

Supplementary Material

Ratiometric fluorescence probe of Cu²⁺ and biothiols by using carbon dots and copper nanoclusters

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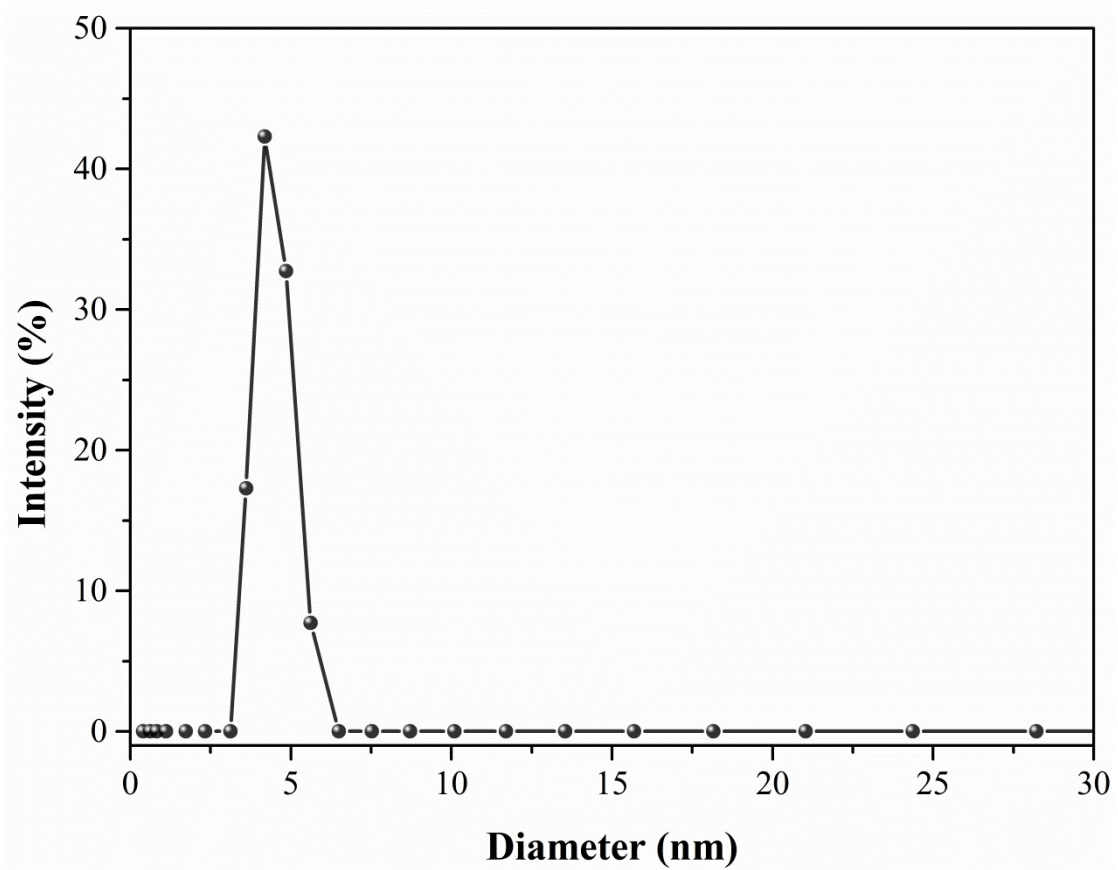


Fig. S1. Hydrodynamic size distribution of y-CDs in water.

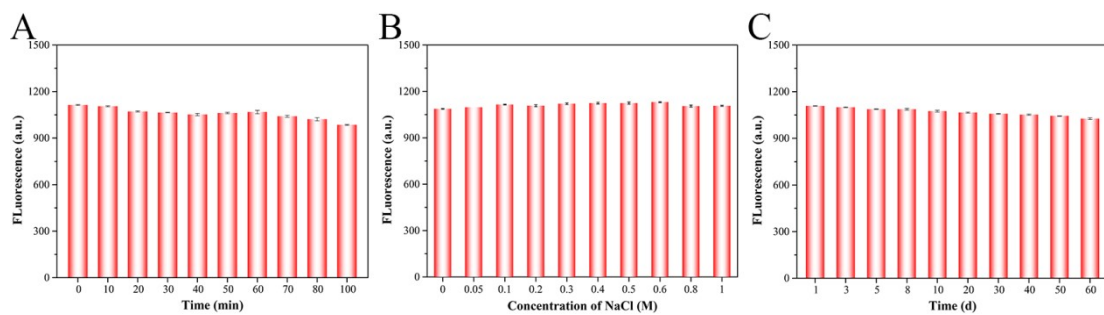


Fig. S2. The effects of (A) radiation time, (B) NaCl concentration and (C) storage time on the fluorescence intensity of γ -CDs. $\lambda_{\text{ex}} = 420 \text{ nm}$, $\lambda_{\text{em}} = 567 \text{ nm}$.

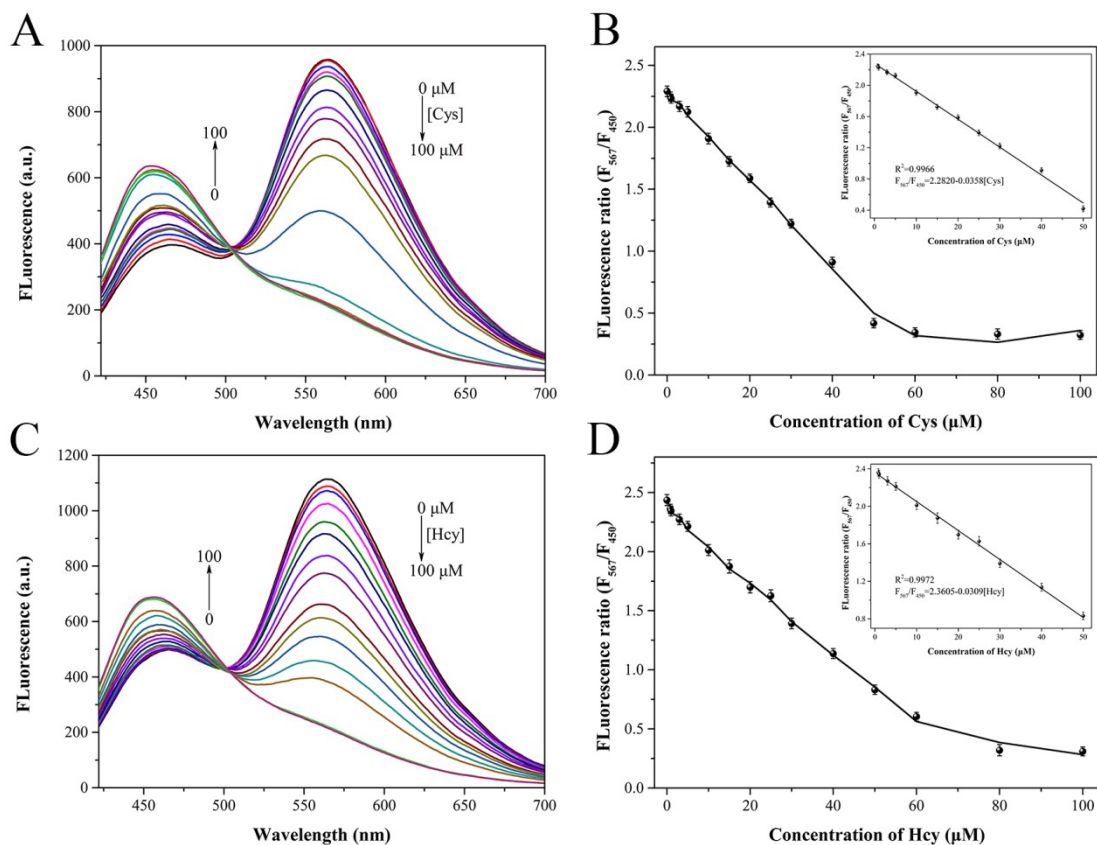


Fig. S3. Fluorescence emission spectra of ratiometric fluorescence probe in the presence of different concentrations of (A) Cys and (C) Hcy (0 - 100 μM). The curves of fluorescence intensity ratio of F_{567}/F_{450} with various concentrations of (B) Cys and (D) Hcy. Insets: linear relationships of F_{567}/F_{450} versus the concentrations of Cys and Hcy from 0.8 to 50 μM .

Table S1. Comparison of this method for the detection of Cu²⁺ with those reported ratiometric fluorescence methods.

Probes	Linear range (μM)	LOD (μM)	Reference
BODIPY derivative	0.4-2.2/2.4-6.5	0.08	1
Rhodamine/cyanine	0-20	1.019	2
Near-infrared BODIPY	0-24	1.02	3
CDs/ CdSe/ZnS QDs	4-40	2.74	4
AuNCs/N-CDs	10-150	3.5	5
y-CDs/CuNCs	0.5-100	0.21	This work

Table S2. Comparison of this method for the detection of biothiols with those reported ratiometric fluorescence methods.

Probes	GSH		Cys		Hcy		Reference
	Linear range	LOD	Linear range	LOD	Linear range	LOD	
	(μM)	(μM)	(μM)	(μM)	(μM)	(μM)	
BODIPY/rhodamine	10-100	0.26	Not given		Not given		6
AgNCs/Au ³⁺ -g-C ₃ N ₄	5-100	0.8	Not given		Not given		7
Azamonardine/MPA-CdTe QDs	Not given		2-12	0.6	Not given		8
TAT peptide	0-12	5.15	0-12	0.865	0-12	6.51	9
L-Cys-BODIPY/M-MoS ₂ QDs	1000-10000	300	1-10	0.3	1-10	0.3	10
Cu ²⁺ -(γ -CDs)/CuNCs	0.8-50	0.33	0.8-50	0.39	0.8-50	0.46	This work

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