

Supporting Information

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Fe-Doped Carbon Dots as NIR-II Fluorescence Probe for In Vivo Gastric Imaging and pH Detection

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Supporting Information

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Table S1. ICP results of different sample groups.

Sample	Concentration Fe ³⁺ (PPM)	RSD
Blank	0	/
DA+OPD	0	/
DA+OPD+Fe ³⁺	80.2	1.243647

Table S2. Functional group percentages of Fe-CDs and CDs measured by XPS.

CDs			Fe-CDs	
Name	Functional group	Area (%)	Functional group	Area (%)
C1s	C-C/C=C	66.83	C-C/C=C	10.52
	C-N/C-O	32.83	C-N/C-O	79.87
	C=O/C=N	0.64	C=O/C=N	9.61
N1s	pyridinic N	56.55	pyridinic N	31.42

	pyrrolic N	5.74	pyrrolic N	2.14
	graphitic N	37.71	graphitic N	66.44
O1s	C=O	32.23	C=O	61.85
	C-O	67.77	C-O	38.15

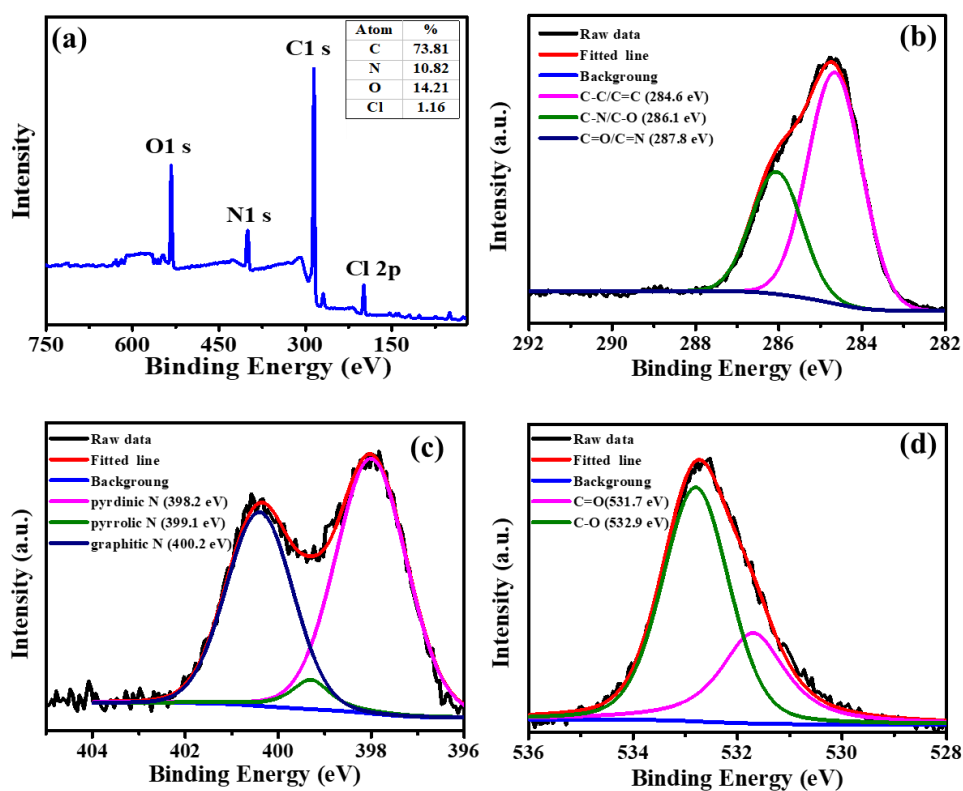


Figure S1. Characterization of CDs synthesized under the same experimental conditions as Fe-CDs but without adding Fe^{3+} , by (a) XPS spectrum, and (b) C 1s, (c) N 1s, (d) O 1s spectra.

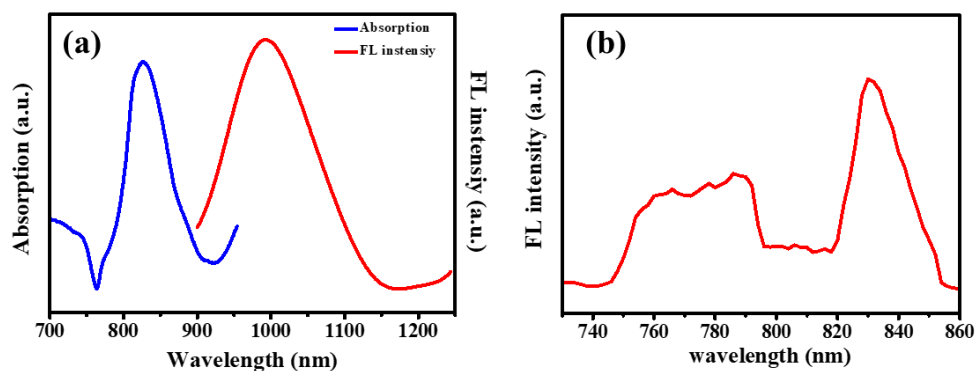


Figure S2. (a) UV absorption and fluorescence emission spectra of Fe-CDs in PBS buffer (10 mM, pH 2.0). (b) Fluorescence excitation spectrum of Fe-CDs in PBS buffer ($\lambda_{em}=1000$ nm) .

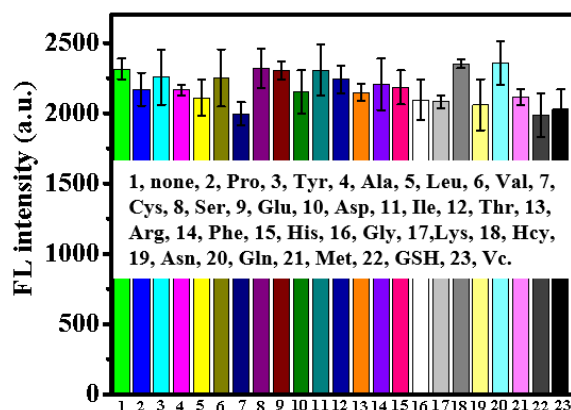


Figure S3. Fluorescence intensity in solutions containing various amino acids and biothiols (200 μ M) in PBS buffer (10 mM, pH 2.0).

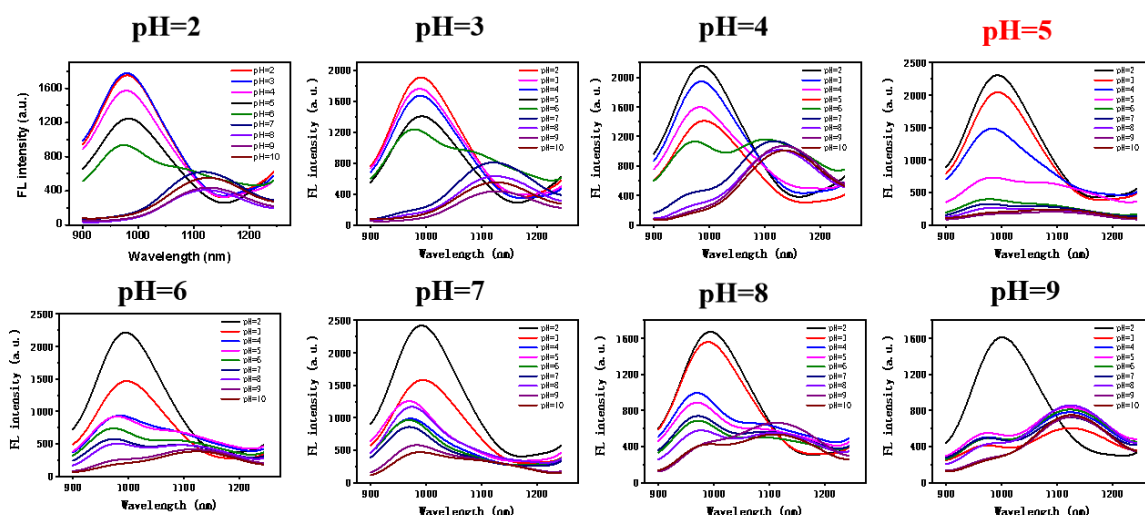


Figure S4. Fluorescence emission spectra of Fe-CDs synthesized under reaction conditions with different pH of 2.0 to 9.0 ($\lambda_{\text{ex}} = 830 \text{ nm}$).

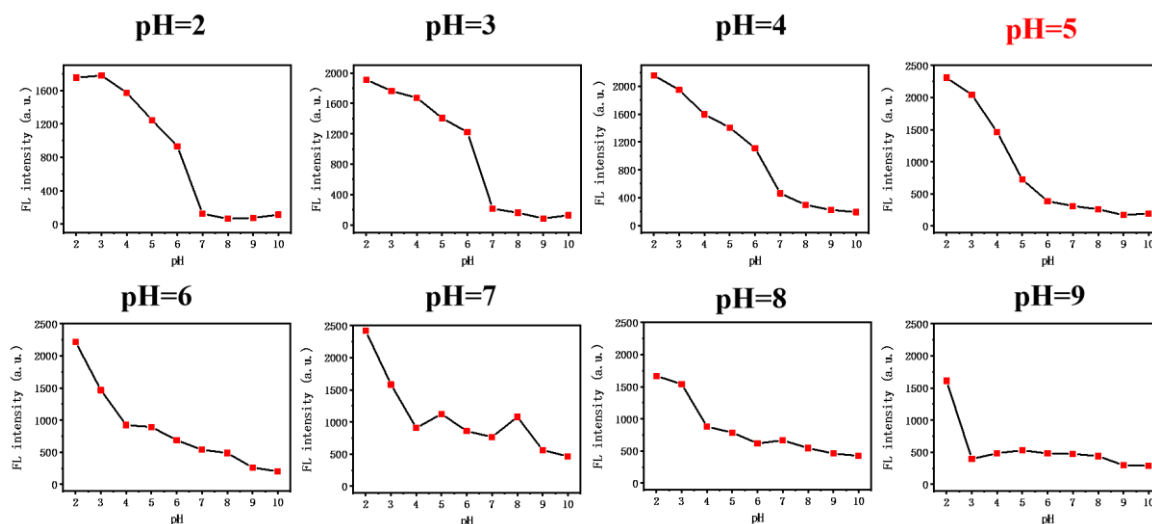


Figure S5. Relationship between the fluorescence intensity and the pH value of Fe-CDs synthesized under different pH reaction solutions ($\lambda_{\text{em}} = 1000 \text{ nm}$).

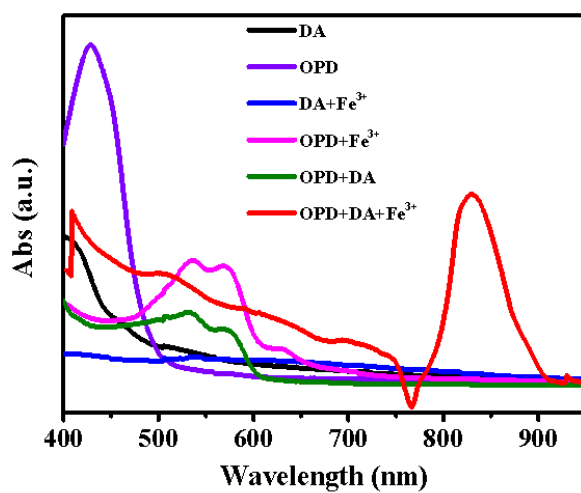


Figure S6. UV absorption of different combinations of reactants for synthesizing CDs in PBS buffer (10 mM, pH 2.0).

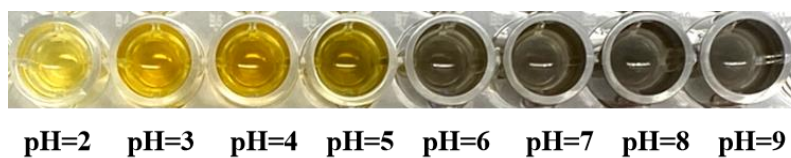


Figure S7. Colorimetric images of Fe-CDs at different pH values.

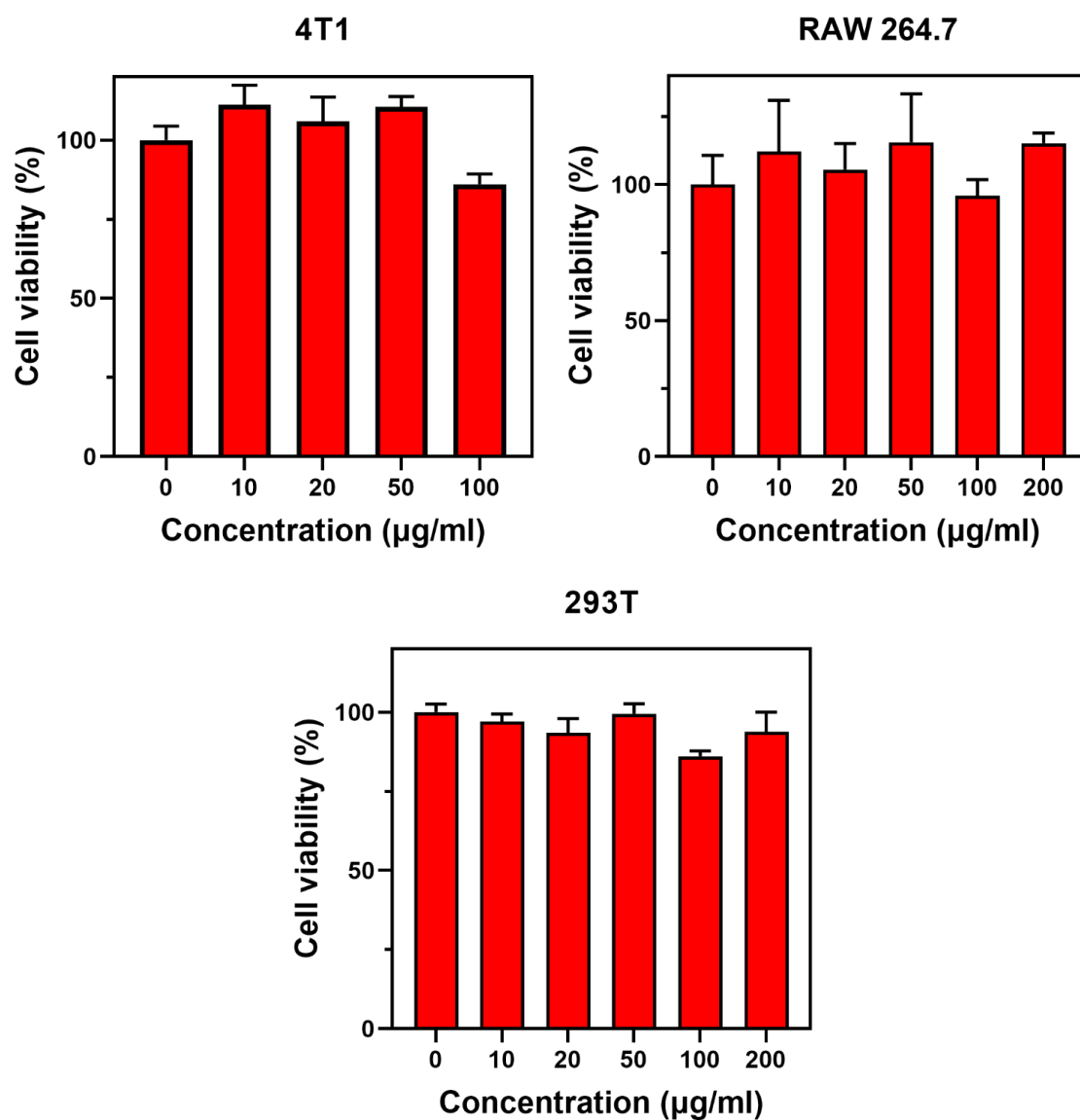


Figure S8. Cytotoxicity evaluation of Fe-CDs.

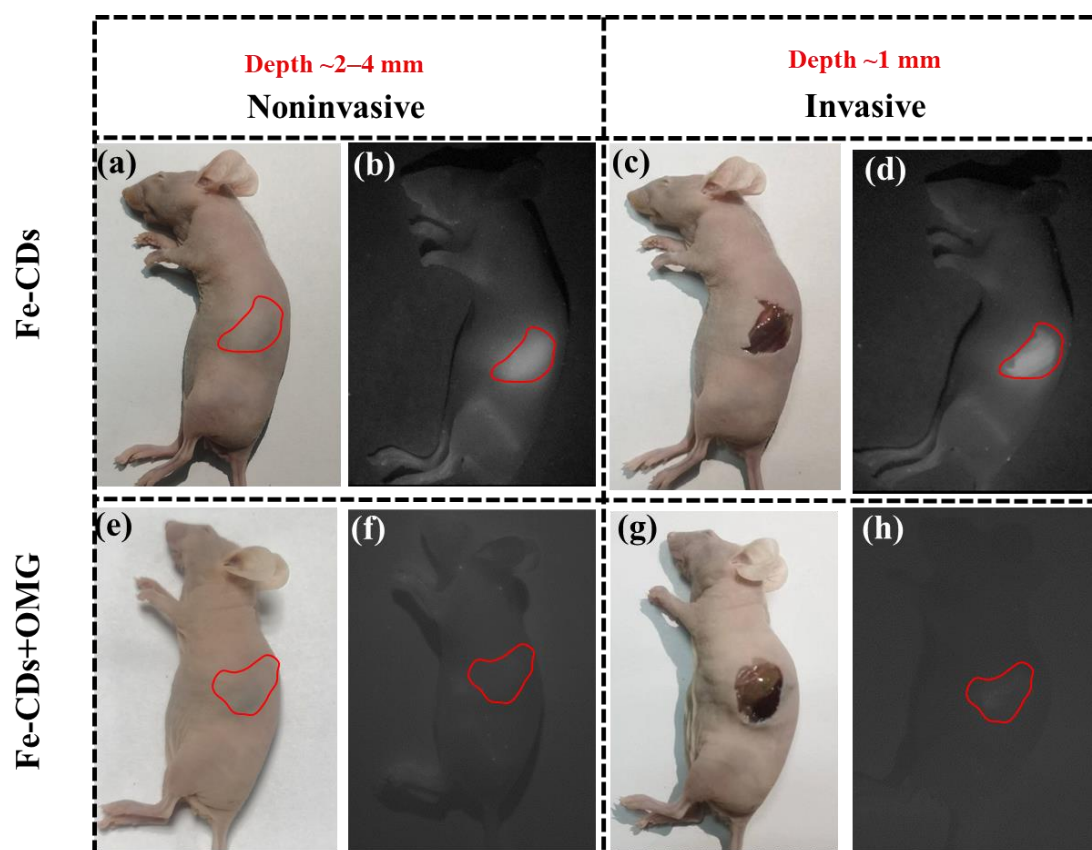


Figure S9. Mice were imaged after being orally administered with 100 μ L Fe-CDs (2 mg/mL), with or without 50 μ L OMG (20 mg/mL). (a, b, e, f) Digital photographs and NIR fluorescence imaging for non-invasive imaging at 2–4 mm tissue depth; (c, d, g, h) invasive imaging of gastric fluid covered by ~1 mm thick gastric wall.

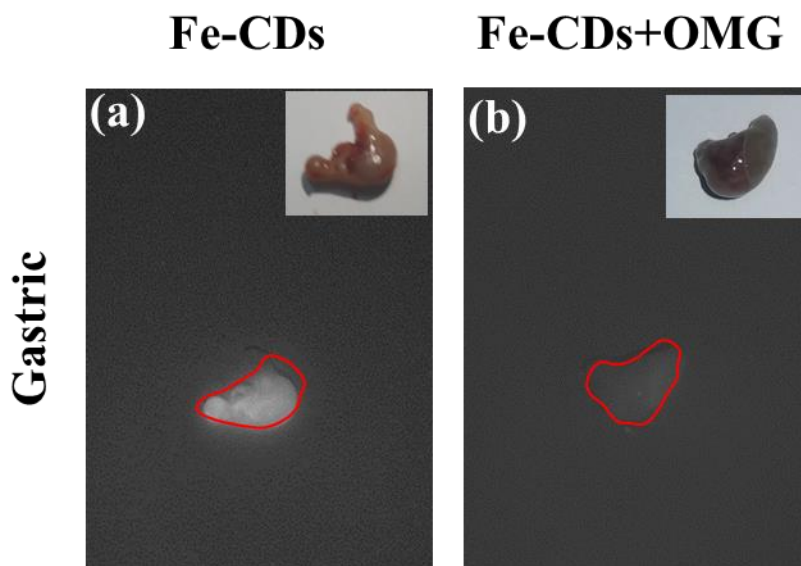


Figure S10. Direct imaging of exposed gastric fluid from dissected stomachs of mice orally administered with 100 μ L Fe-CDs (2 mg/mL), with or without 50 μ L OMG (20 mg/mL).

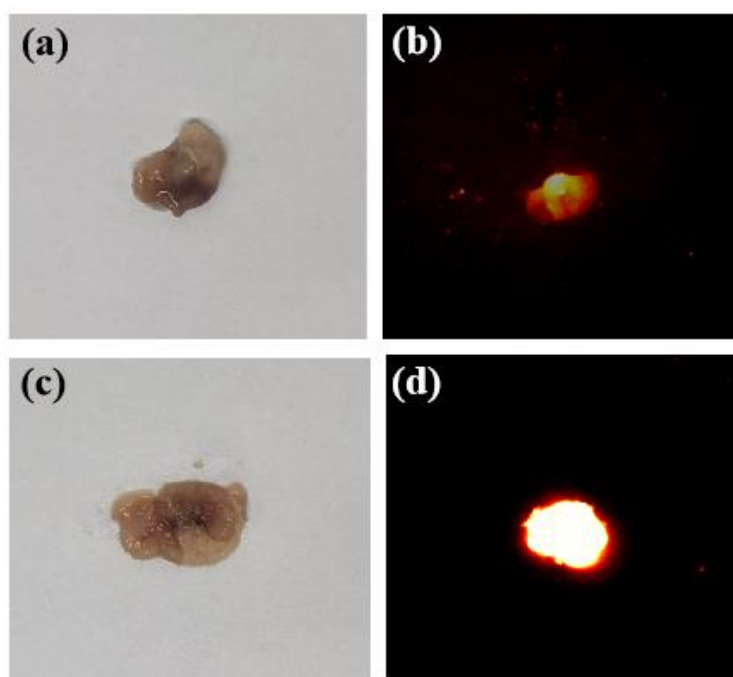


Figure S11. Digital photographs and NIR fluorescence imaging of (a, b) dissected mouse stomach, (c, d) inner wall of mouse stomach after removing gastric content.

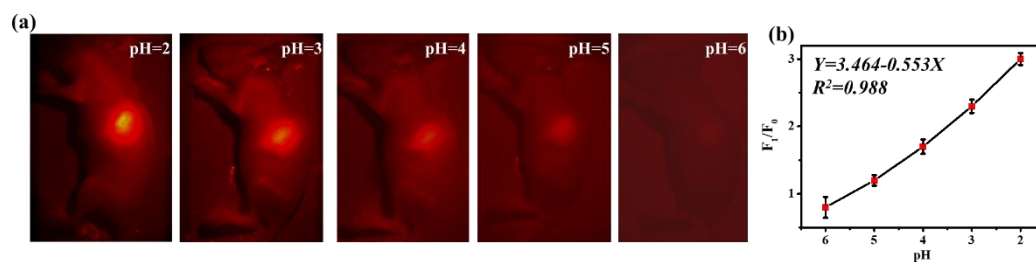


Figure S12. (a) NIR imaging of mice orally administered with 100 μ L Fe-CDs (2 mg/mL) in PBS of different pH (2 to 6). (b) Linear relationship of fluorescence intensity ratio of Fe-CDs versus pH value in the pH range 2 to 6.