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US 09/488,127 (CON)
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(54) Title: RAPID DETERMINATION OF GENE STRUCTURE USING cDNA SEQUENCE

(57) Abstract: The present invention is drawn to a method of identifying boundaries between exon and non-exon regions of genes. In addition to the boundary between said regions, the boundary between sequence on the 5' and 3' termini of the non-exon region is determined. Furthermore, sequence within the non-exon regions, e.g., sequence at the 5' and 3' termini of the non-exon regions sequence upstream and downstream of the coding regions of the gene (i.e. within the 5' and 3' non-translated regions, respectively) is determined. Therefore, as a result of the method of the present invention, gene structure can be determined without the need to sequence the entire gene. The present invention is useful, for example, in germ line sequence variation analysis.



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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/01461

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12Q1/68 C07K14/47

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)

IPC 7 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, WPI Data, PAJ, MEDLINE, BIOSIS, EMBASE, 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	WO 95 06714 A (GEN HOSPITAL CORP ;UNIV COLUMBIA (US); TANZI RUDOLPH E (US); GILLI) 9 March 1995 (1995-03-09) abstract page 75, line 23 - line 35	4,7, 11-15
Y	page 85, line 31 -page 86, line 7	1-3,5,6, 8-10, 16-21
X	WO 99 09147 A (ICOS CORP) 25 February 1999 (1999-02-25)	4,7, 11-15
Y	abstract; example 5	3,5,6
X	EP 0 584 446 A (SQUIBB & SONS INC) 2 March 1994 (1994-03-02) abstract page 24, line 25 - line 32; example 9	7,11-15
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in 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

3 July 2002

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03. 10. 2002

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/01461

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 96 36691 A (SHILOH YOSEF ;UNIV RAMOT (IL); KOHN KENNETH I (US)) 21 November 1996 (1996-11-21) abstract page 44, line 32 -page 45, line 13 ---	1-3,5,6, 8-10, 16-21
Y	EP 0 613 945 A (GEN HOSPITAL CORP) 7 September 1994 (1994-09-07) abstract page 22, line 10 - line 16 ---	1-3,5,6, 8-10, 16-21
A	WO 00 01816 A (IMP CANCER RES TECH ;KNOWLES MARGARET (GB); HABUCHI TOMONORI (JP)) 13 January 2000 (2000-01-13) abstract page 51, line 31 -page 52, line 11 -----	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 01/01461

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.:
because they relate to subject matter not required to be searched by this Authority, namely:
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 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.:

Claims 1-21 (complete)

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:

Invention 1: Claims 1-21 (complete)

Methods for determining a gene structure, for determining boundaries between exons and non-exon regions (e.g. introns), as well as methods for determining in addition 5' and 3' untranslated regions, such methods relying on cDNA-derived primers and their use in sequencing genomic DNA.

Inventions 2 to 16: Claim 22 (partially)

Invention 2:

A composition comprising isolated polynucleic acid consisting of SEQ ID NO:61.

Likewise, invention 3:

A composition comprising isolated polynucleic acid consisting of SEQ ID NO:63.

...ibidem inventions 4, 5, ..., and 16, relying to
SEQ ID NO:65,
SEQ ID NO:67,
..., as well as
SEQ ID NO:91.

Invention 17: Claim 23 (complete)

A composition comprising isolated polynucleic acid consisting of SEQ ID NO:59.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International Application No
PCT/US 01/01461

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INTERNATIONAL SEARCH REPORT
Information on patent family members

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