVIER SCIENTIFIC PUBLISHING COMPANY. AMSTERDAM, NL, vol. 337, no. 11, 5 June 2002 (2002-06-05), pages 1055-1058, XP004367095 ISSN: 0008-6215 * the whole document *</p> <p>-----</p>	1-61	TECHNICAL FIELDS SEARCHED (IPC)
Y	<p>STARR C M ET AL: "Fluorophore-assisted carbohydrate electrophoresis in the separation, analysis, and sequencing of carbohydrates" JOURNAL OF CHROMATOGRAPHY A, ELSEVIER, AMSTERDAM, NL, vol. 720, no. 1, 12 January 1996 (1996-01-12), pages 295-321, XP004038366 ISSN: 0021-9673 * the whole document *</p> <p>-----</p>	1-61	



## PARTIAL EUROPEAN SEARCH REPORT

Application Number  
EP 09 15 6934

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
Y	<p>MEIKLE P J ET AL: "NEWBORN SCREENING FOR LYSOSOMAL STORAGE DISORDERS" SOUTHEAST ASIAN JOURNAL OF TROPICAL MEDICINE AND PUBLIC HEALTH, REGIONAL TROPICAL MEDICINE AND PUBLIC HEALTH, TH, vol. 30, no. SUPPL 2, 1999, pages 104-110, XP009065499 ISSN: 0125-1562 * the whole document *</p> <p>-----</p>	1-61	
Y	<p>ROZAKLIS T ET AL: "DETERMINATION OF OLIGOSACCHARIDES IN POMPE DISEASE BY ELECTROSPRAY IONIZATION TANDEM MASS SPECTROMETRY" CLINICAL CHEMISTRY, AMERICAN ASSOCIATION FOR CLINICAL CHEMISTRY, WASHINGTON, DC, vol. 48, no. 1, 1 January 2002 (2002-01-01), pages 131-139, XP008045690 ISSN: 0009-9147 * the whole document * In particular: Title and abstract; Materials and methods; Tables 1-3.</p> <p>-----</p>	1-61	TECHNICAL FIELDS SEARCHED (IPC)
Y	<p>HOPWOOD J J ET AL: "High-resolution electrophoresis of urinary glycosaminoglycans: An improved screening test for the mucopolysaccharidoses" ANALYTICAL BIOCHEMISTRY, ACADEMIC PRESS INC, NEW YORK, vol. 119, no. 1, 1 January 1982 (1982-01-01), pages 120-127, XP024820964 ISSN: 0003-2697 [retrieved on 1982-01-01] * the whole document * In particular: Title and abstract.</p> <p>-----</p> <p style="text-align: center;">-/--</p>	1-61	



PARTIAL EUROPEAN SEARCH REPORT

Application Number  
EP 09 15 6934

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	<p>BYERS S ET AL: "GLYCOSAMINOGLYCAN ACCUMULATION AND EXCRETION IN THE MUCOPOLYSACCHARIDOSES: CHARACTERIZATION AND BASIS OF A DIAGNOSTIC TEST FOR MPS" MOLECULAR GENETICS AND METABOLISM, ACADEMIC PRESS, SAN DIEGO, CA, US, vol. 65, no. 4, 1 January 1998 (1998-01-01), pages 282-290, XP008045704 ISSN: 1096-7192 * the whole document *</p> <p>In particular: Title, abstract and materials and methods; Results section; Figures 1-5.</p> <p style="text-align: center;">-----</p>	1-61	
			TECHNICAL FIELDS SEARCHED (IPC)
X	<p>RANIERI E ET AL: "Nature of gags stored in mucopolysaccharidosis type VI" JOURNAL OF INHERITED METABOLIC DISEASE, vol. 23, no. Supplement 1, July 2000 (2000-07), page 239, XP002525901 &amp; VIIITH INTERNATIONAL CONFERENCE ON INBORN ERRORS OF METABOLISM; ENGLAND, CAMBRIDGE, UK; SEPTEMBER 13-17, 2000 ISSN: 0141-8955 * the whole document *</p> <p style="text-align: center;">-----</p>	1-61	



**INCOMPLETE SEARCH  
SHEET C**

Application Number  
EP 09 15 6934

Claim(s) not searched:

17

Reason for the limitation of the search (non-patentable invention(s)):

Article 53 (c) EPC - Method for treatment of the human or animal body by therapy.



Application Number

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**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing claims for which payment was due.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):
- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:  
claims 1-61 (in part)
- The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION  
SHEET B**

Application Number  
EP 09 15 6934

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

Inventions 1-28: claims 1-61 (in part)

A method for diagnosing a pre-clinical or a clinical status of a mucopolysaccharide (MPS) disease in a target animal, by using an MPS biomarker as listed as in the methods of claims 8-11.

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Inventions 29-37: claims 1-61 (in part)

A method for diagnosing a pre-clinical or a clinical status of a mucopolysaccharide (MPS) disease in a target animal, by using an MPS biomarker as listed as in the method of claim 61, step (b).

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 15 6934

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-06-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5310646	A	10-05-1994	NONE
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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

专利名称(译)	用于粘多糖和其他相关疾病的寡糖生物标志物		
公开(公告)号	<a href="#">EP2081023A3</a>	公开(公告)日	2009-10-07
申请号	EP2009156934	申请日	2003-06-13
申请(专利权)人(译)	妇女和儿童医院		
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发明人	MEIKLE, PETER JOHN FULLER, MARIA RAMSEY, STEVE LEWIS RANIERI, ENZO HOPWOOD, JOHN JOSEPH		
IPC分类号	G01N33/48 G01N33/50 C12Q1/34 C12Q1/527 G01N30/26 G01N30/88 G01N33/53 G01N33/66		
CPC分类号	G01N33/66 G01N2400/40		
优先权	2002PS2930 2002-06-14 AU		
其他公开文献	EP2081023A2		
外部链接	<a href="#">Espacenet</a>		

摘要(译)

本发明涉及诊断粘多糖 (MPS) 和相关疾病的方法。本发明涉及鉴定和定量存在于患有MPS或相关病症的患者的生物体液或组织中的生化标志物 (“生物标志物”) 的方法。该方法的一个方面包括从取自目标动物的目标生物样品中确定目标MPS生物标记寡糖的目标量，然后将目标量与参考MPS生物标记寡糖的参考量进行比较以用于诊断，表征，监测，以及MPS和相关疾病的临床管理。本发明还描述了包含寡糖衍生化溶液的试剂盒;酸溶液;内部标准;固相萃取柱;固相萃取柱洗涤液;寡糖洗脱液;以及使用该试剂盒诊断MPS或相关疾病的一套说明。

