

Electronic Supplementary Information for
Ultrasonic Assisted Preparation of Lanthanide-Oleate Complexes for
the Synthesis of Multifunctional Monodisperse Upconversion
Nanoparticles for Multimodal Imaging

Shu-Hua Tang,^a Jianing Wang,^b Cheng-Xiong Yang^a, Lu-Xi Dong^a, Deling Kong^b and Xiu-Ping Yan^{*a}

^a State Key Laboratory of Medicinal Chemical Biology (Nankai University), Collaborative Innovation Center of Chemical Science and Engineering (Tianjin), and Research Center for Analytical Sciences, College of Chemistry, Nankai University, 94 Weijin Road, Tianjin 300071, China. E-mail: xpyan@nankai.edu.cn; Fax: +86-22-23506075; Tel: +86-22-23504605

^b State Key Laboratory of Medicinal Chemical Biology (Nankai University), College of Life Sciences, Nankai University, 94 Weijin Road, Tianjin 300071, China

Table of Contents

Table S1

Fig.

S1-S8

Table S1 Elemental analysis of the prepared Gd-oleate complex. The theoretical molar ratio of oleic acid to Gd is 3. The calculated values are given in parentheses.

Ln-oleate	%C	%H	%Ln	Oleic acid/Ln
Gd-oleate	62.96 (64.69)	9.82 (9.88)	14.76 (15.70)	3.11

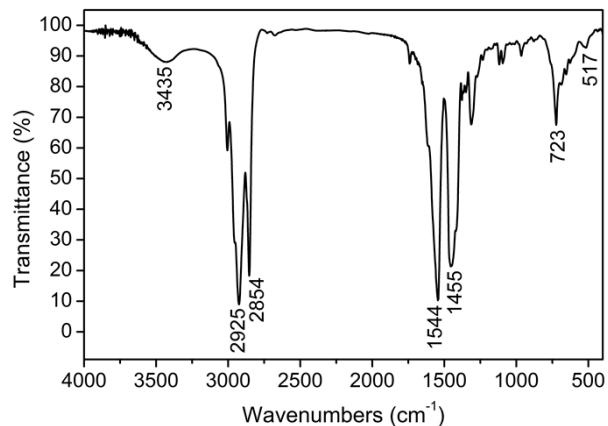


Fig. S1 FT-IR spectra of the prepared Gd-oleate complex.

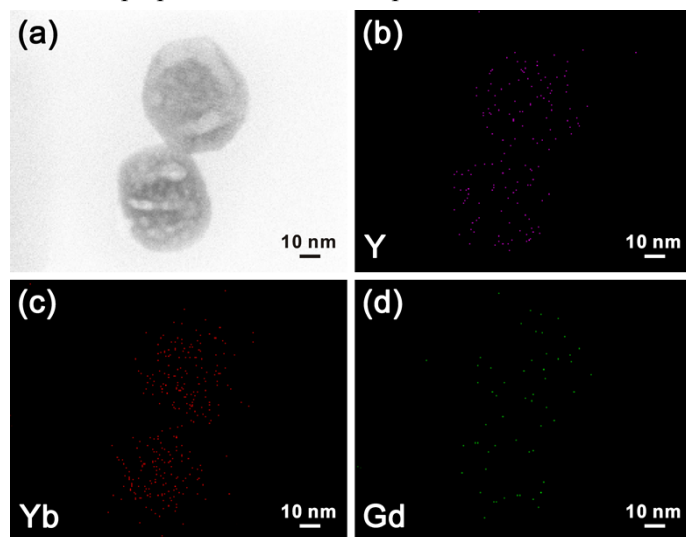


Fig. S2 EDX element mapping images of the $\text{NaYF}_4:59\%\text{Yb}^{3+},0.5\%\text{Tm}^{3+}@\text{NaYF}_4:20\%\text{Gd}^{3+}$ core-shell nanoparticles: (a) TEM of the selected nanoparticles; (b-d) Element maps of Y, Yb and Gd in the nanoparticles shown in (a).

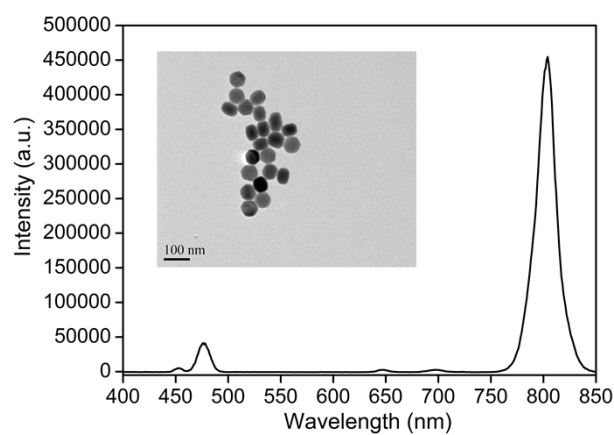


Fig. S3 Upconversion luminescence of the UCNPs-PAA. Inset: TEM of the UCNPs-PAA dispersed in water.

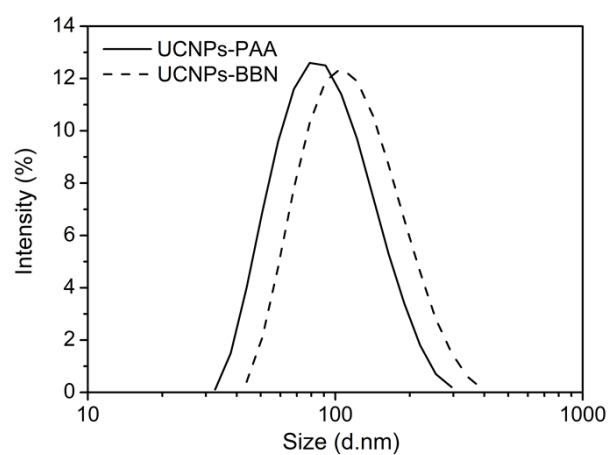


Fig. S4 DLS of UCNPs-PAA and UCNPs-BBN.

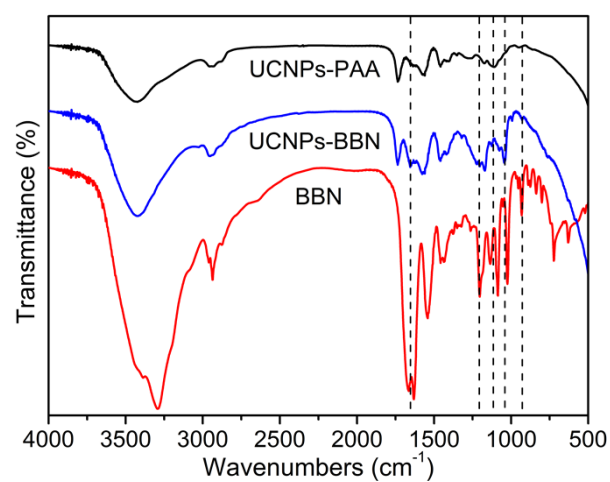


Fig. S5 FT-IR spectra of the UCNPs-PAA, UCNPs-BBN and BBN.

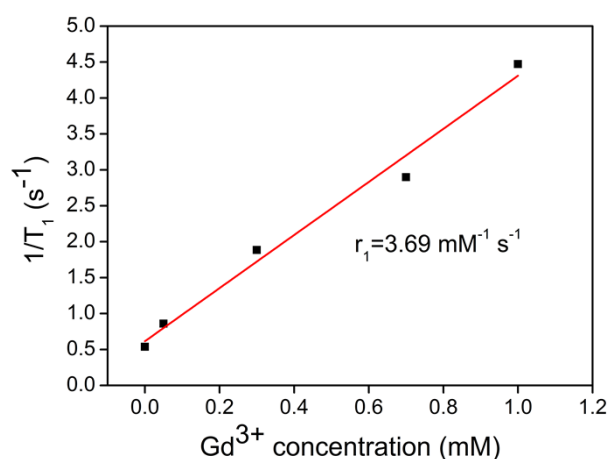


Fig. S6 T₁ relaxivity plot of the Gd-DTPA dispersed in water with different Gd³⁺ concentrations.

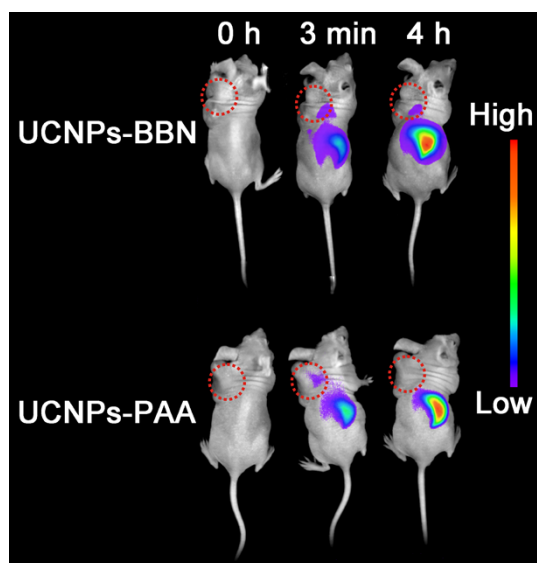


Fig. S7 *In vivo* UCL imaging of PC-3 tumor bearing mice with UCNPs-BBN and UCNPs-PAA.

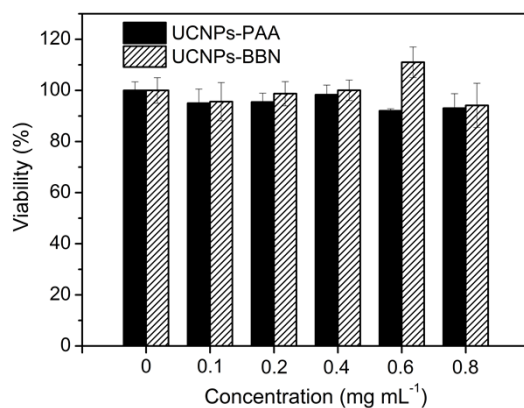


Fig. S8 Cell viability values (%) estimated by MTT proliferation tests versus incubation concentrations of UCNPs-PAA and UCNPs-BBN.