Supplementary Information

Near infrared imaging of intracellular GSH by AuNCs@MnO_2 core-shell nanoparticles based on absorption competition mechanism

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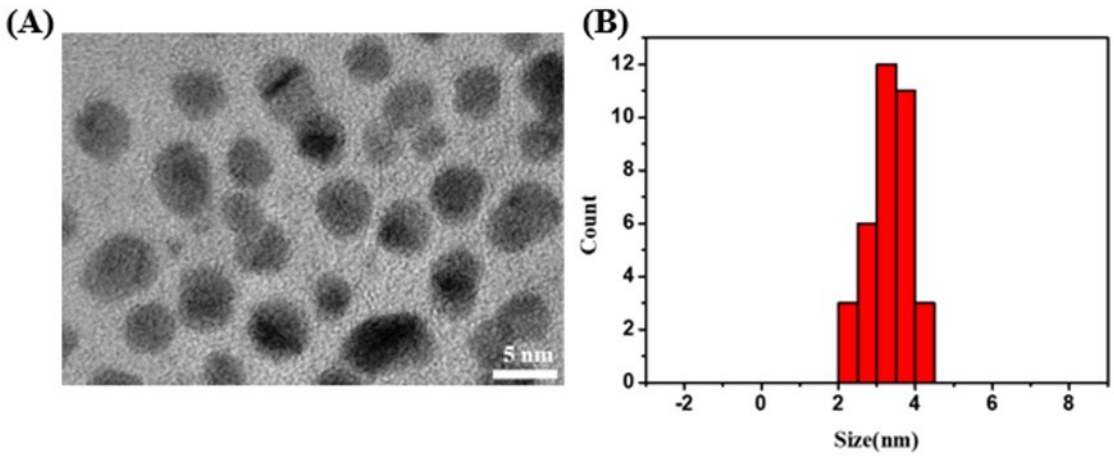

Fig. S1 (A) TEM image of AuNCs. (B) The corresponding size distribution histogram of AuNCs.

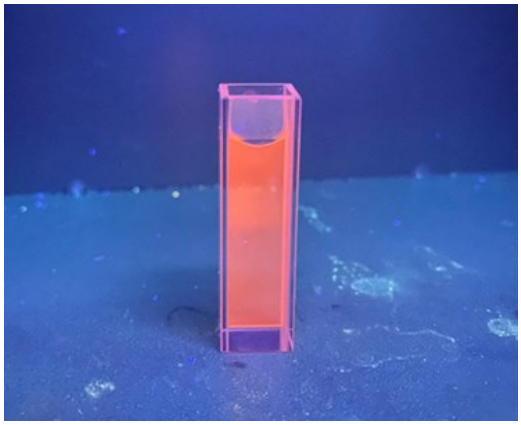

Fig. S2 Photographs of AuNCs solutions under UV light (302 nm).

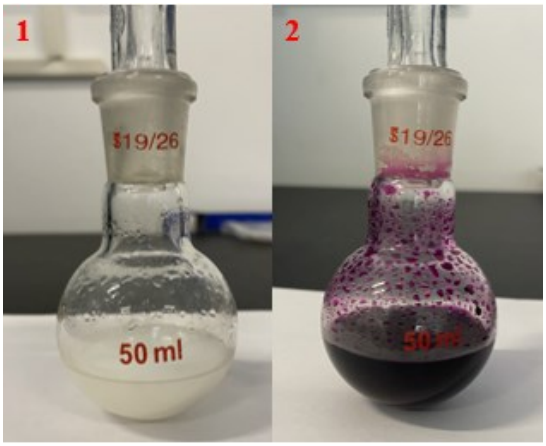

Fig. S3 Two photos of the 50 mL reaction vessel for preparation of AuNCs doped SiO_2 (1) and AuNCs@MnO_2 (2).

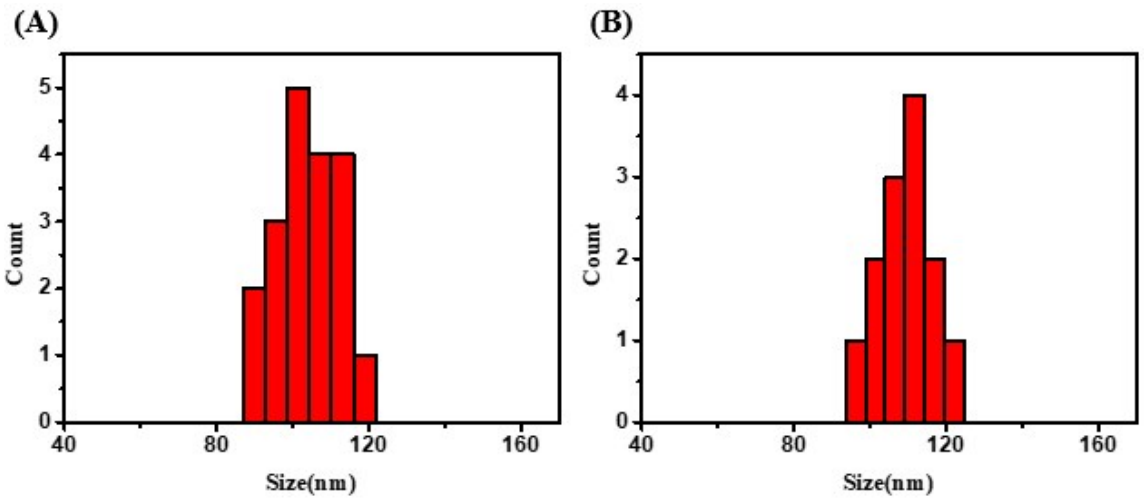

Fig. S4 The corresponding size distribution histogram of AuNCs doped SiO_2 (A) and AuNCs@MnO_2 (B).

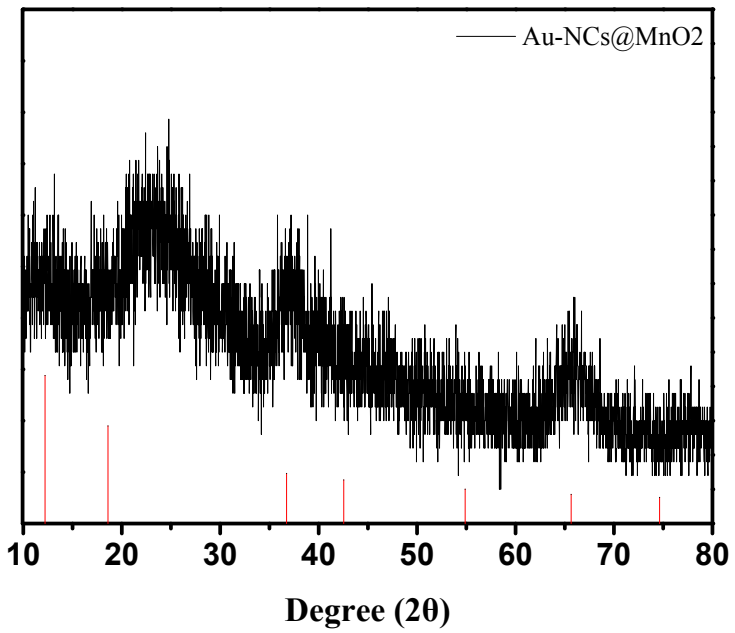

Fig. S5 XRD spectrum of AuNCs@MnO_2.

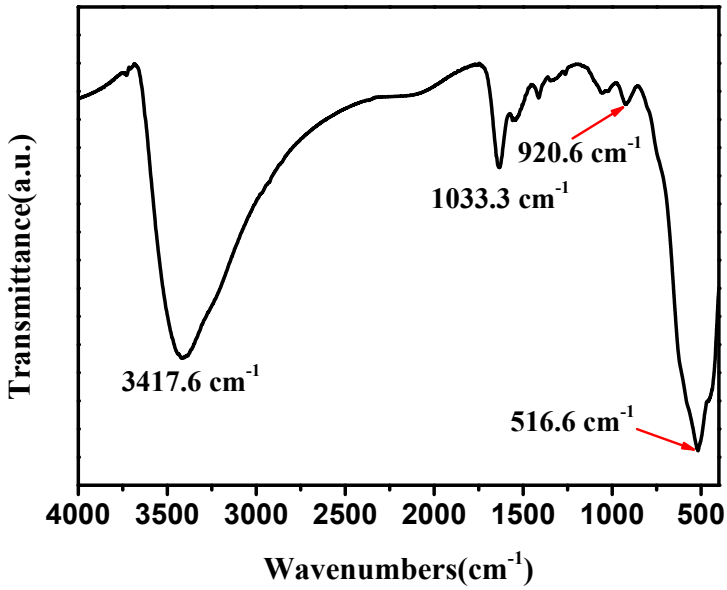

Fig. S6 The FT-IR spectroscopy AuNCs@MnO_2.

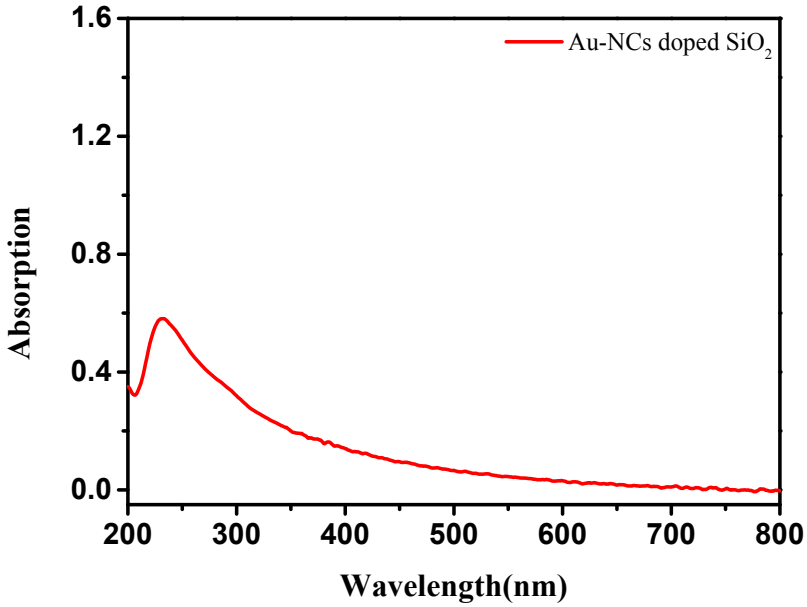

Fig. S7 UV-vis absorption spectrum of AuNCs doped SiO_2.

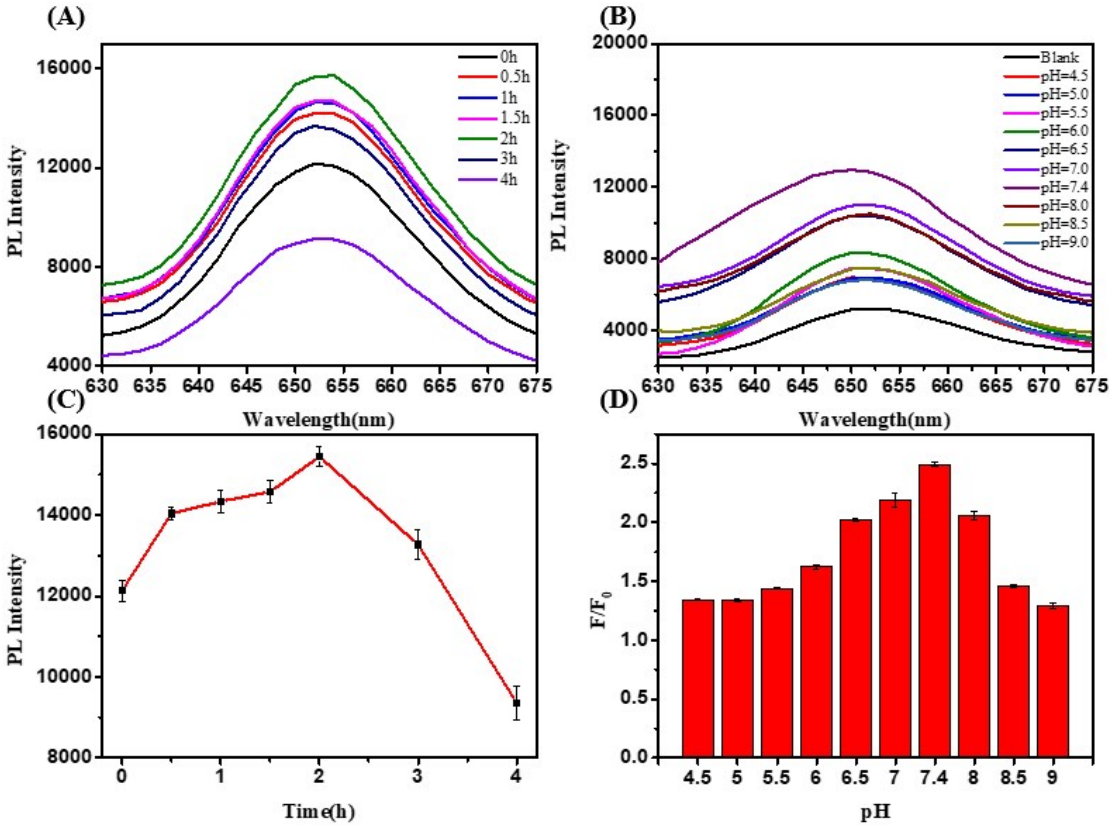

Fig. S8 (A) Fluorescence spectra of AuNCs@MnO_2 with different incubation times. (B) Fluorescence spectra of AuNCs@MnO_2 with different pH. (C) Point-line plot between the PL intensity at 652 nm and incubation time. (D) A histogram between the F/F_0 at 652 nm and pH (F_0 and F delegate the PL intensity in the absence and in the presence of GSH, respectively).

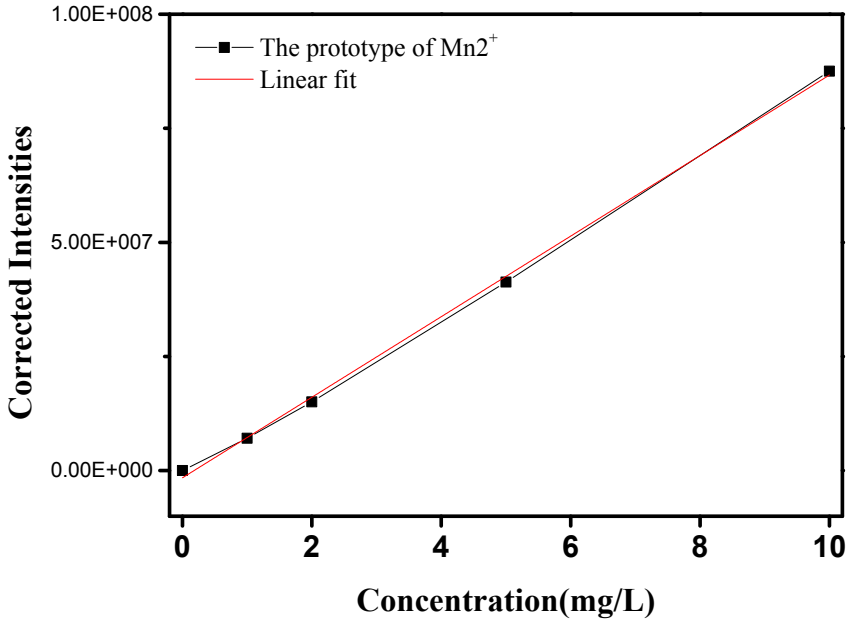

Fig. S9 The standard curve of Mn^{2+} and linear fitting of Mn^{2+} prototype.

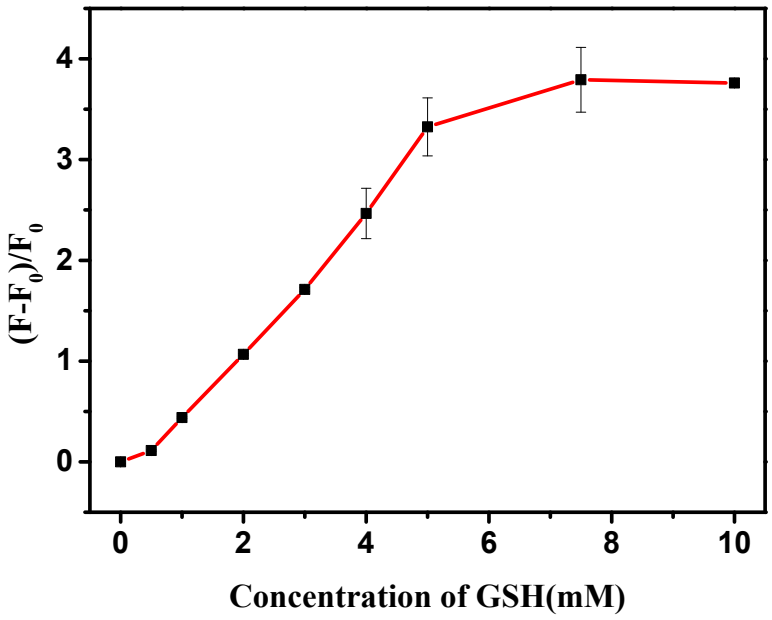

Fig. S10 Point-line plot of the $(F-F_0)/F_0$ at 652 nm and GSH concentrations (F_0 and F delegate the PL intensity in the absence and in the presence of GSH, respectively).

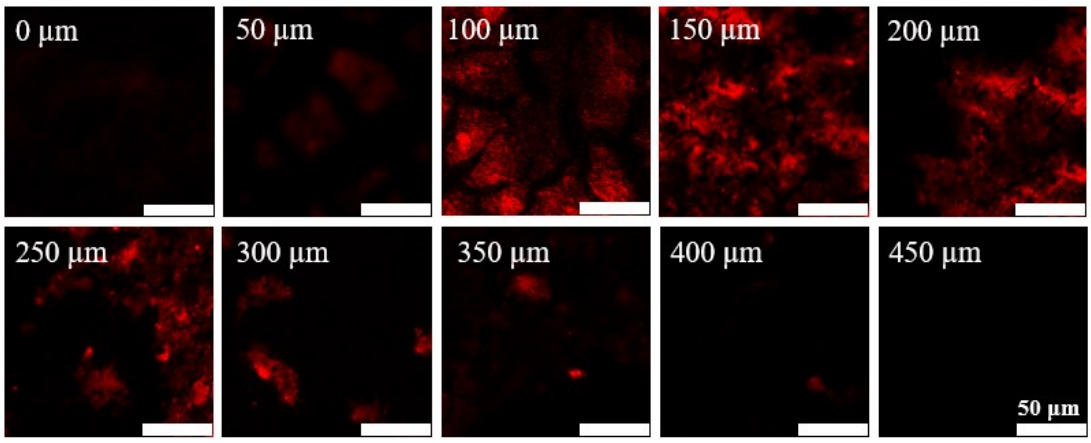

Fig. S11 Depth fluorescence images of AuNCs@MnO_2 in the tissues were obtained in the z-scan mode (from 0 to 450 μm; step size: 2 μm). The images were obtained at 600-670 nm (red channel). Scale bars: 50 μm.

Table S1. Comparison of the proposed method with other methods for GSH detection

Method	Linear range(μmol L^{-1})	Detection Limit(μmol L^{-1})	React time(min)	Reference
HPLC	0.75-10	0.5	/	1
Surface Enhanced Raman Scattering	0.1-0.8	0.05	5	2
Surface Enhanced Raman Scattering	0.05-0.7	0.04	45	3
Colorimetry	0.05-80	0.05	10	4
Colorimetry	0.1-10	0.095	30	5
Electrochemiluminescence	1.58-200	0.62	/	6
Electrochemiluminescence	0.3-500	2.2	/	7
Fluorometry	2-90	0.0204	20	8

Fluorometry	0.5-100	0.15	6	9
Fluorometry	10-250	36	180	10
Fluorometry	0.03-60	/	120	11
Fluorometry	1-50	0.943	20	12
Fluorometry	13.3-417	0.153	/	13
Fluorometry	0.1-60	0.035	3	14
Fluorometry	2-5000	0.67	120	This work

Reference

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