Synthesis of silver nanoparticles and their attachment to zinc oxide-iron oxide hybrid structure: analyte-mediated enhanced peroxidase-like activity for colorimetric detection

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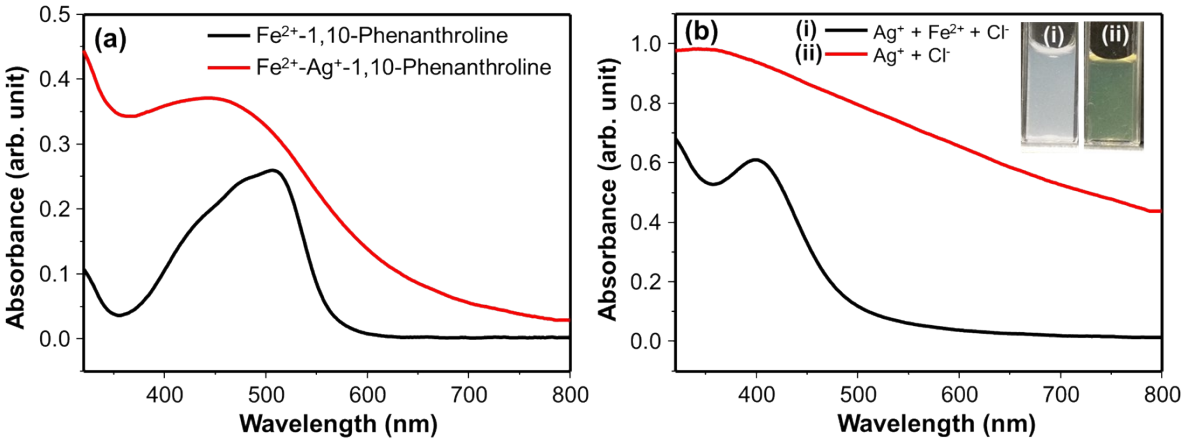

Fig. S1 (a) UV/Visible absorption spectra of Fe^{2+}-1,10-phenanthroline and Fe^{2+}/Ag^{+}-1,10-phenanthroline complexes. (b) Extinction spectra obtained when NaCl solution was mixed with Ag^{+} or Ag^{+}/Fe^{2+} mixtures. The concentrations of Fe^{2+}, Ag^{+}, NaCl, and 1,10-phenanthroline were 2, 1, 2, and 2 mM respectively The inset shows the pictures of the mixtures.

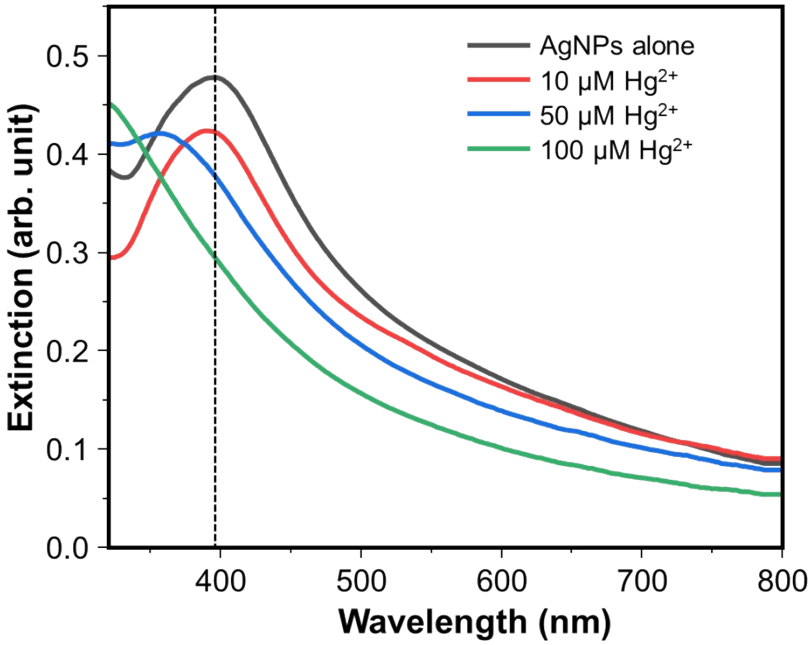

Fig. S2 Extinction spectra of AgNPs colloids in the presence of different concentrations of Hg^{2+}.

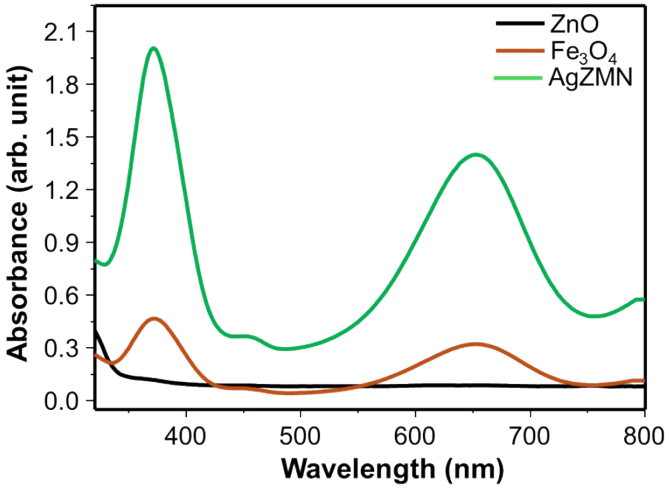

Fig. S3 UV/Visible absorption spectra of TMB obtained using ZnO, Fe_3O_4, and AgZMN as catalysts for oxidation of TMB. The reaction conditions were ZnO or Fe_3O_4 or AgZMN + TMB + H_2O_2 + Hg^{2+}. Acetate buffer of pH 4 was used for all reaction mixtures.

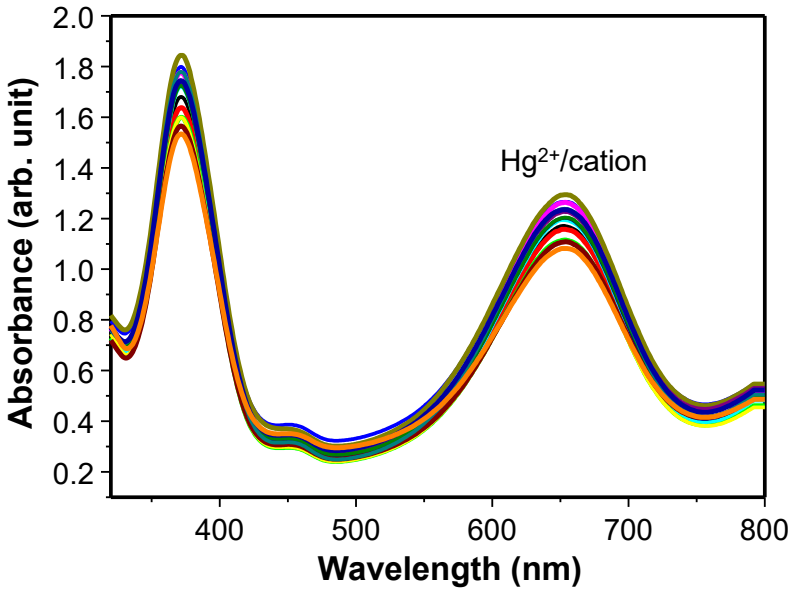

Fig. S4 UV/Visible absorption spectra of oxTMB obtained from the peroxidase-like activity of AgZMN for the binary systems containing Hg^{2+} and a cation. The tested cations include Ba^{2+}, Ca^{2+}, Co^{2+}, Ni^{2+}, Pb^{2+}, Zn^{2+}, Cu^{2+}, Fe^{2+}, Fe^{3+}, Mg^{2+}, Ag^{+}, Na^{+}, K^{+}, and Cr^{6+}.

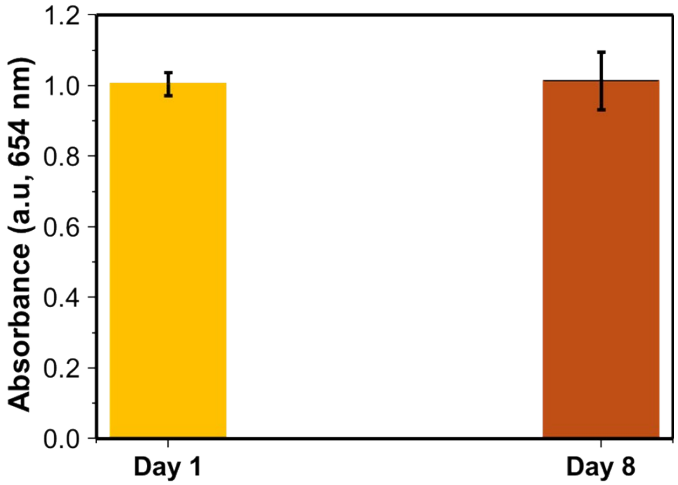

Fig. S5 The absorbance intensity of oxTMB using AgZMN. The measurements were made at different days showing the stability of the nanozymes.

Table S1 Kinetics parameters of AgZMN and previously reported nanozymes.

No	Catalyst	Substrate	Km (mM)	Vmax (×10-7 M/s)	Reference
1.	Os@ZIF-8 NCs	H_2O_2	0.516	2.21	1
		TMB	0.926	2.5776	
2.	10Fe-MnOx	TMB	0.15	0.403	2
3.	GSH-AgNPs	H_2O_2	58.6	2.15	3
		TMB	4.17	24.7	
4.	MnO_2	TMB	0.246	2.19	4
5.	$CuFeS_2$	H_2O_2	0.429	4.917	5
		TMB	1.392	2.07	
6.	AgZMN	H_2O_2	56.92	92.79	This work
		TMB	0.0661	32.51	

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