Electronic Supplementary Material

Portable smartphone assisted multi-color colorimetric sensor for the detection of mercury ions based on the peroxidase-like activity of platinum nanoparticles

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Fig. S1 Photographs of the custom light-tight box under uniform illumination: (A) overall view and (B) internal view.

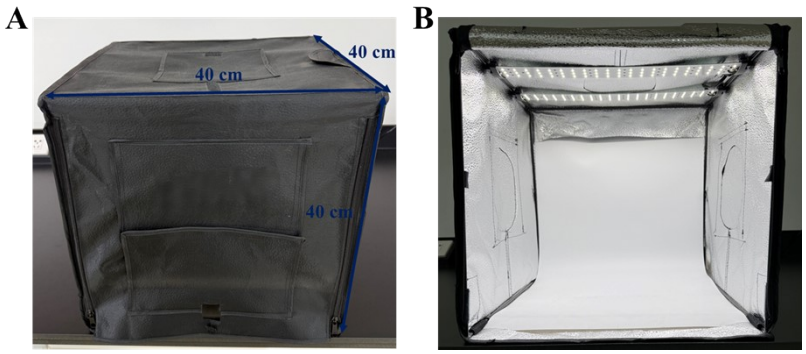

Fig. S2 The size distribution of PVP-stabilized PtNPs.

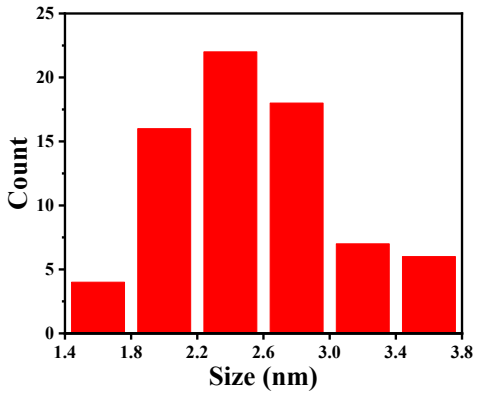

Fig. S3 (A) UV-vis absorption spectra of PtNPs+TMB+H_2O_2 (black curve) and PtNPs+TMB+H_2O_2+200 nM Hg^{2+} (red curve). (B) UV-vis absorption spectra of PtNPs+TMB+H_2O_2+H_2SO_4 (black curve) and PtNPs+TMB+H_2O_2+200 nM Hg^{2+} +H_2SO_4 (red curve). The visual color changes were shown in the inset.

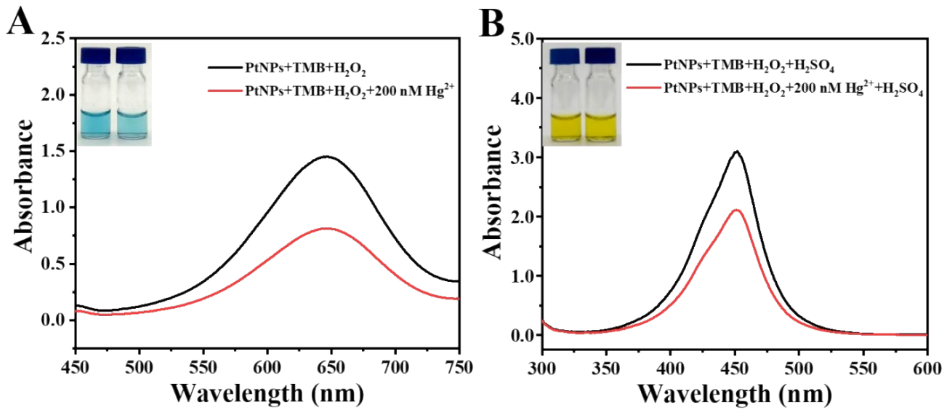

Fig. S4 RGB values of the sensing system with the addition of 0, 100, and 200 nM Hg^{2+}. The error bars represented the standard deviations based on three independent measurements.

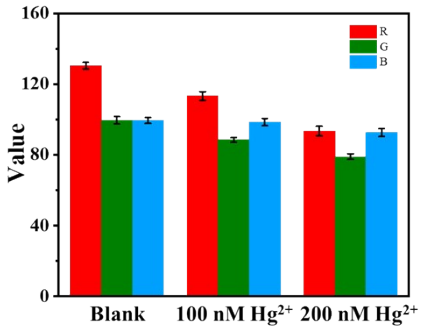

Table S1 Analytical performance comparison of colorimetric methods

Quantitative method	Probe type	Response time (min)	Linear range	Limit of detection (LOD)	Real samples	Ref.
UV-vis spectrophotometer	MnO_2/MWCNTs	63	10-100 μM	1.84 μM	Lake water and tap water	[1]
UV-vis spectrophotometer	Fe_3O_4@ZnO-AuNPs	6	3-10 μM	1.67 μM	Tap water	[2]
UV-vis spectrophotometer	C-A-Fe	35	1-1000 nM	9.65 nM	Cod, spinach and tap water	[3]
UV-vis spectrophotometer	CuO/Au@$Cu_3(BTC)_2$	15	0.05-25 μM	9.7 nM	Tap water	[4]
UV-vis spectrophotometer	AuNPs	30	0-680 nM	11.9 nM	Tap water	[5]
Smartphone RGB analysis	Cu-N/C	20	0.5-30 μM	0.1 μM	Lake water, river water and tap water	[6]
Smartphone RGB analysis	ZnO@Pt	20	50-1250 nM	29.8 nM	Tap water, drinking water and lake water	[7]
Smartphone RGB analysis	AuNPs/NH_2-UiO-66	15	10-100 nM	5.4 nM	Tap water and bottled water	[8]
Smartphone RGB analysis	pap-AuNCs	-	4.98-24.4 μM	3.74 μM	River water and lab water	[9]
Smartphone RGB analysis	PtNPs and AuNRs	13	10-400 nM	5.1 nM	Tap water and reservoir water	This work

Reference

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