**Electronic Supplementary Material**

# Signal-on fluorescent sensor based on GQDs–$MnO_2$ composites for glutathione

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1. Liu and Cai contributed equally to this work.

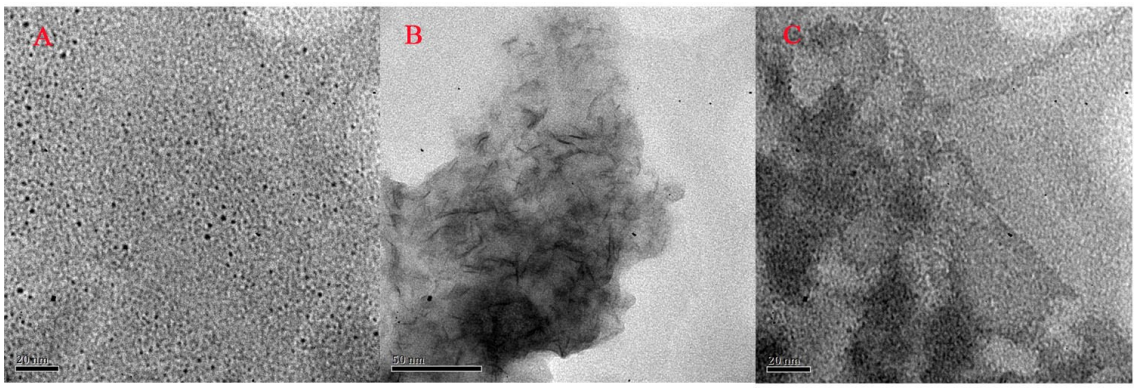


Fig. S1 TEM images of GQDs (A), $MnO_2$ (B) and GQDs-$MnO_2$ composites (C).

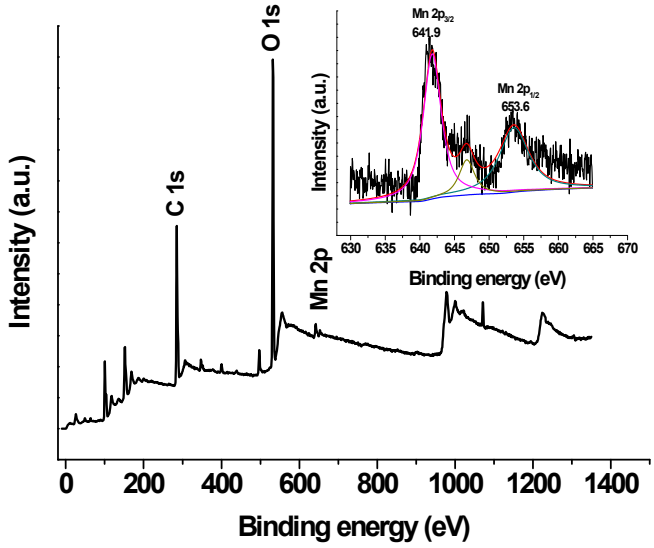


Fig.S2 The XPS survey spectrum of GQDs-$MnO_2$ composites. The inset shows the narrow XPS spectra of the Mn 2p peaks of the composites.

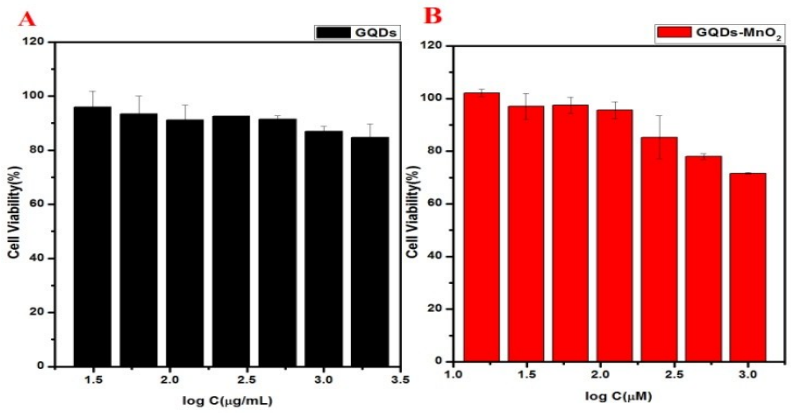


Fig. S3 Cell viability of HL-60 cell in different concentrations of GQDs (A) and different concentrations of GQDs-$MnO_2$ composites (B) by MTT assay.

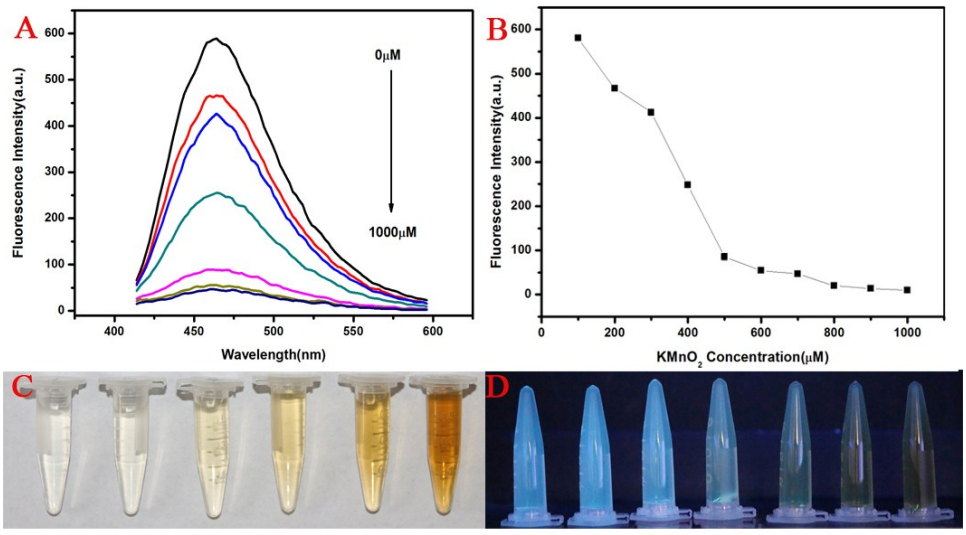


Fig. S4 (A) Fluorescence spectra of GQDs-$MnO_2$ composites prepared from different concentrations of original $KMnO_4$; (B) The variable fluorescence intensities of GQDs-$MnO_2$ composites with increasing concentrations of $KMnO_4$; The photograph of GQDs-$MnO_2$ composites prepared from increasing concentrations of $KMnO_4$ under air environment (C) and UV excited (D).

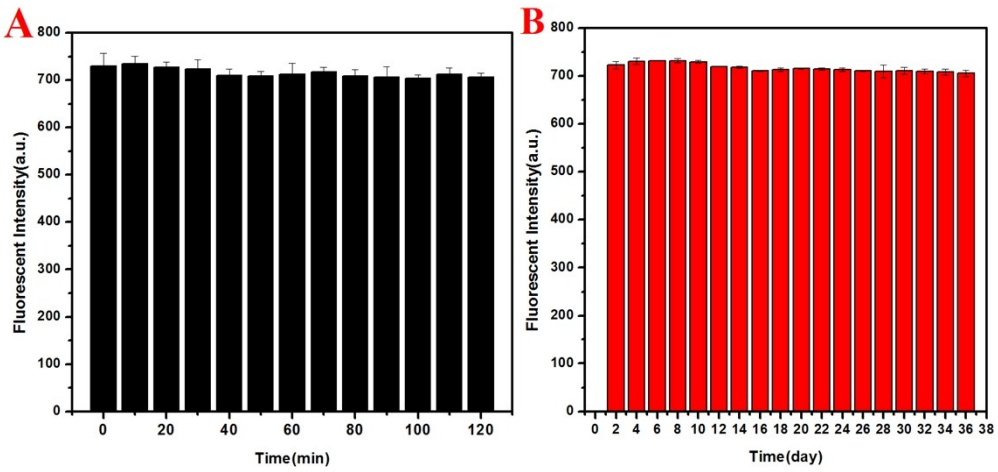


Fig. S5 (A) The stability of GQDs continuous irradiation under UV 365 nm for 120 min; (B) The stability of GQDs stored in a refrigerator at 4 ◦C for 38-day

Table.S1 Comparison of the sensing results of the present work with corresponding GSH sensors

| **Probe** | **Method** | **Linear range** | **LOD** | **Real samples** | **Reference in manuscript** |
|---|---|---|---|---|---|
| Ag+-TMB | colorimetry | 0.05-8 μM | 0.05 μM | Human urine and fatal calf serum | [9] |
| MnO2 NPs–TMB | colorimetry | 0.26–26 mM | 0.1 mM | Human blood | [11] |
| Rhodamin B - AuNPs | Fluorimetry | 12-1384 μM | 1.0 μM | hepG2 | [14] |
| N-(4-(1,5-diphenyl-4,5-dihydro-1H-pyrazol-3-yl)phenyl)-2,4-dinitrobenzenesulfonamide | Fluorimetry | 10-180 μM | 0.411 μM | Calf serum | [33] |
| CdTe-MPA-DA | Fluorimetry | 0.01-10 μM | 6.5 nM | Fetal bovine serum and human urine | [36] |
| GQDs-$MnO_2$ | Fluorimetry | 1-1000 μM | 0.45 μM | Fatal calf serum, Reduced Glutatione injection, Reduced Glutatione Tablets | This work |