Supporting Information

Biocompatible PMAO-coated Gd_2O_3/Fe_3O_4 composite nanoparticles as an effective T_1–T_2 dual-mode contrast agent for Magnetic Resonance Imaging

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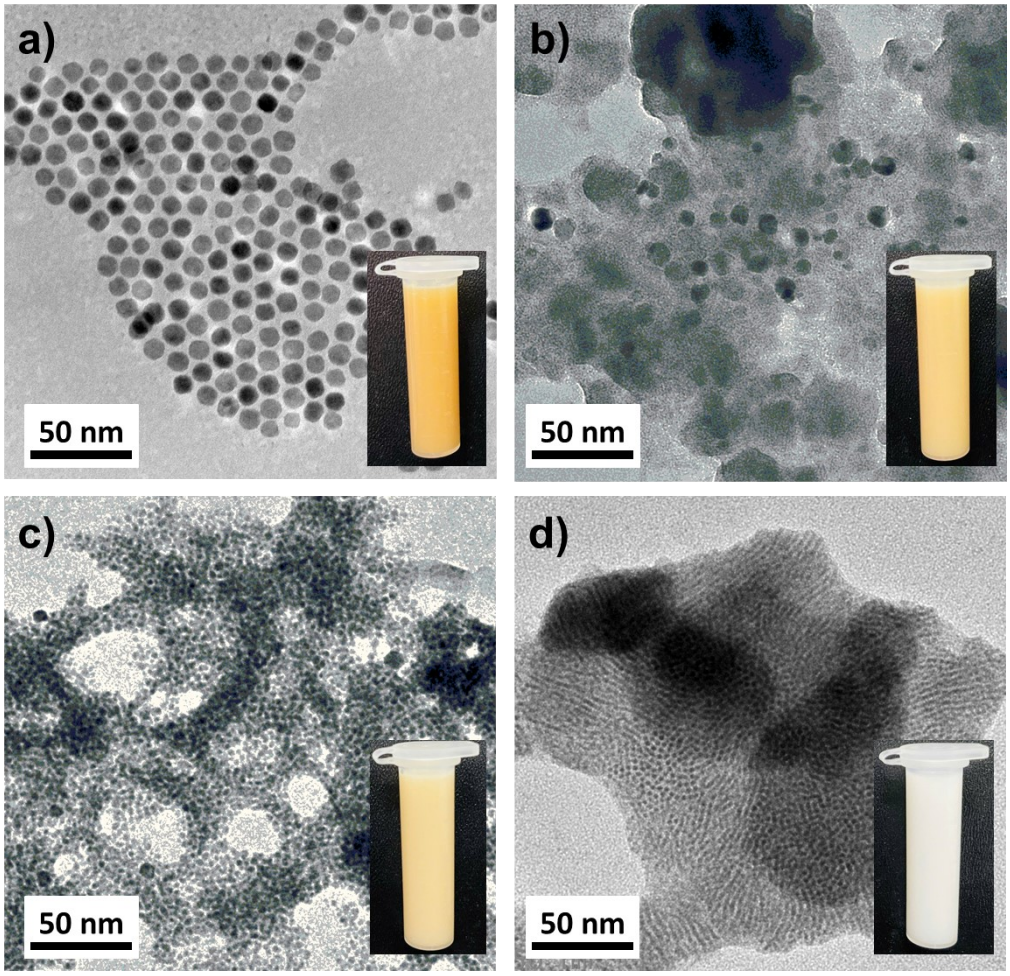

Fig. S1. TEM images and photographs of the GFO solutions at various Gd/Fe precursor ratios: a) GFO-7/3, b) GFO-8/2, c) GFO-9/1 and d) pure Gd.

Table S1. The amount of the metal precursors and the compositions of the obtained GFO samples.

Sample	Gd/Fe molar ratio of precursors	Gd/Fe molar ratio measured by ICP-MS	r_1 ($mM^{-1}s^{-1}$)	r_2 ($mM^{-1}s^{-1}$)	r_2/r_1
GFO-7/3	2.330	1.237	18.20	94.75	5.21
GFO-8/2	3.997	2.093	19.53	67.15	3.44
GFO-9/1	8.996	3.751	20.46	54.60	2.69
Gd_2O_3	N.A	N.A	20.31		

Table S2. The d-spacing values (nm) calculated from the electron diffraction patterns and the standard atomic spacing for Fe_3O_4 (highlighted in yellow) and Gd_2O_3 (highlighted in red) along with respective hkl indexes from the JCPDS cards.

Calculated d-spacing (Å)	*JCPDS data for Fe_3O_4 (Å)*	*JCPDS data for Gd_2O_3 (Å)*	*hkl*
3.138		*3.12*	***222***
2.545	*2.532*		***311***
2.118	*2.099*		***400***
1.733	*1.714*		***422***
1.639		*1.627*	***622***
1.497	*1.484*		***440***
1.256	*1.28*		***533***

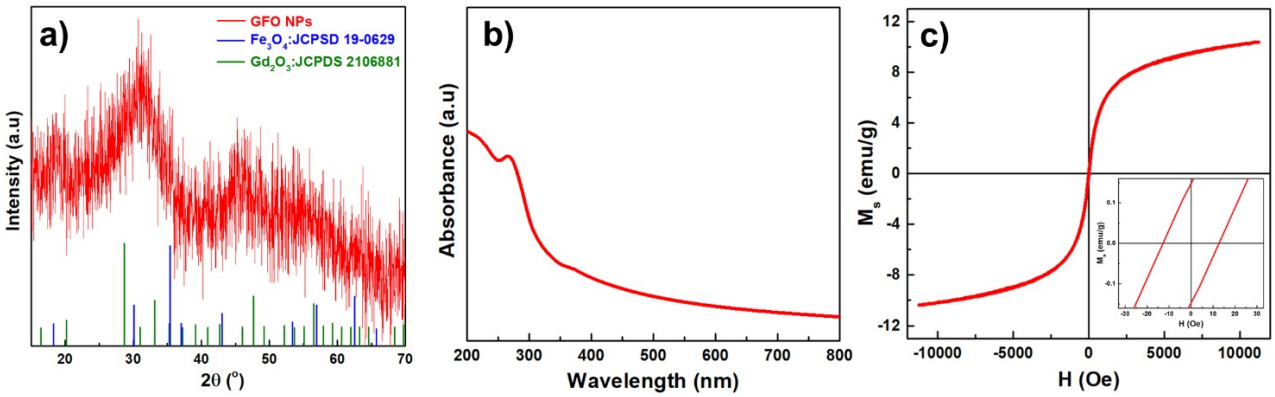

Fig. S2. a) XRD pattern, b) UV-Vis spectrum and c) Hysteresis loops at 300 K of GFO-7/3 CNPs.

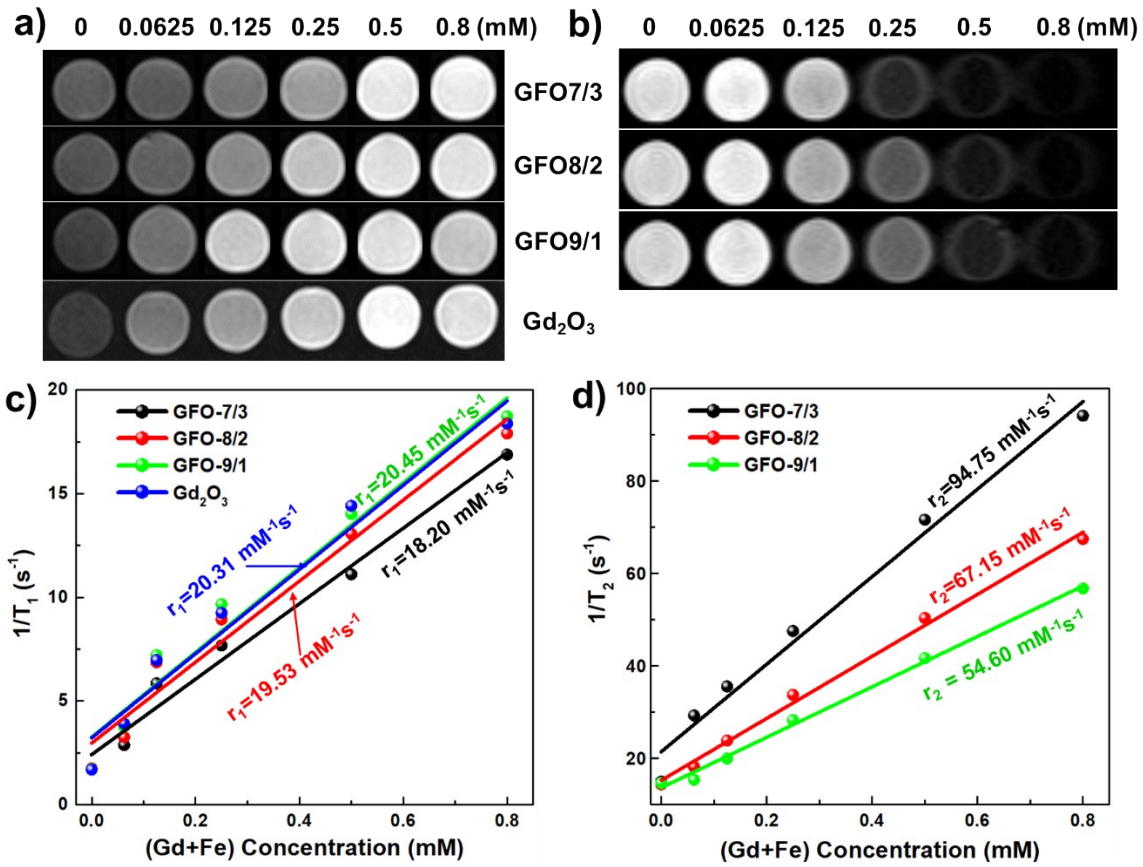

Fig. S3. a) T_1- and b) T_2-weighted phantom MR images of GFO-7/3, GFO-8/2, GFO-9/1 and Gd_2O_3 NPs with various metal concentrations at 1.5 T; c-d) Plots of the inverse longitudinal ($1/T_1$) and transverse ($1/T_2$) relaxation times versus metal concentrations, respectively.