Electronic Supplementary Material (ESI) for RSC Advances

One-pot green synthesis of nitrogen-doped carbon nanoparticles as fluorescent probes for mercury ions

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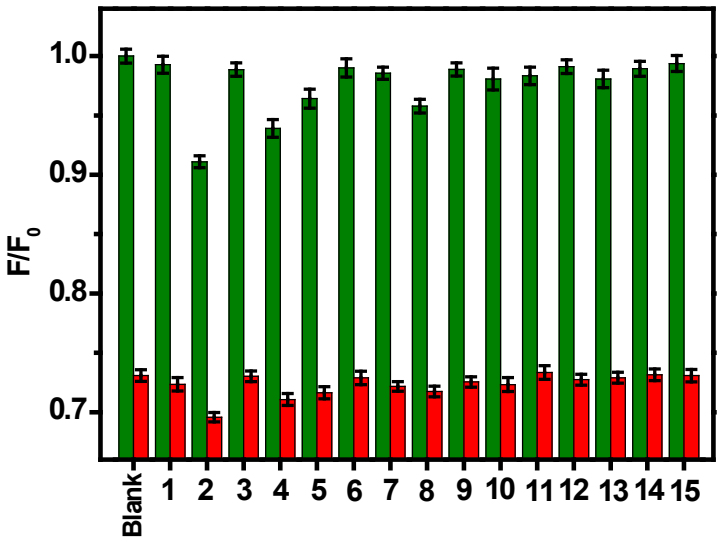

Fig. S1 Fluorescence responses of the FNCPs in the presence of 50 μM Hg^{2+} and excess amount (100 μM) of 15 different metal ions in phosphate buffer solutions (From 1 to 15, the metal ion is Ca^{2+}, Cu^{2+},Ba^{2+}, Fe^{3+}, Pb^{2+}, Zn^{2+}, Ag^{+}, Fe^{2+}, Ni^{2+}, Co^{2+}, Mg^{2+}, Mn^{2+}, Cd^{2+}, Cr^{3+}, and Al^{3+}, respectively).

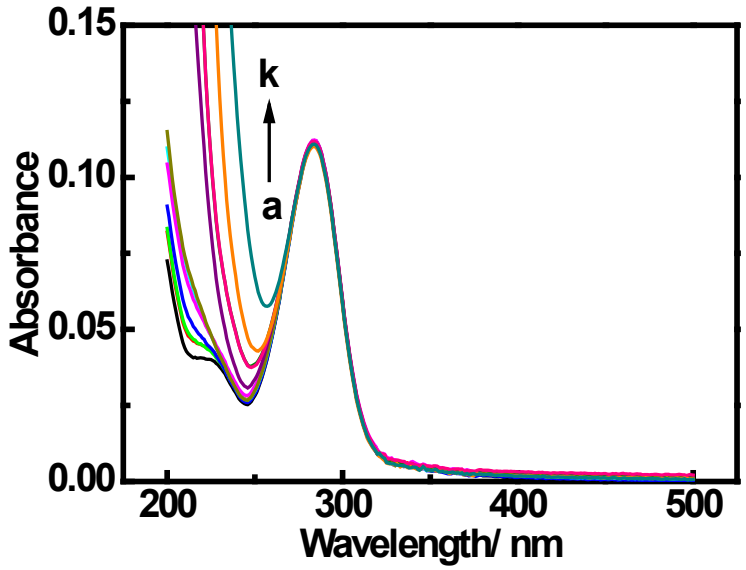

Fig. S2 UV-Vis absorption spectra of the FNCPs in the phosphate buffer solution (25 mM, pH = 7.4) in the presence of various concentration of Hg^{2+} (a to k: 0, 0.010, 0.025, 0.050, 0.100, 0.500, 1.00, 5.00, 10.0, 25.0, and 50.0 μM).

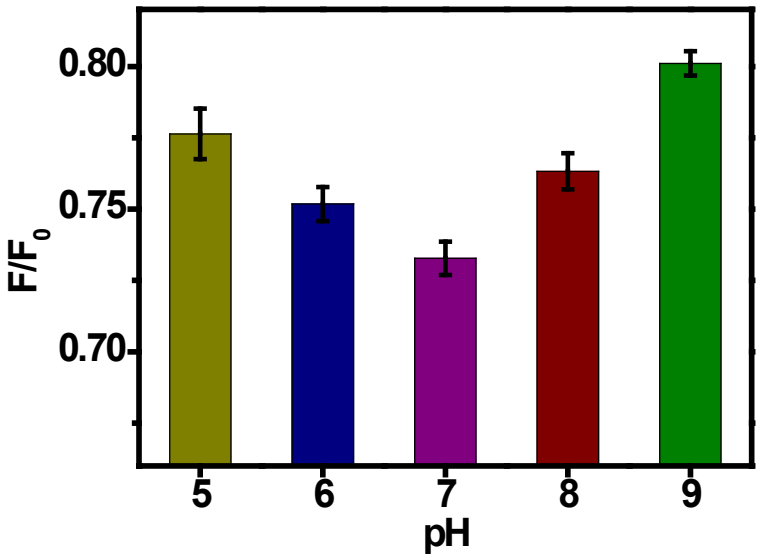

Fig. S3 Fluorescence responses of the FNCPs at different pH values in the presence of 50 μM Hg^{2+}.

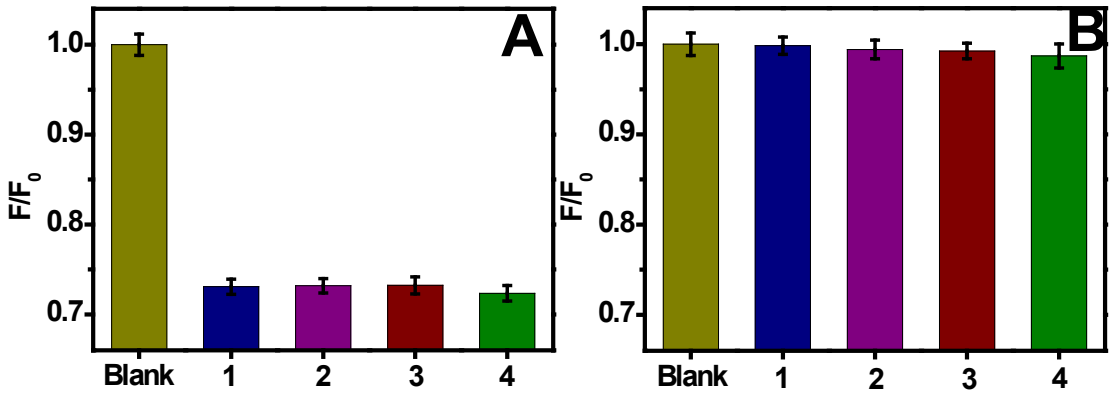

Fig. S4 Fluorescence responses of the FNCPs in the presence of different mercury salts (A) and sodium salts (B) in phosphate buffer solutions (25 mM, pH = 7.4). The concentrations of all the metal ions are 50 μM. 1, 2, 3 and 4 correspond to the chloride, nitrate, acetate and perchlorate salts of mercury (A) and sodium (B), respectively.

Table S1 Comparison of the performances of different fluorescent methods for the determination of Hg^{2+}.

Fluorescence methods	Linear range (nM)	LOD (nM)	Ref.
Single-labeled DNA	4-100	4.0	1
BSA-Au NPs	400-43200	80	2
Lysozyme-Ag NPs	1000-15000	600	3
Glutathione-capped CdS	15-12500	4.5	4
CdTe quantum dots	8-2000	2.7	5
Au-NP-CdTe nanocomposite	131-710	9	6
FNCPs	10-100 and 1000-50000	3	This work

Table S2 Determination of Hg^{2+} in the real water samples by this method.

Samples	Spiked amount (nM)	Found amount (nM)	Recovery (%)
Lake water 1	0	Not detected	---
Lake water 2	50	48.7 ± 3.4	97.4 ± 6.8
Lake water 3	100	98.2 ± 2.8	98.2 ± 5.6
Lake water 4	1000	1065.3 ± 91	106.5 ± 9.1

Reference

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