Electronic Supplementary Material (ESI) for Analytical Methods.

Supporting Information

Real-Time Assay of Inorganic Pyrophosphatase Activity in Red Region Based on Li^+-doped $NaYF_4$:Yb,Er Upconversion Luminescence Nanoparticles

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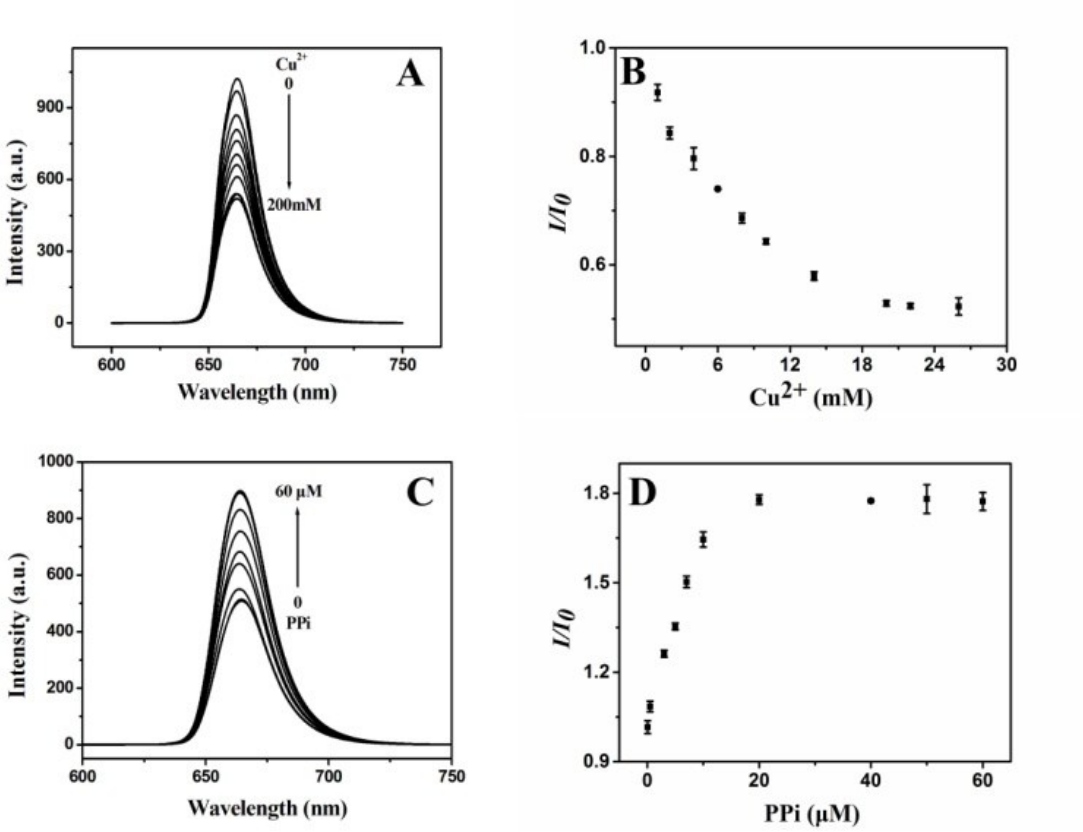

Figure S1(A). The luminescence spectra and (B). Plot of the luminescence intensity versus Cu^{2+} ion concentration (I and I_0 represent the luminescence intensity in the presence and absence of Cu^{2+} respectively) of Li^+-doped $NaYF_4$:Yb,Er UCLNPs in the presence of Cu^{2+}; (C). Luminescence spectra and (D). Plot of luminescence intensity versus PPi concentration (I and I_0 represent the luminescence intensity in the presence and absence of PPi respectively) of the Li^+-doped $NaYF_4$:Yb,Er-Cu^{2+} complexes with the addition of different PPi concentrations. Experiments were performed in HEPES buffer (10.0 mM, pH 7.2).

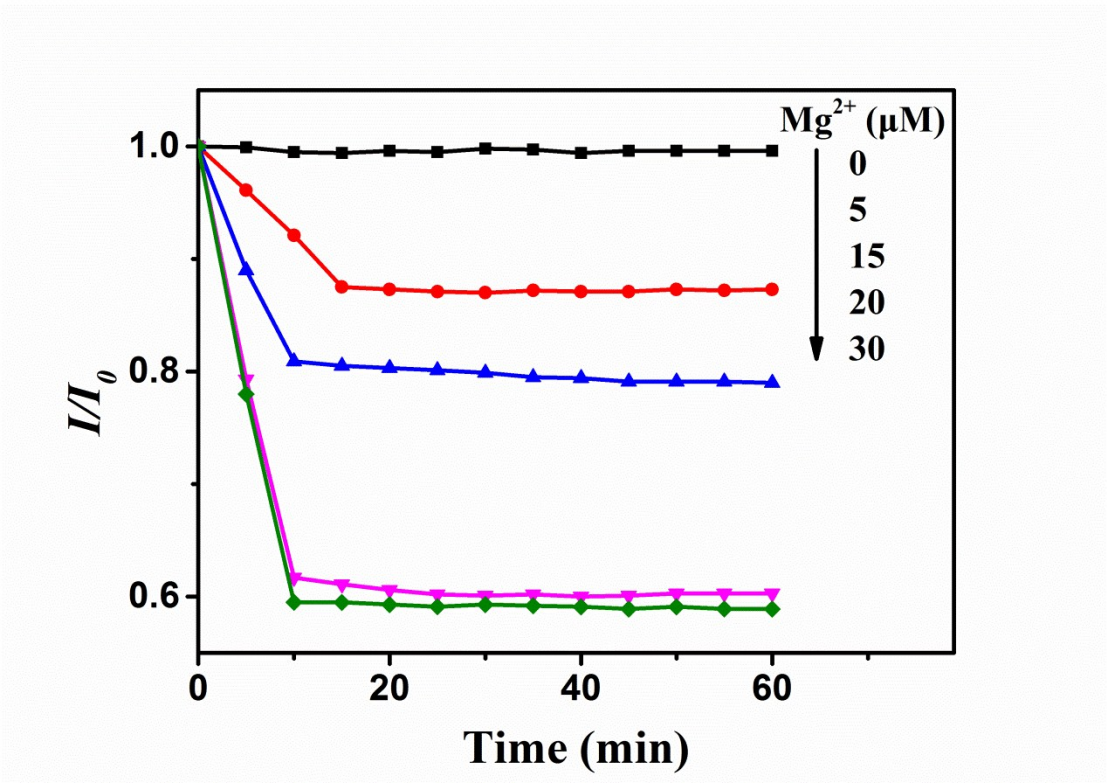

Figure S2. Effect of reaction time on the I/I_0 of the system in 10.0 mM HEPES buffer (pH 7.2) at 37 °C (I and I_0 represent the luminescence intensity in the presence and absence of PPase respectively). Li^+-doped $NaYF_4$:Yb,Er UCLNPs: 0.228 mg mL^{-1}, Cu^{2+}: 20.0 mM, PPi: 20.0 μM, PPase: 40.0 mU mL^{-1}.

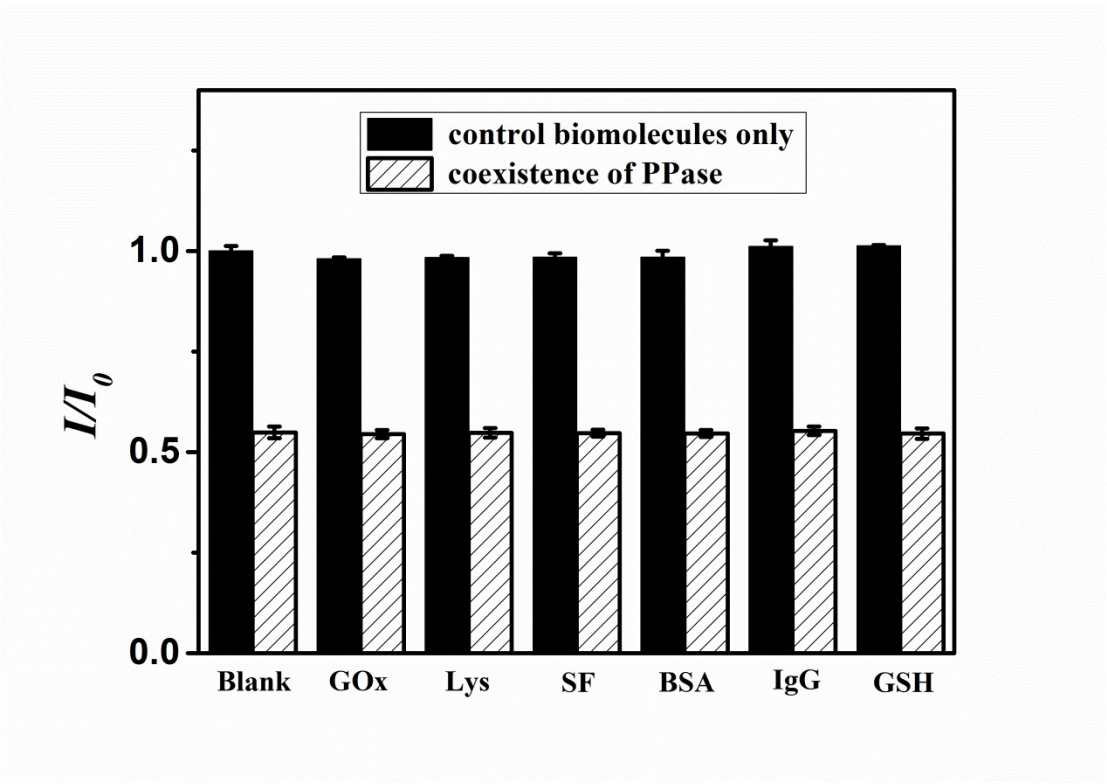

Figure S3. Luminescence response of the UCLNPs upon addition of the control biomolecules in HEPES buffer (10.0 mM, pH 7.2). The concentration of GOx, Lys, SF, BSA, IgG, and GSH was 10.0 μg mL^{-1}, 1.46 μg mL^{-1}, 1.00 μg mL^{-1}, 10.0 μg mL^{-1}, 10.0 μg mL^{-1}, 3.07 μg mL^{-1}, respectively (black columns) with 50.0 mU mL^{-1} PPase (gray columns). All the assays were recorded based on the UCLNPs solution containing Cu^{2+} (20.0 mM), PPi (20.0 μM) and Mg^{2+} (20.0 μM) after 30 min at 37 °C.