Electronic Supplementary Information (ESI):

Fluorescence Turn-on Assay for Glutathione Reductase Activity Based on a Conjugated Polyelectrolyte with Multiple Carboxylate Groups

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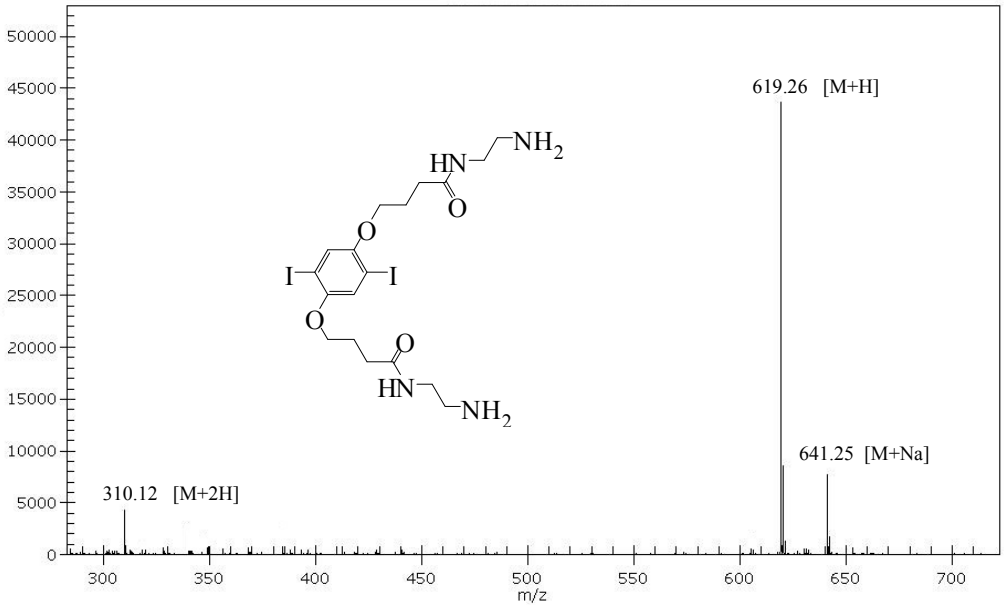
General Information: The dicarboxylate CPE, PPE-OBS was obtained according to a previously reported procedure.[1,2] Mass spectra were recorded with an Analytica of Branford ESI-TOF mass spectrometer. All fluorescence experiments were carried out at ambient temperature using a Shimadzu RF-5301 spectrometer equipped with a Xeron-lamp excitation source. Unless otherwise specified, the excitation wavelength was 400 nm, and the "fluorescence intensity" referred to the maximum emission of PPE-$(COOK)_4$ at 510 nm

1. ESI-MS characterization of monomer 2 and 3



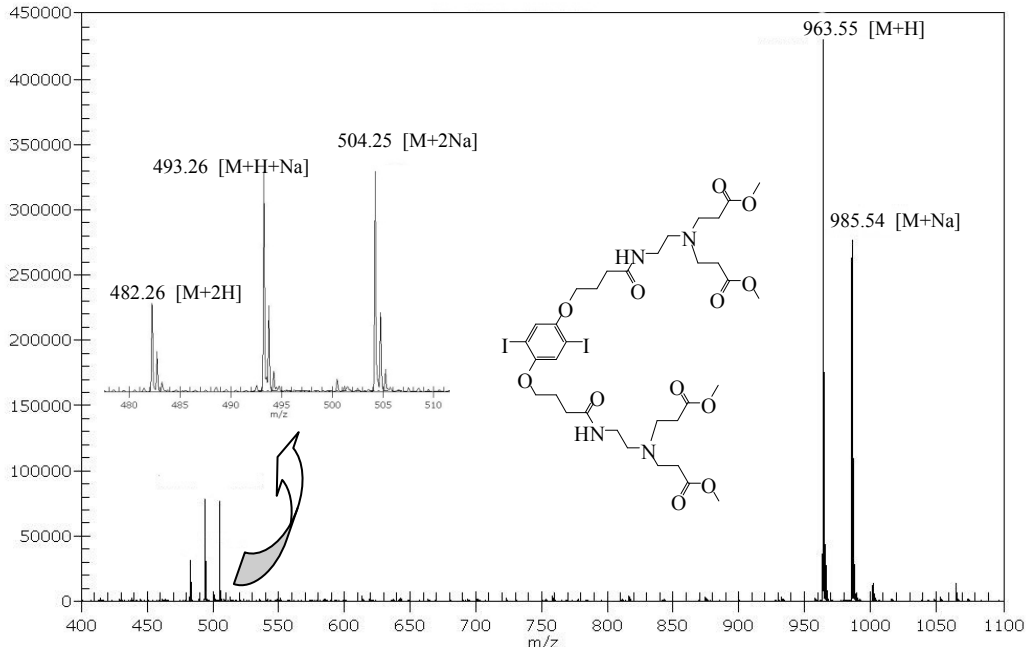


Fig. S1. ESI-MS spectra of monomer 2 and 3

2. Fluorescence quenching of PPE-(COOK)$_4$ and PPE-OBS caused by methyl viologen (MV^{2+})

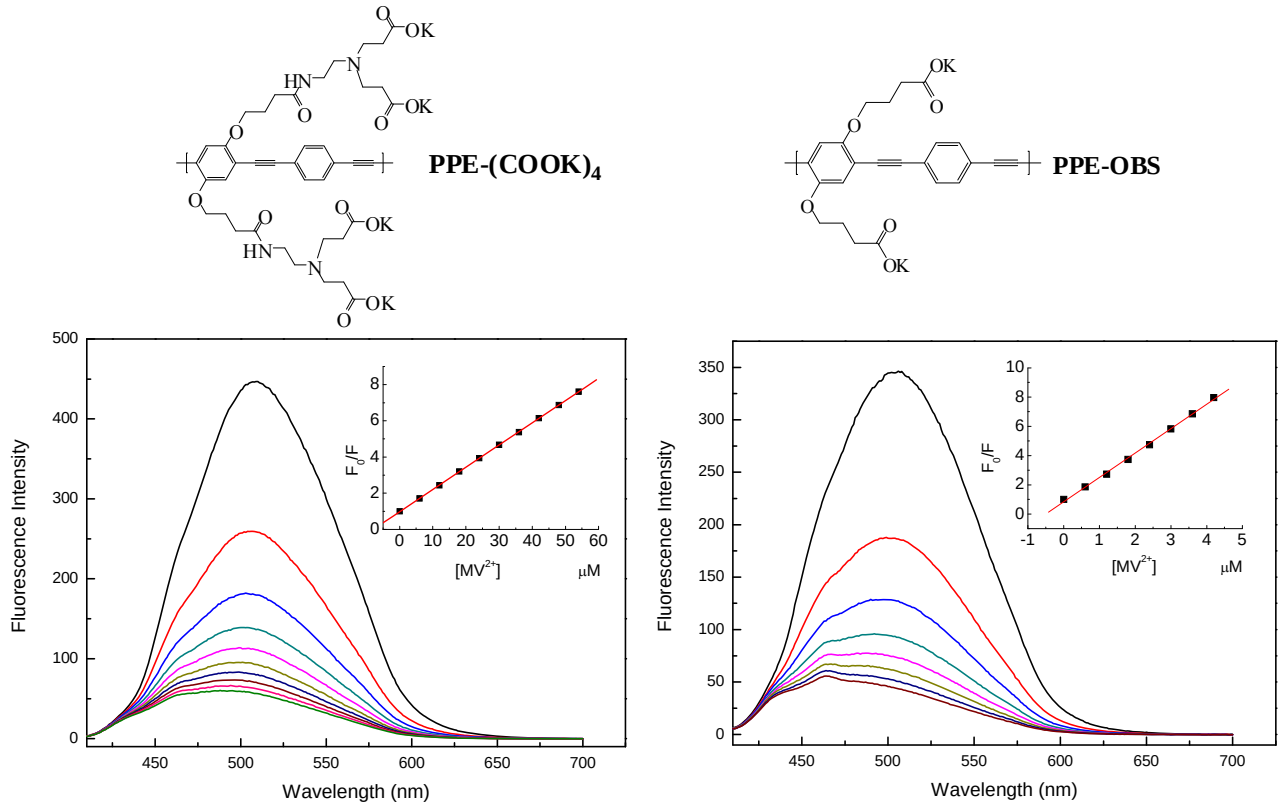


Fig. S2. Fluorescence quenching of PPE-(COOK)$_4$ (Left) and PPE-OBS (Right) caused by MV^{2+}. The obtained K_{SV} values are 1.2×10^5 and 1.6×10^6 M^{-1}, respectively; [PPE-(COOK)$_4$] = [PPE-OBS] = 5 μM.

3. Quenching efficiencies of PPE-$(COOK)_4$ and PPE-OBS caused by Cu^{2+}

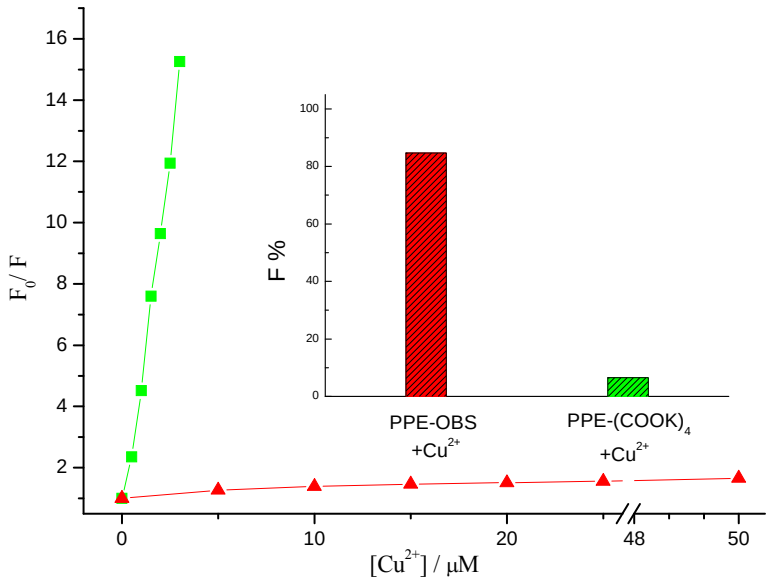


Fig. S3 Cu^{2+}-induced fluorescence quenching of PPE-$(COOK)_4$ (squares) and PPE-OBS (triangles) in PBS (10 mM, pH 7.4), [PPE-$(COOK)_4$] = [PPE-OBS] = 5 μM. Inset: Comparison of the quenching efficiencies at the same concentration of Cu^{2+} (3 μM).

4. Fluorescence superquenching of PPE-$(COOK)_4$ by Cu^{2+}

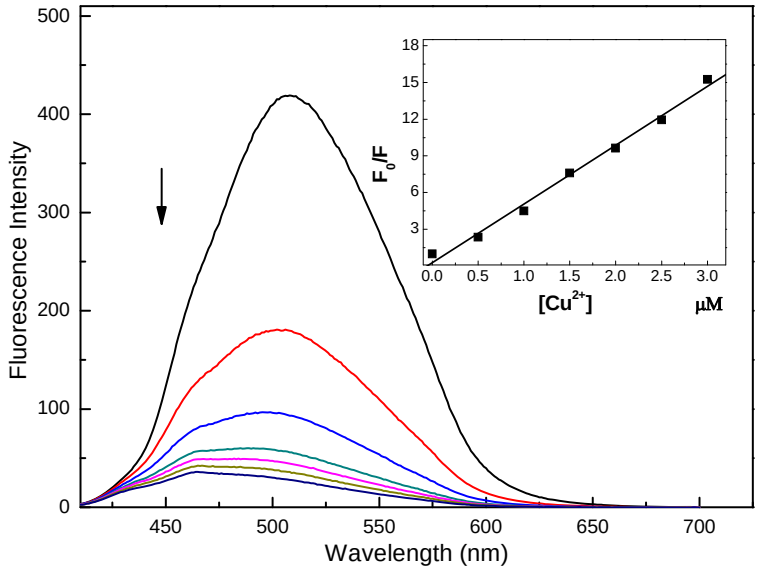


Fig. S4 Fluorescence spectral changes of PPE-$(COOK)_4$ (5 μM) in PBS (10 mM, pH 7.4) upon the addition of Cu^{2+} (Inset: Emission intensity at 510 nm as a function of [Cu^{2+}]; K_{SV}=4.8×10^6 M^{-1}, R=0.995).

5. Fluorescence turn-on of PPE-$(COOK)_4/Cu^{2+}$ caused by GSH

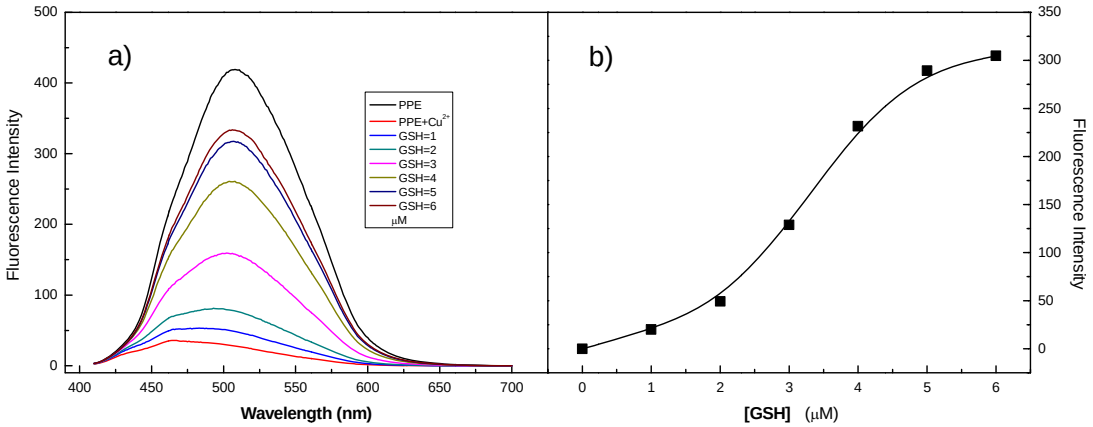


Fig. S5 a) Evolution of the fluorescence spectra of PPE-$(COOK)_4/Cu^{2+}$ (5 μM/3 μM) upon the addition of GSH; b) Emission intensity of PPE-$(COOK)_4/Cu^{2+}$ (5 μM/3 μM) at 510 nm as a function of [GSH].

6. Effects of various proteins/enzymes on the emission of PPE-$(COOK)_4$

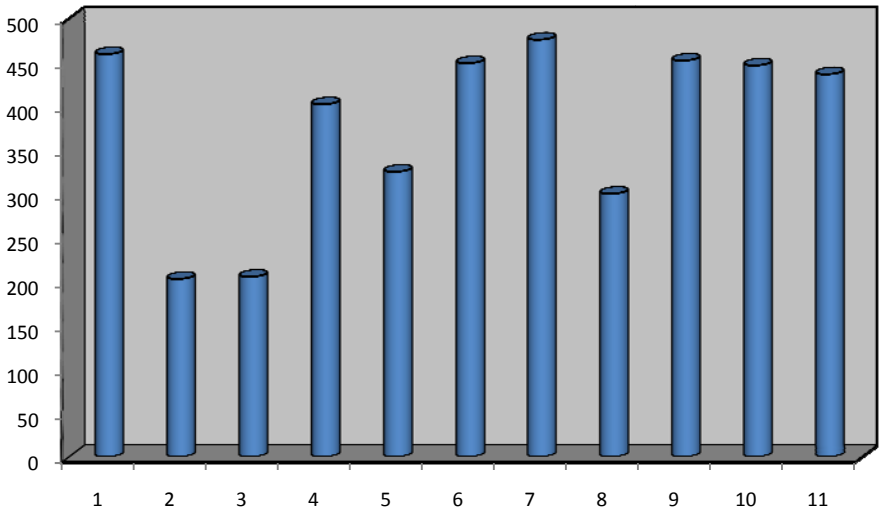


Fig. S6 Effects of various proteins/enzymes (10 μg/mL) on the emission of PPE-$(COOK)_4$ (5 μM). From left to right are Blank, Histone, Cytochrome C, Hemoglobin, BSA, Avidin, Trypsin, Lysozyme, Elastase, Thrombin and Papain, respectively.

References

1) T. Zhang, H. L. Fan, J. G. Zhou and Q. H. Jin, *J. Polym. Sci., Part A: Polym. Chem.*, 2009, **47**, 3056.

2) I. B. Kim, A. Dunkhorst, J. Gilbert and U. H. F. Bunz, *Macromolecules* 2005, **38**, 4560.