



(51) International Patent Classification:

C07D 311/90 (2006.01) *C12Q 1/68* (2006.01)
C12Q 1/25 (2006.01) *G01N 21/64* (2006.01)

(21) International Application Number:

PCT/SG2013/000461

(22) International Filing Date:

28 October 2013 (28.10.2013)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/719,587 29 October 2012 (29.10.2012) US

(71) Applicants: **NATIONAL UNIVERSITY OF SINGAPORE** [SG/SG]; 21 Lower Kent Ridge Road, Singapore 119077 (SG). **AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH** [SG/SG]; 1 Fusionopolis Way, #20-10 Connexis, Singapore 138632 (SG).

(72) Inventors: **CHANG, Young-Tae**; c/o National University of Singapore, Faculty of Science, Department of Chemistry, 21 Lower Kent Ridge Road, Singapore 119077 (SG). **YUN, Seong-Wook**; c/o Singapore Bioimaging Consortium (SBIC), 11 Biopolis Way, #02-02 Helios, Singapore 138667 (SG). **HA, Hyung Ho**; c/o National University of Singapore, Faculty of Science, Department of Chemistry, 21 Lower Kent Ridge Road, Singapore 119077 (SG).

(74) Agent: **AMICA LAW LLC**; 30 Raffles Place, #18-03/04 Chevron House, Singapore 048622 (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, 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,

[Continued on next page]

(54) Title: FLUORESCENT CHEMICAL DYE FOR VISUALIZATION OF NEURAL STEM CELL SYMMETRIC AND ASYMMETRIC DIVISION

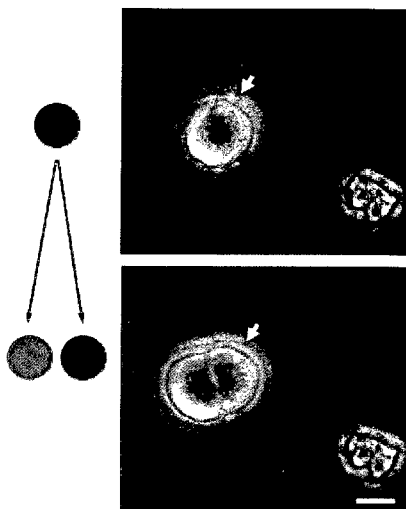
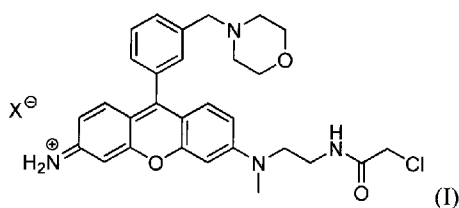


FIG. 3B



(57) Abstract: A fluorescent rosamine dye having specificity for neural stem cells, specifically, proliferative neural stem cells, and represented by Structural Formula (I): wherein X is an anion, is described herein. Synthesis of the fluorescent rosamine dye and use of the fluorescent rosamine dye to detect symmetric and asymmetric division of neural stem cells are also described.



TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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

(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, 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,

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

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