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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: POLYMORPHISM IN CYSTEINE DIOXYGENASE

(57) Abstract: The invention relates to the detection and identification of polymorphisms in cysteine dioxygenase (CDO) for the use of that diagnosis to identify a propensity in a patient towards rheumatoid arthritis and/or to have side effects with a number of drugs, to nucleic acid and isolated proteins encoding the polymorphisms, to assays for CDO activity and for the identification of compounds affecting CDO activity, and additionally to use of interferon- γ optionally in combination with different compounds, to treat rheumatoid arthritis.



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INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2006/002698

A. CLASSIFICATION OF SUBJECT MATTER
 INV. C12Q1/68 A61K38/21

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 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, WPI Data, EMBASE, BIOSIS, EMBL

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	RAMSDEN D B ET AL: "Human cysteine dioxygenase type I (CDO-I; EC 1.13.11.20): 5'flanking region and intron-exon structure of the gene" MOLECULAR PATHOLOGY, vol. 50, no. 5, 1997, pages 269-271, XP009075165 the whole document	9-11
X	MCCANN KAREN P ET AL: "Human cysteine dioxygenase type I: Primary structure derived from base sequencing of cDNA" BIOCHIMICA ET BIOPHYSICA ACTA, vol. 1209, no. 1, 1994, pages 107-110, XP002408234 ISSN: 0006-3002 the whole document	9-11



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

Date of the actual completion of the international search

15 December 2006

Date of mailing of the international search report

10/04/2007

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INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2006/002698

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE SNP [Online] SNPs in gene region CD01 17 November 2006 (2006-11-17), XP002408238 retrieved from NCBI Database accession no. rs11545717 link accessed via Genecards abstract	9-11
X	DATABASE EMBL 1 December 2004 (2004-12-01), XP002408239 Database accession no. AK208807 abstract	12-14
X	DATABASE EMBL 19 July 1994 (1994-07-19), XP002408240 Database accession no. x79038 abstract	12-14
A	WO 03/048323 A2 (SQUIBB BRISTOL MYERS CO [US]; CARMAN JULIE [US]; NADLER STEVEN G [US];) 12 June 2003 (2003-06-12) page 34, line 10 - page 35, line 4	
A	WO 2004/083403 A2 (APPLERA CORP [US]; CARGILL MICHELE [US]; BEGOVICH ANN B [US]; ALEXANDE) 30 September 2004 (2004-09-30)	
A	WO 99/37318 A (SAMYANG GENEX CORP [KR]; BAE INSOO [KR]; KIM DONG SOO [KR]; YIM HEAJOO) 29 July 1999 (1999-07-29)	
A	BRADLEY HELEN ET AL: "Sulfate metabolism is abnormal in patients with rheumatoid arthritis: Confirmation by in vivo biochemical findings" JOURNAL OF RHEUMATOLOGY, vol. 21, no. 7, 1994, pages 1192-1196, XP009075163 ISSN: 0315-162X	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2006/002698

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 and 16 are directed to a diagnostic method practised on 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.:
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.:

1-16

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: 1-16

a method for the diagnosis of a cysteine dioxygenase-mediated condition, a method for diagnosis of one or more polymorphisms in the cysteine dioxygenase gene, an allele specific probe or primer capable of detecting a cysteine dioxygenase gene, a diagnostic kit comprising said primers or probes, an isolated nucleic acid of at least 5 bases long encoding a cysteine dioxygenase polymorphism, isolated cysteine dioxygenase protein obtainable from said nucleic acid, an antibody capable of specifically binding said protein and a method of determining the propensity of an individual to a cysteine dioxygenase-mediated condition.

2. claims: 17, 18

a method for determining the effect of a compound on cysteine dioxygenase activity and a method for identifying a drug candidate for the treatment of rheumatoid arthritis.

3. claims: 19-24

a method of treating rheumatoid arthritis by administering a pharmaceutically effective amount of interferon-gamma, interferon-gamma for use in the manufacture of a medicament to treat rheumatoid arthritis, interferon-gamma in combination with at least one compound selected from cysteine, methionine, D-penicillamine, N-acetyl cysteine, gamma-glutamylcysteine, interleukin-4 and interleukin-10 for use in the manufacture of a medicament to treat rheumatoid arthritis.

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
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