



(51) International Patent Classification:

H01L 27/28 (2006.01) *B82B 1/00* (2006.01)
H01L 51/00 (2006.01) *B82B 3/00* (2006.01)

(21) International Application Number:

PCT/SG2014/000264

(22) International Filing Date:

6 June 2014 (06.06.2014)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/833,130 10 June 2013 (10.06.2013) US

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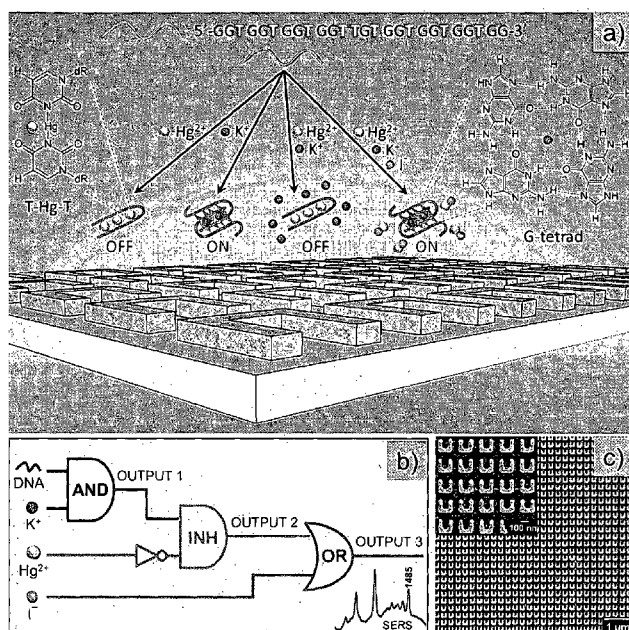
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, 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.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,

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(54) Title: METAMATERIAL DEVICE AND USES THEREOF

Figure 4



(57) Abstract: The present invention relates to a logic gate, comprising a metamaterial surface enhanced Raman scattering (MetaSERS) sensor, comprising (a) alphabetical metamaterials in the form of split ring resonators operating in the wavelength range of from 560 to 2200 nm; and (b) a guanine (G) and thymine (T)-rich oligonucleotide that can, upon presence of potassium cations (K^+), fold into a G-quadruplex structure, and in presence of Hg^{2+} , form a T- Hg^{2+} -T hairpin complex that inhibits or disrupts the G-quadruplex structure formed in presence of K^+ , as well as methods of operating and using such a logic gate.



TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, **Published:**

EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU,

— *with international search report (Art. 21(3))*

LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,

— *with sequence listing part of description (Rule 5.2(a))*

SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,

GW, KM, ML, MR, NE, SN, TD, TG).