

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
2 April 2009 (02.04.2009)

PCT

(10) International Publication Number
WO 2009/041917 A1

(51) International Patent Classification:

G01N 33/53 (2006.01)

(21) International Application Number:

PCT/SG2007/000330

(22) International Filing Date:

28 September 2007 (28.09.2007)

(25) Filing Language:

English

(26) Publication Language:

English

(71) Applicant (for all designated States except US):
AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH [SG/SG]; 20 Biopolis Way #07-01, Centros, Singapore 138668 (SG).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KONG, Jinming** [CN/SG]; c/o Institute of Microelectronics, 11 Science Park Road, Singapore Science Park II, Singapore 117685 (SG). **FAN, Yi** [CN/SG]; c/o Institute of Microelectronics, 11 Science Park Road, Singapore Science Park II, Singapore 117685 (SG). **CHEN, Xiantong** [CN/SG]; c/o Institute of Microelectronics, 11 Science Park Road, Singapore Science Park II, Singapore 117685 (SG).

(74) Agent: **SCHIWECK, Wolfram**; Viering, Jentschura & Partner LLP, P.O. Box 1088, Rochor Post Office, Rochor Road, Singapore 911833 (SG).

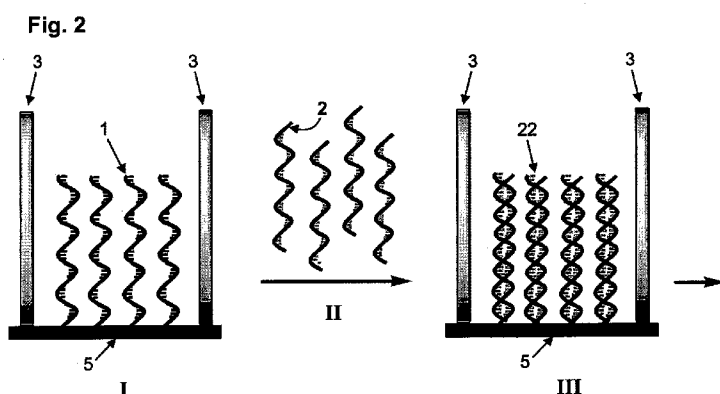
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- with sequence listing part of description published separately in electronic form and available upon request from the International Bureau

(54) Title: METHOD OF ELECTRICALLY DETECTING A NUCLEIC ACID MOLECULE



(57) Abstract: The method is performed by means of a pair of electrodes that are arranged at a distance and within a sensing zone. A nucleic acid capture molecule with an uncharged backbone and a nucleotide sequence that is at least partially complementary to at least a portion of a strand of the target nucleic acid molecule, is immobilised on an immobilisation unit. The immobilisation unit, which is arranged within the sensing zone, is contacted with a solution suspected to comprise the target nucleic acid molecule, which hybridizes to the nucleic acid capture molecule. An activation agent is added, which has an electrostatic net charge complementary to the net charge of the target nucleic acid molecule. It associates to the complex of nucleic acid capture molecule and target nucleic acid molecule. Added is a water soluble polymer with at least one polymer strand and with an electrostatic net charge that is complementary to the net charge of the activation agent. Thus the polymer associates to the activation agent. A metal salt is added, which can act as an oxidant and the metal ions of which have an electrostatic net charge complementary to the net charge of the polymer. The metal ions associate to the polymer. Upon adding a reducing agent, the latter reduces the metal ions, forming a metal wire. The presence of the analyte molecule is determined based on an electrical characteristic of a region in the sensing zone that is affected by the metal wire.



WO 2009/041917 A1