



(51) International Patent Classification:

B82B 1/00 (2006.01) **B82B 3/00** (2006.01)
B82Y 5/00 (2011.01) **B82Y 15/00** (2011.01)
B82Y 40/00 (2011.01)

(21) International Application Number:

PCT/SG2011/000330

(22) International Filing Date:

23 September 2011 (23.09.2011)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/385,977 24 September 2010 (24.09.2010) US

(71) Applicants (for all designated States except US): **AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH** [SG/SG]; 1 Fusionopolis Way #20-10, Connexis, Singapore 138632 (SG). **SINGAPORE HEALTH SERVICES PTE LTD** [SG/SG]; 31 Third Hospital Avenue, #03-03 Bowyer Block, Singapore 168753 (SG).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **PRAVEEN, Nagma** [IN/SG]; c/o Singapore Bioimaging Consortium, 11

Biopolis Way #01-02, Singapore 138667 (SG). **THONIYOT, Praveen** [IN/SG]; c/o Singapore Bioimaging Consortium, 11 Biopolis Way #01-02, Singapore 138667 (SG). **OLIVO, Malini** [MY/SG]; c/o Singapore Bioimaging Consortium, 11 Biopolis Way #01-02, Singapore 138667 (SG).

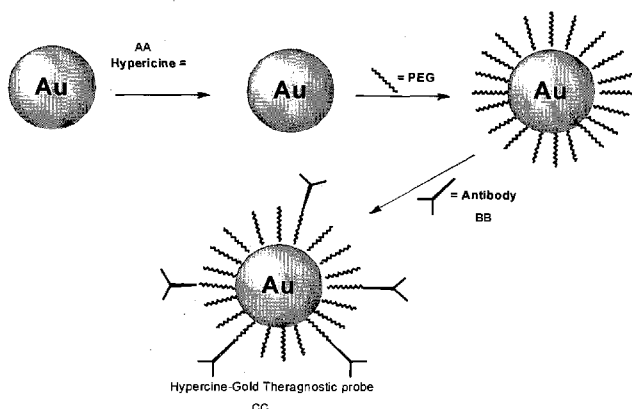
(74) Agent: **VIERING, JENTSCHURA & PARTNER LLP**; P.O. Box 1088, Rochor Post Office, Rochor Road, Singapore 911833 (SG).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, 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.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: A NANOPROBE COMPRISING GOLD COLLOID NANOPARTICLES FOR MULTIMODALITY OPTICAL IMAGING OF CANCER AND TARGETED DRUG DELIVERY FOR CANCER



(57) Abstract: The present invention is directed to a nanoprobe loaded with a light sensitive molecule and a method of preparing the nanoparticle, wherein the nanoparticle is a colloidal gold nanoparticle and the light sensitive molecule is non-covalently adsorbed to the surface of the nanoparticle. The present invention is also directed to a nanoprobe comprising the nanoparticle and further comprising a targeting moiety covalently coupled to the surface of the nanoparticle. Additionally, the present invention is directed to an imaging method comprising administering the nanoprobe to a subject and collecting imaging data of the subject or part of the subject with optical multimodality imaging. A method of treating cancer in a subject comprising administering the nanoprobe and performing photodynamic therapy on the subject is further disclosed.

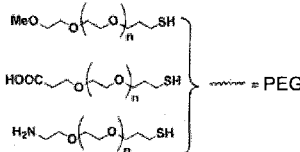
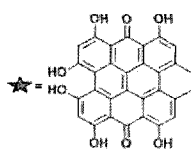


Figure 1



GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG,
ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU,
LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,

SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

Published:

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