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(71) Applicant (for all designated States except US): **ACCESS MEDICAL SYSTEMS, LTD.** [US/US]; 1455 Adams Dr. #1322, Menlo Park, California 94025 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ZUK, Robert F.** [US/US]; 1455 Adams Dr. #1322, Menlo Park, California 94025 (US). **TAN, Hong** [US/US]; 1455 Adams Dr. #1322, Menlo Park, California 94025 (US).(74) Agents: **KUNG, Viola T.** et al.; Perkins Coie LLP, P.O. Box 1208, Seattle, Washington 98111-1208 (US).

(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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Published:

- with international search report (Art. 21(3))
- 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:

20 December 2012

(54) Title: LUMINESCENT POLYMER CYCLIC AMPLIFICATION

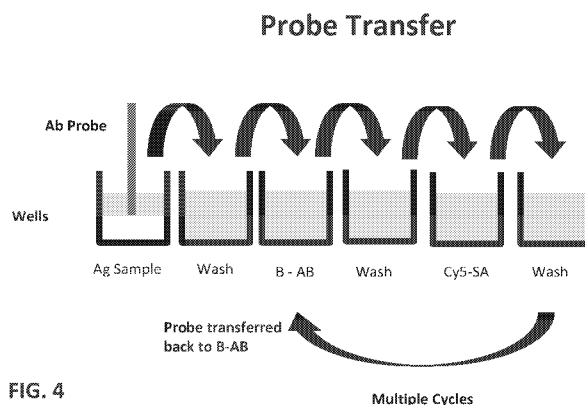


FIG. 4

(57) **Abstract:** The present invention is directed to a luminescent immunoassay method for detecting an analyte in a liquid sample with high sensitivity. The invention provides a unique combination of (i) using a probe having a small sensing surface area for binding analyte molecules, (ii) using a high molecular weight branched polymer conjugated with multiple binding molecules and multiple luminescent labels, and (iii) cycling the probe having immunocomplex formed back to the reagent vessel and amplification vessel 1-10 times and repeating the reaction with the reagent and the amplification polymer, to improve the sensitivity of detection level. For each cycling, the luminescent signal is increased significantly over the noise.

A. CLASSIFICATION OF SUBJECT MATTER*G01N 33/53(2006.01)i, G01N 33/52(2006.01)i, G01N 33/533(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 33/53; G01N 21/64; G01N 33/487; G01N 33/553; C12Q 1/68

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: analyte, antigen, antibody, luminescent signal and cyclic amplification

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2010-101931 A2 (ACCESS MEDICAL SYSTEM CO., LTD. et al.) 10 September 2010 See claims 1 and 14.	14-17
A	See claim 11.	1-13
A	US 6399397 B1 (ZARLING; DAVID A. et al.) 04 June 2002 See abstract.	1-17
A	US 2003-0124595 A1 (PAUL M. LIZARDI) 03 July 2003 See abstract.	1-17
A	US 2006-0127942 A1 (TORE STRAUME et al.) 15 June 2006 See abstract.	1-17



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

10 OCTOBER 2012 (10.10.2012)

Date of mailing of the international search report

16 OCTOBER 2012 (16.10.2012)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
189 Cheongsu-ro, Seo-gu, Daejeon Metropolitan
City, 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

LEE, Choong Jae

Telephone No. 82-42-481-5629



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2012/033808**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.:
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:

Claims 1-13 are directed to a method of detecting an analyte in a liquid sample.

Claims 14 and 15 are directed to a composition for the method of claims 1-13.

Claims 16 and 17 are directed to an electrochemiluminescent system for the method of claims 1-13.

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

Information on patent family members

International application No.

PCT/US2012/033808

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2010-101931 A2	10.09.2010	CN 102341696 A EP 2404162 A2 JP 2012-519850 A US 2011-312105 A1 WO 2010-101931 A3 WO 2010-101931 A3	01.02.2012 11.01.2012 30.08.2012 22.12.2011 06.01.2011 10.09.2010
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US 2003-0124595 A1	03.07.2003	None	
US 2006-0127942 A1	15.06.2006	US 2012-028273 A1 US 6994971 B1 US 8034555 B2	02.02.2012 07.02.2006 11.10.2011