Supporting Information

ROS generation strategy based on biomimetic nanosheets by self-assembly of nanozymes

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Supporting Figures

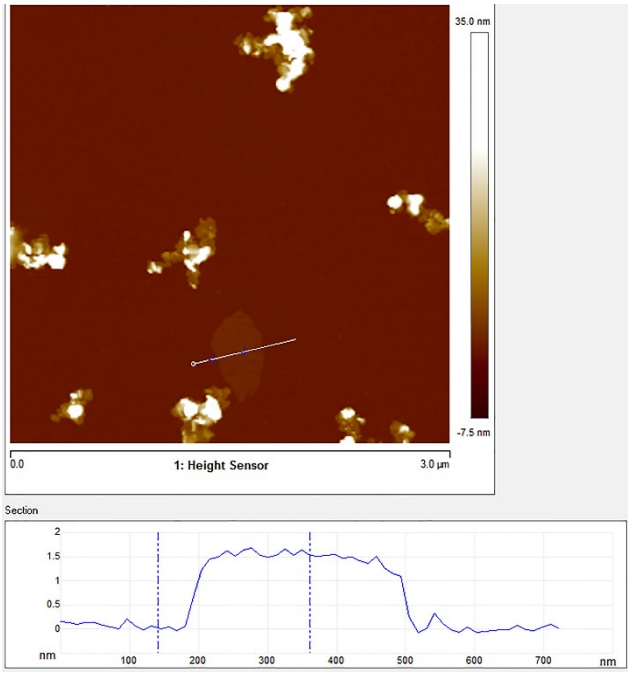

Fig. S1. AFM image of CPNS and the height profile along the white line.

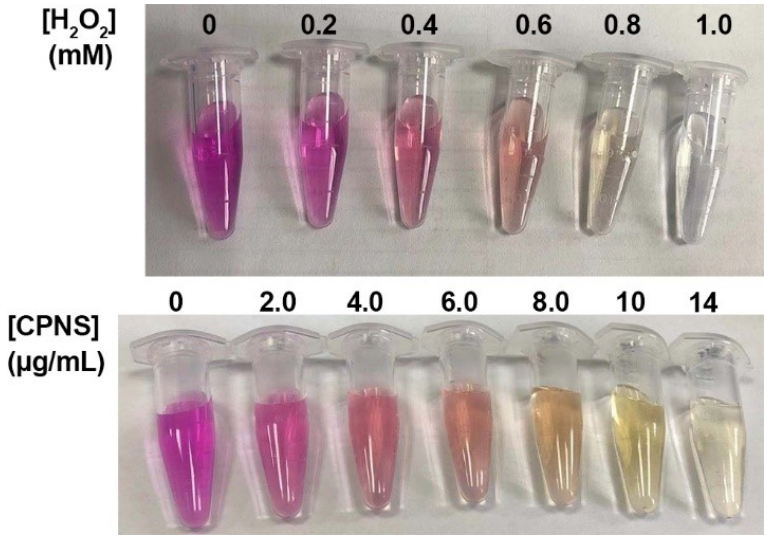

Fig. S2. MnO_4^--based colorimetric analysis demonstrating the presence of peroxo groups in CP nanodots. Under the strong acid condition (0.1 M H_2SO_4), CP nanodots were quickly dissociated to generate H_2O_2, which can reduce pink MnO_4^- to colorless Mn^{2+} in the acidic media.

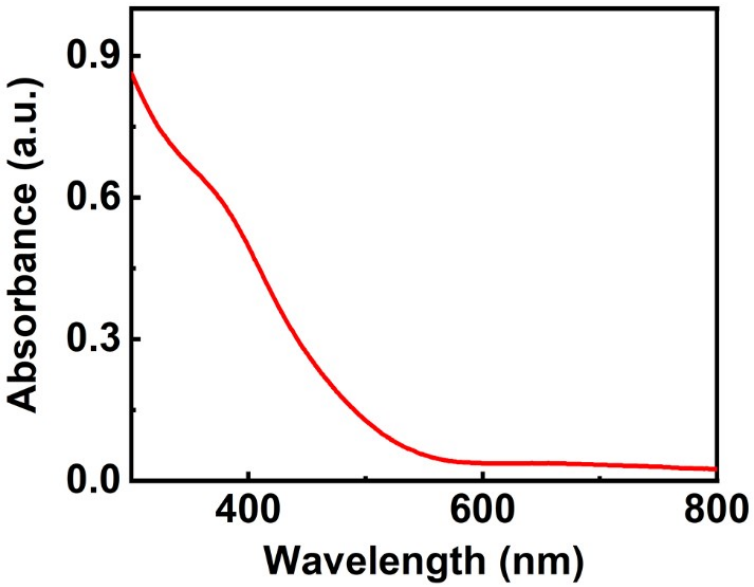

Fig. S3. UV−vis absorption spectrum of CPNS.

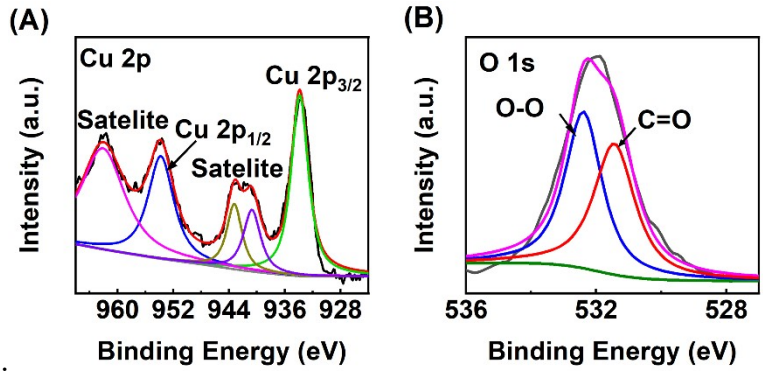

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Fig. S4. XPS spectra of CPNS: (A) Cu 2p, (B) O 1s.

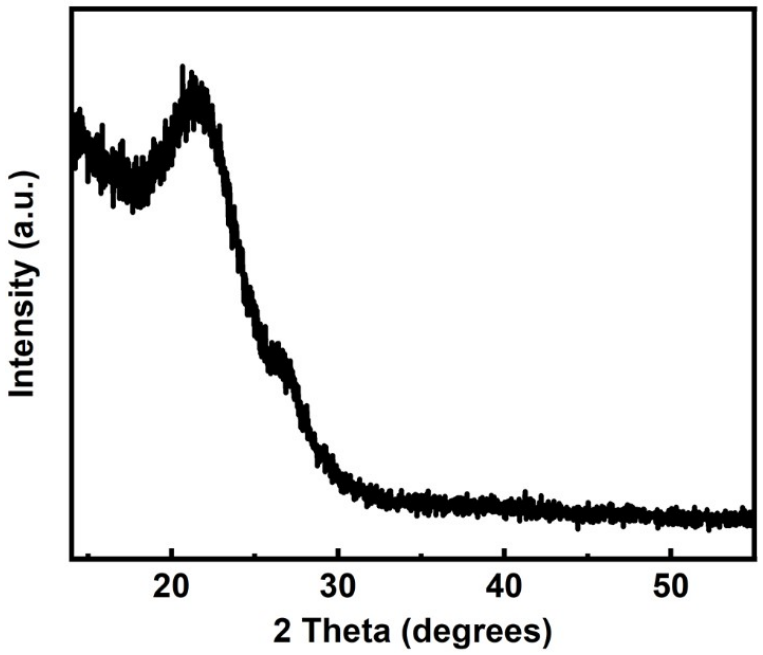

Fig. S5. X-ray diffraction (XRD) pattern of CPNS.

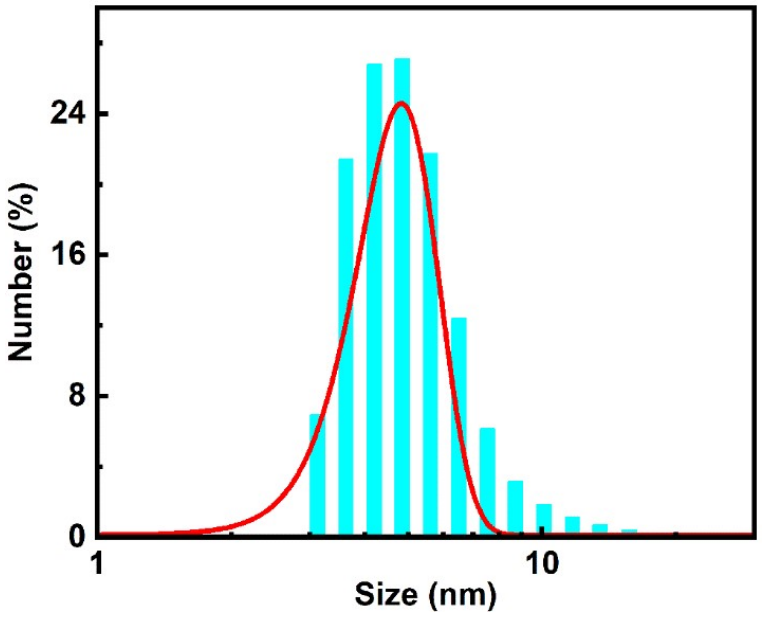

Fig. S6. Dynamic light scattering (DLS) measurement of Pt NPs.

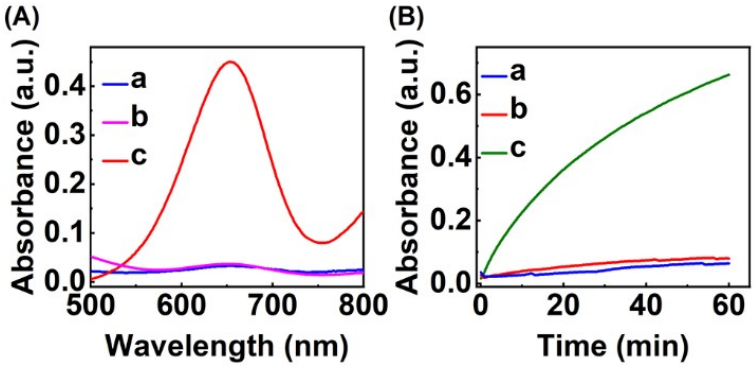

Fig. S7. (A) UV−vis spectra and photographs of TMB aqueous solution treated with H_2O_2 (a) Cu^{2+} (b), or Cu^{2+} plus H_2O_2 (c). (B) Time-dependent absorbance spectra of TMB aqueous solution treated with H_2O_2 (a) Cu^{2+} (b), or Cu^{2+} plus H_2O_2 (c).

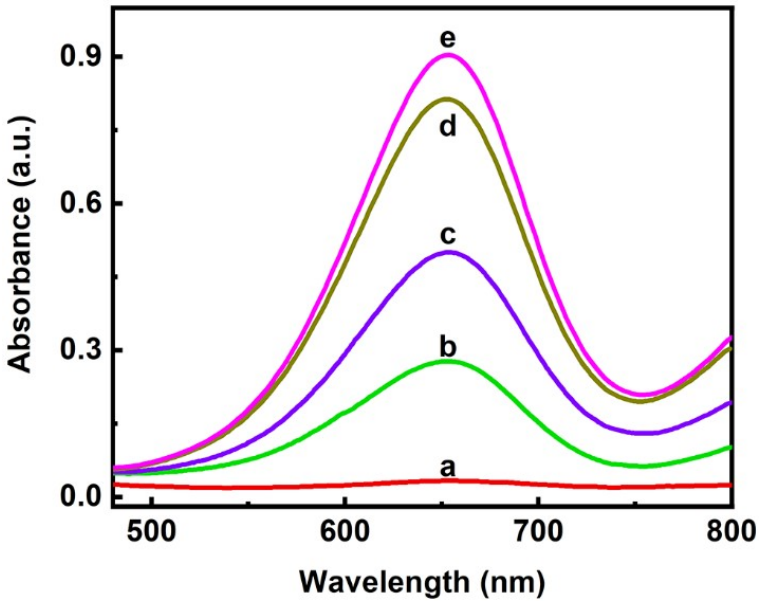

Fig. S8. UV-vis spectra of TMB aqueous solution incubated with different concentrations of H_2O_2: 0 mM (a), 0.5 mM (b), 1.0 mM (c), 2.0 mM (d), 5.0 mM (e) in the presence of 0.5 mM Cu^{2+}.

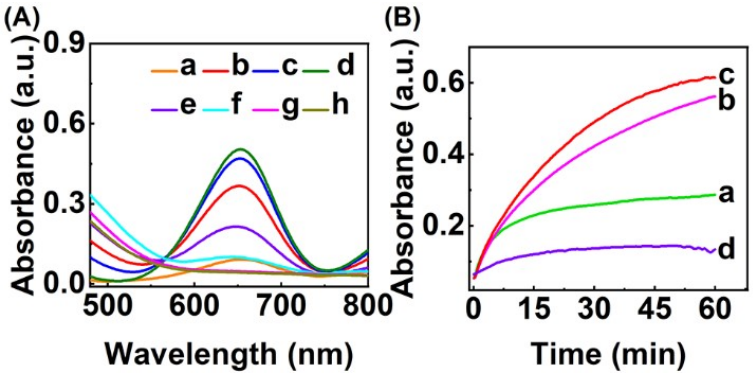

Fig. S9. UV-vis spectra of TMB aqueous solution exposed to CP nanosheets at different pH: pH 3.0 (a), pH 4.0 (b). pH 5.0 (c), pH 6.0 (d), pH 7.0 (e), pH 8.0 (f), pH 9.0 (g), and pH 10 (h). (B) Time-dependent absorbance spectra of TMB aqueous solution treated with CPNS at different pH: pH 4.0 (a), pH 5.0 (b). pH 7.0 (c), and pH 7.0 (d).

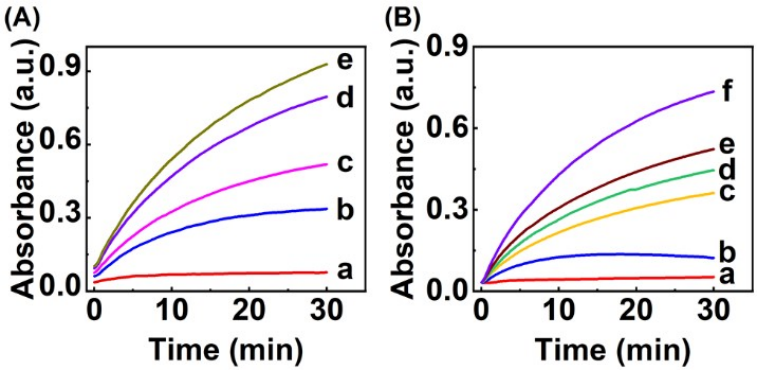

Fig. S10. (A) Time-dependent absorbance spectra of TMB oxidation exposed to variable concentrations of CPNS: 3 μg/mL (a), 6 μg/mL (b), 9 μg/mL (c), 12 μg/mL (d), and 15 μg/mL (e) in the presence of 50 μg/mL TMB. (B) Time-dependent absorbance spectra of TMB oxidation with variable concentration of 5 μg/mL (a), 10 μg/mL (b), 15 μg/mL (c), 20 μg/mL (d), 30 μg/mL (e), and 50 μg/mL (f) in the presence of 12 μg/mL CPNS.

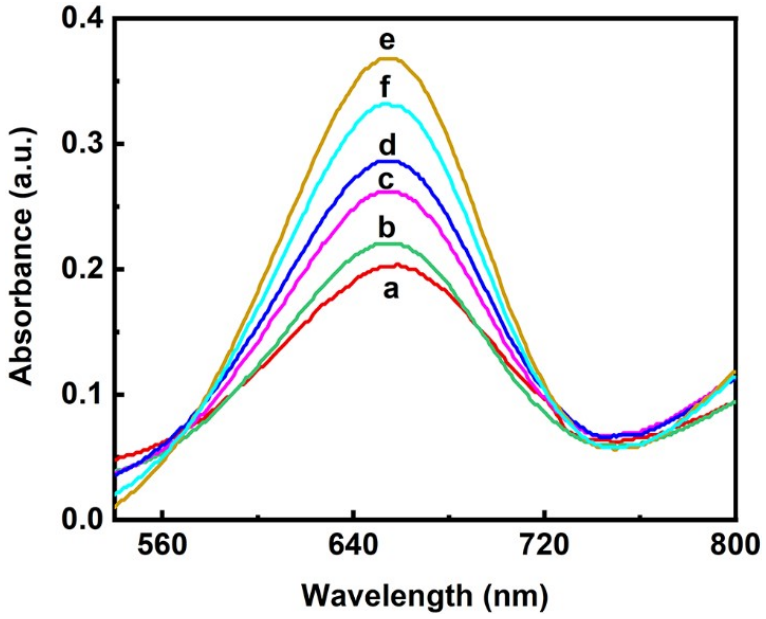

Fig. S11. The influence of temperature on activity of CPNS, 25 °C (a), 30 °C (b) 35 °C (c) 40 °C (d) 45 °C (e) and 50 °C (f).

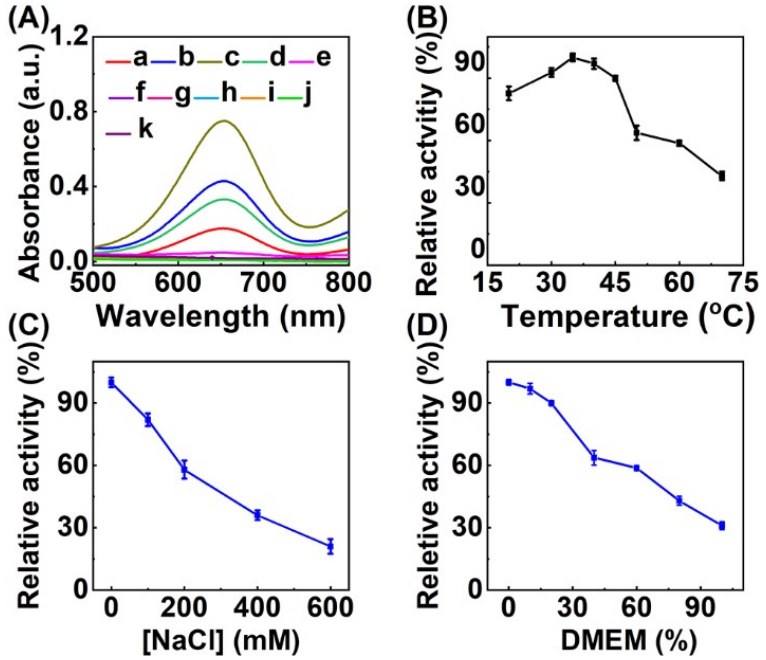

Fig. S12. The influence of (A) pH, 3.0 (a), 4.0 (b), 5.0 (c), 6.0 (d), 7.0 (e), 8.0 (f), 9.0 (g), 10 (h) 11 (i), 11 (j) and 12 (k). (B) temperature, (C) NaCl and (D) DMEM on oxidase-like activity of Pt NPs.

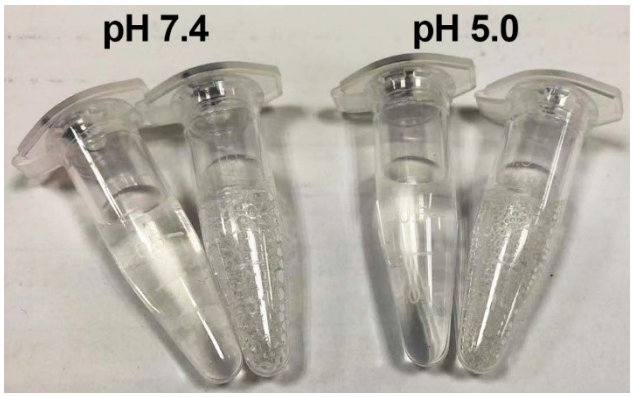

Fig. S13. The O_2 generation ability of Pt NPs in different pH values.

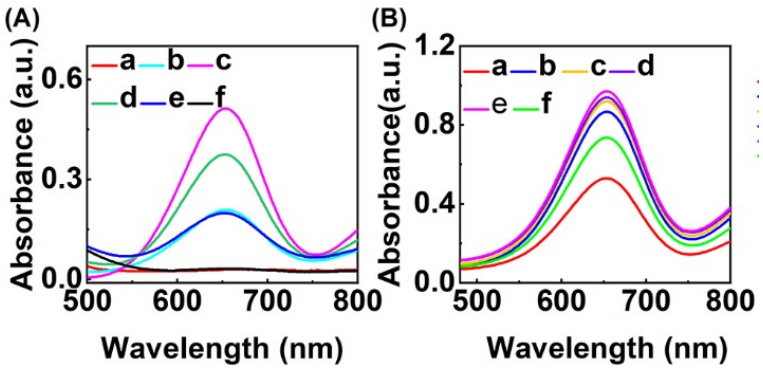

Fig. S14. The influence of (A) pH, 2.0 (a), 3.0 (b), 4.0 (c), 5.0 (d), 6.0 (e), and 7.0 (f), (B) temperature, 25 °C (a), 30 °C (b) 35 °C (c) 40 °C (d) 45 °C (e) and 50 °C (f).

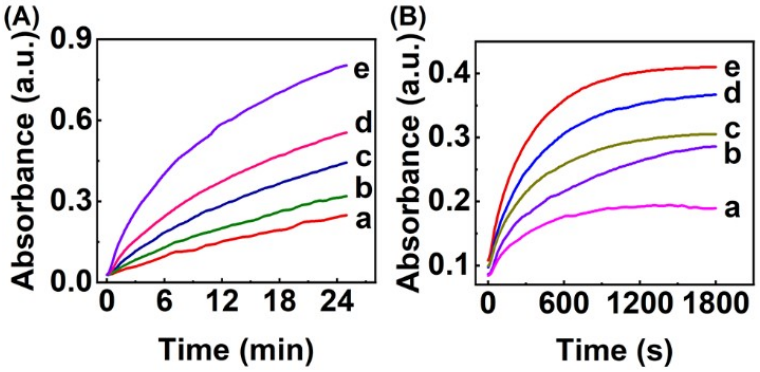

Fig. S15. (A) Time-dependent absorbance spectra of TMB oxidation exposed to variable concentrations of CPNS@Pt nanosheets: 1.5 μg/mL (a), 3 μg/mL (b), 4.5 μg/mL (c), 6 μg/mL (d), and 25 μg/mL (e) in the presence of 40 μg/mL TMB. (B) Time-dependent absorbance spectra of TMB oxidation with variable concentration of 5 μg/mL (a), 10 μg/mL (b), 15 μg/mL (c), 20 μg/mL (d), and 25 μg/mL (e) in the presence of 6 μg/mL CPNS@Pt nanosheets.

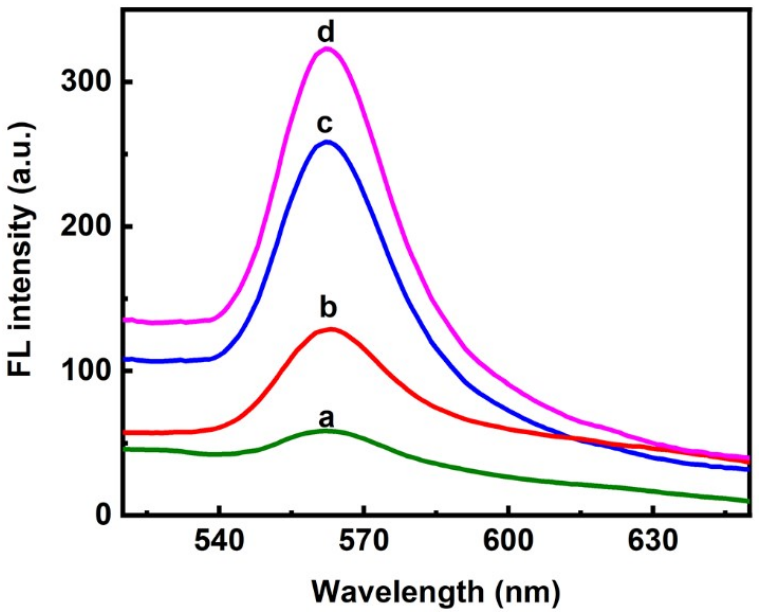

Fig. S16. The $O_2^{\bullet-}$ generation ability of nanozymes, control (a), CPNS (b), Pt NPs (c) and CPNS@Pt nanosheets(d).

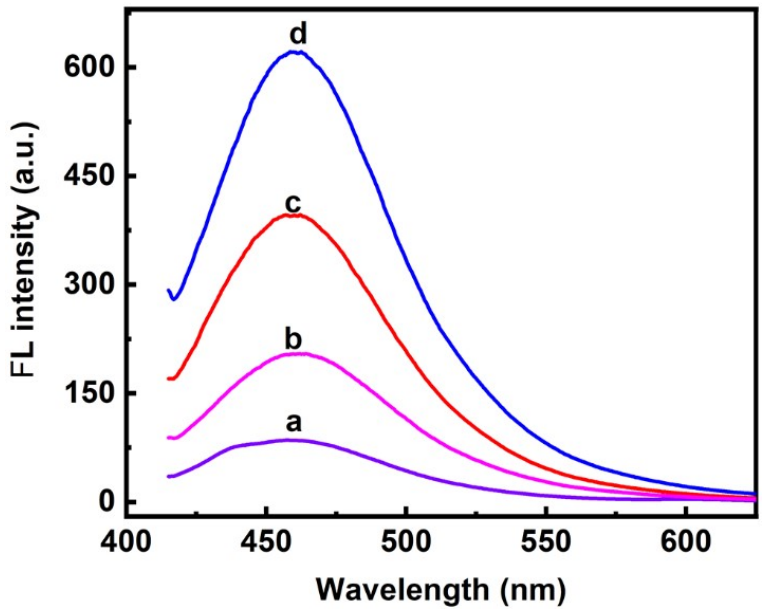

Fig. S17. The·OH generation ability of nanozymes, control (a), Pt NPs (b), CPNS (c) and CPNS@Pt nanosheets(d).

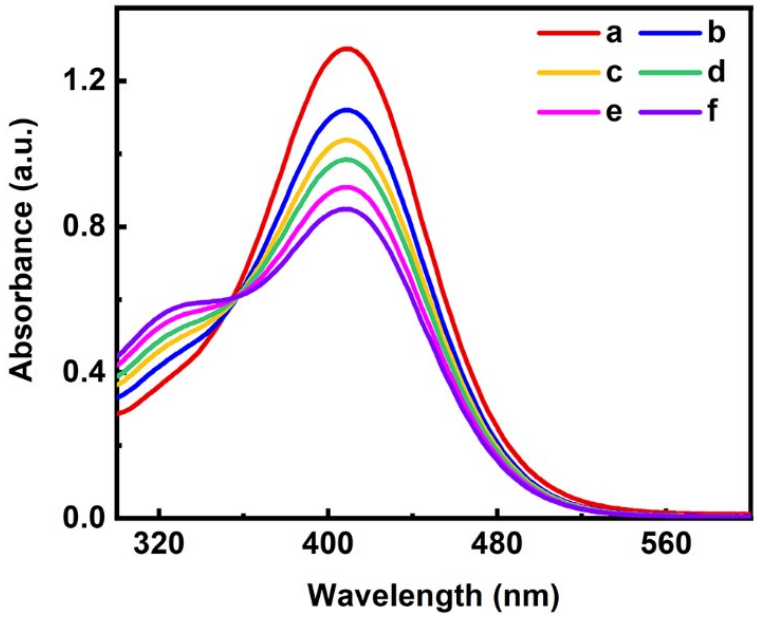

Fig. S18. Time-dependent GSH depletion in the presence of CPNS@Pt nanosheets and Ellman's reagent (DTNB), 5 min (a), 10 min (b), 15 min (c), 20 min (d), 25 min (e), and 30 min (f).

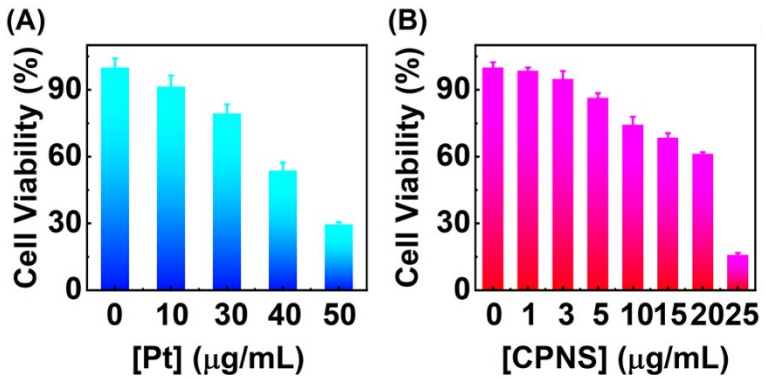

Fig. S19. Cell viability of HeLa cells treated with different concentrations of (A) Pt NPs and (B) CPNS for 48 h.

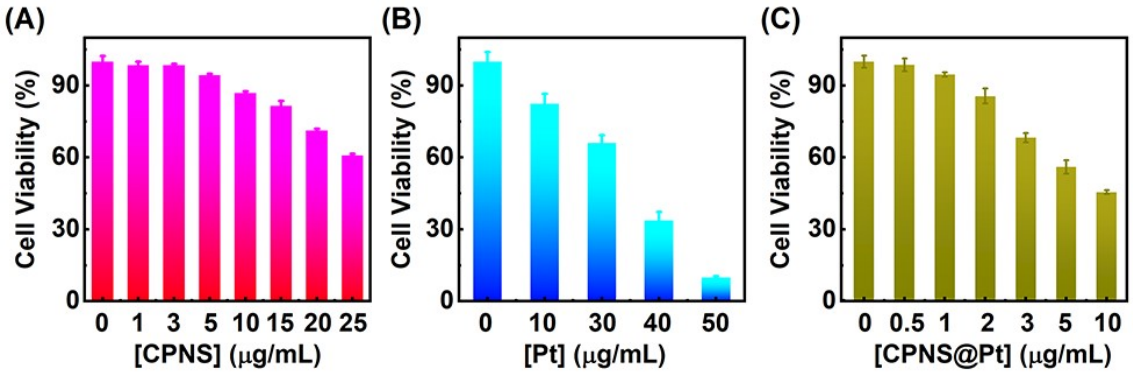

Fig. S20. Cell viability of non-cancerous 293T cells after 48 h of incubation with CPNPs, Pt NPs and CPNS@Pt.