Supporting Information

Regulation of multifunctional mesoporous core-shell nanoparticles with luminescence and magnetic properties for biomedical applications

Xiaoqing Hu, Mingliang Wang, Fei Miao, Jingwei Ma, Hebai Shen, Nengqin Jia*

Figure S1. Flow chart of solvothermal synthetic procedures for (Y,Gd)\textsubscript{2}O\textsubscript{3}:Eu\textsuperscript{3+} NPs. The inset at the bottom: DLS size distribution (in ethanol) of YGO-A NPs (left) and YGO-A* NPs (right).
Figure S2. N$_2$ adsorption/desorption isotherms and mesopore size distribution curves (the inset) of (a) YGO-Bmc NPs, (b) YGO-Bmc$_{\text{8:1}}$ NPs; low-angle XRD patterns of (c) YGO-Bmc NPs, (d) YGO-Bmc$_{\text{8:1}}$ NPs.
Figure S3. TEM image of mSiO$_2$. 

![TEM image of mSiO$_2$.](image)
Figure S4. The FT-IR spectra of (a) YGO-Bm NPs, (b) YGO-Bmn NPs, (c) YGO-Bmnc NPs. Contrary to YGO-Bm NPs, the bands in the region 2800–3000 cm$^{-1}$ which attributed to the vibrations of -CH$_3$, -CH$_2$ of CTAB templates disappeared for YGO-Bmn NPs, suggesting that the CTAB templates are eradicated completely after NH$_4$NO$_3$/EtOH extraction. For YGO-Bmnc NPs, the new characteristic vibration of Ln-O bond in 543 cm$^{-1}$ turns up, demonstrating that the amorphous Ln(OH)$_3$ completely dehydrated and transformed into Ln$_2$O$_3$ after calcination.
Figure S5. In vitro cytotoxicity of YGO-Bmnc NPs against BxPC-3, K562 and MC cells after 24 h, 48 h and 72h incubation.