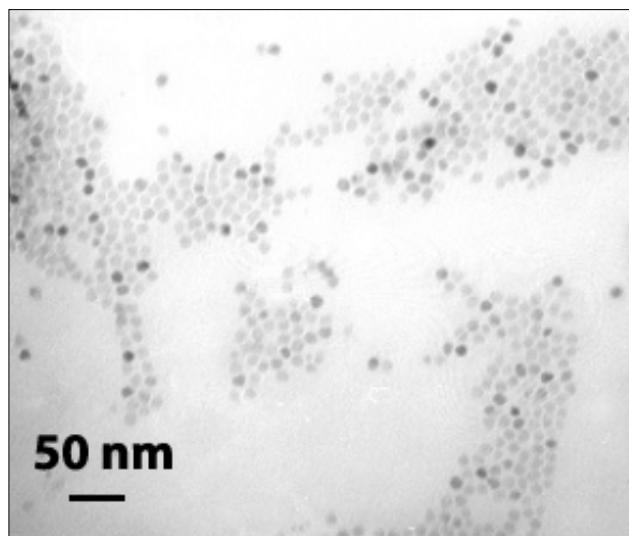


*Supporting information*

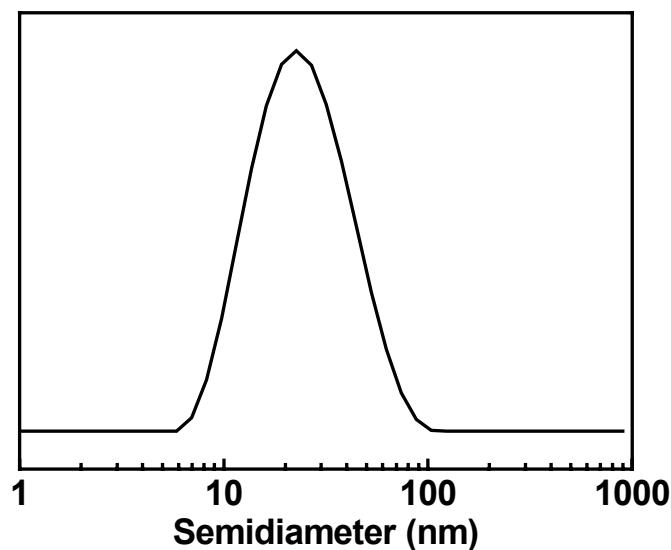
**Resonance Energy Transfer in Steady-State and Time-Decay  
Fluoro-Immunoassays for Lanthanide Nanoparticles Based on Biotin and  
Avidin Affinity**

Jian-Qin Gu, Jie Shen, Ling-Dong Sun\*, and Chun-Hua Yan\*

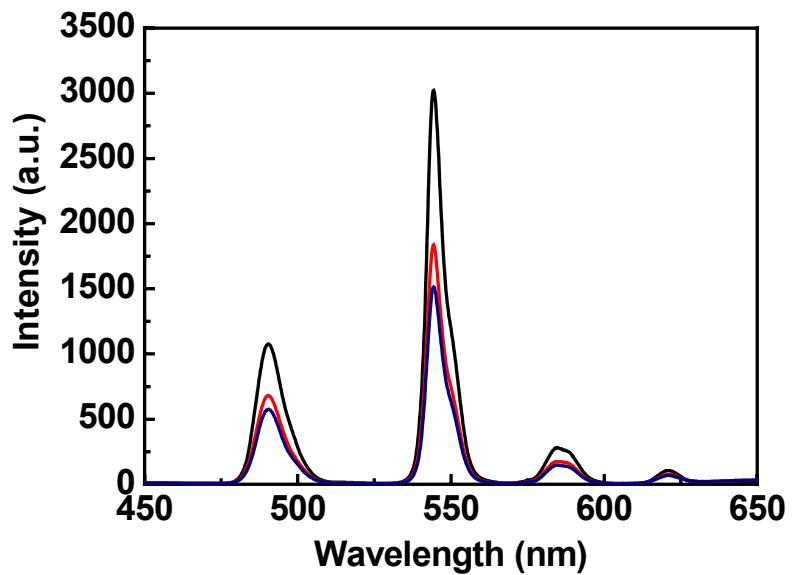
Beijing National Laboratory for Molecular Sciences, State Key Lab of Rare Earth Materials Chemistry and Applications & PKU-HKU Joint Lab in Rare Earth Materials and Bioinorganic Chemistry, Peking University, Beijing 100871, China



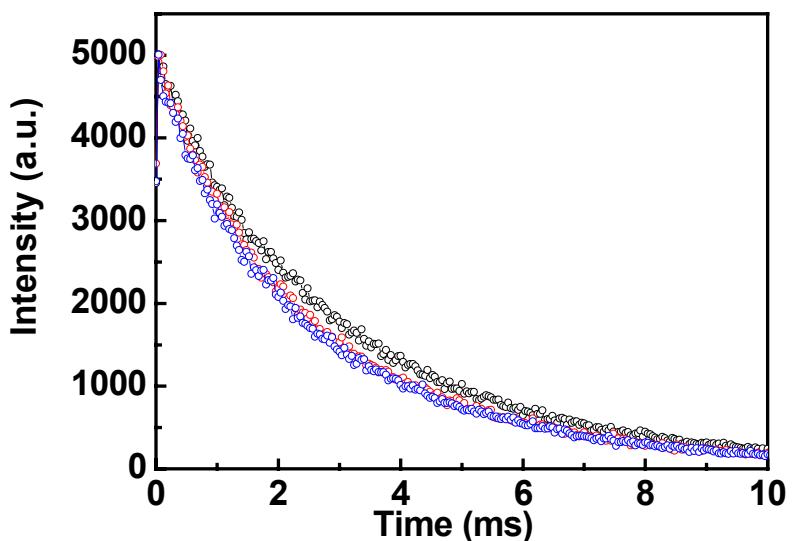
**Figure S1.** TEM image of as-prepared gold nanoparticles with an average diameter of *ca.* 13 nm.



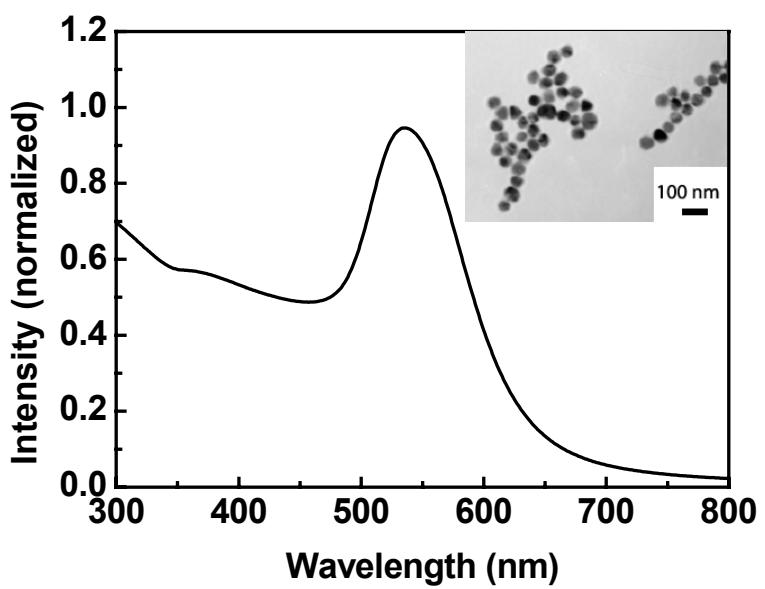
**Figure S2.** DLS curve of the as-prepared LaPO<sub>4</sub>:Ce,Tb nanoparticles in aqueous solution.



**Figure S3.** FRET of biotinylated LaPO<sub>4</sub>:Ce,Tb nanoparticles with avidin coated gold nanoparticles. (black line: biotinylated LaPO<sub>4</sub>:Ce,Tb nanoparticles, red line: biotinylated LaPO<sub>4</sub>:Ce,Tb nanoparticles bioconjugated with avidin coated 13 nm gold nanoparticles, blue line: biotinylated LaPO<sub>4</sub>:Ce,Tb nanoparticles bioconjugated with avidin coated 70 nm gold nanoparticles).



**Figure S4.** Decay curves of biotinylated LaPO<sub>4</sub>:Ce,Tb nanoparticles with avidin coated gold nanoparticles. (black line: biotinylated LaPO<sub>4</sub>:Ce,Tb nanoparticles, red line: biotinylated LaPO<sub>4</sub>:Ce,Tb nanoparticles with avidin coated 13 nm gold nanoparticles, blue line: biotinylated LaPO<sub>4</sub>:Ce,Tb nanoparticles with avidin coated 70 nm gold nanoparticles).



**Figure S5.** The extinction spectrum of gold nanoparticles with an average diameter of *ca.* 70 nm, the inset is the corresponding TEM image.