Supporting Information

Highly Selective and Sensitive Fluorescence Probe Based on Thymine-modified Carbon Dots for Hg^{2+} and L-Cysteine Detection

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Figures

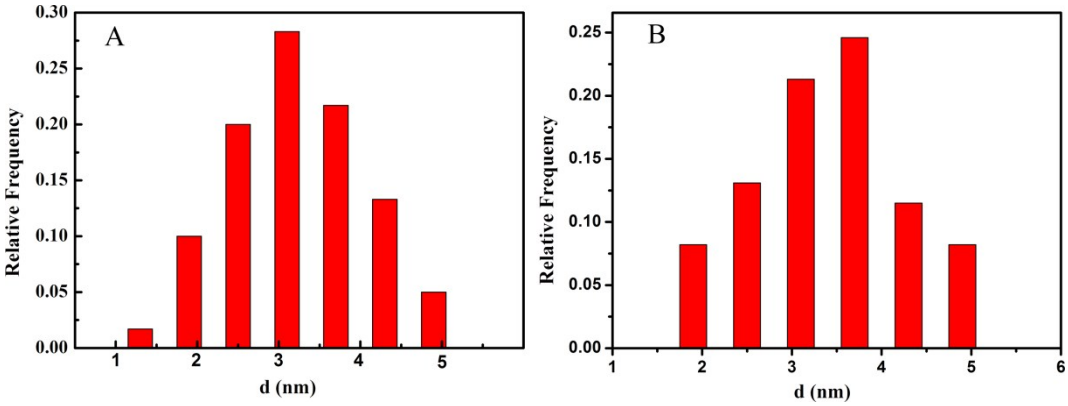

Fig. S1. The size distribution of CDs (A) and CDs-T (B).

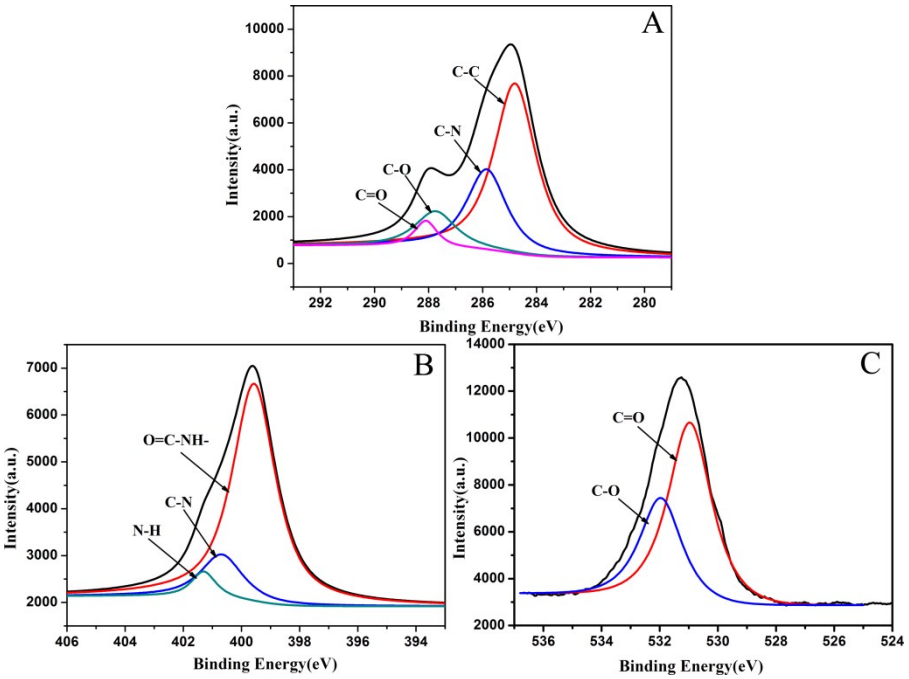

Fig. S2. The high-resolution XPS spectra of CDs-T C_{1s} (A), N_{1s} (B), and O_{1s}(C).

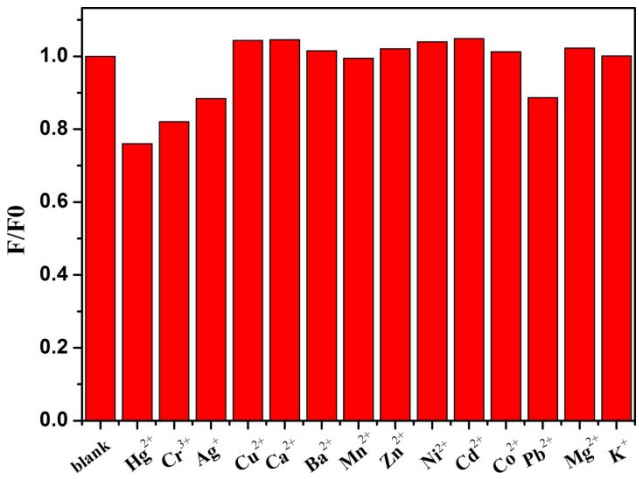

Fig. S3. Fluorescence intensity ratio for CDs (10 μg·mL^{-1}) in the presence of 20 μM different metal ions.

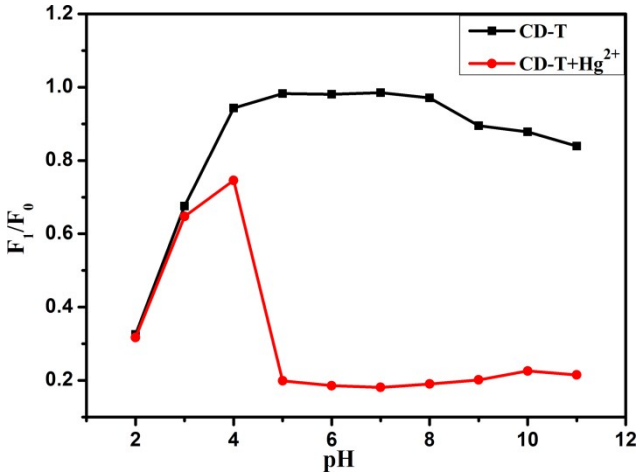

Fig. S4. Fluorescence intensity ratio of the CDs-T (10 μg·mL^{-1}) in the absence and in the presence of Hg^{2+} (20 μM) as a function of pH (λ_{ex}= 360 nm).

Table S1. Comparison of different nanoparticles-based methods for the detection of Hg^{2+}.

Method	Liner range	Detect limit	Reference
Mononucleotides-stabilized gold nanoparticles	0.02-6.0 μM	50 nM	S[1]
Carbon nanodots	0-3 μM	4.2 nM	S[2]
CdSe@ZnS quantum dots and carbon dots	0.2-2 μM	100 nM	S[3]
Carbon dots-labeled oligodeoxyribonucleotide	0.005-0.2 μM	2.6 nM	S[4]
Quantum dots/DNA/gold nanoparticles	0.002-0.06 μM	2 nM	S[5]
Colorimetric gold nanoparticles on paper-based	0.025-0.75 μM	50 nM	S[6]
Thymine-modified carbon dots	0.03-8 μM	0.93 nM	This work

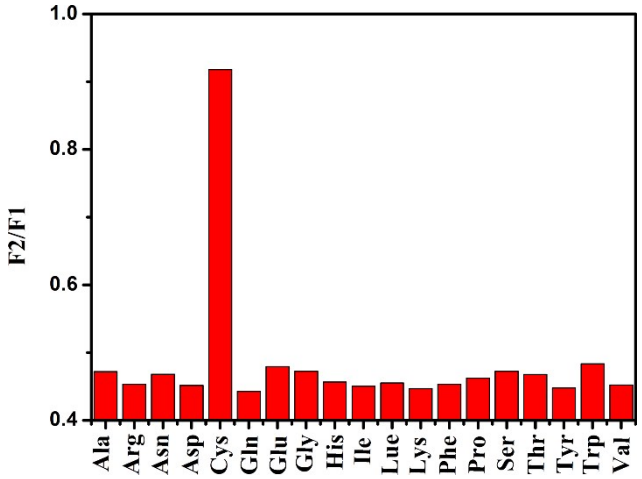

Fig. S5. Fluorescence change of CDs-T/Hg^{2+} in the presence of various amino acids with a concentration of 10 μM. (λ_{ex}= 360 nm, λ_{em}= 450 nm).

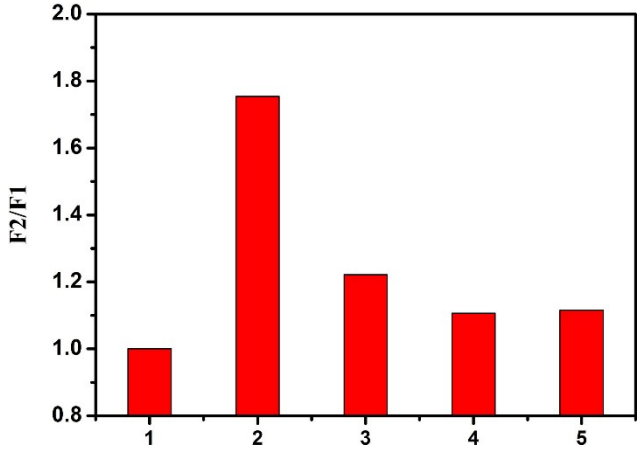

Fig. S6. Fluorescence change of CDs-T/Hg^{2+} in the absence and presence of various biothiols with a concentration of 10 μM. (λ_{ex}= 360 nm, λ_{em}= 450 nm).1-CDs-T/Hg^{2+}, 2-CDs-T/Hg^{2+} + $_{L}$-Cys, 3-CDs-T/Hg^{2+} + GSH, 4-CDs-T/Hg^{2+} + cysteamine, 5-CDs-T/Hg^{2+} + mercaptoacetic acid.

Table S2. Comparison of different nanoparticles-based methods for the detection of $_{L}$-Cys.

Method	Liner range	Detect limit	Reference
Carbon nanodots	0.01-5 μM	4.9 nM	S[2]
Oligonucleotide-stabilized fluorescent silver nanoclusters	0.008-0.1 μM	4 nM	S[7]
Conducting polymers/gold nanoparticles	0.5-200 μM	50 nM	S[8]
Cellulose polyampholyte-gold nanoparticles	0.1-10 μM	20 nM	S[9]
Graphene quantum dots	0.01-0.6 μM	4.5 nM	S[10]
Thymine-modified carbon dots	0.003-7 μM	0.88 nM	This work

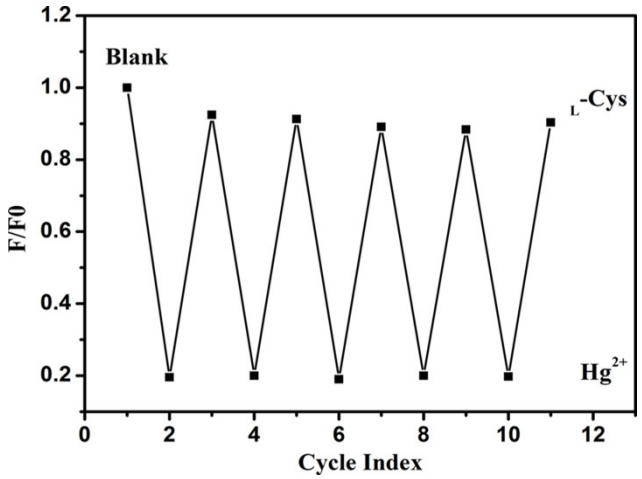

Fig. S7 Reversibility of CDs-T for Hg^{2+} and $_{L}$-Cys

References

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