

Electronic Supplementary Material (ESI) for Nanoscale.
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Electronic Supplementary Information

Organic compound-based nanozyme for agricultural herbicide detection

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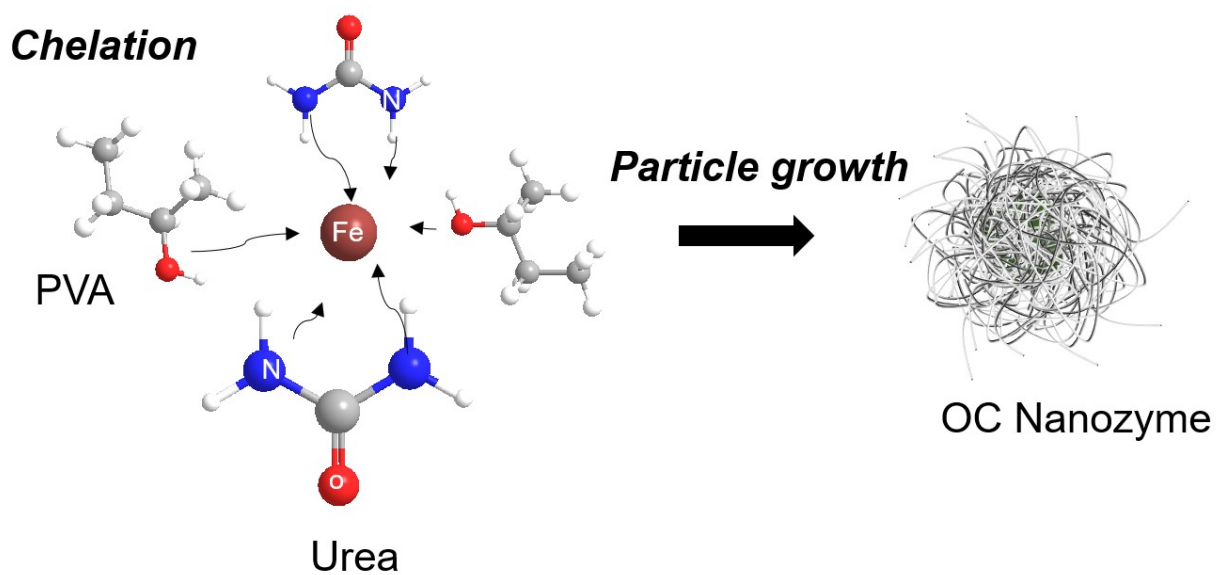


Figure S1. Illustrated Conceptualization of the OC nanozyme

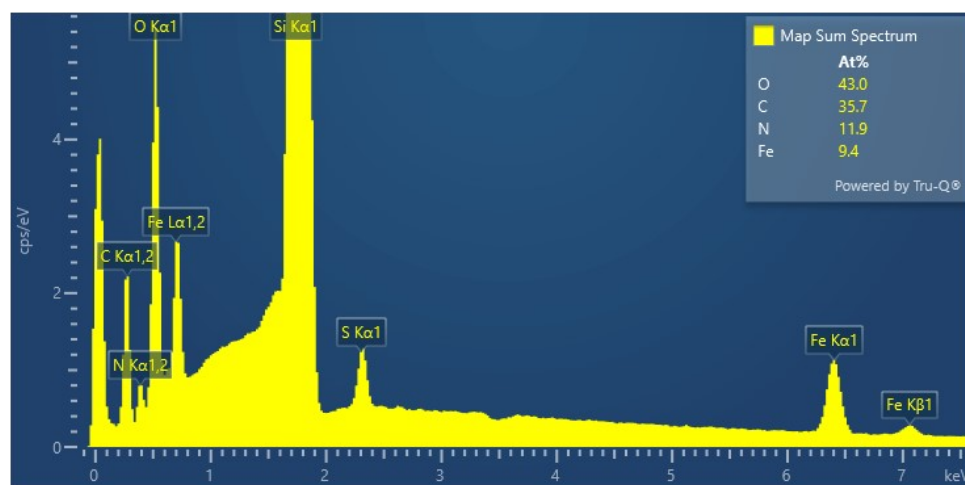


Figure S2. Quantified profile of the SEM/EDS analysis on OC nanozyme

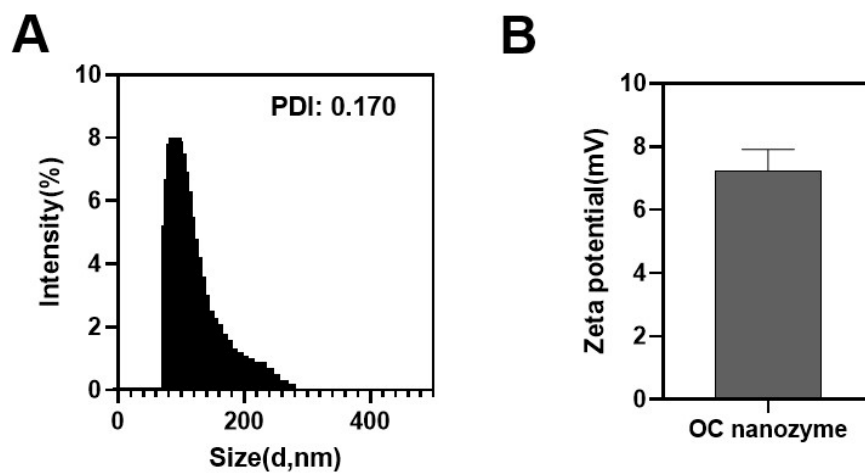


Figure S3. DLS, Zeta potential of OC nanozyme (*Zeta potential*, $N=3$, $IN = 33$ counts)

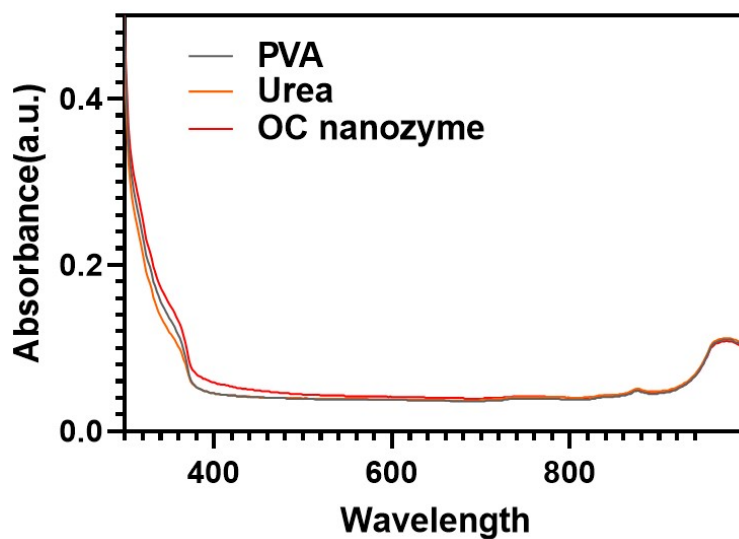


Figure S4. UV-VIS-NIR absorption spectra of the OC nanozyme, Urea and PVA

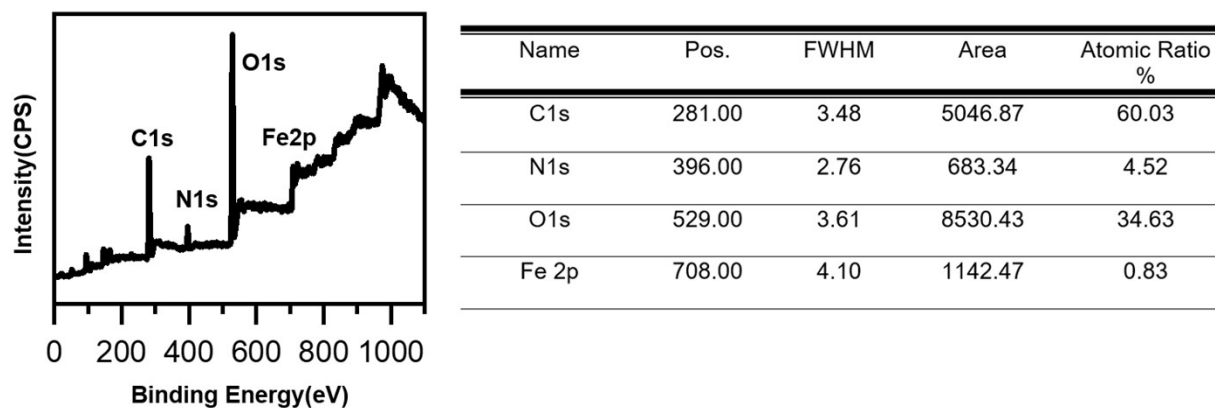


Figure S5. XPS survey and its quantification table

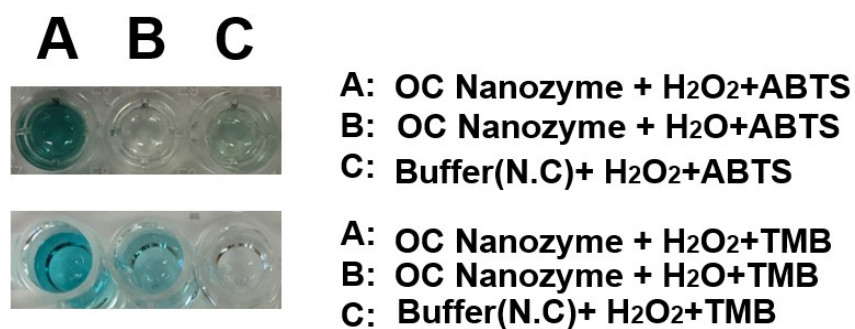


Figure S6. Result image of the OC nanozyme-ABTS(TMB)-substrate colorimetric assay

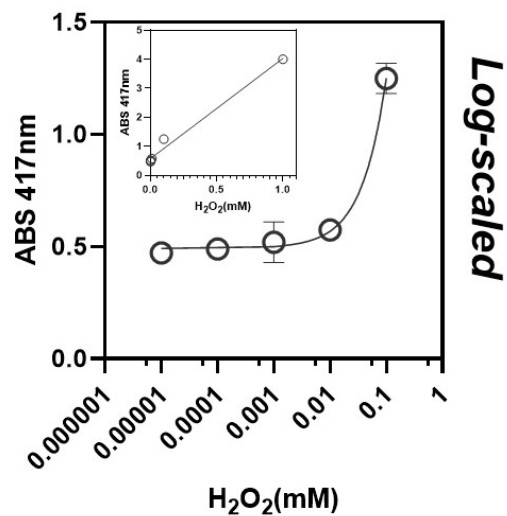


Figure S7. Logscale Substrate(H₂O₂) dependent Linearity (inbox: normal) $R^2 = 0.9856$ ($N=3$)

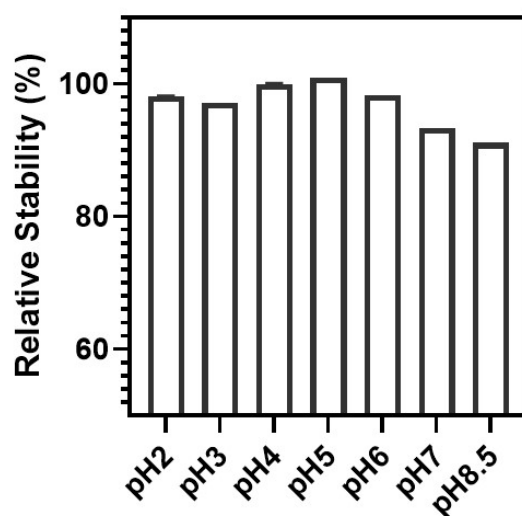


Figure S8. Relative pH stability after incubation of the NaAc buffer up to 5 hours (pH 4 = 100%) ($N=5$)

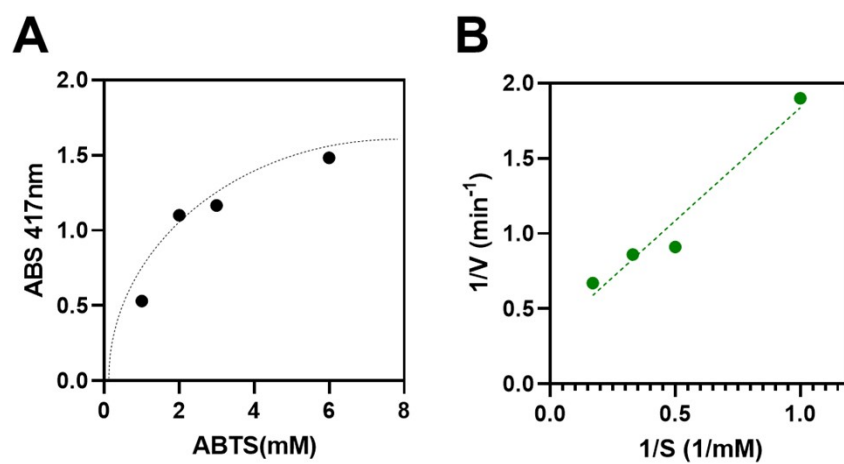


Figure S9. Steady-State kinetic assay for the ABTS($N=3$)

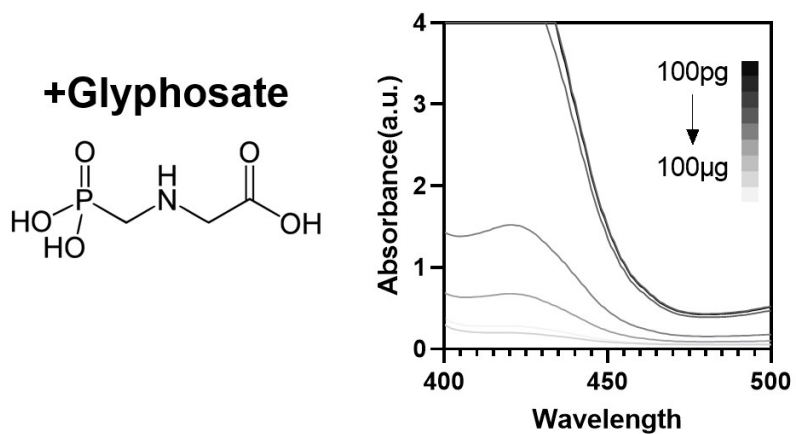


Figure S10. Absorbance spectra depend on the concentration of the glyphosate on OC nanozyme/ H_2O_2 /ABTS assay.

Table S1. Kinetic profiles with the references.

Nanozyme	Km(mM)	Vmax ($\mu\text{M s}^{-1}$)	Kcat (10^{-1} s^{-1})	Kcat/Km ($\text{mM}^{-1} \text{ s}^{-1}$)	Substrate	Reference
OC nanozyme	0.056	2.195	1.6×10^5	-	H ₂ O ₂	This work
Nano-CeO ₂	0.420	0.100	0.02	0.005	H ₂ O ₂	Ref.SI.1
FeN5 SA/CNF	0.148	0.758	7.08	4.786	H ₂ O ₂	Ref.SI.2
HRP (natural enzyme)	3.70	0.871	3.48×10^3	0.94	H ₂ O ₂	Ref.SI.3
Zn-N-C 800	0.14	3.31	-	0.014	H ₂ O ₂	Ref.SI.4
PMCS	40.32	12.15	-	-	H ₂ O ₂	Ref.SI.5
CU SAzyme	9.89	3.85	-	-	H ₂ O ₂	Ref.SI.6
MCCP	2.02	0.004	3.49	-	H ₂ O ₂	Ref.SI.7
Fe ₃ O ₄	154	0.097	8.54×10^4	-	H ₂ O ₂	Ref.SI.3

Reference

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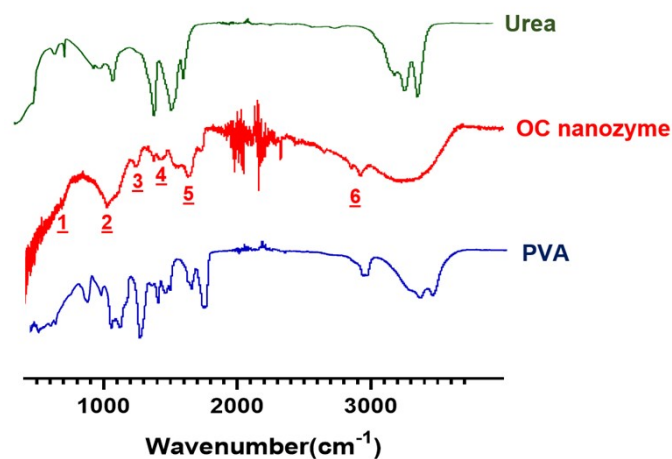


Figure S11. FT-IR spectra analysis of Urea, PVA and OC nanozyme(adjusted)

: Number) Wavenumber (Bond) ^{reference}

- 1) 569cm^{-1} (Fe-O) ^{Ref.SI.8} 2) 1063cm^{-1} (Fe-N) ^{Ref.SI.9} 3) 1370cm^{-1} (C-H) ^{Ref.SI.10} 4) 1450cm^{-1} (C-N) ^{Ref.SI.11} 5) 1645cm^{-1} (C=O) ^{Ref.SI.12} 6) 2862cm^{-1} / 2942cm^{-1} (-CH₂-) ^{Ref.SI.13}

Reference

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