Supporting Information

"Three-in-One" platform based on Fe-CDs nanozyme for dual-mode/dual-target detection and NIR assisted bacterial killing

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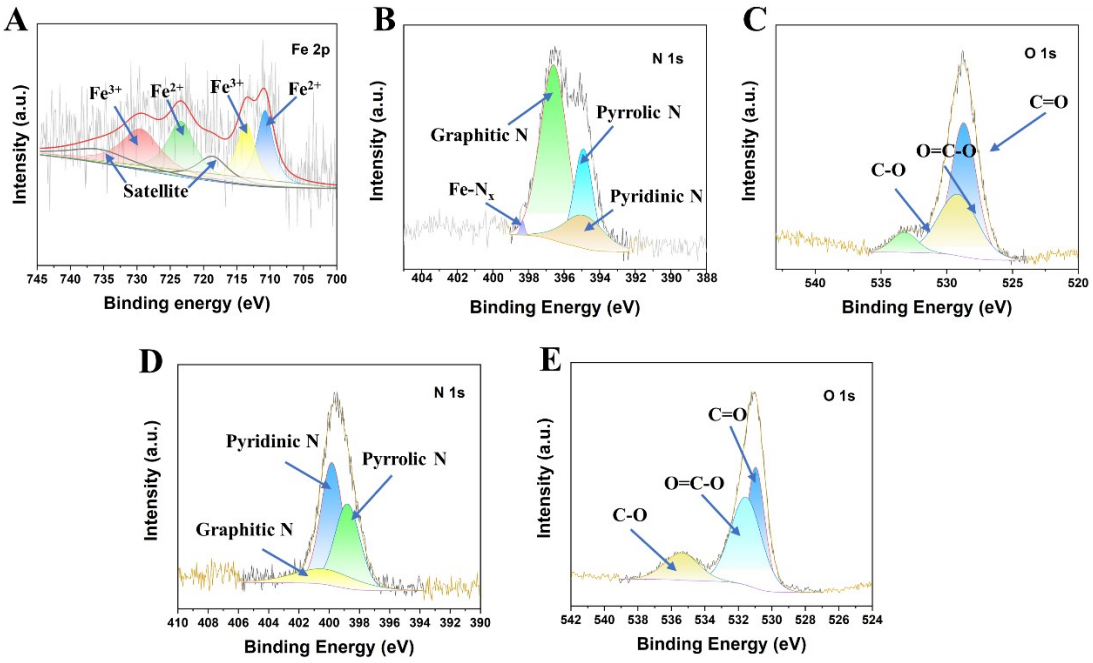

Fig. S1. XPS analysis of Fe-CDs and CDs. (A-C) Fe 2p, N 1s, and O1s of Fe-CDs. (D, E) N 1s, and O1s of CDs.

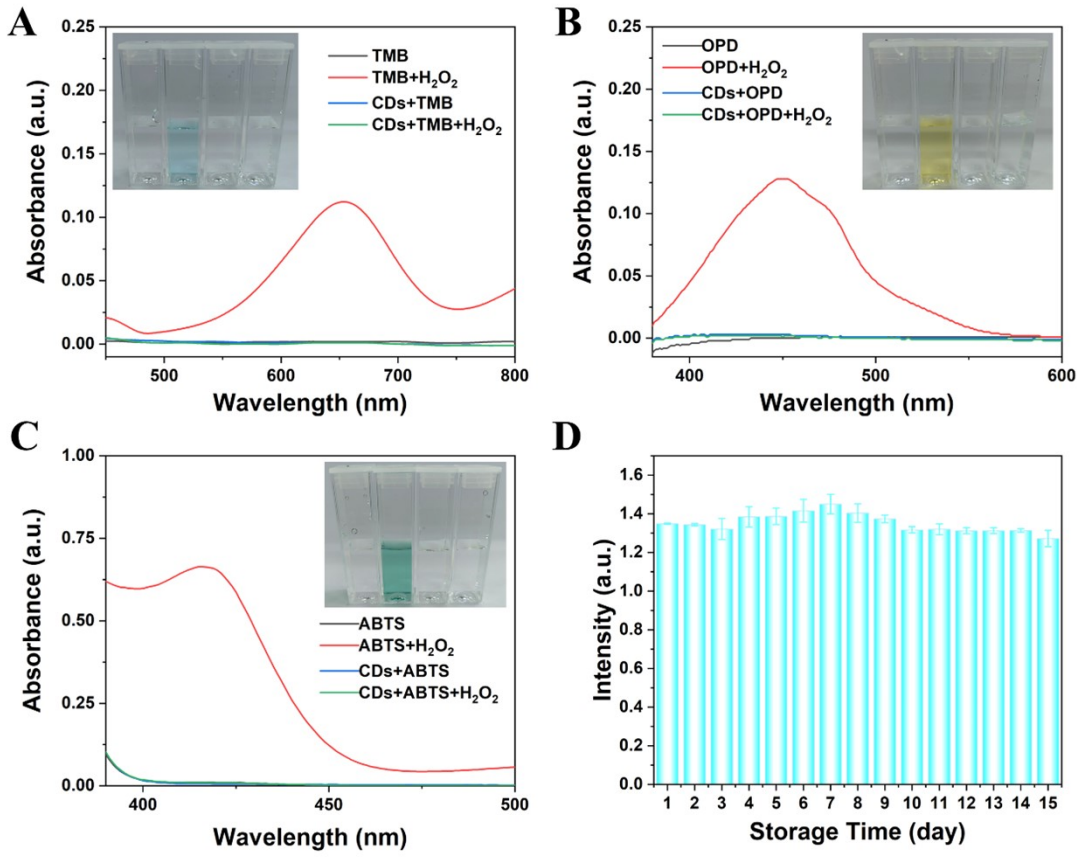

Fig. S2. (A-C) Absorbance of substrate, substrate + H_2O_2, CDs + substrate, CDs +

substrate + H_2O_2, the inset is the corresponding visual color changes. For A, B, and C, the substrate is TMB, OPD and ABTS, respectively. (D) Relative activity of Fe-CDs nanozymes within 15 days.

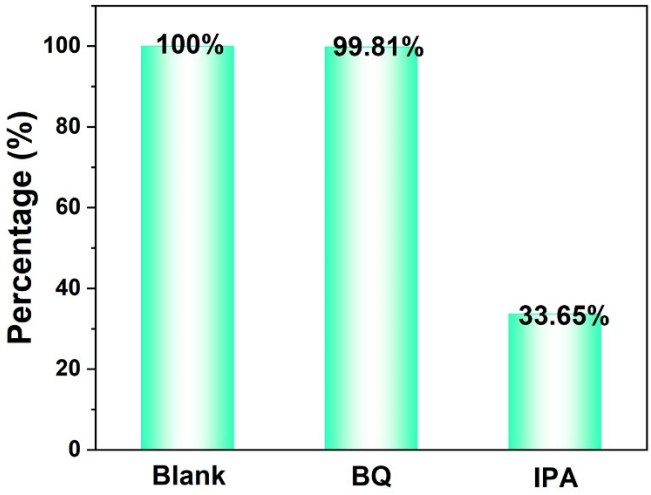

Fig. S3. Radical scavenger experiment of active free radicals.

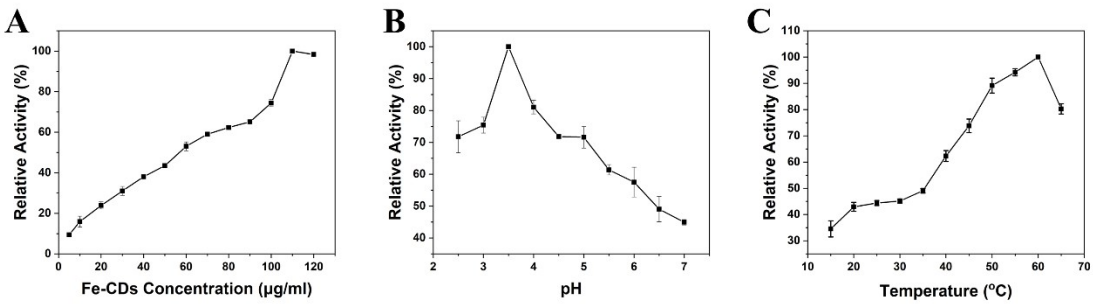

Fig. S4. The relative activity variation of Fe-CDs under different conditions. (A) Comcentration, (B) pH, (C) temperature.

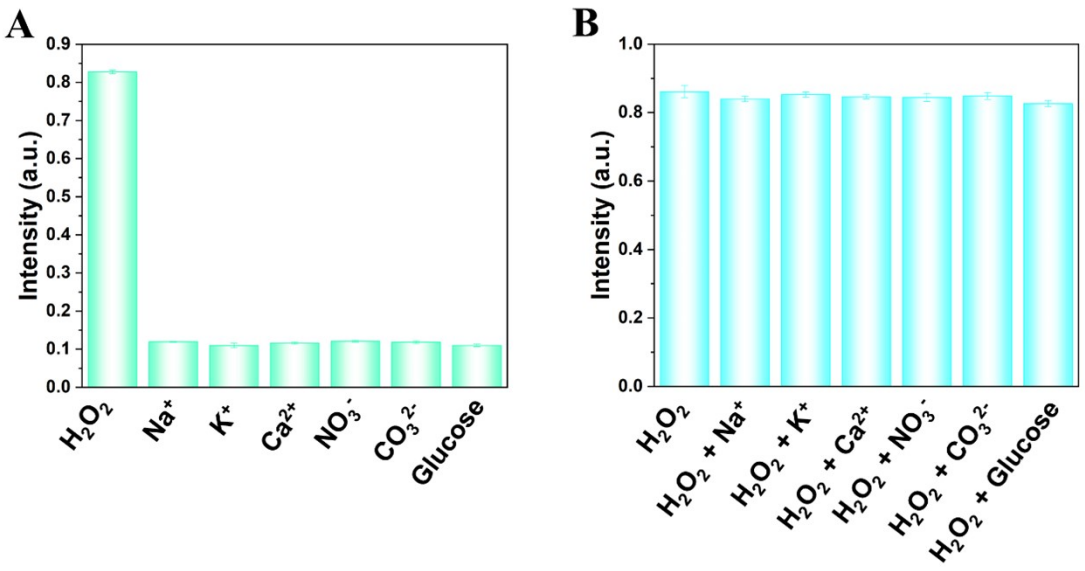

Fig. S5. The selectivity and anti-interference of the proposed sensing for H_2O_2 over other interferents.

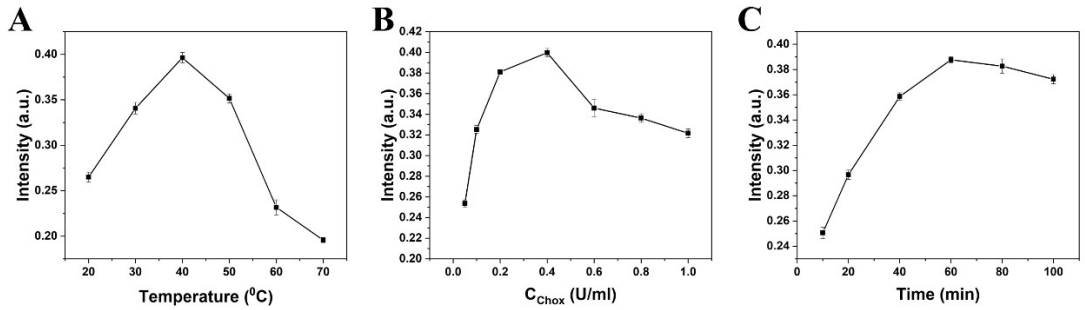

Fig. S6. Effect of Chox concentration, incubation temperature and incubation time on the detection of cholesterol.

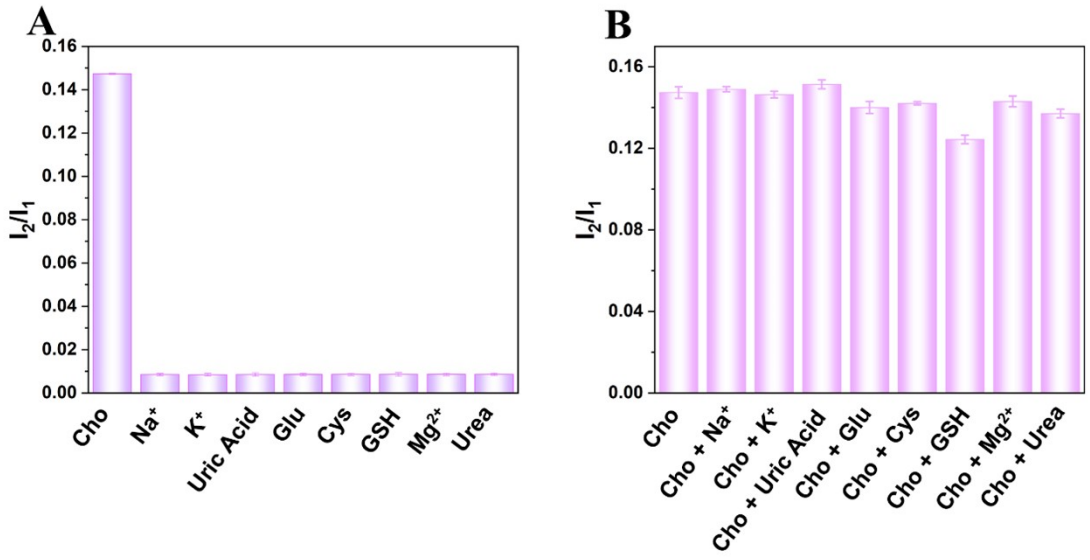

Fig. S7. The selectivity and anti-interference of the proposed sensing for cholesterol over other interferents.

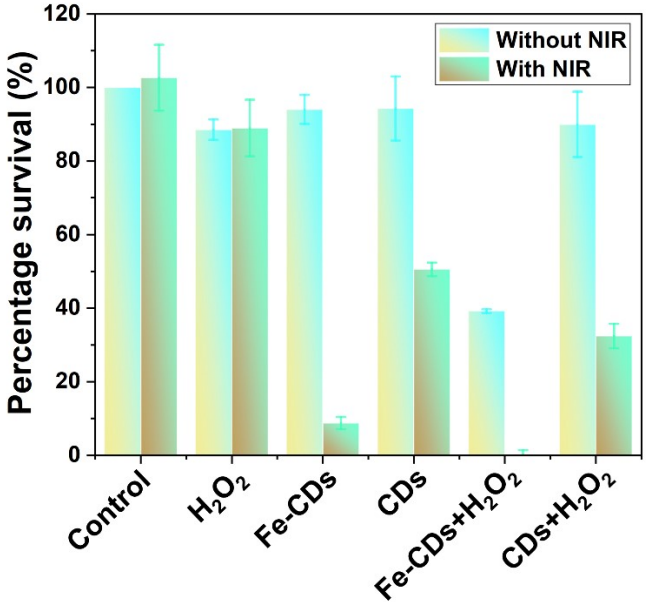

Fig. S8. Survival rates of E. coli with different treatments.

Table S1 Comparison of various methods for the determination of H_2O_2.

Method	Materials	Liner range (μM)	LOD (μM)	Reference
Electrochemistry	AuNPs/porous GaN	10-100	2	1

Fluorometry	CdSe@ZnS/AgNCs	0.5-60	0.3	2
Fluorometry	CdTe QDs	10-125	0.3	3
Ratiometric Fluorometry	C-dots/Ag NPs	10-100	1.39	4
Electrochemistry	GC/rGO-Nf@Ah_6	1-10	1.78	5
Colorimetry	$Ce(OH)CO_3$	0-80	0.3	6
Colorimetry	Fe-CDs	0.5-100&200-1500	0.16	This work
Ratiometric Fluorometry	Fe-CDs	1-500	0.14	This work

Table S2 Determination of cholesterol in serum samples by colorimetric and fluorometric methods (n = 3).

Sample	Colorimetric mode				Fluorometric mode			
	Spiked (μM)	Found (μM)	Recovery (%)	RSD (%)	Spiked (μM)	Found (μM)	Recovery (%)	RSD (%)
Serum 1	0	62.3		1.4	0	62.2		0.7
	50	112.6	100.6	3.4	10	72.3	101.7	0.5
	100	164.3	102.0	1.1	20	81.9	98.6	0.8
Serum 2	0	55.8		1.7	0	56.6		1.1
	50	107.0	102.3	1.4	10	67.5	108.5	1.1
	100	156.1	100.3	2.6	20	76.1	97.2	0.2
Serum 3	0	46.2		1.8	0	47.4		0.7
	50	95.0	97.7	1.8	10	57.7	102.9	0.9
	100	143.3	97.1	2.9	20	67.4	100.0	0.2
Serum 4	0	27.8		2.3	0	26.6		0.9
	50	76.9	98.2	3.9	10	37.4	108.7	1.4
	100	123.1	95.3	2.5	20	47.3	103.8	0.4

References

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