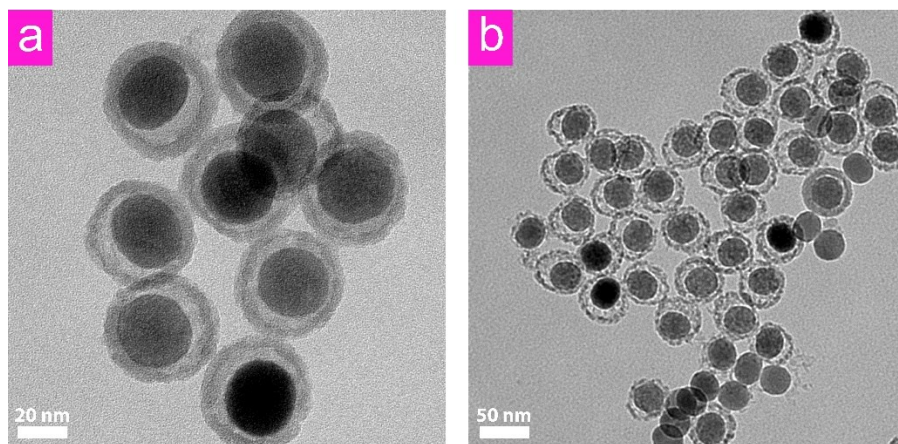


## Supplementary Information:

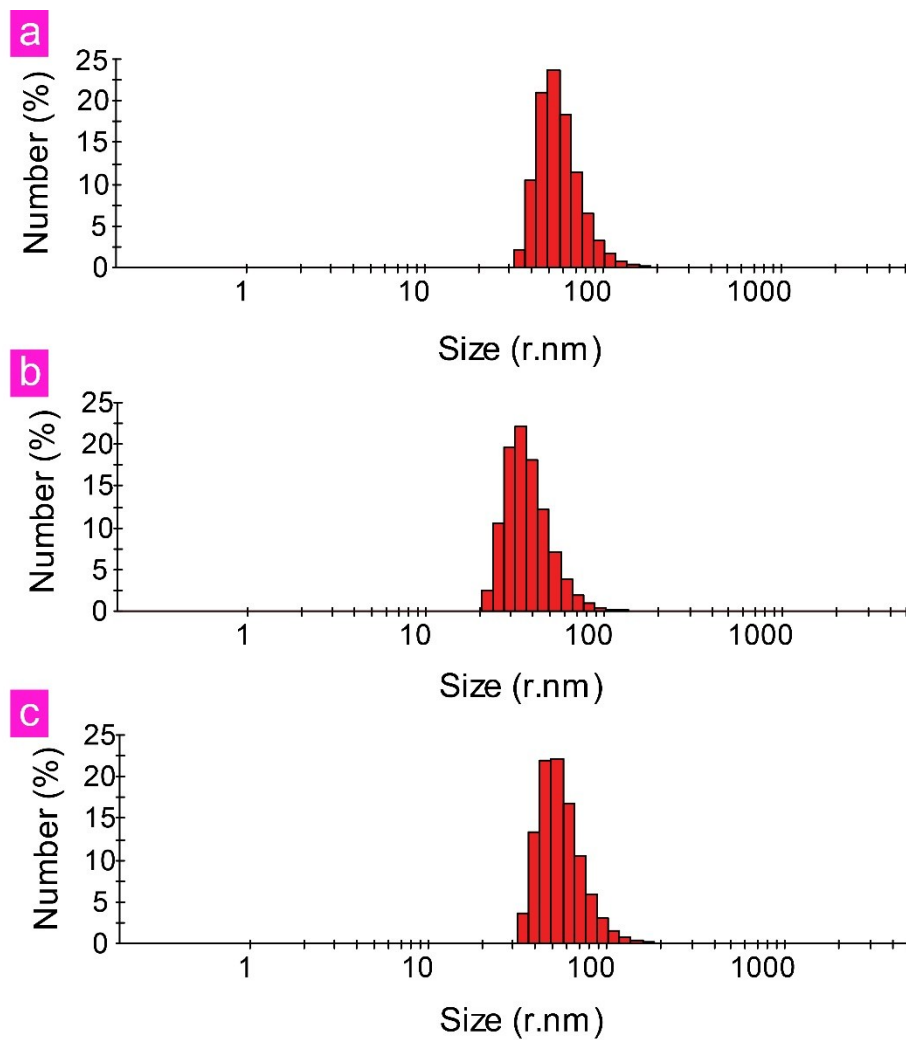
# A facile strategy for the synthesis of NaREF<sub>4</sub>-gold nanocomposite as a dual-modal bioimaging agent

Bin Shen,<sup>a</sup> Yilin Gao,<sup>a</sup> Qingyun Liu,<sup>a</sup> Shengming Cheng,<sup>a</sup> Wei Feng,<sup>\*a</sup> and Fuyou Li<sup>\*a</sup>

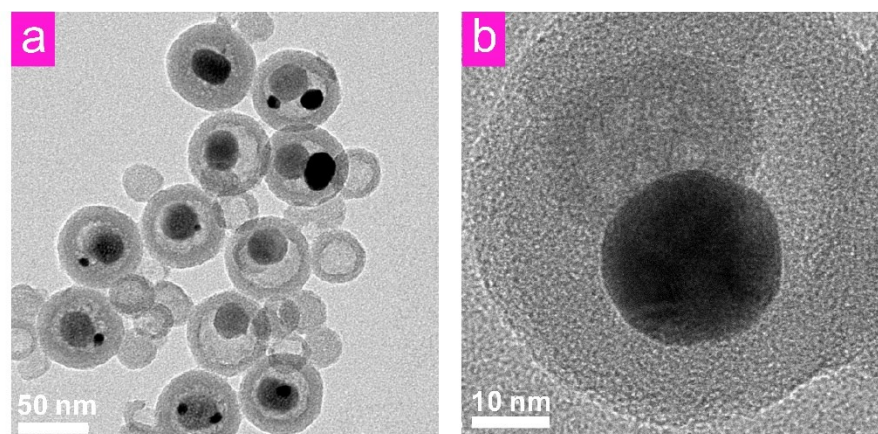
<sup>a</sup> *Department of Chemistry and The State Key Laboratory of Molecular Engineering of Polymers and Institute of Biomedicine Science and Collaborative Innovation Center of Chemistry for Energy Materials, Fudan University, Shanghai, 200433, P. R. China*



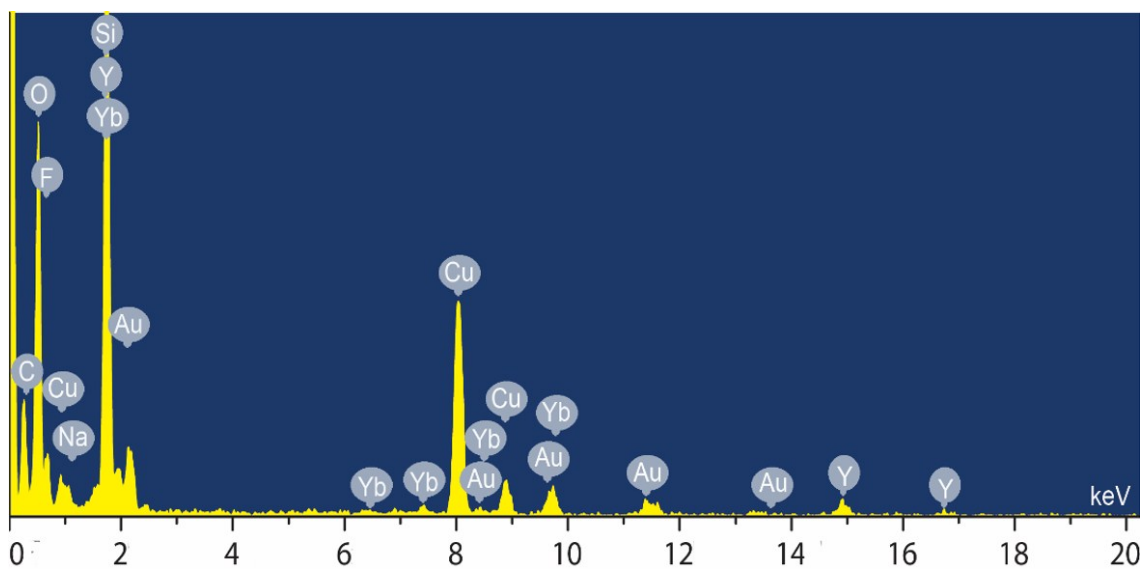
**Figure S1.** TEM images of (a) yolk-shell structure; (b) over-etched yolk-shell structure by excess HF.



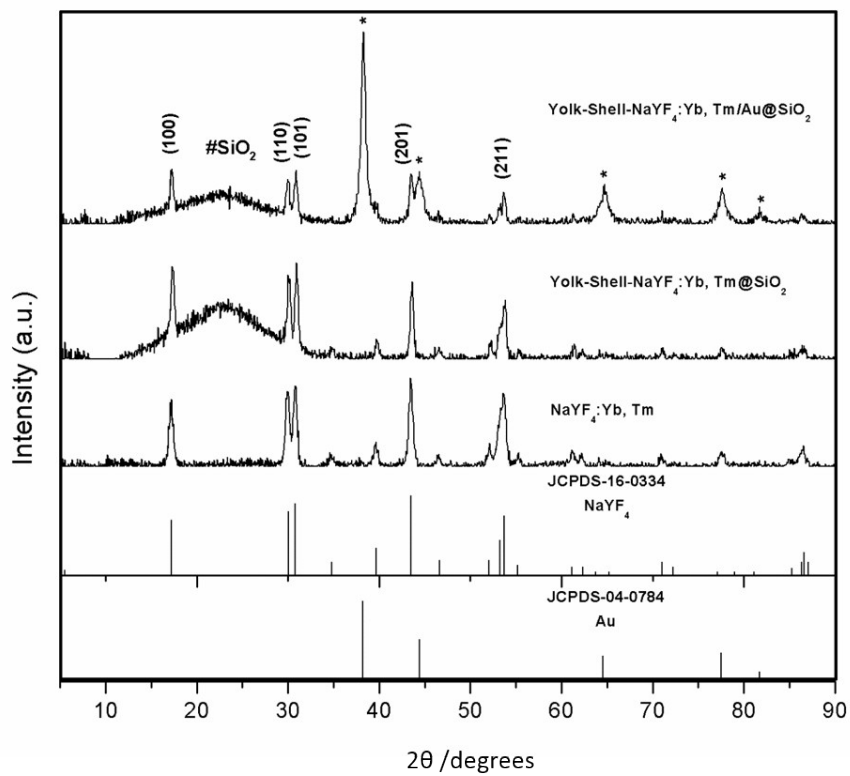
**Figure S2** The hydrated diameter of (a) RE-UCNP@NH<sub>2</sub>-SiO<sub>2</sub>@SiO<sub>2</sub>; (b) RE-UCNP@porous-NH<sub>2</sub>-SiO<sub>2</sub>@SiO<sub>2</sub>; (c) RE-UCNP/GNPs@SiO<sub>2</sub> determined by DLS.



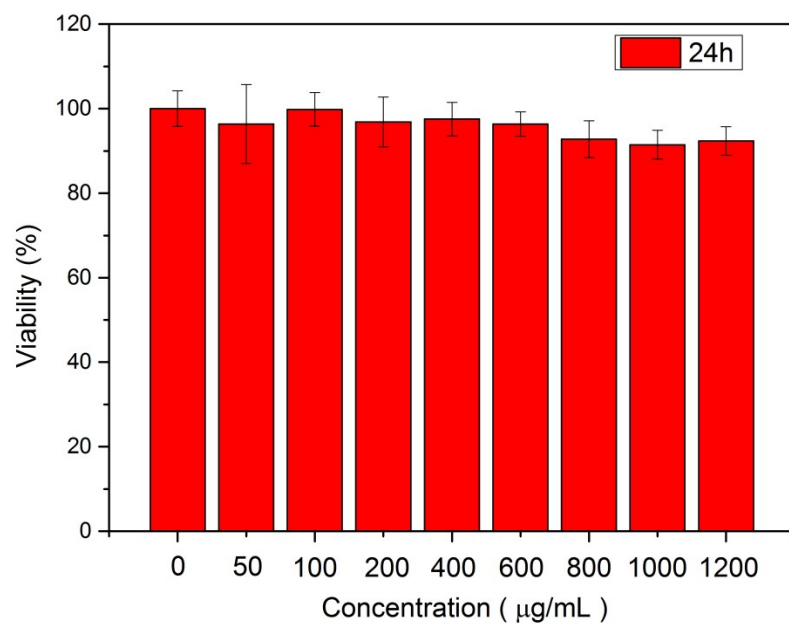
**Figure S3** TEM images of yolk-shell RE-UCNP/GNPs@SiO<sub>2</sub>.



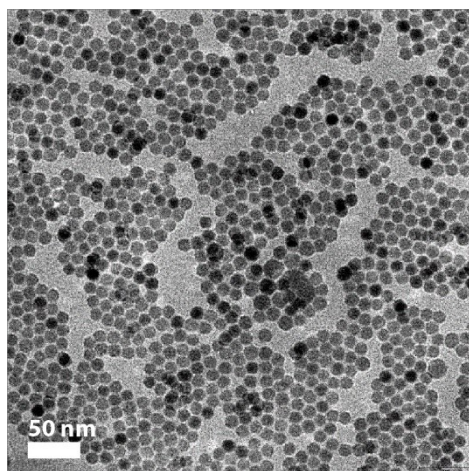
**Figure S4** EDXA spectrum of the corresponding RE-UCNP/GNPs@SiO<sub>2</sub>.



**Figure S5** XRD patterns of the corresponding nanoparticles.



**Figure S6** *In vitro* cytotoxicity measure of RE-UCNP/GNPs@SiO<sub>2</sub> by MTT assay.



**Figure S7** TEM image of NaYF<sub>4</sub>:Yb,Gd,Er (48:20:30:2).