Electronic Supplementary Material

Investigation on the Peroxidase-Like Activity of Vitamin B6 and Its Applications in Colorimetric Detection of Hydrogen Peroxide and Total Antioxidant Capacity Evaluation

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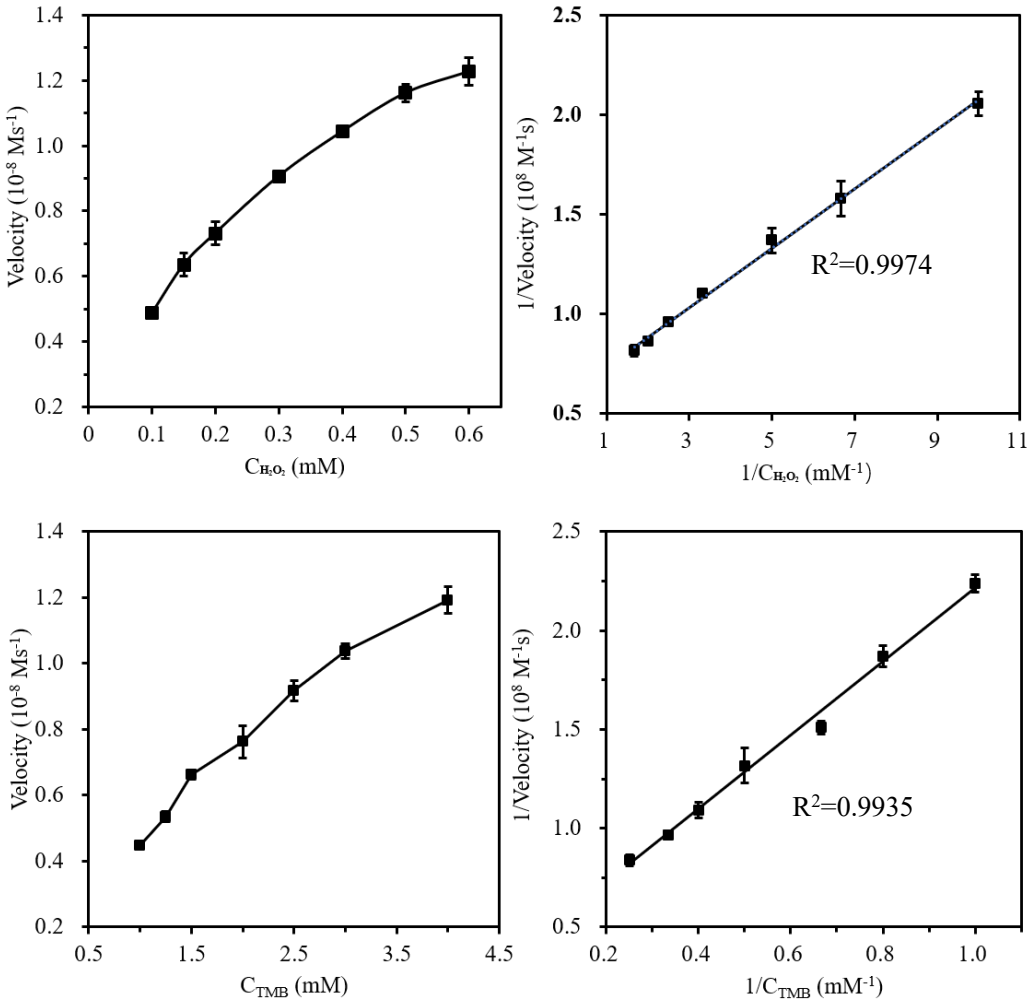

Figure S1. Reaction velocity under 4.0 mM of TMB with varied concentrations of H_2O_2 (A) and the corresponding double-reciprocal plots of VB6-catalyzed activity (B); Reaction velocity under 0.5 mM of H_2O_2 with varied concentrations of TMB (C) and the corresponding double-reciprocal plots of VB6-catalyzed activity (D). Error bars represent the standard deviation of three independent measurements.

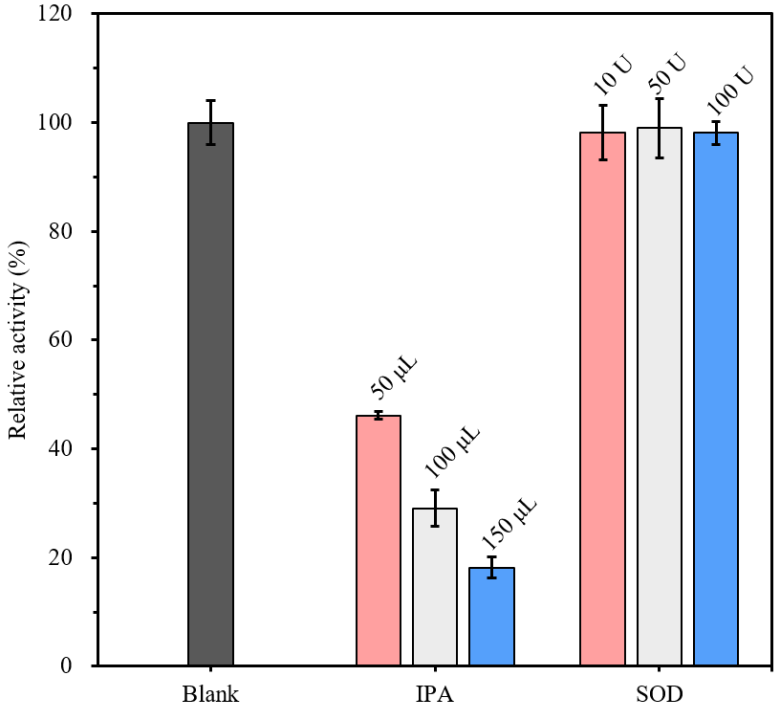

Figure S2. Effects of various active scavengers during the catalysis of TMB by VB6.

Table S1. Kinetic parameters (K_m and v_{max}) of different small-molecule and nanomaterials-based peroxidase mimics.

Catalyst	K_m (mM)		v_{max} (10^{-8} M s^{-1})		Ref.
	TMB	H_2O_2	TMB	H_2O_2	
AF	1.90 ± 0.126	1.86 ± 0.232	0.384 ± 0.16	0.217 ± 0.02	[21]
DFF	1.78	2.97	0.404	0.983	[22]
PA/$Cu_3(PO_4)_2 \cdot 3H_2O$	3.6	4.0	1.6	1.3	[42]
CoS	0.41	7.15	5.82	2.65	[32]
HRP	0.179 ± 0.020	1.18 ± 0.147	3.895 ± 0.218	7.307 ± 0.824	[23]
VB6	5.33	0.25	2.85	1.71	This work

K_m: Michaelis constant; v_{max}: the maximal reaction rate; AF: Aminofluorescein; DFF: 2′, 7′-difluorofluorescein; PA/$Cu_3(PO_4)_2 \cdot 3H_2O$: hydrophilic phytic-acid modified copper phosphate; CoS: sphere-like cobalt sulfide with nanostructures; HRP: Horseradish peroxidase; VB6: Vitamin B6, pyridoxine hydrochloride.

Table S2. H_2O_2 detection in different brands of milk samples.

Samples	Added (μM)	Found (μM)	Recovery (%)	RSD (%)
Tianyou	0	0	-	-
	100.0	103.4	103.4	6.9
	300.0	297.0	99.0	5.3
Yili	0	0	-	-
	100.0	102.9	102.9	6.5
	300.0	294.0	98.0	7.2
Mengniu	0	0	-	-
	100.0	105.4	105.4	5.8
	300.0	285.7	95.2	2.7