

Supporting Information

Er³⁺-doped YbPO₄ Up-conversion Porous Nanospheres for UCL/CT Bimodal Imaging *In Vivo* and Chemotherapy

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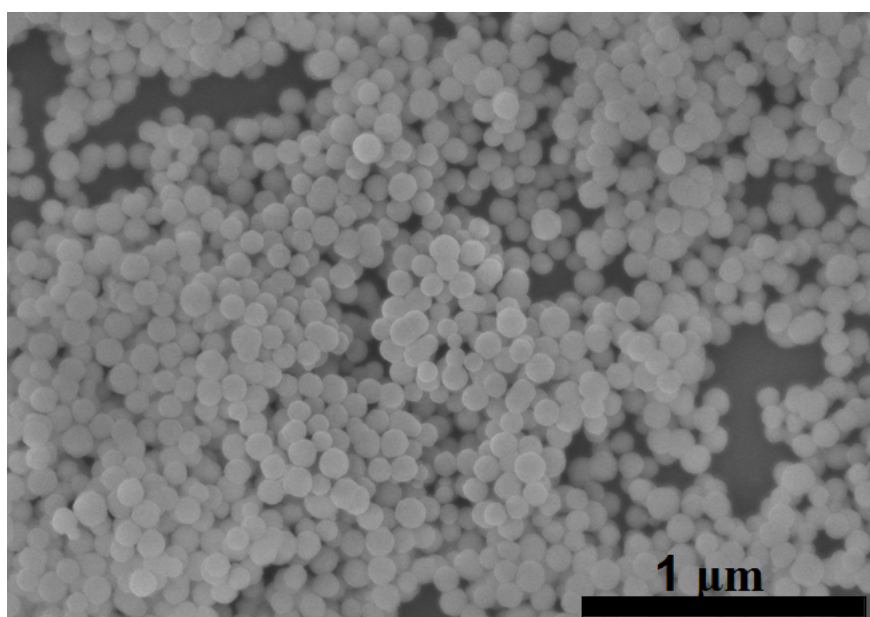


Fig. S1. SEM image of the as-obtained Yb carbonate precursors.

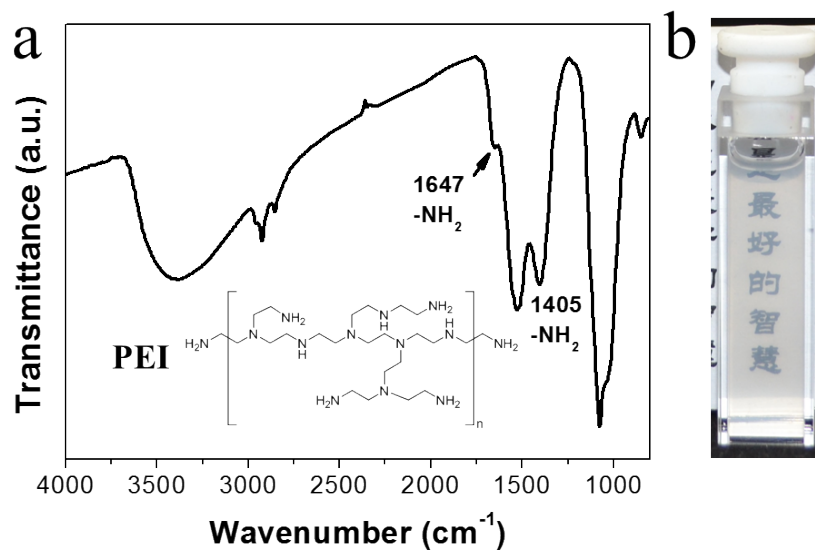


Fig. S2. (a) FT-IR spectrum of the as-obtained YbPO₄:Er PEI-UCPSs. Inset: molecular structure of PEI. The bands at 2923 and 2853 cm⁻¹ are attributed to the stretching vibrations of the -CH₂- group, respectively. In addition, peaks centered at 1649 and 1405 cm⁻¹ are ascribed to the internal vibrations of the amide group, demonstrating the successful PEI coating on YbPO₄:Er UCPSs.^{1, 2} (b) Digital image of PEI-YbPO₄:Er UCPSs dispersed in water (1 mg/mL).

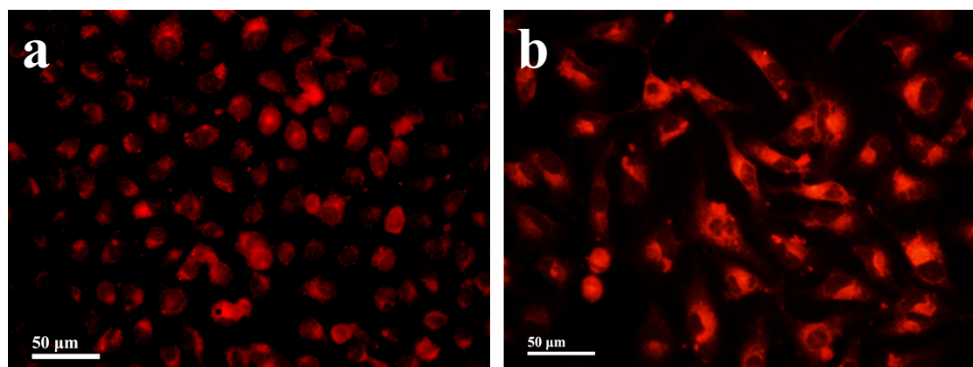


Fig. S3 Cell fluorescence images showing cellular accumulation and distribution of PEI-UCPSs@DOX (100 $\mu\text{g}/\text{mL}$ for 1 h) in (a) 16HBE and (b) A549 cells.

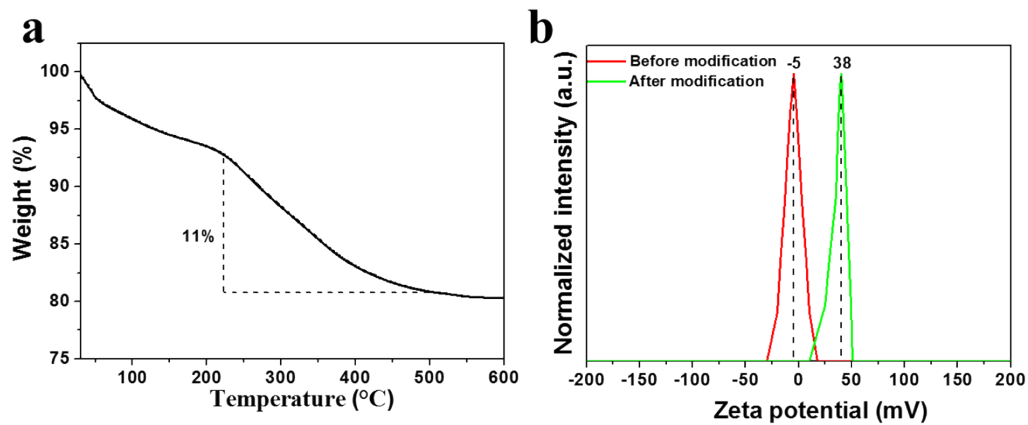


Fig. S4 (a) The thermogravimetric analysis of PEI-UCPSs; (b) Zeta potential analysis of NPs before and after PEI-modification.

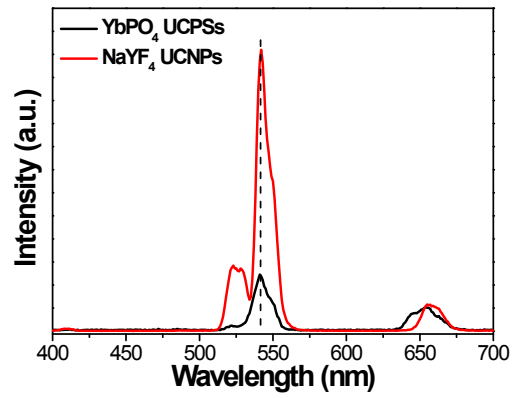


Fig. S5 The comparison of UCL intensity between YbPO_4 UCPSs and NaYF_4 UCNPs.

References:

- 1 H. T. Wong, M. K. Tsang, C. F. Chan, K. L. Wong, B. Fei and J. Hao, *Nanoscale*, 2013, **5**, 3465.
- 2 D. Yang, X. Kang, P. Ma, Y. Dai, Z. Hou, Z. Cheng, C. Li and J. Lin, *Biomaterials*, 2013, **34**, 1601.