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C12Q 1/48 (2006.01)
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- (71) **Applicant (for all designated States except US):**
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- (72) **Inventors; and**
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- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
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— with international search report (Art. 21(3))

[Continued on next page]

- (54) **Title:** METHODS OF DIAGNOSING CANCER IN A PATIENT

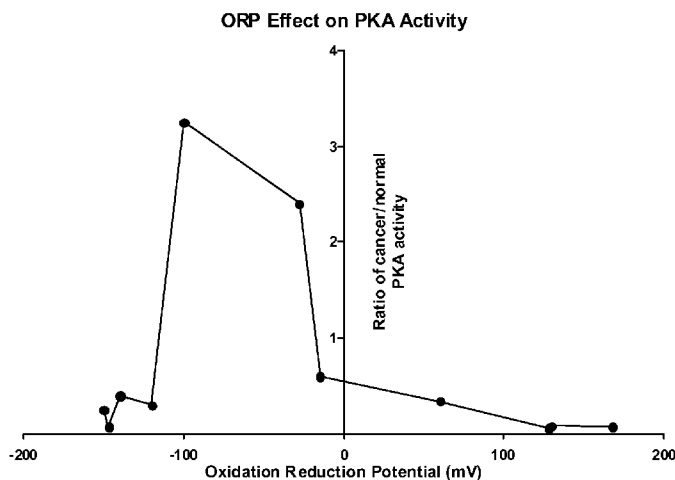


Fig. 1

(57) **Abstract:** The present disclosure relates to methods for determining the presence, activity, and/or concentrations of certain cancer biomarkers and their use in determining the presence of cancer.





— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:
24 January 2013

A. CLASSIFICATION OF SUBJECT MATTER*G01N 33/574(2006.01)i, C12Q 1/48(2006.01)i, G01N 33/68(2006.01)i*

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)

G01N 33/574; C07K 16/18; A61K 31/34; A61K 9/51; A61K 31/21; C12M 1/34

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: cancer, tumor, carcinoma, neoplasm, detect, characterize, diagnose, assay, analysis, marker, double, composite, PKA, cAMP-dependent protein kinase A, extracellular, activity

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EUN YOUNG SONG et al. Development of analysis system for hepatocellular carcinoma-related protein biomarker. 21st Country Frontier R&D Program. 2010, KRIBB	1,4-6
Y	See the whole document, especially, summary, pp. 11-41, 47-61	2,3
Y	HUI WANG et al. Extracellular activity of cyclic AMP-dependent protein kinase as a biomarker for human cancer detection: distribution characteristics in a normal population and cancer patients. Cancer Epidemiol Biomarkers Prev. 2007, Vol. 16, No. 4, pp. 789-795 See the whole document, especially, abstract, pp. 790, 792	2,3
A	YEE SOOK CHO et al. Extracellular protein kinase A as a cancer biomarker: its expression by tumor cells and reversal by a myristate-lacking C-alpha and RII-beta subunit overexpression. Proc Natl Acad Sci U S A. 2000, Vol. 97, No. 2, pp. 835-840 See the whole document	1-6
A	US 2009-0123948 A1 (YOON S. CHO-CHUNG et al.) 14 May 2009 See the whole document	1-6

 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 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 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 NOVEMBER 2012 (29.11.2012)

Date of mailing of the international search report

30 NOVEMBER 2012 (30.11.2012)

Name and mailing address of the ISA/KR


 Korean Intellectual Property Office
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 City, 302-701, Republic of Korea

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Telephone No. 82-42-481-3344



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.: 9-16
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:

Claims 9-16 are unclear, as they refer to the multiple dependent claims which are not drafted in accordance with the third sentence of Rule 6.4(a).

3. Claims Nos.: 7, 8, 17-27
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 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 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.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2012/034080

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2011-0028543 A1 (CHARLES H. GRAHAM et al.) 03 February 2011 See the whole document	1-6
A	US 7582471 B2 (EUN-GYEONG YANG et al.) 01 September 2009 See the whole document	1-6
A	US 2007-0258894 A1 (RICHARD J. MELKER et al.) 08 November 2007 See the whole document	1-6

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/034080

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Information on patent family members

International application No.

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