Electronic Supplementary Information (ESI)

Synthesis of functionalized fluorescent gold nanoclusters for acid phosphatase sensing

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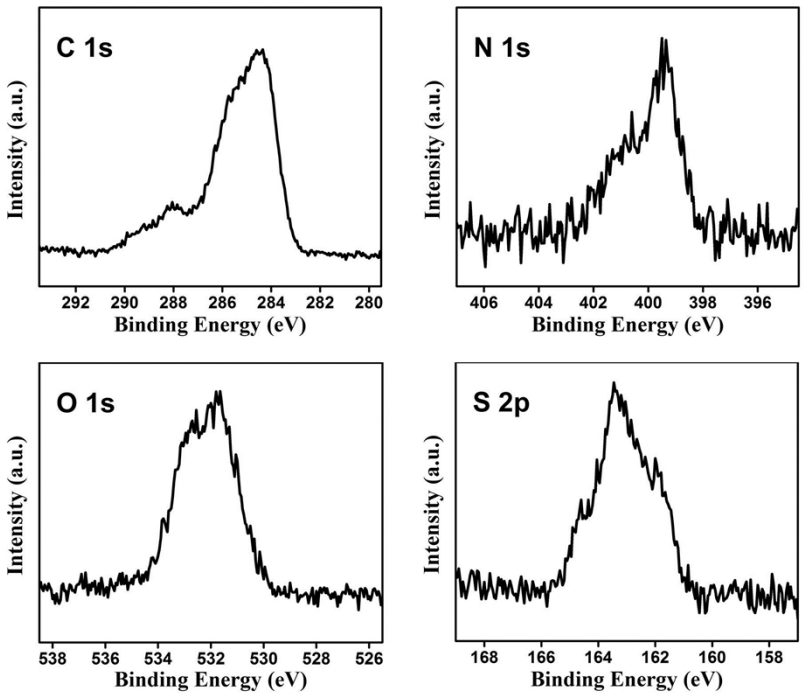

Fig. S1 XPS spectra of C 1s, N 1s, O 1s, and S 2p for AuNCs@GSH/MUA.

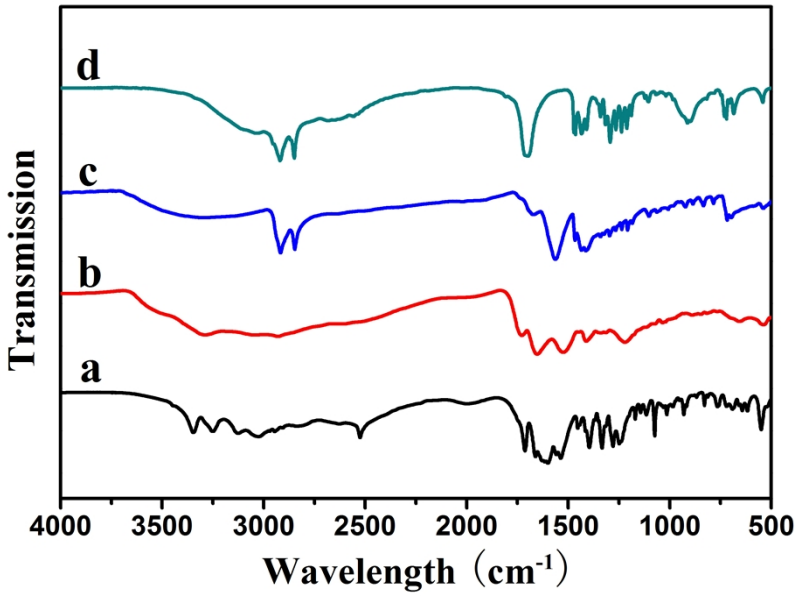

Fig. S2 FT-IR spectra of pure GSH (a), GSH-Au^{+} complex (b), AuNCs@GSH/MUA (c) and pure 11-MUA (d).

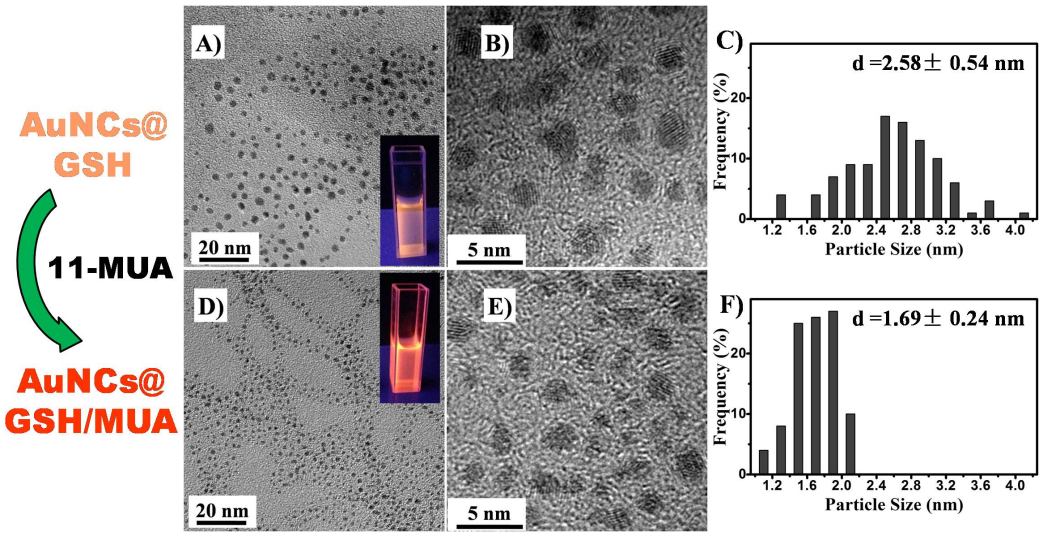

Fig. S3 Typical TEM images (A, D), HRTEM images (B, E), and size distribution histograms (C, F) of the AuNCs@GSH (A–C) and corresponding AuNCs@GSH/MUA (D–F), respectively. Insets of A and D show the corresponding digital images under the ulraviolet light.

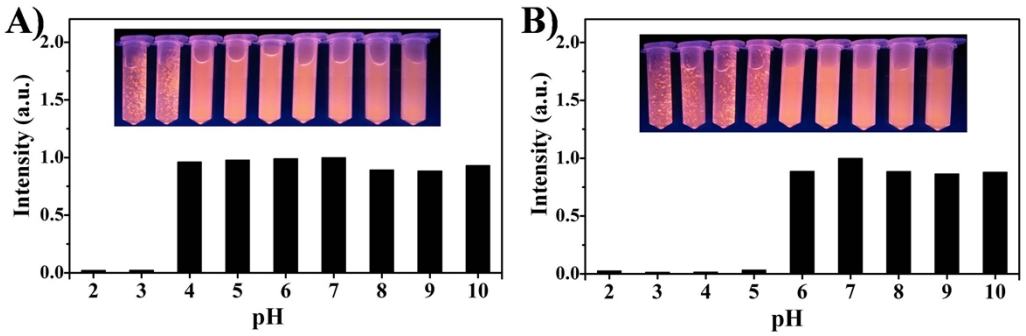

Fig. S4 The relative fluorescence intensity at 610 nm of the (A) AuNCs@GSH/MUA and (B) AuNCs@MUA measured in the MES buffer at different pHs from 2 to 10. Insets show the corresponding digital images under the ulraviolet light.

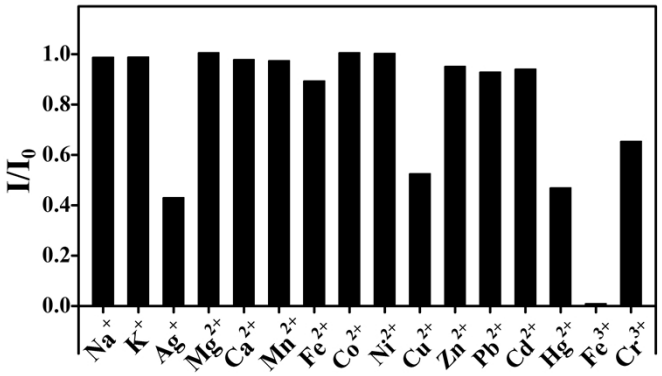

Fig. S5 Fluorescence intensity ratios (I/I_0 at 610 nm, where I and I_0 are the fluorescence intensities in the absence and presence of the metal ions, respectively) for the AuNCs@GSH/MUA (2 μM) measured after the addition of 10 μM various individual metal ions in 5 mM, pH 5.0 MES buffer.

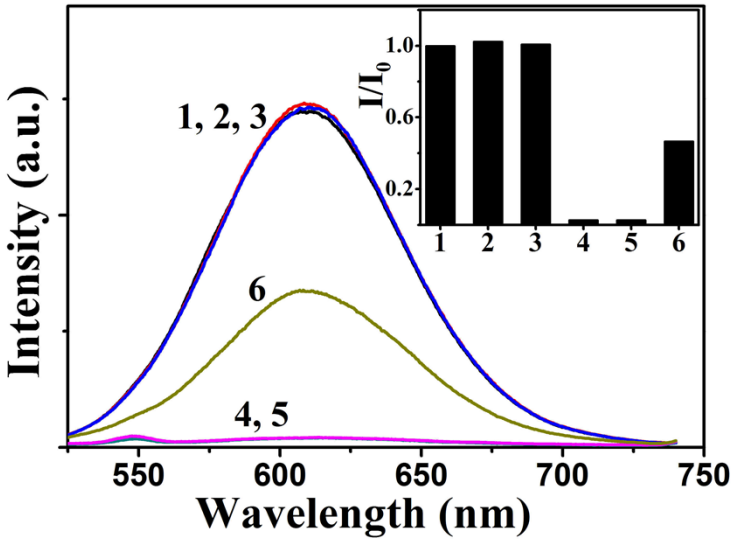

Fig. S6 Fluorescence spectra and corresponding intensity ratios (inset) of (1) the sole AuNCs@GSH/MUA, (2) AuNCs@GSH/MUA with added GSH, (3) AuNCs@GSH/MUA with added MUA, (4) AuNCs@GSH/MUA–Fe^{3+} ensemble, (5) AuNCs@GSH/MUA–Fe^{3+} ensemble with added GSH, and (6) AuNCs@GSH/MUA–Fe^{3+} ensemble with added MUA.

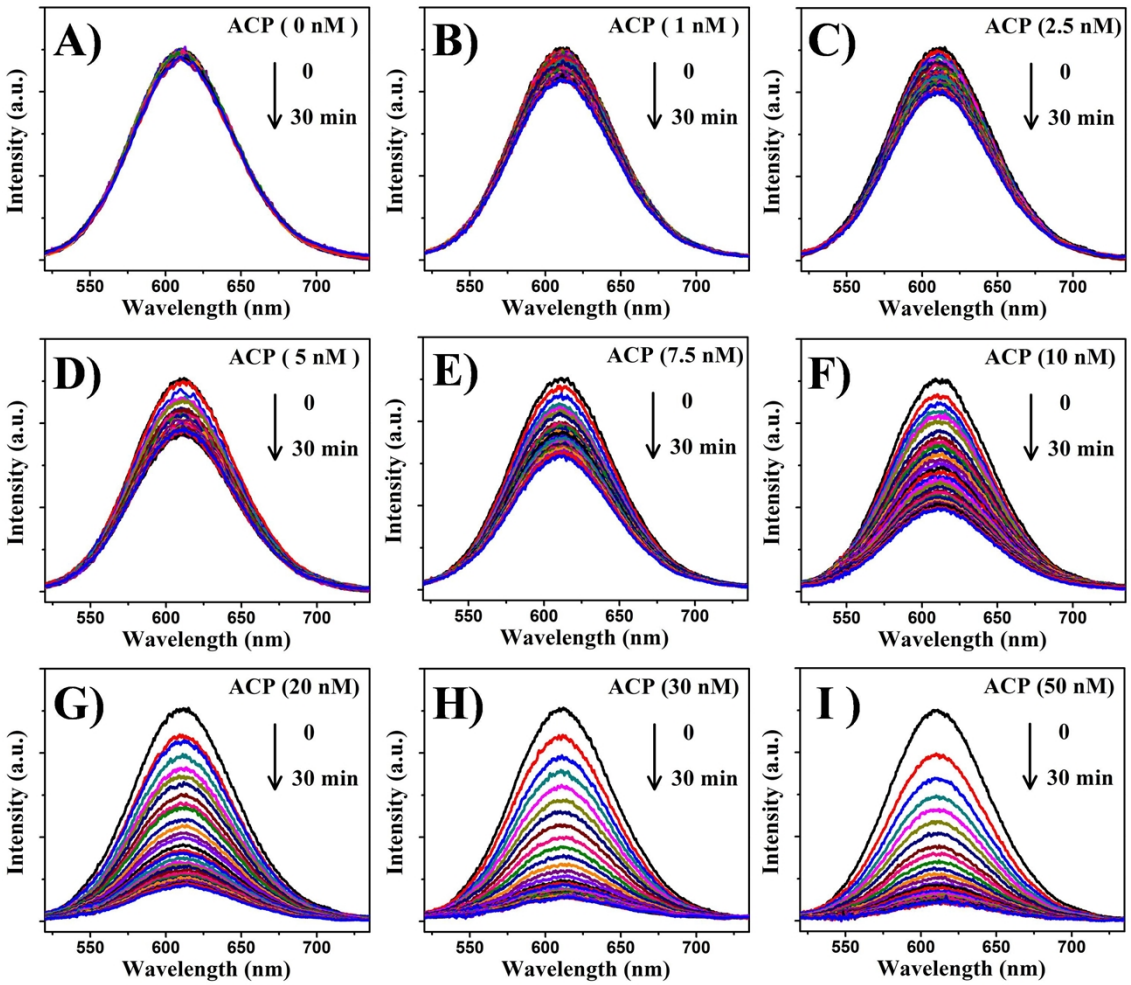

Fig. S7 Fluorescence emission spectra of the AuNCs@GSH/MUA solution (2 μM) in 5 mM, pH 5.0 MES buffer containing Fe^{3+} (2 μM) and PPi (3 μM) were consecutively recorded every 1 min by adding different concentrations of ACP at 37 °C. The ACP concentrations in the resulting mixtures were 0 nM (A), 1 nM (B), 2.5 nM (C), 5 nM (D), 7.5 nM (E), 10 nM (F), 20 nM (G), 30 nM (H), and 50 nM (I), as indicated in the figure respectively.

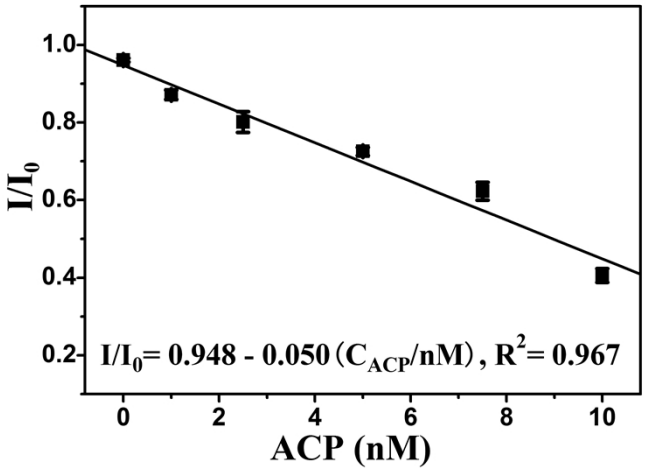

Fig. S8 Plots of I/I_0 at 610 nm for 30 min as a function of ACP concentrations from 0 to 10 nM.

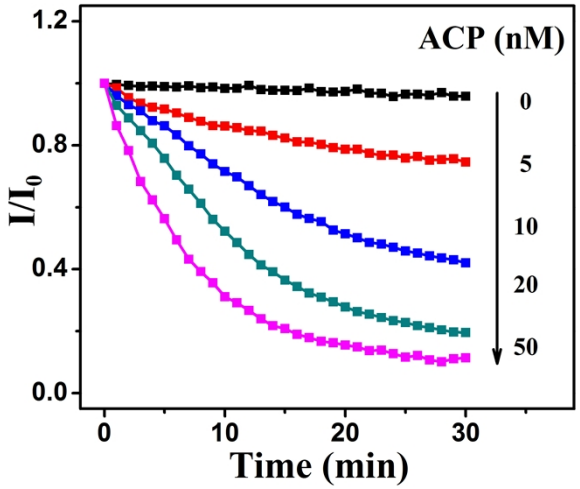

Fig. S9 Real-time fluorescence ratios (I/I_0 at 610 nm) changes of AuNCs@GSH/MUA–Fe^{3+}–PPi recorded every 1 min with different concentrations of ACP (0, 5, 10, 20, 50 nM) in cell lysate solution. The cell lysate solution was 2% 3T3L1 cell lysate diluted with MES buffer (5 mM, pH 5.0) containing AuNCs (2 μM), Fe^{3+} (2 μM) and PPi (3 μM).