Supplementary Material (ESI) for Chemical Communications

Supporting Information

Fluorescent Gold Nanoparticles-Based Fluorescence Sensor for Cu^{2+} ions

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Experiment section:

Synthesis of GSH-capped F-AuNPs: The F-AuNPs were synthesized through reduction of $HAuCl_4.3H_20$ with GSH. Briefly, 10mL (5mM) GSH and 10mL (2.5 mM) $HAuCl_4$ were mixed together. Then the mixture was stirred under room-light irradiation for 4 days. The resulting light yellow F-AuNPs solutions were subsequently centrifugated (15,000) for 20 min to remove larger particles. The supernatants were collected, and then were dialyzed against deionized water in 12,000 molecular weight cutoff dialysis membrane tubing to purified F-AuNPs solutions. This as-prepared F-AuNPs were stored at 4℃ for further used.

Assay of Cu^{2+} ion: 20 μL GSH-capped F-AuNPs were added into 3mL MES buffer (20mM, pH 5.5). The resulting solution was mixed with different concentration of Cu^{2+} ion and their fluorescence spectra were measured in a Shimadzu RF-5301pc spectrofluorometer with an excitation wavelength at 390 nm.

TEM images were acquired by using a JEOL JEM-2100 HRTEM operating at an accelerating voltage of 200 kV. DLS were performed in a Brookhaven Zeta PALS instrument with the detector at 90° angle from the light source to the sample. The lifetime measurements were done on an Edinburgh Instruments FLS920 spectrometer. FT-IR spectra were recorded with Nicolet IR200 spectrophotometer.

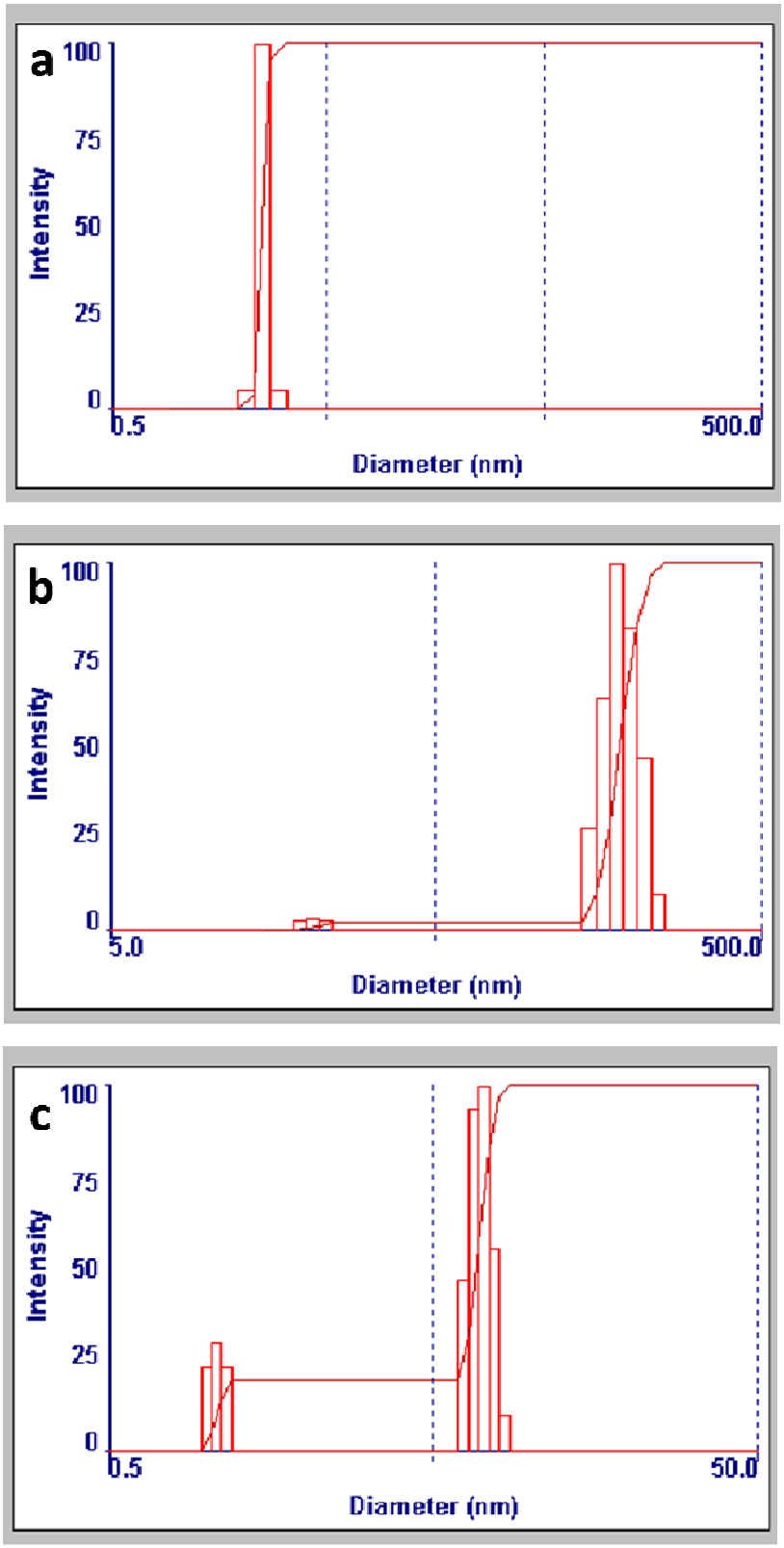

Fig. S1 Hydrodynamic diameter of GSH-capped F-AuNPs measured by DLS in different solution. a) F-AuNPs in water; b) F-AuNPs in Cu^{2+} solution; c) the same as (b) + EDTA.

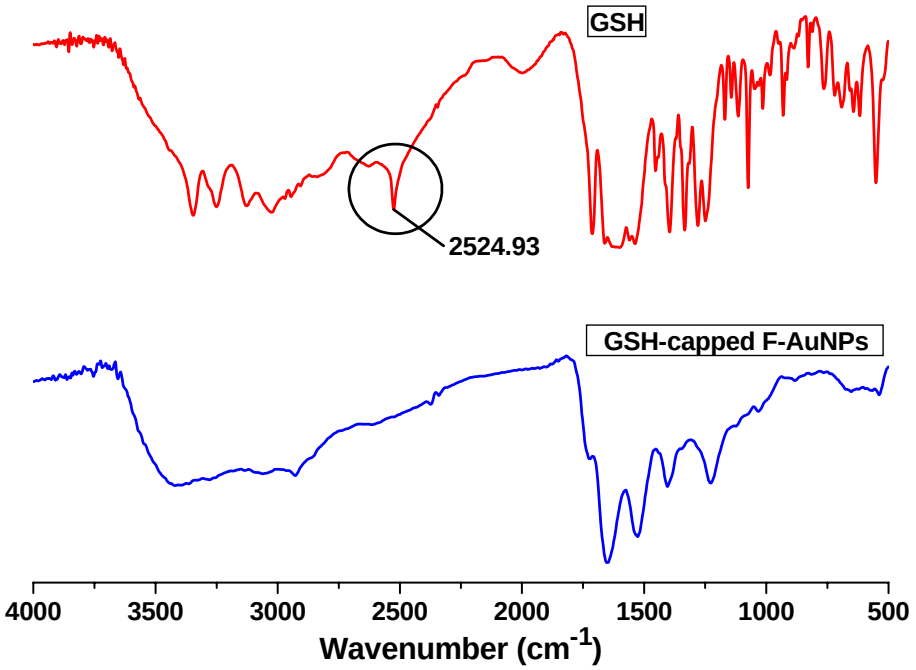

Fig.S2 FT-IR spectra of free GSH (red) and GSH-capped F-AuNPs (blue). The S-H stretching feature was marked by circle.

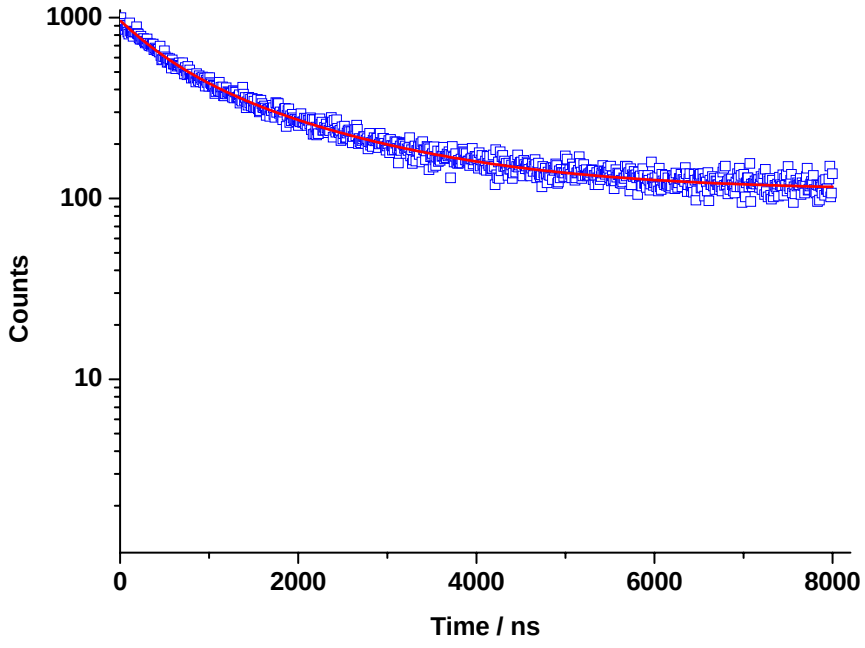

Fig. S3 Lifetime measurement of GSH-capped F-AuNPs. The solid line gives a 2-exponential fit.