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(54) Title: METHODS AND COMPOSITIONS FOR THE EXTRACTION AND AMPLIFICATION OF NUCLEIC ACID FROM A SAMPLE

(57) Abstract: Provided herein are methods, compositions and kits to extract and relatively enrich by physical separation or amplification short base pair nucleic acid in the presence of a high background of genomic material (e.g., host or maternal nucleic acids).

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 07/69991

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - C12Q 1/68; C12P 19/34 (2007.01)

USPC - 435/6, 435/91.2

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)
435/6, 435/91.2Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Google(Bio101; "magnetic beads" dna rna; beads dna rna isolation); Google Patent("adaptor attached to " pcr);
Google Scholar(rosenthal 1990; Liao 1997 zebrafish; representational difference analysis); Google(adaptor "solid support" ligate)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	BIRNBOIM et al. A rapid alkaline extraction procedure for screening recombinant plasmid DNA. Nucleic Acids Research, 1979 (00.00.1979), Vol. 7, Num. 6, pg. 1515, para 2-3; pg. 1516, para 1-2	45
X	CLONTECH. ApoAlert. LM-PCR Ladder Assay Kit User Manual, 17 August 2001 (17.08.2001), pg. 4	39
Y		40-43
X	US 2006/0024712 A1 (Baker et al.) 2 February 2006 (02.02.2006), para. [0026], [0038], [0043], [0049]-[0063], [0066], [0086]-[0087], [0153]-[0157]	1,3,11,15,17-20,24-25, 31-32,36
Y		2,4-10,12-14,16,21-23, 26-30,33-35,37-38, 40-43
Y	QBIOGENE, INC. GENE CLEAN: Gel Isolation and Reaction Cleanup, 2002 (00.00.2002), pg. 2, Mermaid kit and "Possible mechanism..."	2, 38
Y	US 5234809 A (Boom et al.) 10 August 1993 (10.08.1993), col. 1, ln. 10-16; col. 2, ln. 13-46; col. 3, ln. 62-68; col. 4 ln. 1-2, ln. 9-15; col. 6, ln. 65-67; col. 7, ln. 15-17, ln. 37-40; col. 8, ln. 13-35	4, 13-14, 16, 21-23, 26, 28-30, 34-35, 37
Y	LO et al. Quantitative Analysis of Fetal DNA in Maternal Plasma and Serum: Implications for Noninvasive Prenatal Diagnosis, 1998 (00.00.1998), Am. J. Hum. Genet. 62:768-775, pg. 768, Abstract.; pg. 769, "Subjects and Methods" para 1-3	5-10, 12, 33
Y	PICHL et al. Magnetic bead technology in viral RNA and DNA extraction from plasma minipools, TRANSFUSION, July 2005 (00.07.2005), Vol. 45, p1107, "Automated Nucleic Acid Extraction	27, 29

 Further documents are listed in the continuation of Box C.

* 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 application or patent 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

13 October 2007 (13.10.2007)

Date of mailing of the international search report

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 20050053986 A1 (Makarov et al.) 10 March 2005 (10.03.2005), [0605]-[0608]	40
Y	US 6777187 B2 (Makarov et al.) 17 August 2004 (17.08.2004), col. 2, ln. 34-56; Fig. 5A-5B	41-43
Y	US 6274351 B2 (Peponnet) 14 August 2001 (14.08.2001), col. 1, ln. 45-50	43

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 07/69991

Box No. 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.:
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.: 44
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. 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:

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 additional fees, this Authority did not invite payment of additional fees.
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 and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.