

An Oligopeptide-Protected Ultrasmall Gold Nanocluster with Peroxidase-Mimicking and Cellular-Imaging Capacities

Supplementary Information

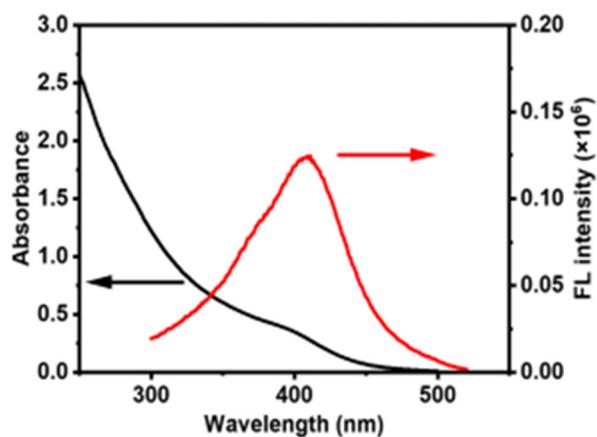


Figure S1. UV-vis absorption spectrum (black line) and the luminescence excitation (red line) of PGN.

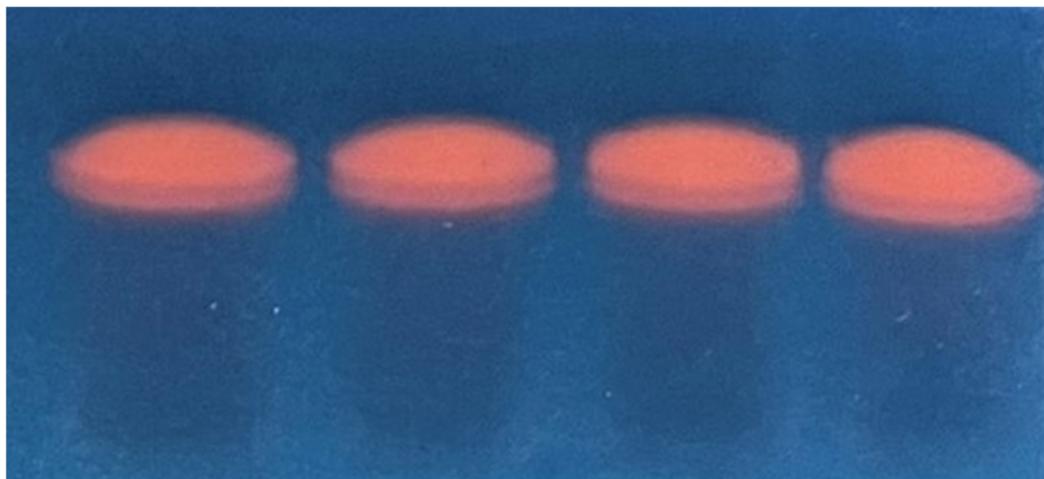


Figure S2. Digital photo of the PAGE bands upon UV light excitation.

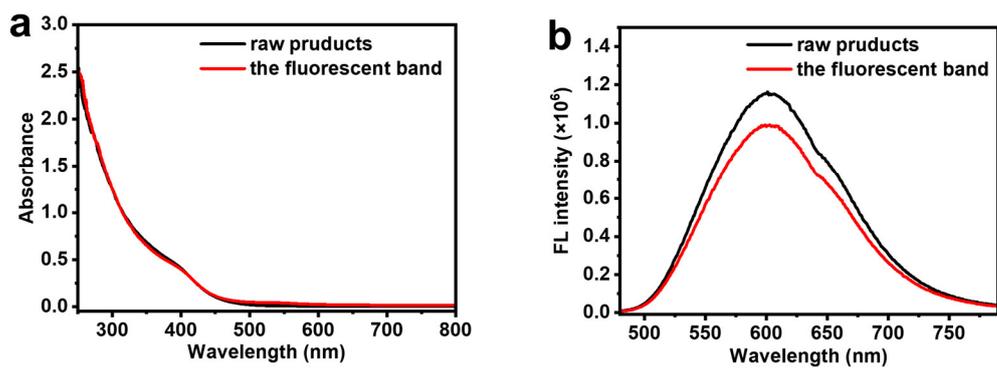


Figure S3. Comparison of (a) UV-Vis and (b) fluorescence intensity of the crude products and the fluorescent band.

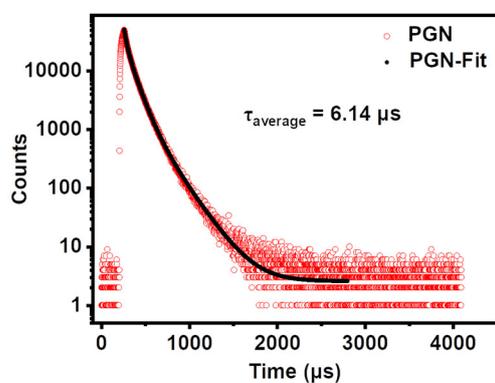


Figure S4. Fluorescence lifetime decays of PGN.

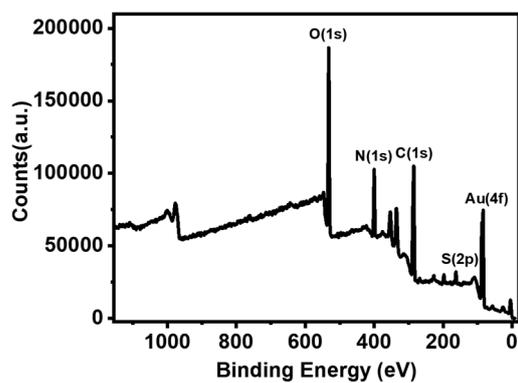


Figure S5. The whole XPS spectra of PGN.

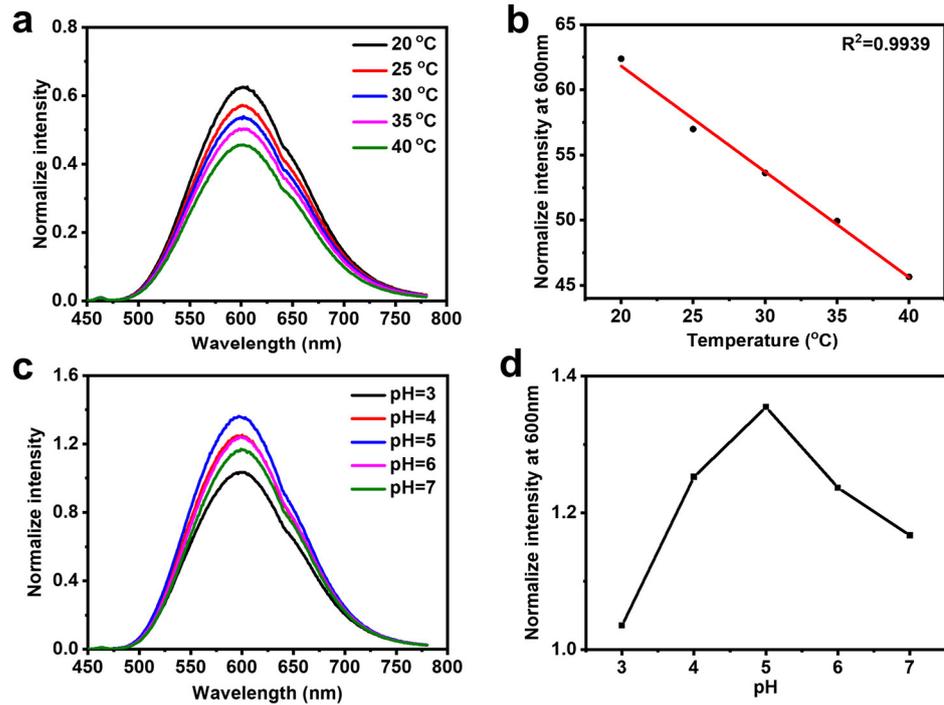


Figure S6. (a) Fluorescence spectra of PGN at different temperatures (from 20 to 40 °C). (b) Correlation of fluorescence intensity at 600 nm with temperature ranging from 20 to 40 °C. (c) Fluorescence spectra of PGN at different pH (from 3 to 7). (d) Correlation of fluorescence intensity at 600 nm with pH in the range of 3-7.

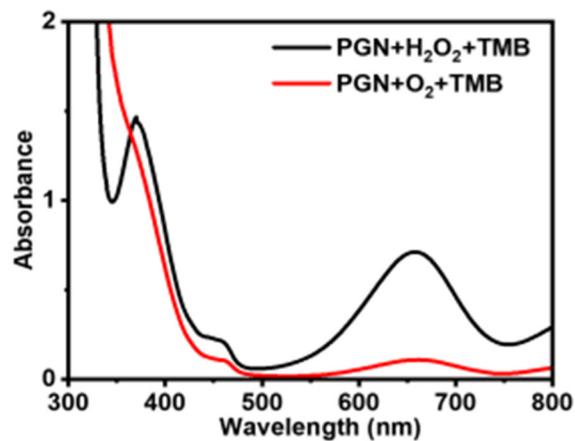


Figure S7. Comparison of the peroxidase-like (in presence of H₂O₂) and the oxidase-like (in presence of dioxygen) activity of PGN.

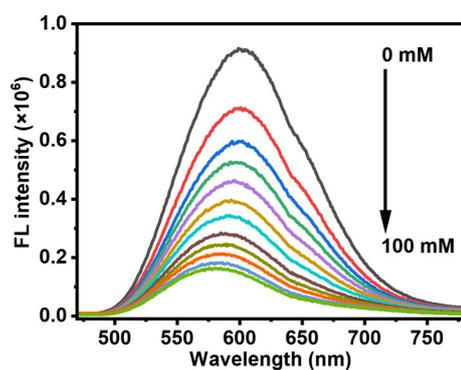


Figure S8. Fluorescence changes of the PGN-TMB system after adding H₂O₂ at different concentrations (0,5,10,20,30,40,50,60,70,80,90 and 100mM).

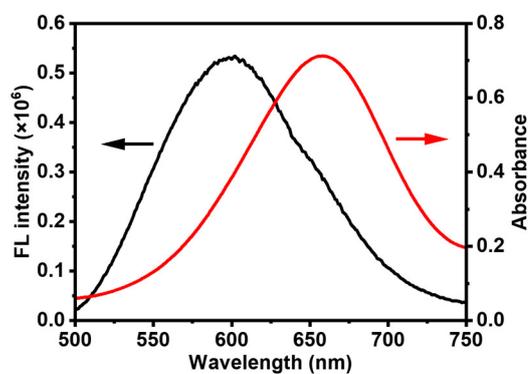


Figure S9. Emission spectra of PGN (black line) and UV-Vis absorption spectra of the PGN-TMB-H₂O₂ system (red line).

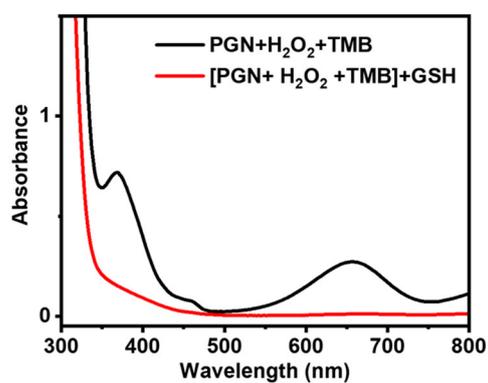


Figure S10. The UV-Vis spectrum of PGN+H₂O₂+TMB before and after adding GSH.

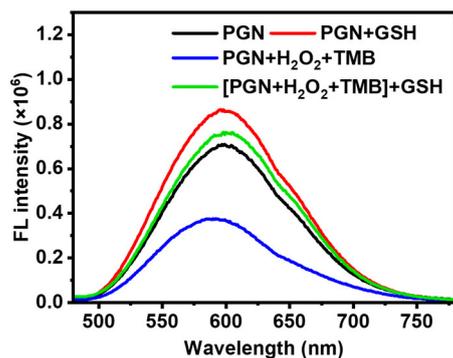


Figure S11. Fluorescence spectrum of PGN; PGN+GSH; PGN+H₂O₂+TMB and [PGN+H₂O₂+TMB] + GSH.

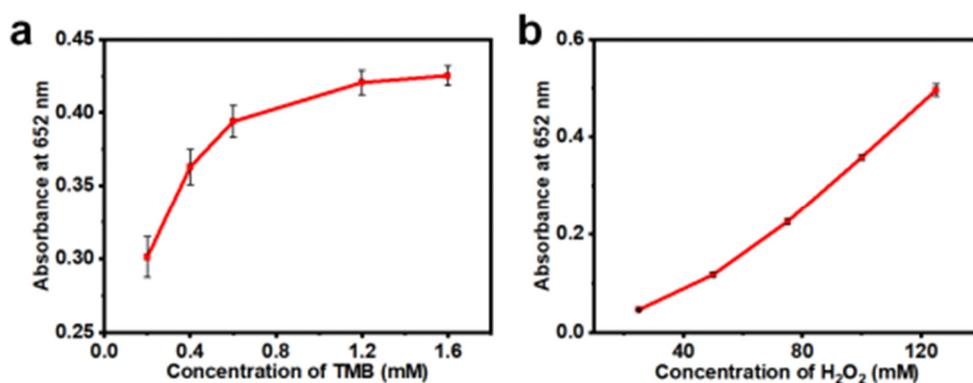


Figure S12. (a) The absorption peak at 652 nm in the presence of different concentrations of TMB (0.2, 0.4, 0.6, 1.2, 1.6 mM). (b) The absorption peak at 652 nm in the presence of different concentrations of H₂O₂ (25, 50, 75, 100, 125 mM). The concentration of the GSH-Au NCs was fixed at 100 μ M (Au basis).

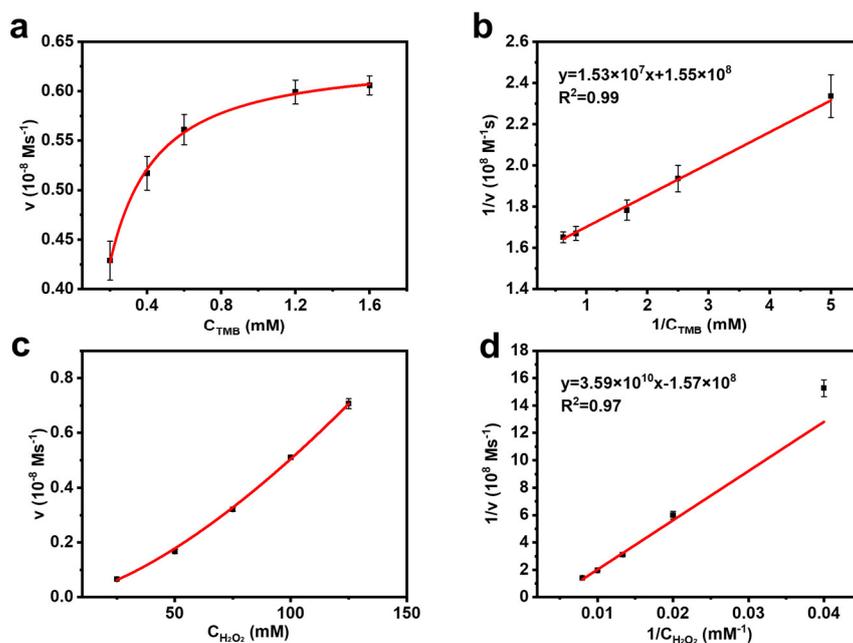


Figure S13. Steady-state kinetic assay and catalytic mechanism of the synthesized GSH-Au NCs towards various components: (a, b) 1 mM TMB and different concentrations of H₂O₂, (c, d) 100 mM H₂O₂ and different concentrations of TMB.

Table S1. Comparison of kinetic parameters of K_m and K_{cat} of PGN, and GSH-Au NCs.

Catalyst	Substrate	K_m (mM)	K_{cat} (s^{-1})	Reference
PGN	TMB	0.31	8×10^{-5}	This work
	H ₂ O ₂	1069	5.35×10^{-4}	
GSH-Au NCs	TMB	0.0987	6.45×10^{-5}	[23]
	H ₂ O ₂	228.66	6.37×10^{-5}	