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Electronic Supplementary Information (ESI) for:

Surface Charge Effect on the Cellular Interaction and Cytotoxicity of $NaYF_4$: Yb^{3+}, Er^{3+}@SiO_2 Nanoparticles

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This file includes:

Figs S1 to S6

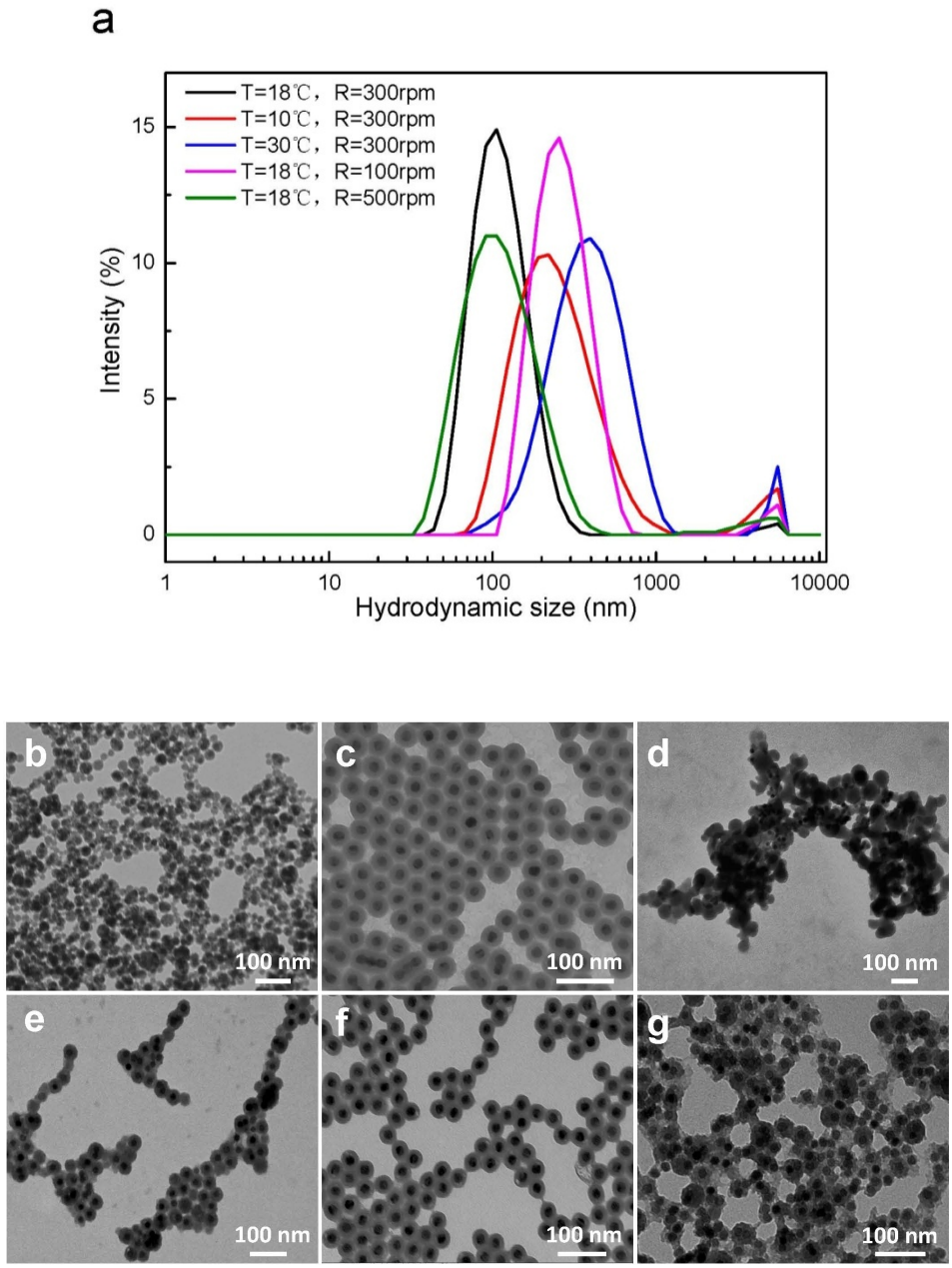

Fig. S1 Hydrodynamic size distributions of UCNP@SiO_2-COOH under various synthesis conditions (a) and TEM micrographs of UCNP@SiO_2-COOH at different reaction temperatures (10 °C (b), 18 °C (c) and 30 °C (d)) and stirring rates (100 rpm (e), 300 rpm (f) and 500 rpm (g)), respectively.

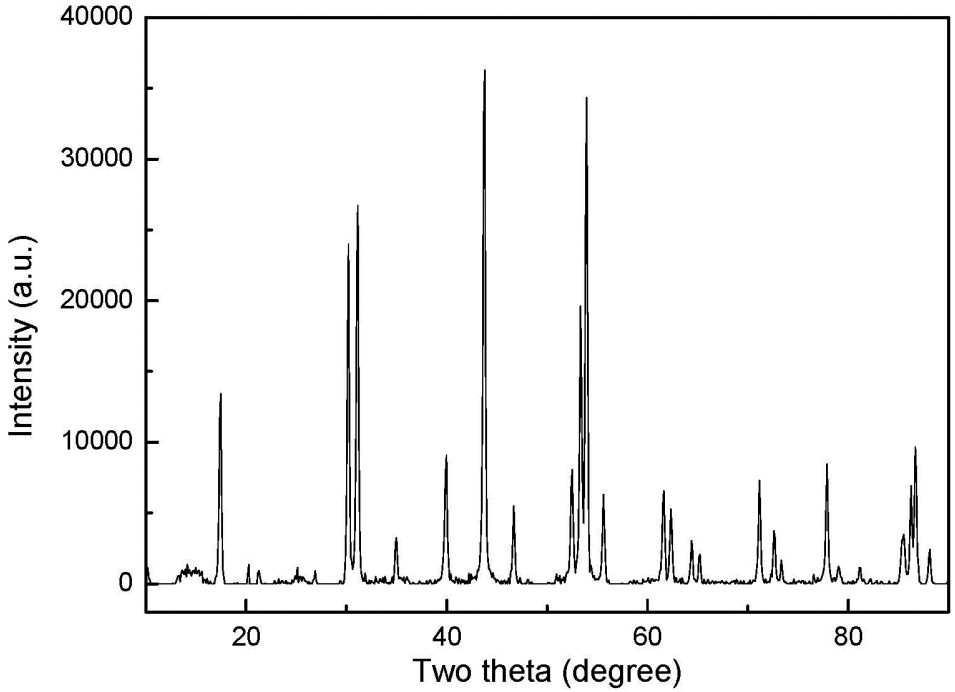

Fig. S2 Powder XRD pattern of UCNP.

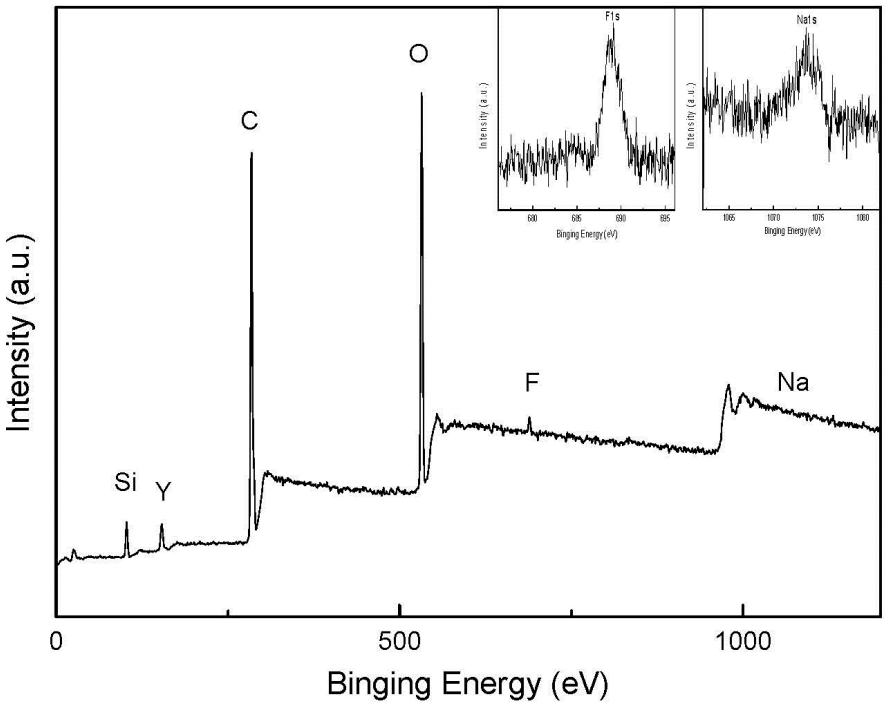

Fig. S3 The high resolution (inset) and wide scan XPS analysis of UCNP@SiO_2-COOH.

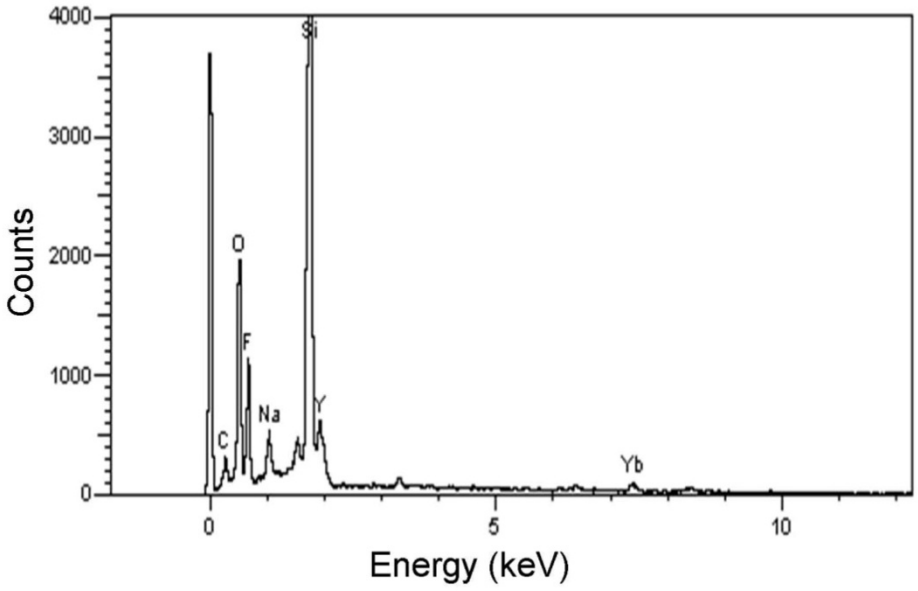

Fig. S4 The energy X-ray spectroscopy (EDS) analysis of UCNP@SiO_2-COOH.

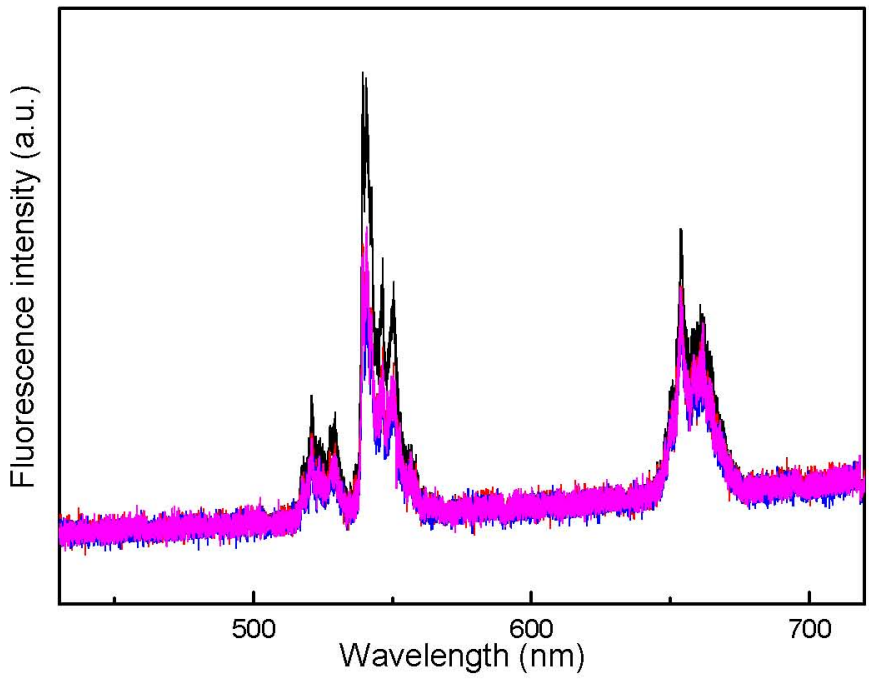

Fig. S5 UCL spectra of OA-capped UCNP (black line), UCNP@SiO_2-COOH (red line), UCNP@SiO_2-PEG (blue line) and UCNP@SiO_2-PEG-NH_2 (magenta line).

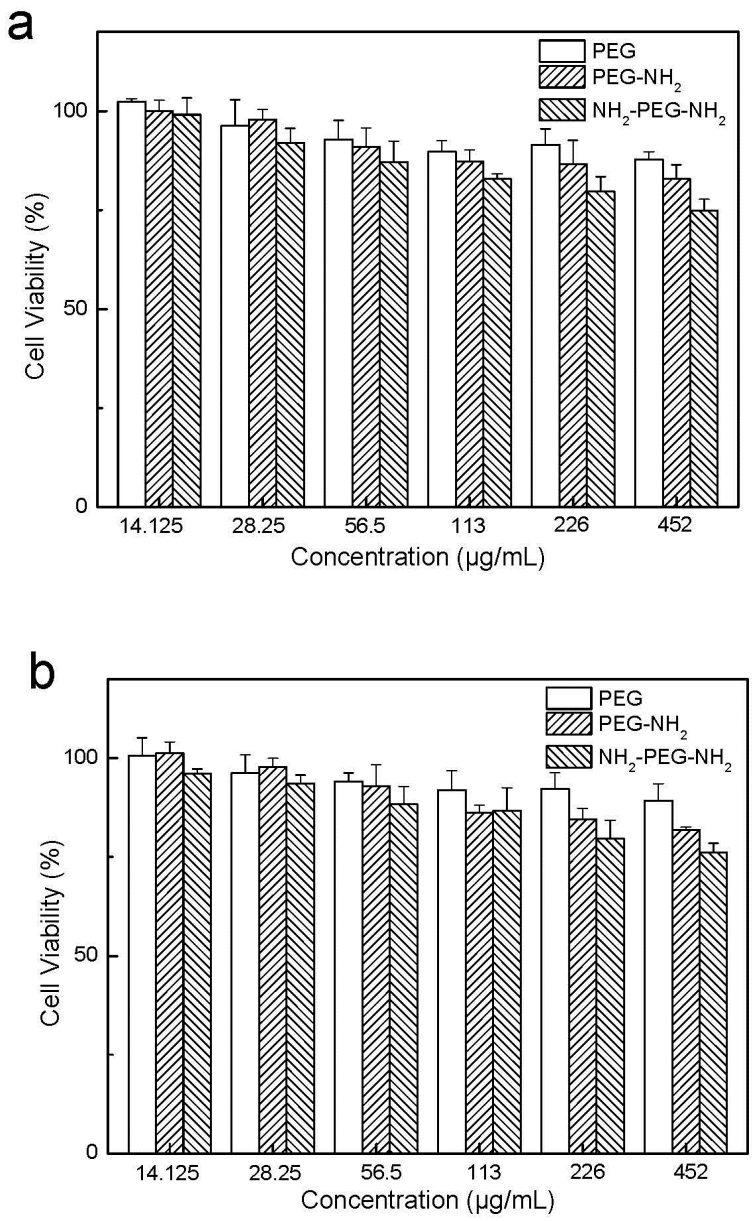

Fig. S6 MTT assay of HeLa (a) and HepG-2 (b) cells. The cells are treated with various concentrations of PEG derivatives.