Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supplementary Material

Fluorometric and colorimetric analysis of alkaline phosphatase activity based on nucleotide coordinated copper ion as mimicking polyphenol oxidase

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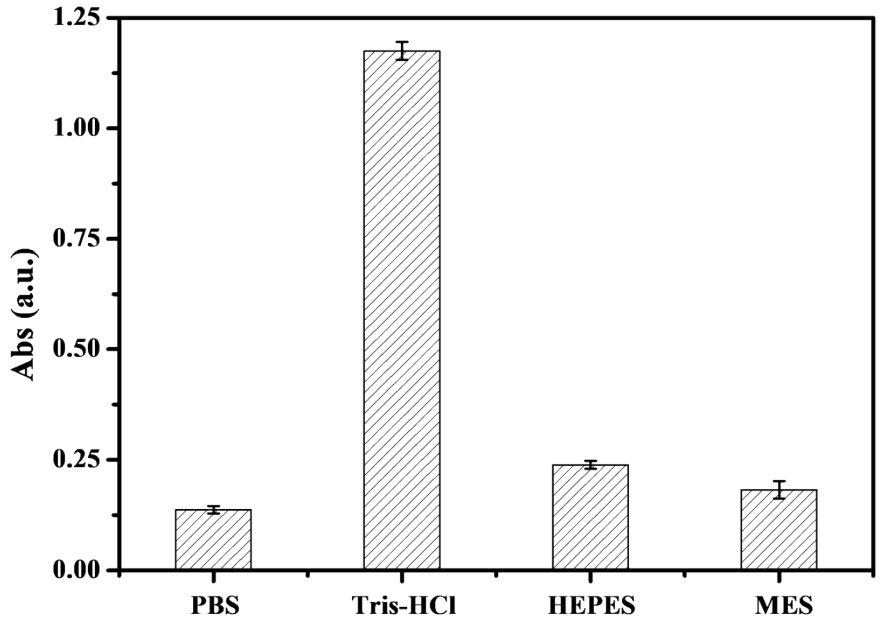

Figure S1 Comparison of catalytic activities of nanozymes synthesized in four kinds of buffer solutions. All the buffers are 10 mM, pH=8.5.

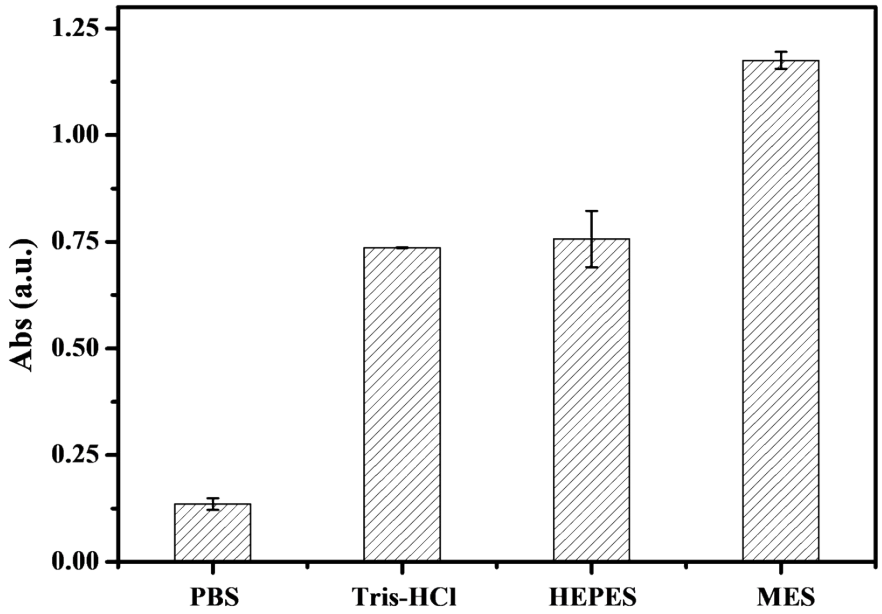

Figure S2 Comparison of catalytic activities of nanozymes in four buffers in the chromogenic reaction. All the buffers are 30 mM (pH=6.7).

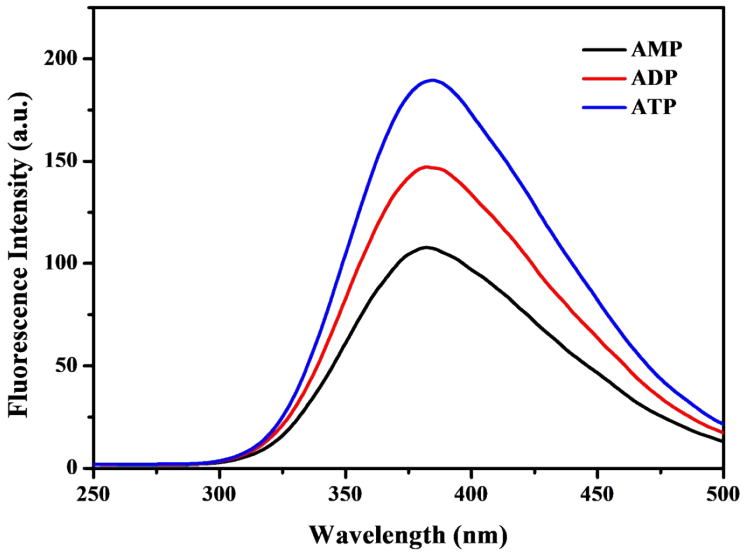

Figure S3 The fluorescence spectra of nucleotides. The concentrations of ATP, ADP and AMP are 10 mM in 60 mM MES buffer (pH = 6.7). Ex = 220 nm.

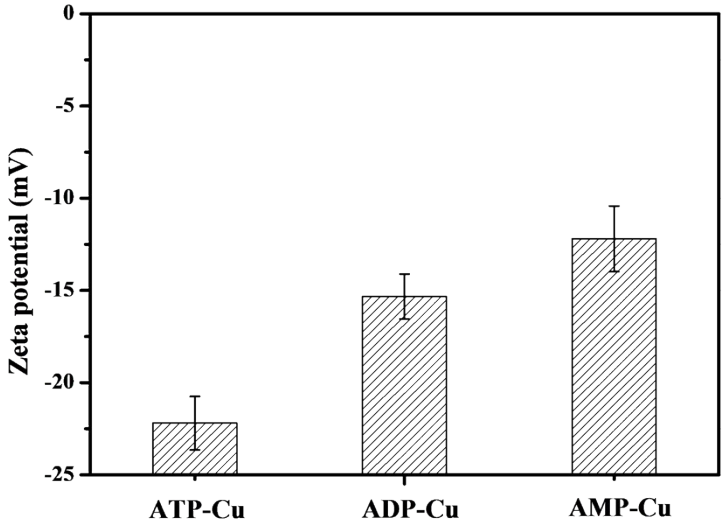

Figure S4 The zeta potential of prepared nanozymes.

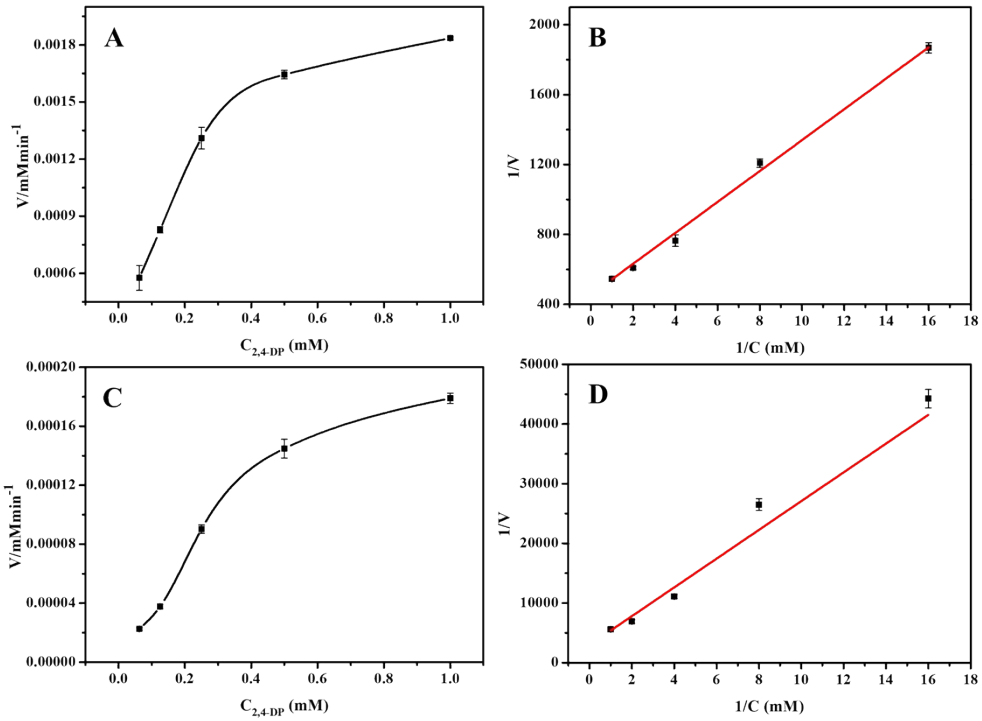

Figure S5 Steady-state kinetic assay of ATP-Cu (A and B) and laccase (C and D). The concentration of 2,4-DP was 0.0625, 0.125, 0.25, 0.5, 1 mM. The error bars represent the standard deviation of three measurements.

Table S1 The kinetic parameters of ATP-Cu and laccase

Catalysts	V_{max} (mM/min)	K_m (mM)
ATP-Cu	0.0022	0.207
Laccase	0.0003	0.891

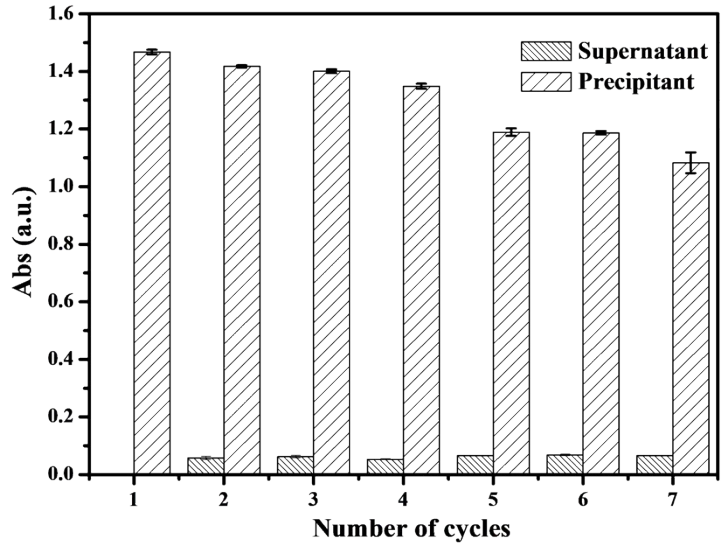

Figure S6 The catalytic activity of the supernatant and precipitation of the nanozymes cycled for 7 times, respectively.

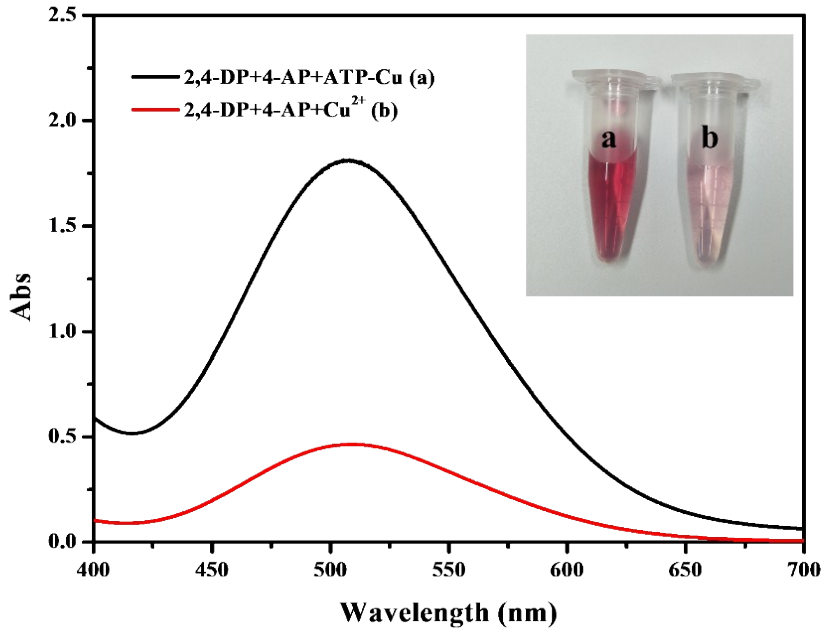

Figure S7 Control experiment comparing single Cu^{2+} and ATP-Cu for PPO-like activity.

Table S2 Comparison of different methods for the determination of ALP.

System	Linear range (U/L)	Detection limit (U/L)	Ref.
Near infrared Ag_2S quantum dots and calcein	2-100	1.28	S1
Facile colorimetric assay	60-100	5.4	S2
Gold nanoparticles-based colorimetric assay	100-600	10	S3
High-Resolution Colorimetric Assay	5-100	3.3	S4
Real-time Ratiometric Fluorescent Assay	25-200	10	S5
This work	1-30	0.3	-

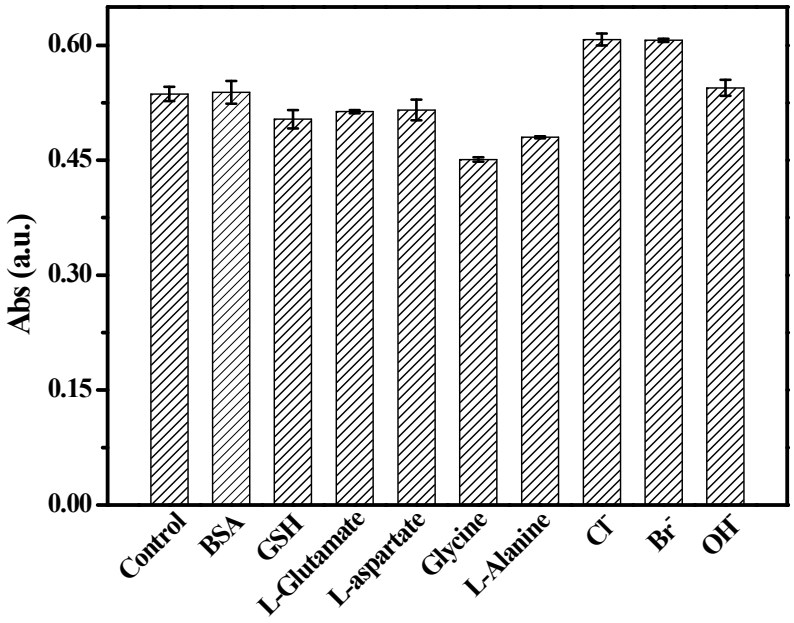

Figure S8 The selectivity of the GTP-based method for ALP assay. Absorbance intensity at 510 nm for reaction solutions containing BSA (10 μM), GSH (3 mM), L-Glutamate (100 μg/mL), L-aspartic acid (100 μg/mL), Glycine (100 μg/mL), L-alanine (100 μg/mL), Cl^- (3 mM), Br^- (3 mM), and OH^- (3 mM) respectively in the presence of 30 U/L of ALP.

Supplementary References

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