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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: SINGLE NUCLEOTIDE POLYMORPHISM (SNP) ASSOCIATED TO TYPE II DIABETES

(57) Abstract: Association of Type 2 diabetes with single nucleotide polymorphisms and haplotypes are disclosed. Also disclosed are diagnostic applications in identifying those who have Type 2 diabetes or are at risk of developing Type 2 diabetes, and discovery of therapeutic agents and methods of treatment.



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INTERNATIONAL SEARCH REPORT

International application No
PC1, 05/012986

A. CLASSIFICATION OF SUBJECT MATTER
INV. C12Q1/68 G01N33/53

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)
C12Q

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, Sequence Search, BIOSIS, EMBASE, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2004/084797 A (HUBIT GENOMIX, INC; DAIMON, MAKOTO; KATO, TAKEO) 7 October 2004 (2004-10-07) abstract	1,31-55
X	----- DAIMON MAKOTO ET AL: "Large-scale search of SNPs for type 2 DM susceptibility genes in a Japanese population." BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS, vol. 302, no. 4, 21 March 2003 (2003-03-21), pages 751-758, XP002369695 ISSN: 0006-291X the whole document ----- -/--	1,31-55

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.
- "&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

International application No

PCT/E. ...05/012986

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>LAUKKANEN OLLI ET AL: "Polymorphisms of the SUR1 (ABCC8) and Kir6.2 (KCNJ11) genes predict the conversion from impaired glucose tolerance to type 2 diabetes. The Finnish diabetes Prevention Study" JOURNAL OF CLINICAL ENDOCRINOLOGY & METABOLISM, vol. 89, no. 12, December 2004 (2004-12), pages 6286-6290, XP002369697 ISSN: 0021-972X the whole document</p>	1,47-55
X	<p>ELBEIN S C ET AL: "Role of common sequence variants in insulin secretion in familial type 2 diabetic kindreds: the sulfonylurea receptor, glucokinase, and hepatocyte nuclear factor 1alpha genes." DIABETES CARE. MAR 2001, vol. 24, no. 3, March 2001 (2001-03), pages 472-478, XP002369698 ISSN: 0149-5992 the whole document</p>	1,47-55
X	<p>FLOREZ JOSE C ET AL: "Haplotype structure and genotype-phenotype correlations of the sulfonylurea receptor and the islet ATP-sensitive potassium channel gene region" DIABETES, vol. 53, no. 5, May 2004 (2004-05), pages 1360-1368, XP002369696 ISSN: 0012-1797 the whole document</p>	1,47-55
X	<p>DATABASE Geneseq [Online] 31 January 1996 (1996-01-31), "Human sulphonylurea receptor cDNA fragment." XP002369705 retrieved from EBI accession no. GSN:AAT01566 Database accession no. AAT01566 the whole document & WO 95/28411 A (BAYLOR COLLEGE OF MEDICINE; THE BOARD OF REGENTS, THE UNIVERSITY OF TEXAS) 26 October 1995 (1995-10-26)</p>	1,31-55
X	<p>DATABASE EMBL [Online] 5 October 2000 (2000-10-05), "UC-59 Human Homo sapiens STS genomic clone BAC 204E21 SP6 side, sequence tagged site." XP002369706 retrieved from EBI accession no. EM_STG:G31183 Database accession no. G31183 the whole document</p>	31, 33-39, 41-46
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INTERNATIONAL SEARCH REPORT

Inter plication No
PC., L. 05/012986

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>& WO 02/052044 A (RIKEN; NAKAMURA, YUSUKE; SEKINE, AKIHIRO; IIDA, ARITOSHI; SAITO, SUSUM) 4 July 2002 (2002-07-04) sequences 1969, 4564</p> <p>-----</p> <p>DATABASE EMBL [Online] 5 October 2002 (2002-10-05), "Sequence 1883 from Patent W002052044." XP002369707 retrieved from EBI accession no. EM PRO:AX515685 Database accession no. AX515685 the whole document & WO 02/052044 A (RIKEN; NAKAMURA, YUSUKE; SEKINE, AKIHIRO; IIDA, ARITOSHI; SAITO, SUSUM) 4 July 2002 (2002-07-04) sequences 1883, 4478</p>	<p>31, 33-39, 41-46</p>
A	<p>-----</p> <p>WO 03/079747 A (UAB RESEARCH FOUNDATION; SELL, SUSAN, M) 2 October 2003 (2003-10-02)</p>	
A	<p>-----</p> <p>GLOYN ANNA L ET AL: "Large-scale association studies of variants in genes encoding the pancreatic beta-cell KATP channel subunits Kir6.2 (KCNJ11) and SUR1 (ABCC8) confirm that the KCNJ11 E23K variant is associated with type 2 diabetes." DIABETES, vol. 52, no. 2, February 2003 (2003-02), pages 568-572, XP002369699 ISSN: 0012-1797</p> <p>-----</p>	

INTERNATIONAL SEARCH REPORT

Inte al application No.
T/EP2005/012986

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:

2. Claims Nos.: 56-62
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:
see FURTHER INFORMATION sheet PCT/ISA/210

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.:

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.:
18 (completely), 1, 31-55 (partially)

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

Continuation of Box II.2

Claims Nos.: 56-62

The present claims 56-62 encompass compounds defined only by their desired function, contrary to the requirements of clarity of Article 6 PCT, because the result-to-be-achieved type of definition does not allow the scope of the claim to be ascertained. The fact that any compound could be screened does not overcome this objection, as the skilled person would not have knowledge beforehand as to whether it would fall within the scope claimed, except for the compounds disclosed in the description. Undue experimentation would be required to screen compounds randomly. This non-compliance with the substantive provisions is to such an extent, that no search can be performed.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 18 (completely), 1, 31-55 (partially)

An isolated polynucleotide comprising a SNP located within Seq. Id 1-5, methods (for determining susceptibility to Type 2 Diabetes Mellitus) using it and vectors, cells, transgenic animals, reagents and kits containing it and a method for determining susceptibility to Type 2 Diabetes Mellitus using haplotypes from fig.2 derived from the ABCC8 gene.

2. claims: 1, 31-55 (partially)

An isolated polynucleotide comprising a SNP located within Seq. Id 6, methods (for determining susceptibility to Type 2 Diabetes Mellitus) using it and vectors, cells, transgenic animals, reagents and kits containing it and a method for determining susceptibility to Type 2 Diabetes Mellitus using haplotypes from fig.2 derived from the ABCC9 gene.

Inventions 3-41

Claims 2-17 and 19-30 (completely for the Seq. Ids, corresponding to each respective gene), 31-55 (partially). idem as above for respectively each gene listed in fig. 1 as represented by corresponding Seq. Ids 7-92.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/LR/2005/012986

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2004084797	A	NONE	

WO 9528411	A	AU 694507 B2	23-07-1998
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		CA 2187945 A1	26-10-1995
		EP 0789705 A1	20-08-1997
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