SUPPLEMENTARY INFORMATION

Triggered peroxidase-like activity of Au decorated carbon dots strategy for colorimetric monitoring the Hg^{2+} enrichment of *Chlorella vulgaris*

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1 Synthesis of GNPs

According to the previous report[1], 5 mL of lysine aqueous solution was mixed with 10 mL of aqueous $HAuCl_4$ (10mM) . After the mixed solution was stirred vigorously at 37 °C for 20 minutes, it was incubated with 0.5 mL of NaOH (1 M) for 12 h, then stirred continuously for 3 h with 3 mL of hydrazine hydrate to obtain GNPs. The GNPs was dialyzed for 2 days using a 1000 Da cut-off dialysis bag with deionized water to separate the unreacted small molecules from the mixture. The obtained GNPs solution was stored at 4 °C for subsequent use.

Fig. S1A. The experiment of Hg^{2+}-triggered peroxidase-like activity of GNP@CDs with different substrates and (B)corresponding color changes (a. ABTS+100nM Hg^{2+}; b. ABTS+0nM Hg^{2+}; c. TMB+100nM Hg^{2+}; d. TMB+0nM Hg^{2+}; e. OPD+100nM Hg^{2+}; f. OPD+0nM Hg^{2+})

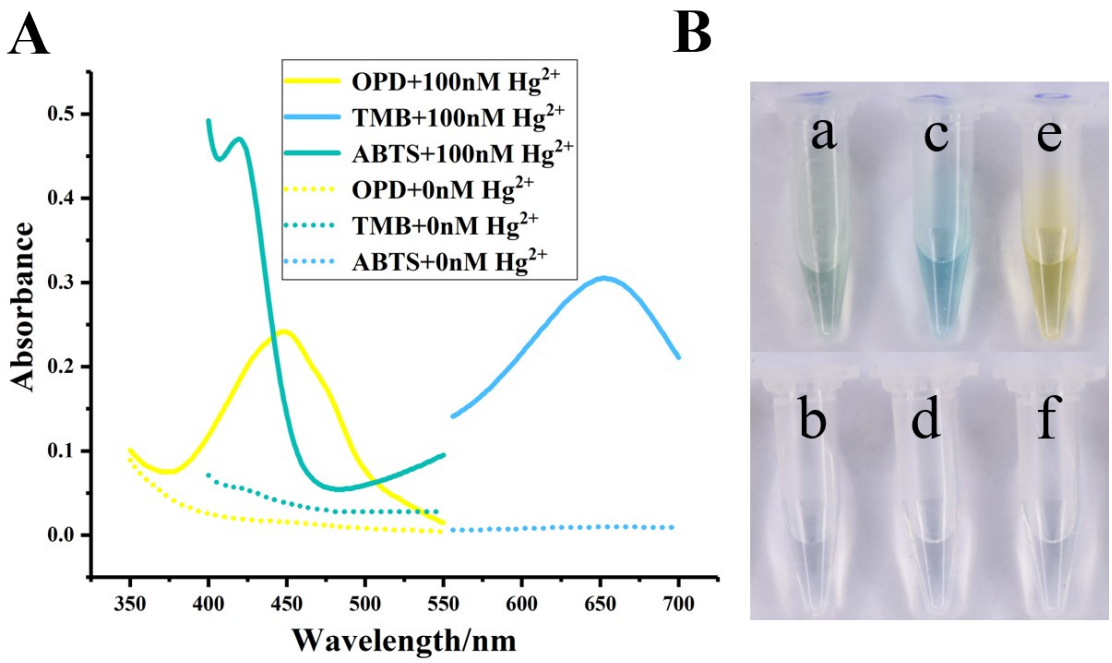

Fig. S2 The influence of (A) the value of pH; (B). the concentration of acetate buffer; (C). the concentration of TMB; (D). the concentration of H_2O_2 on Hg^{2+} induced the peroxidase-like activity of GNP@CDs.

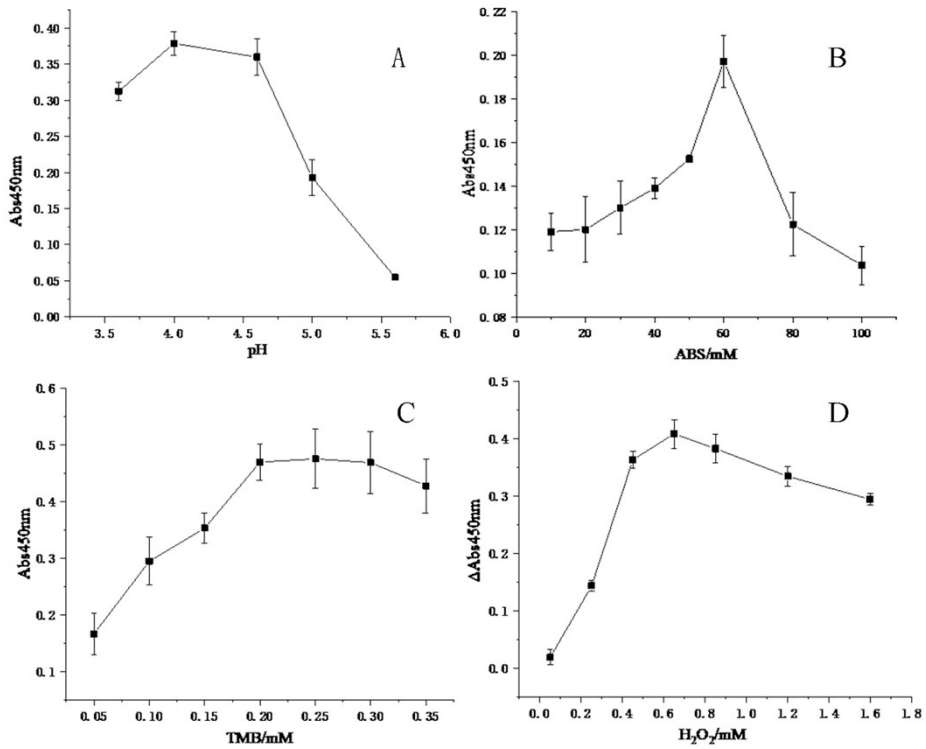

Table S1 Comparison of this strategy with other methods for the determination of Hg^{2+}

Materials	Linear Range	LOD	Ref.
BSA-Pt NPs	0-120 nM	7.2 nM	[2]
CoS-p-rGO	2-100 nM	14.23 nM	[3]
Fe3O4@ZnO	0-10nM	23nM	[4]
Sphere-like CoS	0.25-3μM	0.1μM	[5]
Cu@Au nanoparticles	10-500nM	10nM	[6]
Oxide-PEI-Pd Nanohybrids	0.1-25nM	0.39nM	[7]
CS-AuNPs	0.04-10.2μM	20nM	[8]
GNP@Lys@CDs	7-150nM	3.7 nM	This Work

Fig. S3A. The pictures of GNP@CDs stored at different times; B. Shelf-life of the GNP@CDs after 16 weeks

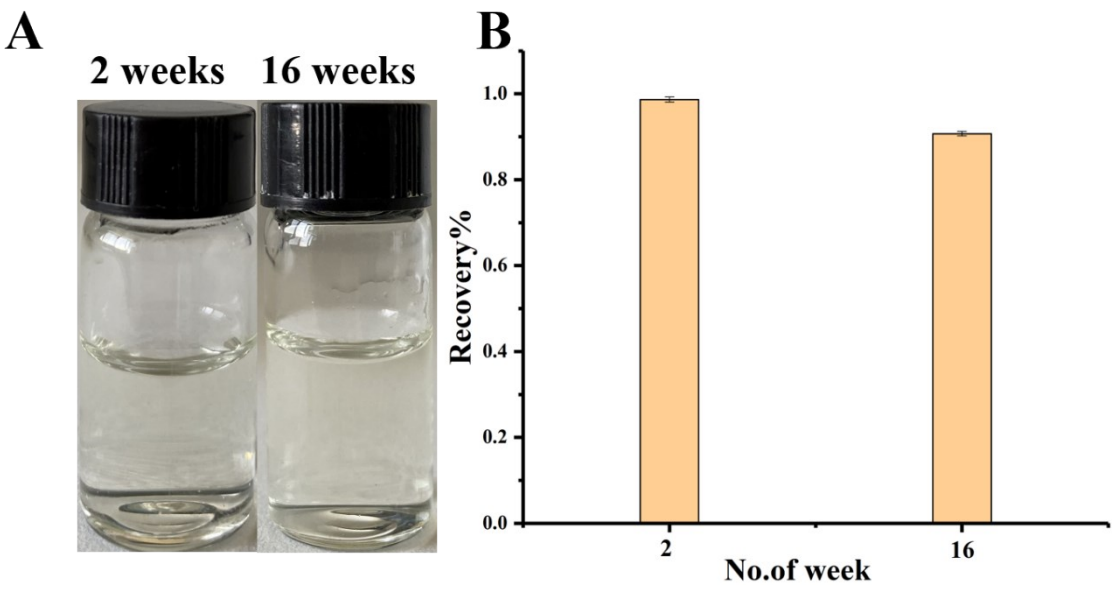

Table S2 Results of the determination of Hg^{2+} in Chlorella extract

Sample	Content of Hg^{2+}/nM	Added/nM	Found/nM	Recovery%	RSD%
Chlorella vulgaris	40.56	20	61.90	106.70	5.21
		50	92.88	104.64	6.16

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