Preparation of Fluorescent Diamond Nanoparticles Stably Dispersed under Physiological Environment through Multi-Step Organic Transformations

Tatsuya Takimoto¹, Tokuhiro Chano², Sawako Shimizu², Hidetoshi Okabe², Masaaki Ito³, Masahito

Morita⁴, Takahide Kimura¹, Toshiro Inubushi⁵, and Naoki Komatsu^{1}*

¹ Department of Chemistry, Shiga University of Medical Science, Seta, Otsu 520-2192, Japan

² Department of Clinical Laboratory Medicine, Shiga University of Medical Science, Seta, Otsu 520-2192, Japan

³ Organic Chemical Company, Daicel Chemical Industries, LTD., 2-1-4 Higashisakae, Ohtake, Hiroshima 739-0605, Japan

⁴ Immunology Frontier Research Center, □ Osaka University, □ 3-1 Yamadaoka, Suita 565-0871, Japan

⁵ Biomedical MR Science Center, Shiga University of Medical Science, Seta, Otsu 520-2192, Japan

E-mail: nkomatsu@belle.shiga-med.ac.jp

a

b

Figure S1. (a) Bright field (left) and fluorescent images (right) of ND **3** prepared according to Scheme 1 (excitation at 470 – 490 nm, emission at 515 – 550 nm). (b) IR spectra of **2** and **3**.

Figure S2. Solution-phase ^{13}C -NMR of **4** and *N*-Boc- ω -aminododecanoic acid in CDCl_3 .

Figure S3. Solution-phase ^1H -NMR spectra of **7** in DMSO-d_6 .

Figure S4. IR spectra of 6-B and 7.

Figure S5. Solution-phase ^{13}C -NMR of **8** and **9** in DMSO-d_6 .

Figure S6. IR spectra of **6-B**, **8** and **9**.

Figure S7. Fluorescent spectrum of **10** dispersed in PBS at excitation of 490 nm.

Figure S8. TEM images of 10.

Figure S9. Particle size analyses of **10** dispersed in PBS (**a**, median diameter: 48 nm), the starting ND dispersed in water (**b**, median diameter: 30 nm) and **5** dispersed in DMSO (**c**, median diameter: 37 nm).