Supplementary Materials

A Ratiometric Fluorescence Sensor Based on BSA Assembled Gold-Silver Bimetallic Nanoclusters for Highly Selective Detection of Chlortetracycline in Water

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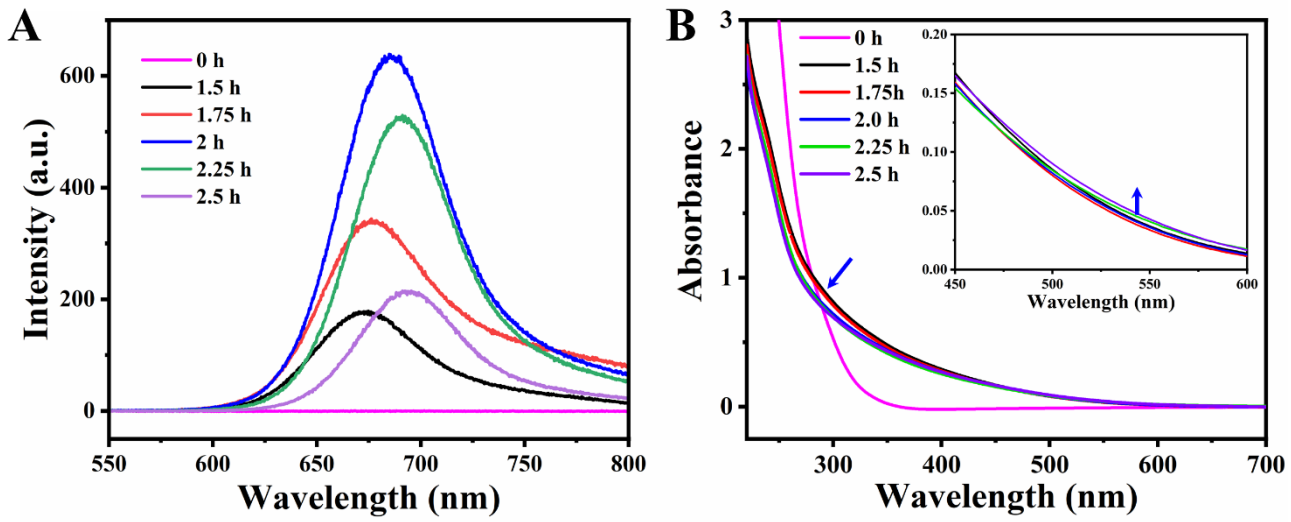


Figure S1 (A) Fluorescence and (B) UV-vis absorption spectra of Au-AgNCs synthesized with different reaction times (inset: enlarged absorption spectra).

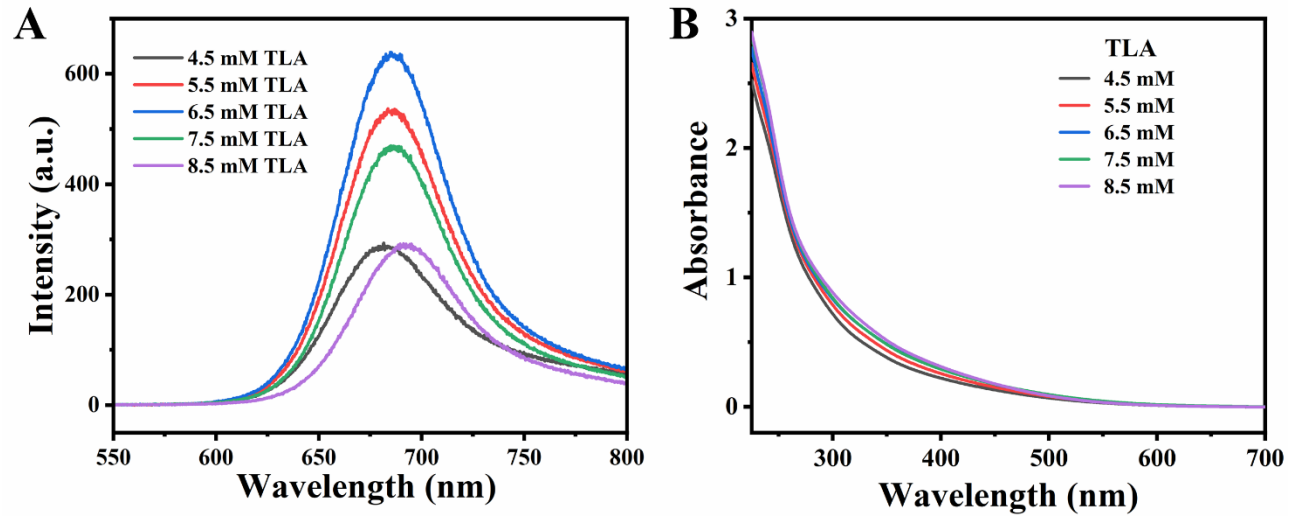


Figure S2 (A) Fluorescence and (B) UV-vis absorption spectra of Au-AgNCs synthesized with different amounts of TLA (4.5 – 8.5 mM, λ_{ex} = 465 nm).

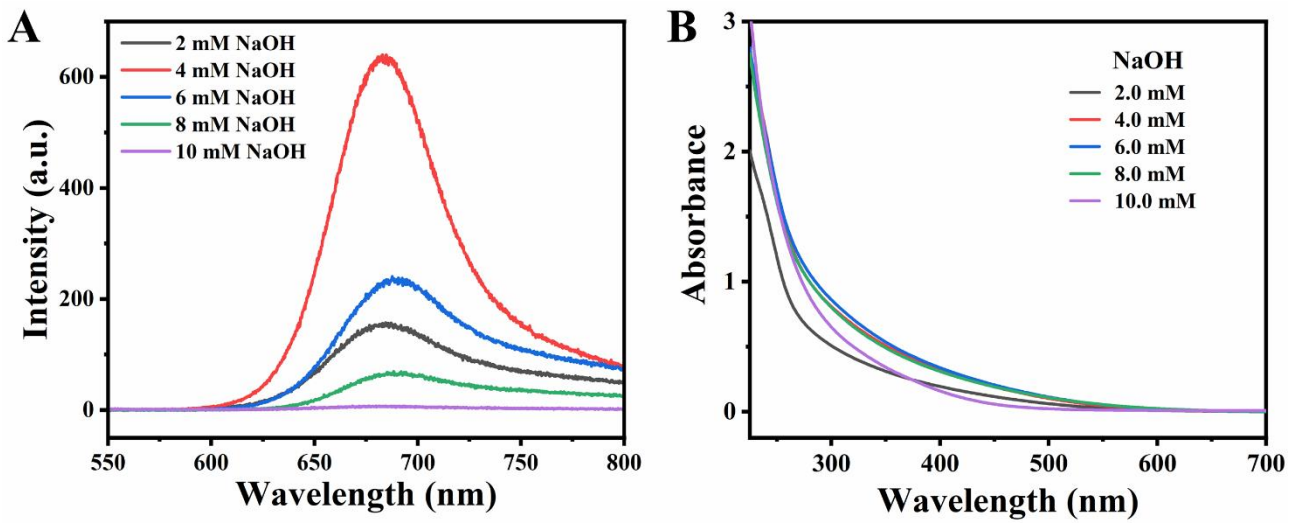


Figure S3 (A) Fluorescence and (B) UV-vis absorption spectra of Au-AgNCs synthesized with varying NaOH concentrations (2.0 –10.0 mM, λ_{ex} = 465 nm).

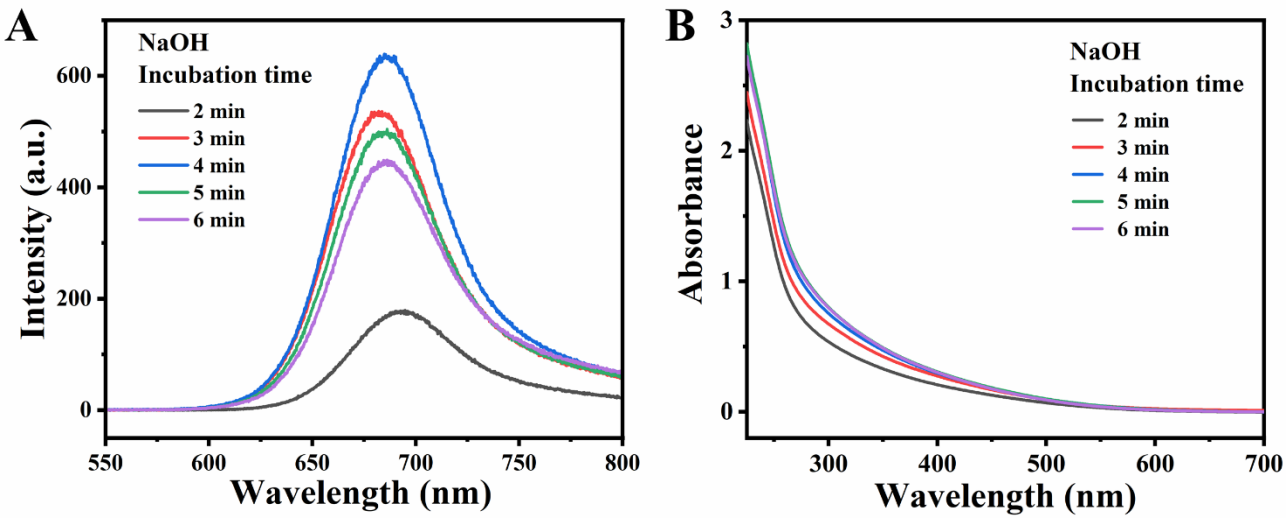


Figure S4 (A) Fluorescence and (B) UV-vis absorption spectra of Au-AgNCs synthesized with different NaOH incubation times (2 – 6 min, λ_{ex} = 465 nm).

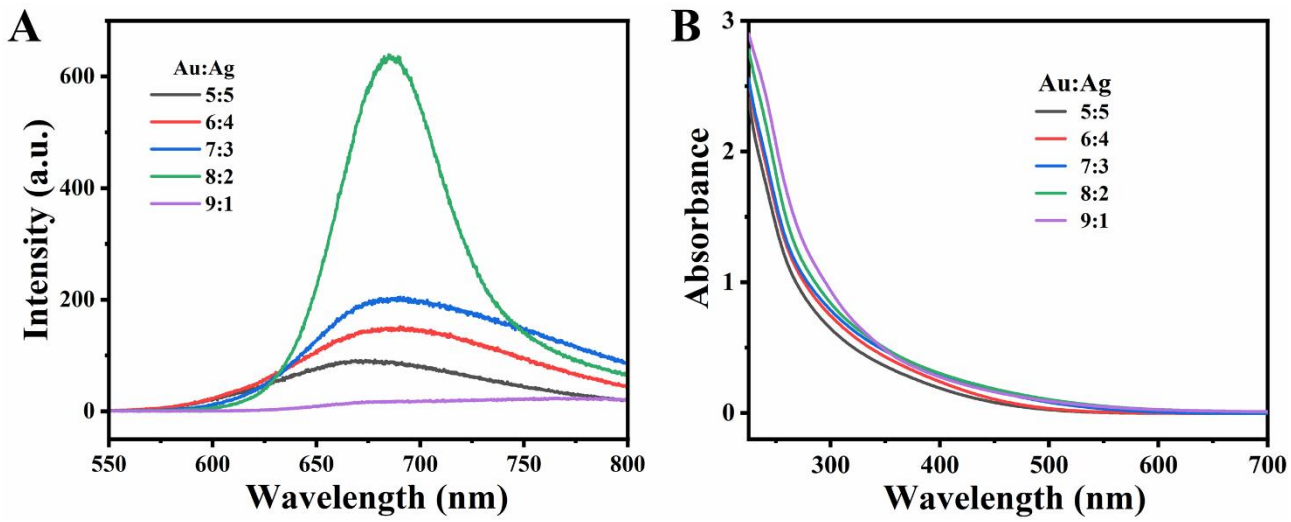


Figure S5 (A) Fluorescence and (B) UV-vis absorption spectra of Au-AgNCs synthesized with different ratio of Au to Ag (5:5 – 9:1, λ_{ex} = 465 nm).

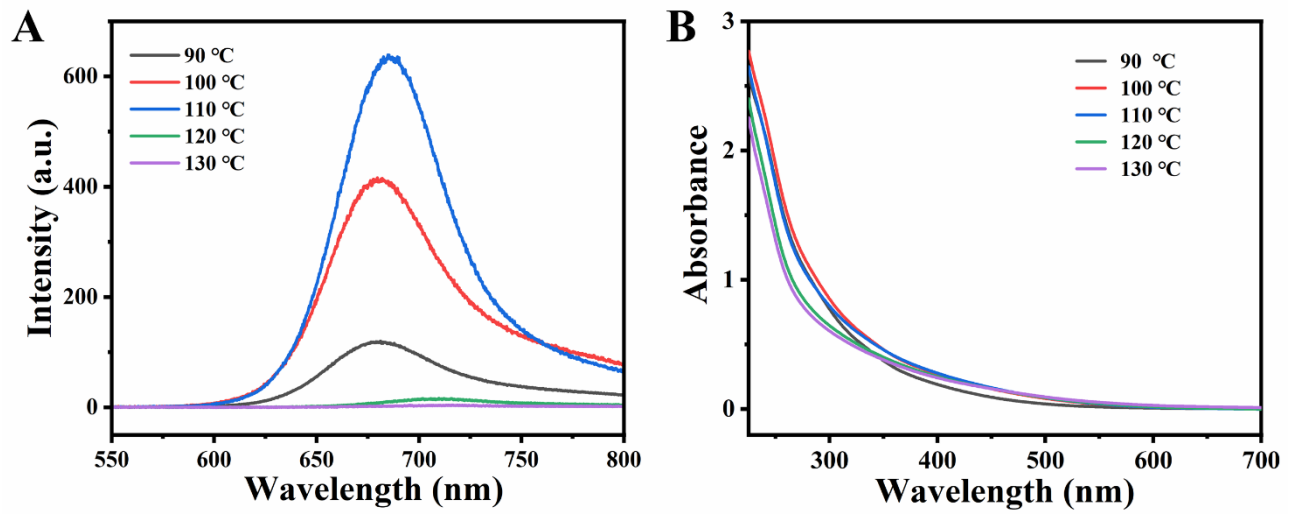


Figure S6 (A) Fluorescence and (B) UV-vis absorption spectra of Au-AgNCs synthesized with different temperature (90 – 130 ℃, λ_{ex} = 465 nm).

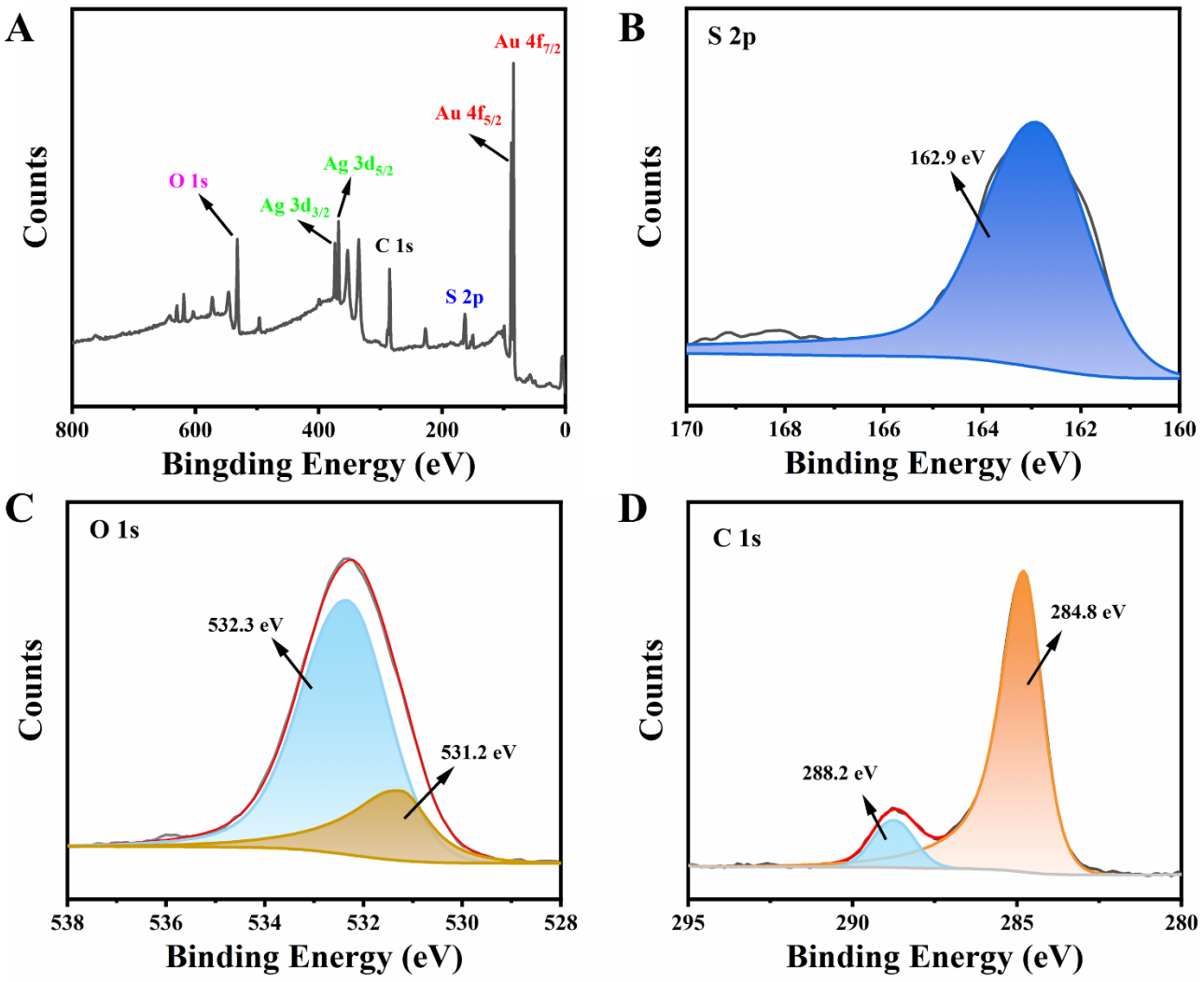


Figure S7 (A) XPS full-survey spectrum of the Au-AgNCs. High-resolution spectra of (B) S 2p, (C)

O 1s, and (D) C 1s regions.

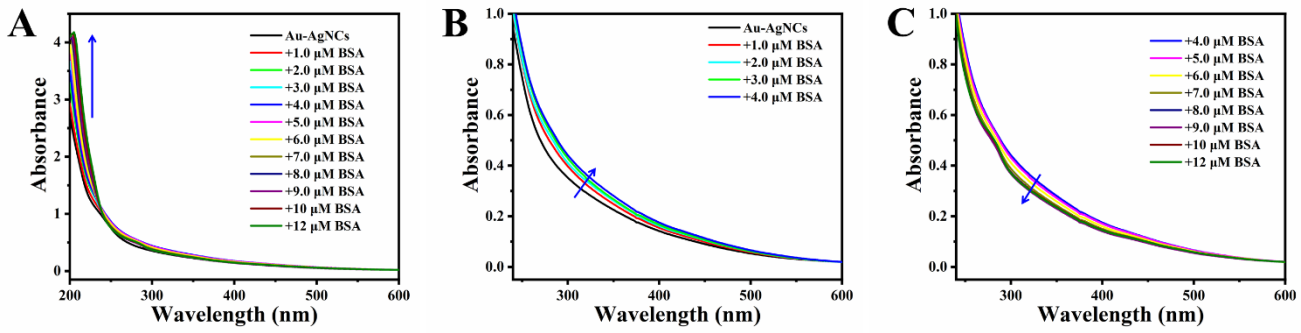


Figure S8 (A) UV-vis absorption spectra of Au-AgNCs in the presence of different amounts of BSA (0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 8.0, 9.0, 10, and 12 μM) in Tris-HCl buffer. (B,C) The amplified UV-vis absorption spectra of Au-AgNCs in the presence of different amounts of BSA.

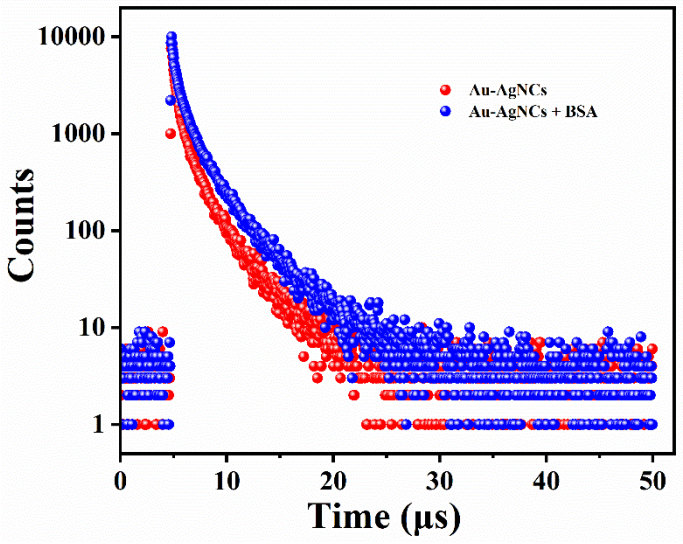


Figure S9 Fluorescence decay curves of Au-AgNCs at 687 nm in the absence and presence of BSA.

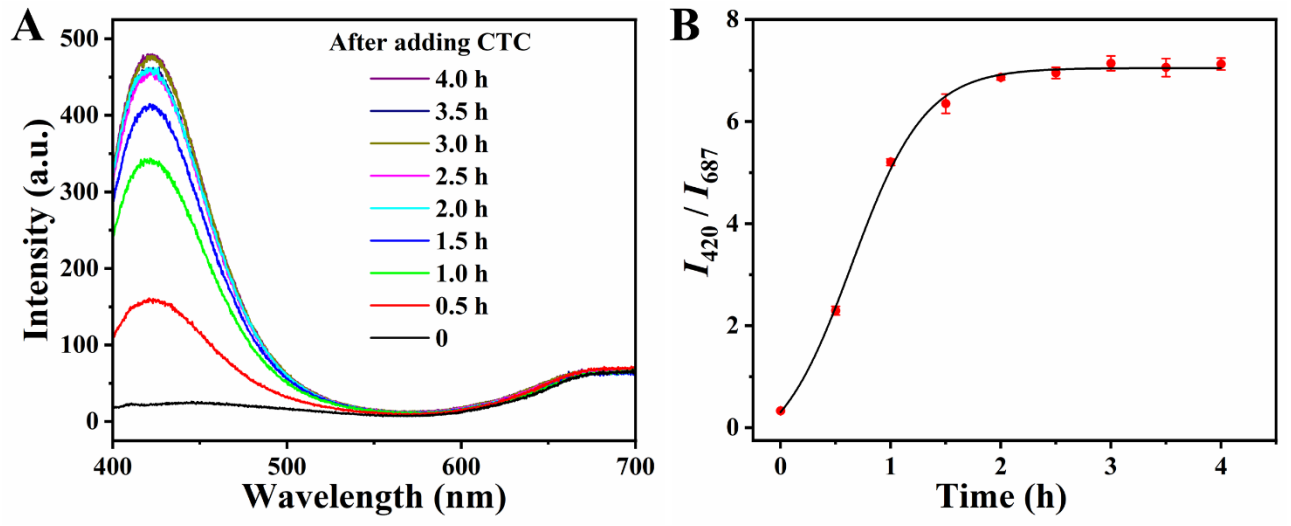


Figure S10 Fluorescence spectra of Au-AgNCs@BSA in the presence of CTC (15 μM) with different response times (0 – 4.0 h, λ_{ex} = 360 nm).

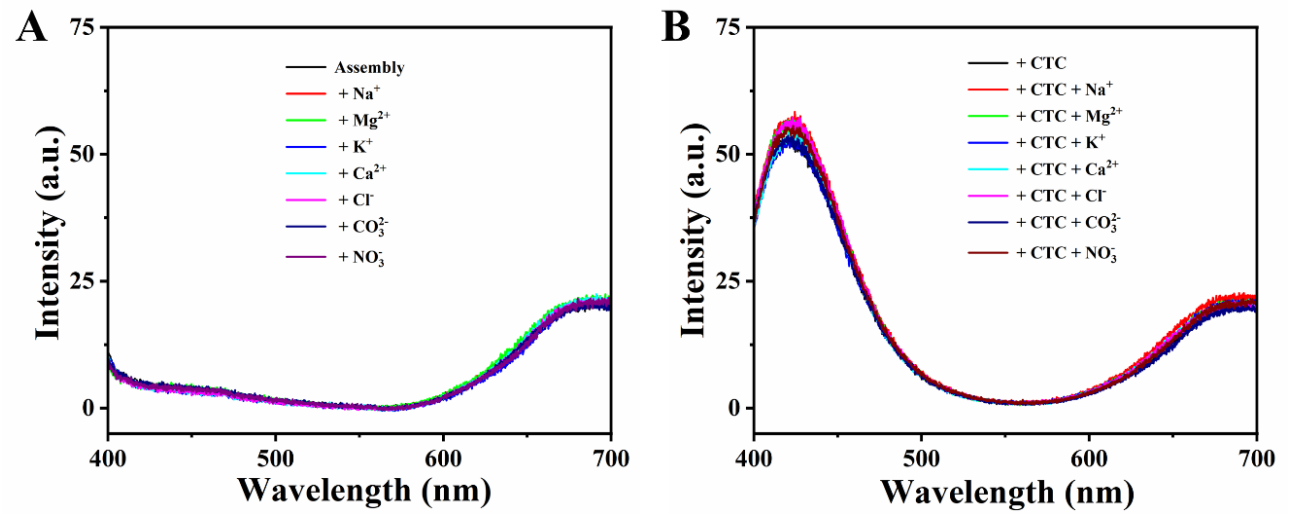


Figure S11 (A) Fluorescence spectra of Au-AgNCs@BSA (5.0 μg·mL^{-1} and 4.0 μM) upon addition of various potential interferents (100 μM), respectively. (B) Fluorescence spectra of the assembly in the presence of 5.0 μM CTC and each interferent (100 μM).

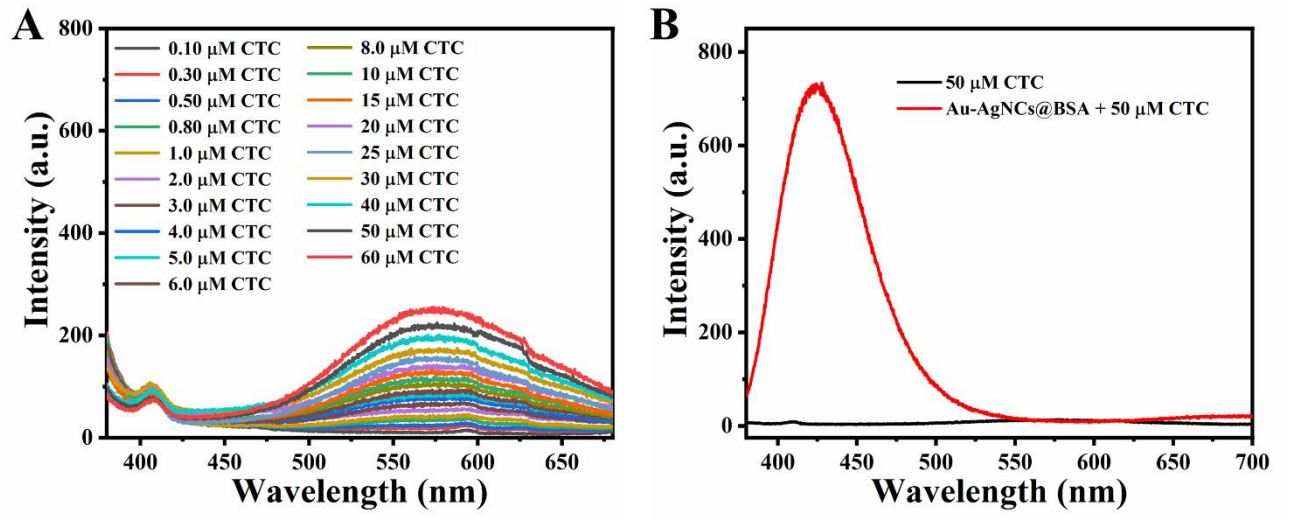


Figure S12 (A) Fluorescence spectra of CTC with varying concentrations (0.10 – 60 μM, λ_{ex} = 360 nm). (B) Fluorescence spectra of CTC (50 μM) and the mixture of Au-AgNCs@BSA and CTC (50 μM) under the same equipment parameters.

Table S1 Summarizes the ratiometric fluorescence response (I_{420}/I_{687}) for all interferents tested individually.

Samples	I_{420}/I_{687} value	Deviation	Samples	I_{420}/I_{687} value	Deviation
Blank	0.24646	0.01501	+ CTC	2.69413	0.04063
+ Arg	0.24156	0.01036	+ CTC + Arg	2.75374	0.07758
+ Met	0.23837	0.01039	+ CTC + Met	2.72543	0.02202
+ Trp	0.25128	0.02195	+ CTC + Trp	2.65283	0.07378
+ Thr	0.25607	0.02957	+ CTC + Thr	2.77786	0.06743
+ His	0.25204	0.02313	+ CTC + His	2.77095	0.06144
+ Ser	0.24512	0.01337	+ CTC + Ser	2.67365	0.02282
+ Glu	0.25312	0.02482	+ CTC + Glu	2.62956	0.07918
+ Gly	0.25617	0.02974	+ CTC + Gly	2.62373	0.07323
+ Leu	0.24676	0.01539	+ CTC + Leu	2.64666	0.04620
+ Asn	0.24318	0.01142	+ CTC + Asn	2.66407	0.03112
+ Lys	0.24667	0.01528	+ CTC + Lys	2.69404	0.00516
+ Phe	0.23167	0.01755	+ CTC + Phe	2.68356	0.01424
+ Asp	0.24667	0.01528	+ CTC + Asp	2.64202	0.13105

+ Na^+	0.23167	0.01755	+ CTC + Na^+	2.66726	0.09499
+ K^+	0.23046	0.01931	+ CTC + K^+	2.64506	0.12584
+ Ca^{2+}	0.23248	0.01642	+ CTC + Ca^{2+}	2.70084	0.04030
+ Mg^{2+}	0.2368	0.01143	+ CTC + Mg^{2+}	2.6828	0.04679
+ Al^{3+}	0.24624	0.01472	+ CTC + Al^{3+}	2.69895	0.03747
+ Zn^{2+}	0.24087	0.01011	+ CTC + Zn^{2+}	2.76924	0.10428
+ Fe^{2+}	0.23284	0.01592	+ CTC + Fe^{2+}	2.687	0.05651
+ Co^{2+}	0.25903	0.03444	+ CTC + Co^{2+}	2.73015	0.05542
+ Ni^{2+}	0.24206	0.01062	+ CTC + Ni^{2+}	2.73253	0.12683
+ Ag^+	0.25883	0.03412	+ CTC + Ag^+	2.72073	0.06552
+ Fe^{3+}	0.23782	0.01069	+ CTC + Fe^{3+}	2.77285	0.08929
+ NH_4^+	0.24002	0.01000	+ CTC + NH_4^+	2.70185	0.03474
+ F^-	0.25093	0.02141	+ CTC + F^-	2.71528	0.02669
+ Cl^-	0.25253	0.02390	+ CTC + Cl^-	2.74414	0.04781
+ Br^-	0.247	0.01572	+ CTC + Br^-	2.7388	0.06743
+ I^-	0.24709	0.01583	+ CTC + I^-	2.83482	0.15858
+ SO_4^{2-}	0.23749	0.01090	+ CTC + SO_4^{2-}	2.76477	0.05939
+ CO_3^{2-}	0.22963	0.02055	+ CTC + CO_3^{2-}	2.71847	0.07494
+ NO_3^-	0.23215	0.01688	+ CTC + NO_3^-	2.73164	0.04077
+ PO_4^{3-}	0.23071	0.01894	+ CTC + PO_4^{3-}	2.78039	0.18011
+ S^{2-}	0.24416	0.01232	+ CTC + S^{2-}	2.73071	0.03921
+ DS	0.24709	0.01584	+ CTC + DS	2.70235	0.01048
+ TC	0.24709	0.01584	+ CTC + TC	2.66485	0.13381
+ DC	0.2377	0.01077	+ CTC + DC	2.73744	0.05294
+ OTC	0.23713	0.01117	+ CTC + OTC	2.7069	0.00976