Supplementary Information

Amphiphilic polymer-encapsulated Au nanoclusters with enhanced emission and stability for highly selective detection of hypochlorous acid

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Experiment section

Electrochemical experiment

The measurement of the amperometric time curves of DSPE-PEG-Au NCs was carried out using a conventional three-electrode system with an ITO as the working electrode, Ag/AgCl as reference electrode and a platinum wire as a counter electrode. At constant potential of 0.022 V, we investigated the amperometric time curves of DSPE-PEG-Au NCs in 6 mL PBS buffer solution (10 mM, pH 7.4) under successive addition of 50 μL of 5 mM HClO.

Cytotoxicity Assay

HeLa cells were used to evaluate the cytotoxicity of DSPE-PEG-Au NCs by MTT assay. The cells were cultured in DMEM medium supplemented with 10% fetal calf serum, 100 U/mL penicillin and 100 μg/mL streptomycin at 37 ℃ under 5% CO_2. Firstly, the cells in the logarithmic growth phase were seeded in 96-well culture plate (100 μL well) at a density of 8×10^3 cells per well. After the cells were cultured for 24 h, the cells were incubated with 100 μL of complete medium containing various concentrations of DSPE-PEG-Au NCs for 24 h. Next, the liquid in the wells were aspirated and the cells were washed with 1×PBS. Then, 100 μL of DMEM medium containing 0.5 mg/mL MTT was added to each well. After further incubation for 4 h, the supernatant was aspirated and 150 μL of DMSO was added to each well. The cell viability was calculated by the equation: Cell viability =｛ (OD $_{490\ nm}$ of the experimental group－OD $_{490\ nm}$ of the blank group)/(OD $_{490\ nm}$ of the control group－OD $_{490\ nm}$ of the blank group) ｝× 100%.

Supplementary Figures

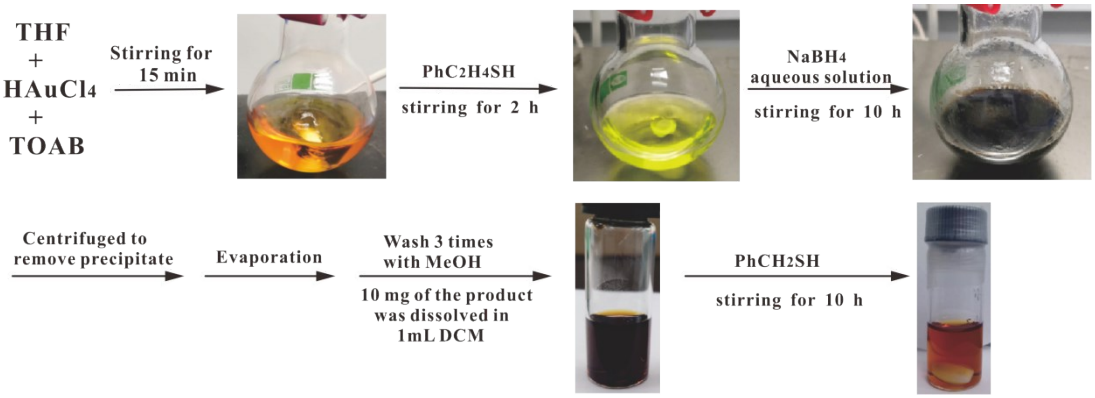

Figure S1. Schematic drawings of the synthesis of BM-Au NCs.

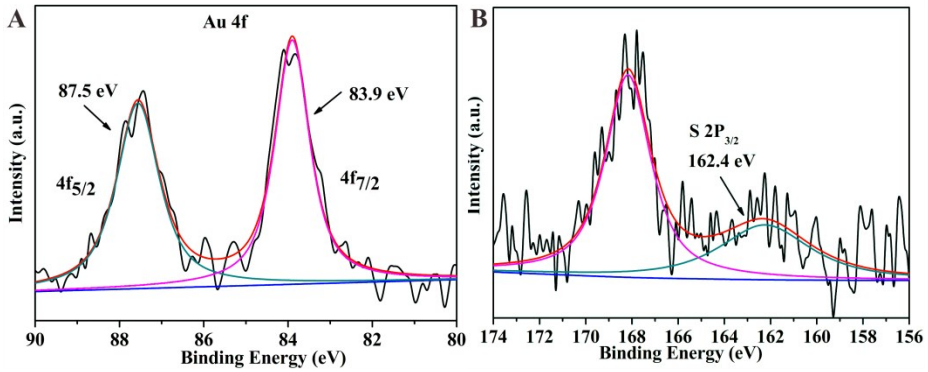

Figure S2. XPS spectra of BM-Au NCs in Au 4f region (A) and S 2p region (B).

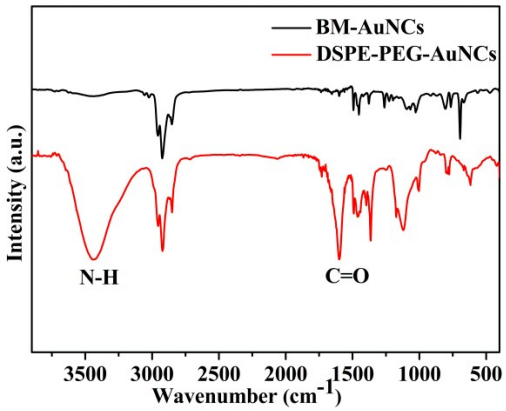

Figure S3. FT-IR spectra of BM-Au NCs (black) and DSPE-PEG-Au NCs (red).

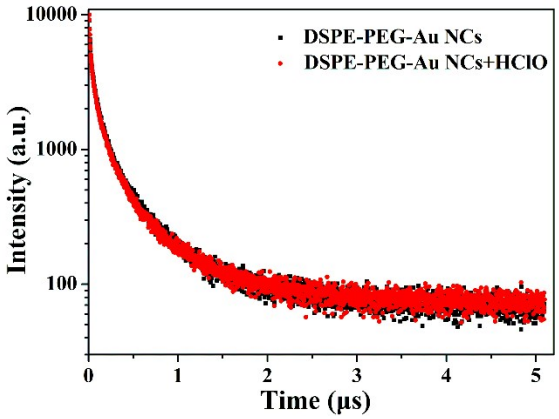

Figure S4. Luminescence decay of DSPE-PEG-Au NCs in the absence (black curve) and presence (red curve) of 60 μM HClO.

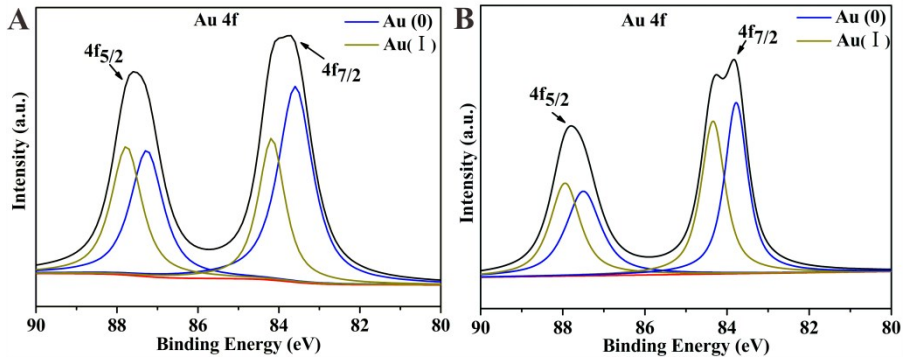

Figure S5. XPS spectra of the DSPE-PEG-Au NCs in Au 4f region before (A) and after (B) HClO treatment.

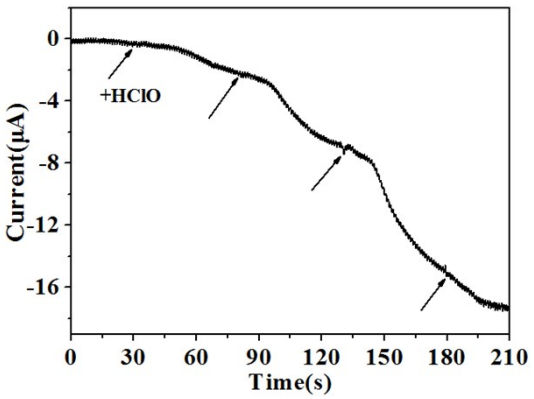

Figure S6. Amperometric time curves of DSPE-PEG-Au NCs in PBS buffer solution (10 mM, pH 7.4) upon successive injections of 50 μL of 5 mM HClO for each step at 0.022 V.

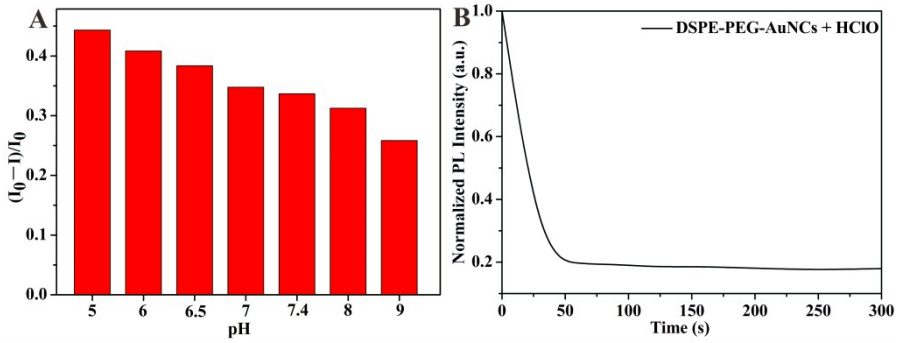

Figure S7. (A) The quenching of luminescence of DSPE-PEG-Au NCs by HClO under different pH conditions. (B) Time dependent fluorescence changes of DSPE-PEG-Au NCs at 650 nm towards HClO.

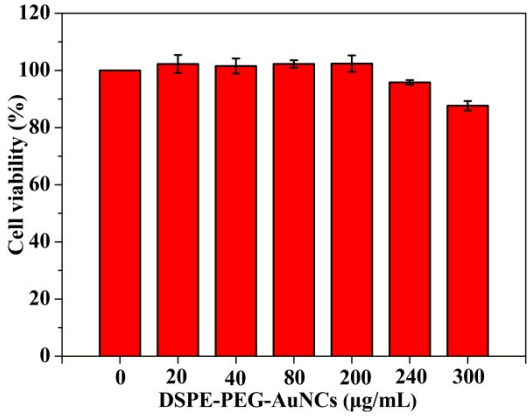

Figure S8. Cell viability of HeLa cells incubated with the various concentrations of DSPE-PEG-Au NCs.

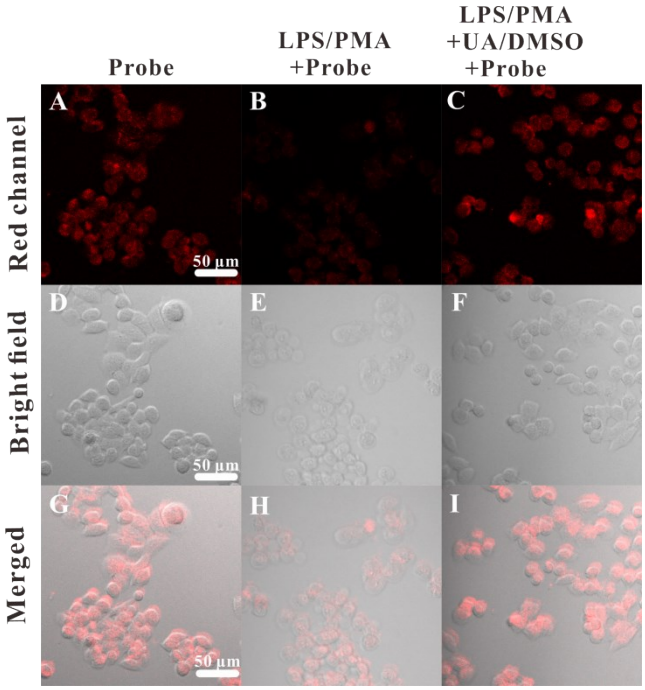

Figure S9. Fluorescence images of HeLa cells incubated with the nanoprobes under different condition. (A, D and G) Cells were incubated with DSPE-PEG-Au NCs; (B, E and H) cells were pretreated with LPS and PMA, and then were incubated with DSPE-PEG-Au NCs; (C, F and I) cells were first pretreated with LPS and PMA, followed by co-incubation with UA and DMSO, and finally incubated with DSPE-PEG-Au NCs. Scale bar was 50 μm.