Supporting Information

A dual-channel "on-off-on" fluorescent probe for the detection and discrimination of Fe^{3+} and Hg^{2+} in piggery feed and swine wastewater

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Table S1

Comparison of reported sensing systems for fluorescent CDs with current work.

Type of Probes	Carbon sources	Ion detected	Linear range(μM)	LOD (μM)	QY(%)	Ref.
Feathers-CDs[1]	Pigeon feathers	Fe^{3+}&Hg^{2+}	0-1.6 & 0-1.2	0.0609 & 0.0103	24.87	36
Soot-CDs[2]	Candle soot	Fe^{3+}&Hg^{2+}	20–50	0.01&0.05	-	38
Leaves-CDs[3]	Bamboo leaves	Hg^{2+} &Pb^{2+}	0.001-1&0.0006-0.8	0.00022 & 0.00014	3.8&4.7	41
Soot-CDs[4]	Diesel soot	Fe^{3+}&Hg^{2+}	0-12	0.325& 0.898	8	58
Bluegrass-CDs[5]	Kentucky bluegrass	Fe^{3+}&Mn^{2+}	5–25	1.4 & 1.2	7	59
Bergamot-CDs[6]	Jinhua bergamot	Fe^{3+}&Hg^{2+}	0.025-100&0.01-100	0.075& 0.0055	50.78	63
Blood-CDs[7]	Chicken blood	Fe^{3+}&Hg^{2+}	0-120&0-100	0.23&0.17	13.78	This work

[1] Synthesis with Pigeon feathers as carbon source.
[2] Synthesis with Candle soot as carbon source.
[3] Synthesis with Bamboo leaves as carbon source.
[4] Synthesis with Diesel soot as carbon source.
[5] Synthesis with Kentucky bluegrass as carbon source.
[6] Synthesis with Jinhua bergamot as carbon source.
[7] Synthesis with Chicken blood as carbon source.

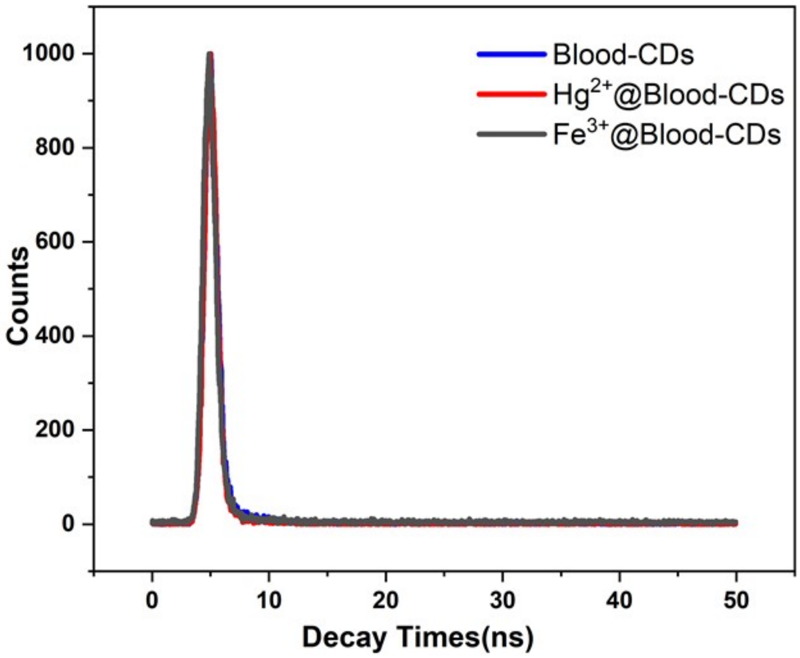

Fig. S1. PL decay curves of Blood-CDs, Hg^{2+}@Blood-CDs, and Fe^{3+}@Blood-CDs.

Table. S2. The lifetime values of Blood-CDs, Hg^{2+}@Blood-CDs, and Fe^{3+}@Blood-CDs.

Sample	τ_1/ns	A_1/%	τ_2/ns	A_2/%	$\tau_{average}$/ns
Blood-CDs	0.544	93.48	3.118	6.52	0.712
Hg^{2+}@Blood-CDs	0.493	92.77	3.004	7.23	0.674
Fe^{3+}@Blood-CDs	0.511	93.04	3.013	6.96	0.685

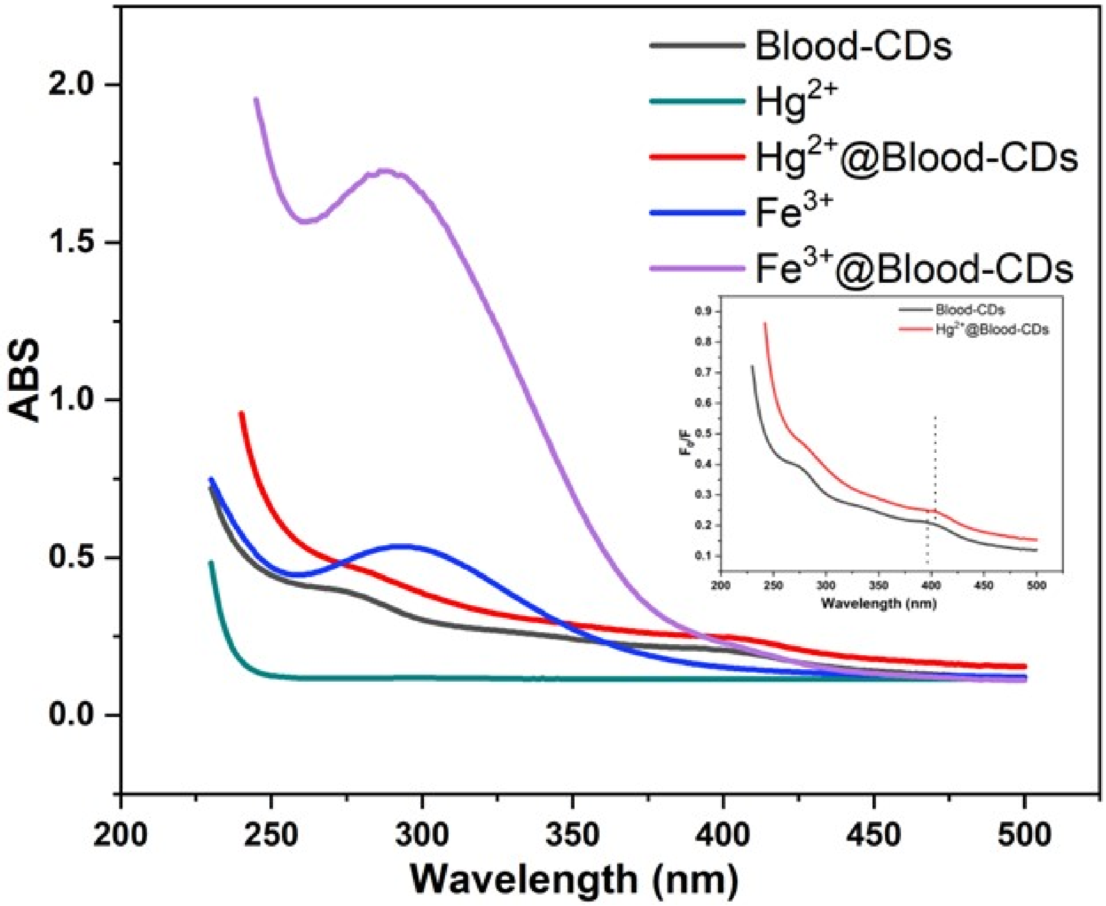

Fig. S2. UV-vis absorption spectra of Blood-CDs, Hg^{2+}, Hg^{2+}@Blood-CDs, Fe^{3+}, and Fe^{3+}@Blood-CDs. The concentration of all the ions were 500 μM.

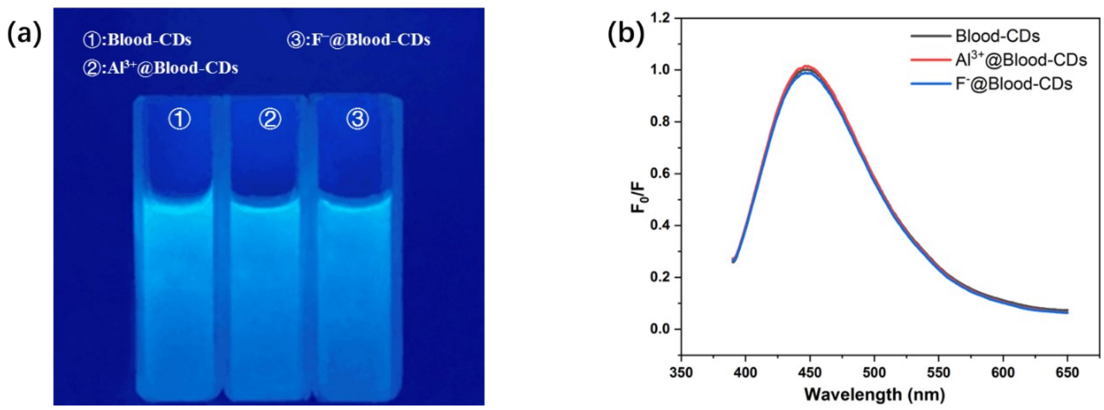

Fig. S3. (a) Fluorescence of Blood-CDs, Al^{3+}@Blood-CDs, and F^-@Blood-CDs under UV lamp (365 nm); (b) Fluorescence spectra of Blood-CDs, Al^{3+}@Blood-CDs, and F^-@Blood-CDs under excitation at 370 nm.

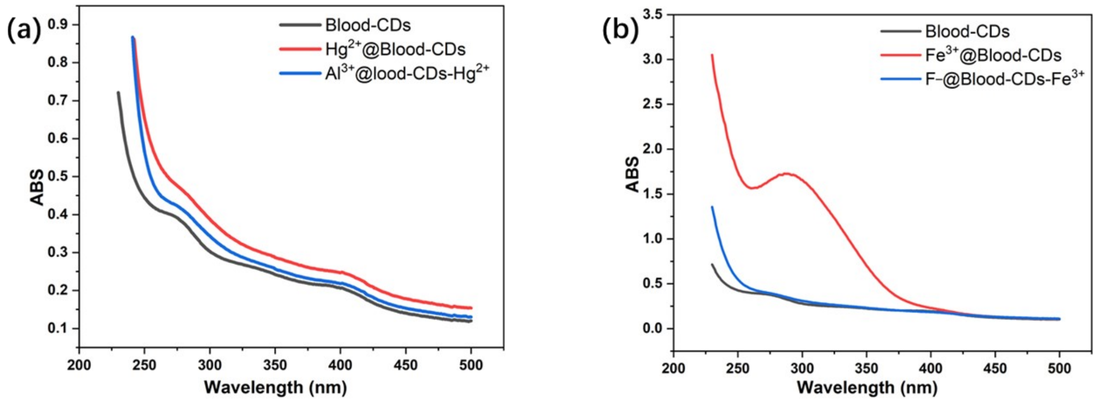

Fig. S4. (a) UV-vis absorption spectra of Blood-CDs, Hg^{2+}@Blood-CDs, and Al^{3+}@Blood-CDs-Hg^{2+}; (b) UV-vis absorption spectra of Blood-CDs, Fe^{3+}@Blood-CDs, and F^{-}@Blood-CDs-Fe^{3+}.