Supplementary materials for

A visual ratiometric fluorescence sensor for glutathione response based on MnO_2 nanowires as oxidants, quencher and recognition unit

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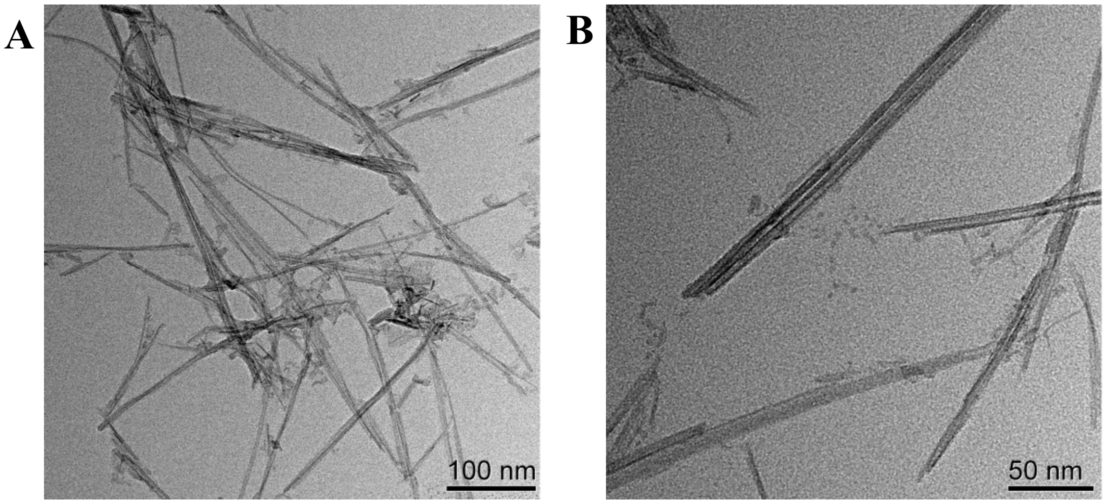

Fig. S1. (A) and (B) The TEM image of the as-prepared MnO_2 NWs.

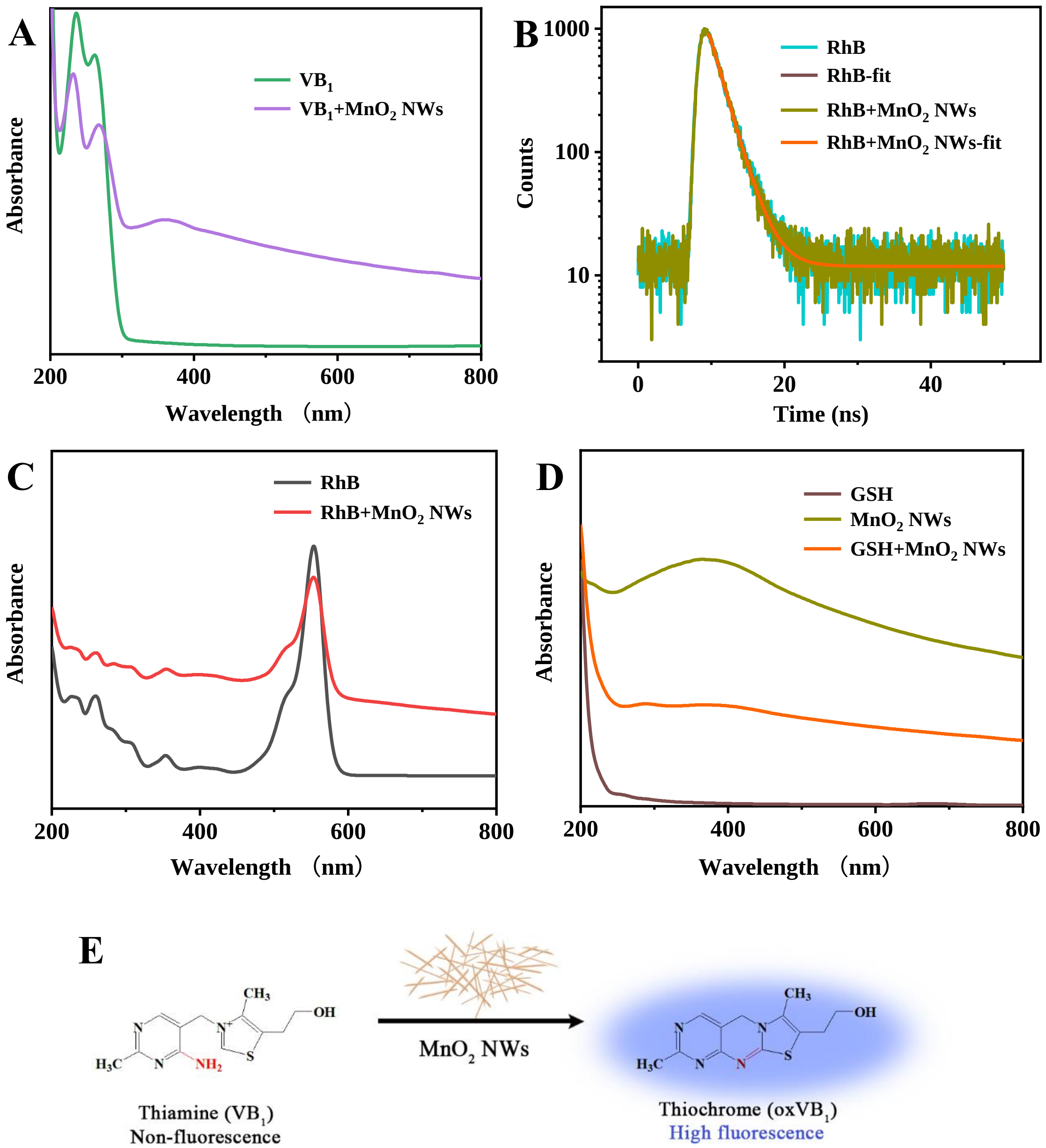

Fig.S2. (A) UV–vis absorption spectrum of VB_1 and VB_1 + MnO_2 NWs; (B) The time-resolved fluorescence decay curve of RhB and RhB + MnO_2 NWs; (C) UV–vis absorption spectrum of RhB and RhB + MnO_2 NWs; (D) UV–vis absorption spectrum of GSH, MnO_2 NWs and GSH + MnO_2 NWs; (E) Schematic illustration of VB_1 being oxidized by MnO_2 NWs to $oxVB_1$.

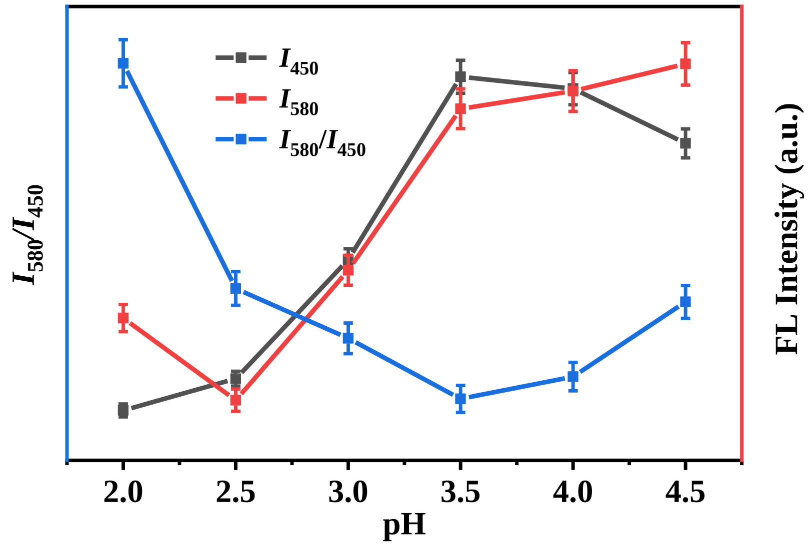

Fig. S3. Effects of pH on the ratiometric fluorescent sensor. Plots of I_{450}, I_{580}, and the ratio value I_{580}/I_{450} *versus* pH, respectively.

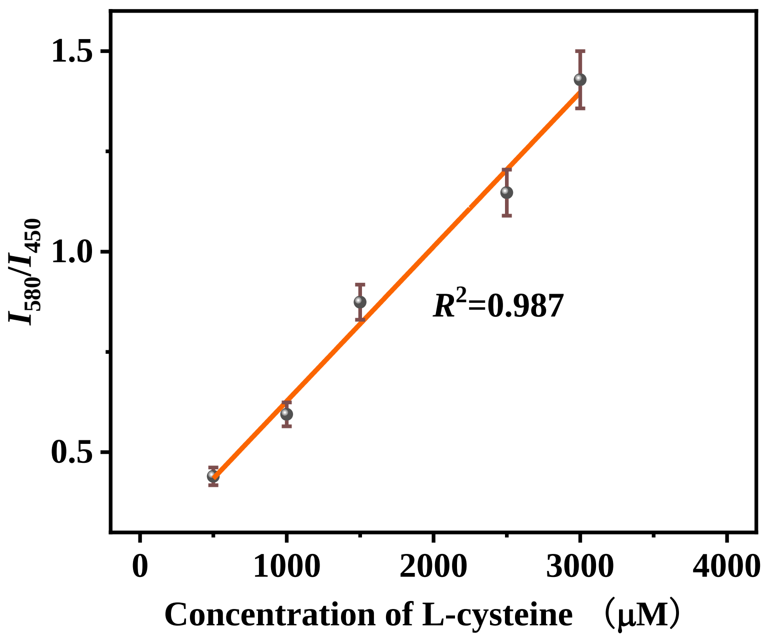

Fig.S4. The linear relationship between the ratio value I_{580}/I_{450} and L-cysteine concentrations from 500 to 3000 μM.

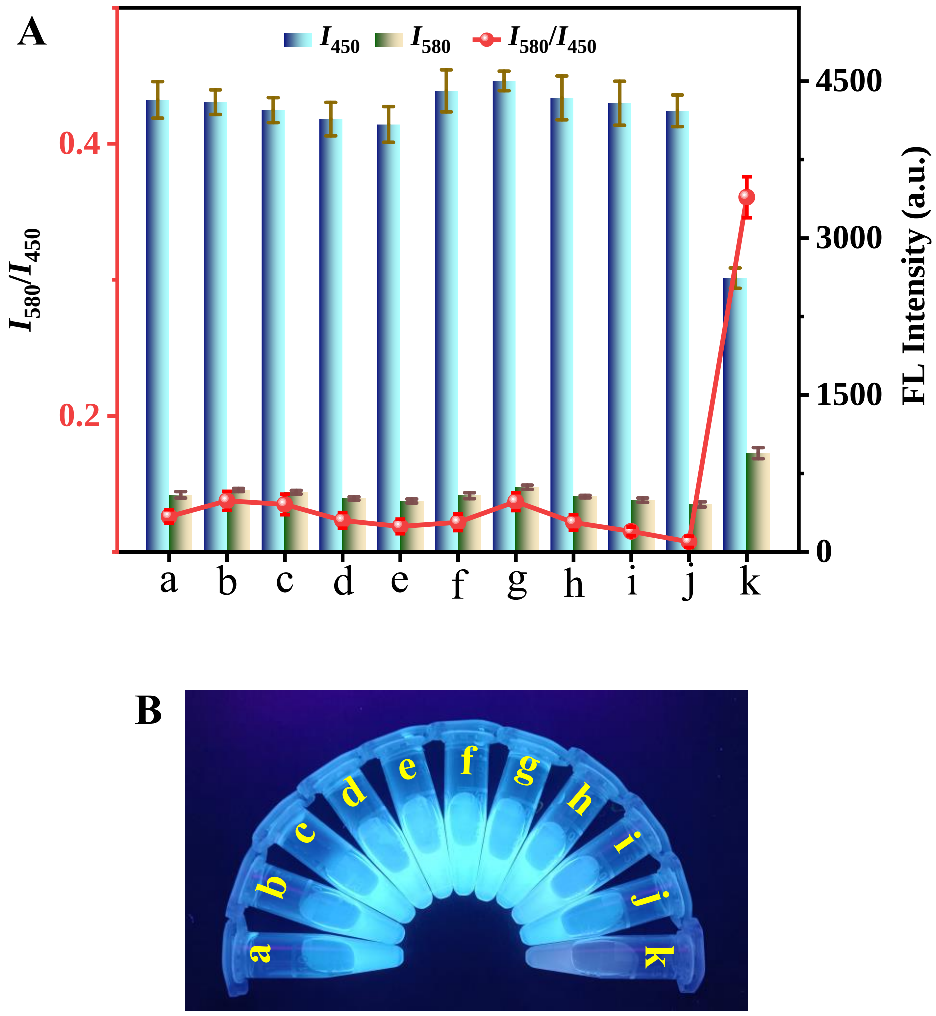

Fig. S5. (A) Selectivity of the ratiometric fluorescent sensor, a: l-alanine, b: l-phenylalanine, c: proline, d: methionine, e: glucose, f: NaCl, g: KCl, h: $NaHCO_3$, i: NaH_2PO_4, j: H_2O and K: GSH. (B) Photographs of the ratiometric fluorescent sensor under UV light after addition of different substances.

Table S1 Recovery results of GSH in real samples.

Sample	Added (μM)	Detected [a] (μM)	Recovery (%)
whitening capsules	0	475.9 ± 10.5	−
	500	998.8 ± 10.6	104.6
	1000	1481 ± 11.2	100.5
glutathione tablets	0	490.0 ± 7.7	−
	500	1037 ± 11.3	109.4
	1000	1546 ± 12.3	105.6

[a] Average of three determination ± SD, n=3

Table S2 Applications of the prepared sensor to the real sample in contrast to HPLC.

Sample	Present work (μM)	HPLC (μM)
whitening capsules	475.9 ± 10.5	483.9 ± 3.9
glutathione tablets	490.0 ± 7.7	487.3 ± 6.5