

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
3 January 2002 (03.01.2002)

PCT

(10) International Publication Number
WO 02/000842 A3

- (51) International Patent Classification⁷: **C12Q 1/68**
- (21) International Application Number: PCT/US01/19966
- (22) International Filing Date: 22 June 2001 (22.06.2001)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/228,793 23 June 2000 (23.06.2000) US
- (63) Related by continuation (CON) or continuation-in-part (CIP) to earlier application:
US 60/228,793 (CON)
Filed on 23 June 2000 (23.06.2000)
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- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— with international search report
- (88) Date of publication of the international search report:
19 June 2003
- 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.*



WO 02/000842 A3

(54) Title: METHODS FOR ISOLATING CENTROMERE DNA

(57) Abstract: The invention provides efficient methods for the isolation of centromeres from potentially any organism. The methods represents an advance over the prior art in that costly and labor intensive mapping programs are not required. Using the technique, methylated centromere DNA may be isolated from potentially any centromere in an organism. The technique is amenable to mass screenings employing use of arrays comprising libraries of DNA from a target species.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/19966

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12Q1/68

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)

WPI Data, EPO-Internal, 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.
A	WO 98 55637 A (ARCH DEV CORP ;PREUSS DAPHNE (US); COPENHAVER GREGORY (US)) 10 December 1998 (1998-12-10) page 4-7; claims 1-8 ---	74-116
A	COPENHAVER GREGORY P ET AL: "Genetic definition and sequence analysis of Arabidopsis centromeres" SCIENCE, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE,, US, vol. 286, no. 5449, 24 December 1999 (1999-12-24), pages 2468-2474, XP002159528 ISSN: 0036-8075 abstract --- -/--	74-116

 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

29 January 2003

Date of mailing of the international search report

12/02/2003

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/19966

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WOODCOCK DAVID M ET AL: "Asymmetric methylation in the hypermethylated CpG promoter region of the human L1 retrotransposon." JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 272, no. 12, 1997, pages 7810-7816, XP002228796 ISSN: 0021-9258 cited in the application abstract -----	74-116
E	WO 02 38811 A (TOMIGAHARA YASHITAKA ; JONES PETER A (US); LAIRD PETER W (US); LIAN) 16 May 2002 (2002-05-16) abstract; claims 1,2; figures 1,2; examples 2,7 -----	74-116

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 01/19966

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:
Although claim(s) 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.: 1-73, 117-119
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 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:

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 1-73, 117-119

Present claims 1-70 relate to a large number of "methods of obtaining centromere nucleic acid sequences". However, said claims are not clear in the sense of Article 6 PCT, because they do not comprise any screening step for centromer sequences (i.e. for sequences conferring the ability to segregate to daughter cells during cell division). Instead, the methods of said claims only screen for methylated sequences. Since, however, numerous non-centromeric sequences are also methylated (as also mentioned on page 13, lines 8-13; page 18, line 1 - page 19, line 3; and page 29, line 9 - page 30, line 17, of the present description), such a screen for methylated nucleic acids segments is not sufficient for obtaining centromer sequences. Thus, in the absence of screening procedures for centromeric nucleic acids segments, claims 1-70 so lack clarity (Article 6 PCT), and the application so lacks disclosure (Article 5 PCT), that a meaningful search cannot be performed for said claims.

Consequently, the subject-matter of claims 71-73 (sequences, organisms and progeny prepared by the above-mentioned methods) also cannot be searched.

Instead, the search has been carried out for those parts of the claims which do appear to be clear and sufficiently disclosed (see present examples 2B-2E on pages 67-74), namely those centromer screening methods recited in claims 74-116.

Present claims 117-119 relate to centromer sequences, organisms and progeny prepared by the methods of claims 74, 103, and 118, respectively. Since said claims cover all sequences and organisms which are obtainable by said methods (independent of how the sequences and organisms were actually obtained), claims 117-119 do not contain any technical features. Consequently, a meaningful search cannot be carried out for said claims.

The applicant's attention is drawn to the fact that claims, or parts of 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.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 01/19966

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9855637	A	10-12-1998	AU 746775 B2	02-05-2002
			AU 7608698 A	21-12-1998
			EP 0986648 A1	22-03-2000
			US 6156953 A	05-12-2000
			WO 9855637 A1	10-12-1998

WO 0238811	A	16-05-2002	AU 3398802 A	21-05-2002
			WO 0238811 A2	16-05-2002
