Supporting information

Synthesis of sub-100 nm biocompatible superparamagnetic Fe₃O₄ colloidal nanocrystal clusters as contrast agents for magnetic resonance imaging

Yuxia Tang, a Ying Liu,a Wei Li,*a,c Yuan Xie,a Yanjun Li,a Jiang Wu,a Shouju Wang,a Ying Tian,a Wei Tian,a Zhaogang Teng,*a,b and Guangming Lu* a,b

aDepartment of Medical Imaging, Jinling Hospital, School of Medicine, Nanjing University, Nanjing 210000, P.R. China
bState Key Laboratory of Analytical Chemistry for Life Science, School of Chemistry and Chemical Engineering, Nanjing University, Nanjing, 210093 Jiangsu, P.R. China
cDepartment of Chemistry, Laboratory of Advanced Materials, Fudan University, Shanghai 200433, P. R. China.
*Corresponding Author. Fax: +86 25 8480 4659. Tel: +86 25 8086 0185. E-mail: (W.L.) li_w10@fudan.edu.cn; (Z.T.) tzg@fudan.edu.cn; (G.L.) cjr.luguangming@vip.163.com
Fig. S1. SEM image and corresponding size distribution plot of 180 nm colloidal superparamagnetic nanocrystal clusters.
Fig. S2. TEM images of (a) 70 nm, (b) 100 nm and (c) 130 nm colloidal superparamagnetic nanocrystal clusters.
Fig. S3. TEM image of the sample with the content of water increased to 4.0 mL. Irregular nanoparticles are obtained.

Fig. S4. TEM image (a) and XRD pattern (b) of α-Fe₂O₃ nanoparticles. Uniform α-Fe₂O₃ nanoparticles would be obtained when pure water was used as the solvent.
Fig. S5. The HRTEM image of 70 nm colloidal superparamagnetic nanocrystal clusters.
Fig. S6. The HRTEM image of 85 nm colloidal superparamagnetic nanocrystal clusters. The individual particles are marked by the red dash lines.

Fig. S7. FT-IR spectra of SPNCs with different sizes.

Fig. S8. Zeta potentials of SPNCs with different sizes.
**Fig. S9.** The colloidal stability of 85 colloidal superparamagnetic nanocrystal clusters in H$_2$O, PBS, DMEM and FBS at the concentration of 50 μg mL$^{-1}$ for 1 h.

**Fig. S10.** *In vitro* viability of MCF-7 cells incubated with 85 nm and 70 nm colloidal superparamagnetic nanocrystal clusters for 24 h.