Supplementary Material (ESI) for Journal of Materials Chemistry

Supporting information

Multicolor Upconverted Luminescence-Encoded Superparticles via Controlling Self-assembly Based on Hydrophobic Lanthanide-doped $NaYF_4$ Nanocrystals

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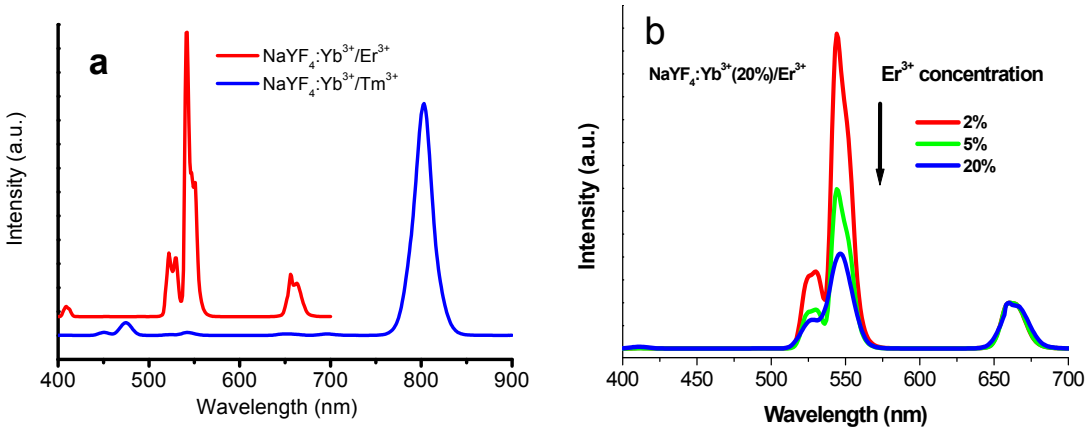

Figure S1. (a)The UCL spectra of $NaYF_4$: Yb^{3+}/Er^{3+} (red line) and $NaYF_4$: Yb^{3+}/Tm^{3+} (blue line) under 980 nm light excitation (left); (b) the UCL spectra of $NaYF_4$: Yb^{3+}/Er^{3+} doped with different Er ion concentration changing from 1% to 20% when normalized to the 654 nm emission of Er^{3+} ions (right).

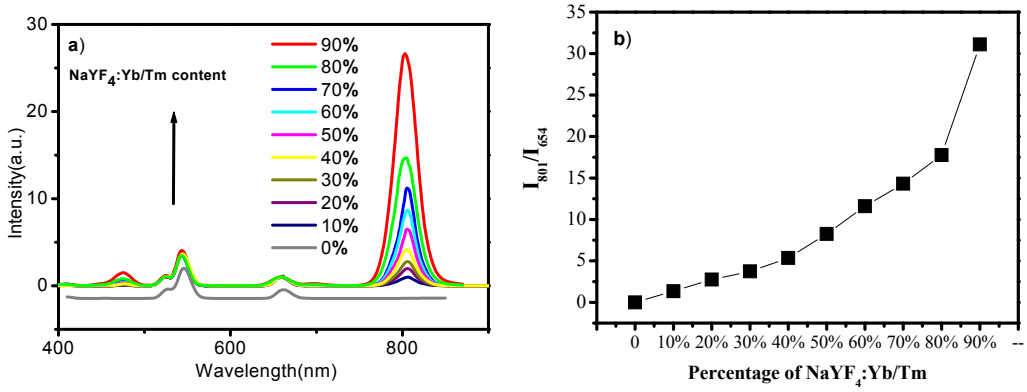

Figure S2. a) UCL spectra of the assembled SPs with a series of varying mass content of $NaYF_4$: Yb/Er (20/2 mol %) to $NaYF_4$: Yb/Tm (20/1.5 mol %) nanocrystals (normalized to 654 nm emission peak of Er^{3+}). b) A plot of I_{801}/I_{654} (luminescence intensity ratio of emissions at 654 to at 801 nm) versus the mass percentage of $NaYF_4$: Yb/Tm (20/1.5 mol %) in the SPs.

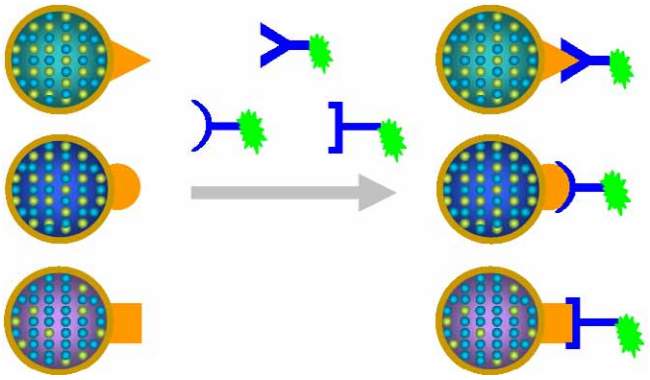

Figure S3. The principle of protein immunoassay based on the UCL-encoded SPs.

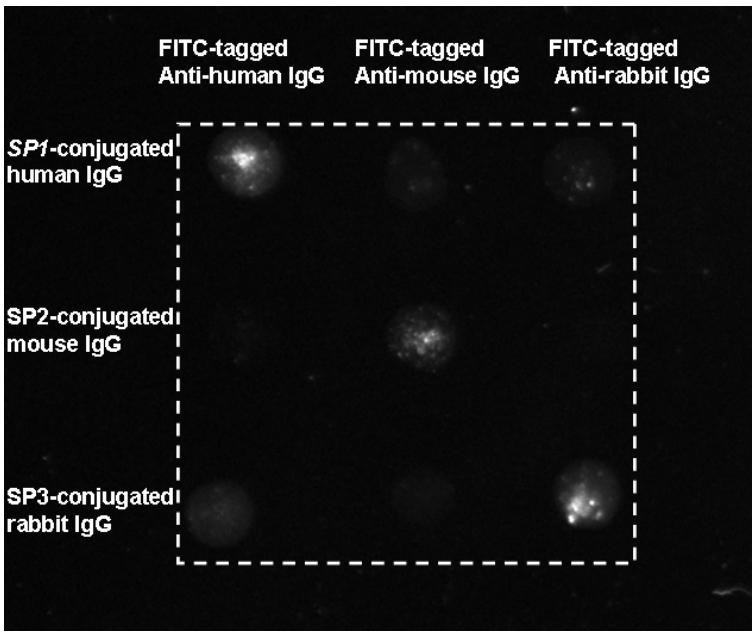

Figure S4. A chip-array imaging of FITC fluorescence from Fujifilm gel imaging system.