Supporting Information

Enhanced electrochemiluminescence of gold nanoclusters via silver doping and its application for ultrasensitive detection of dopamine

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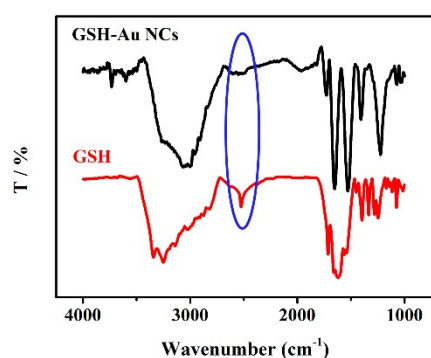# Supplementary Figures and Table

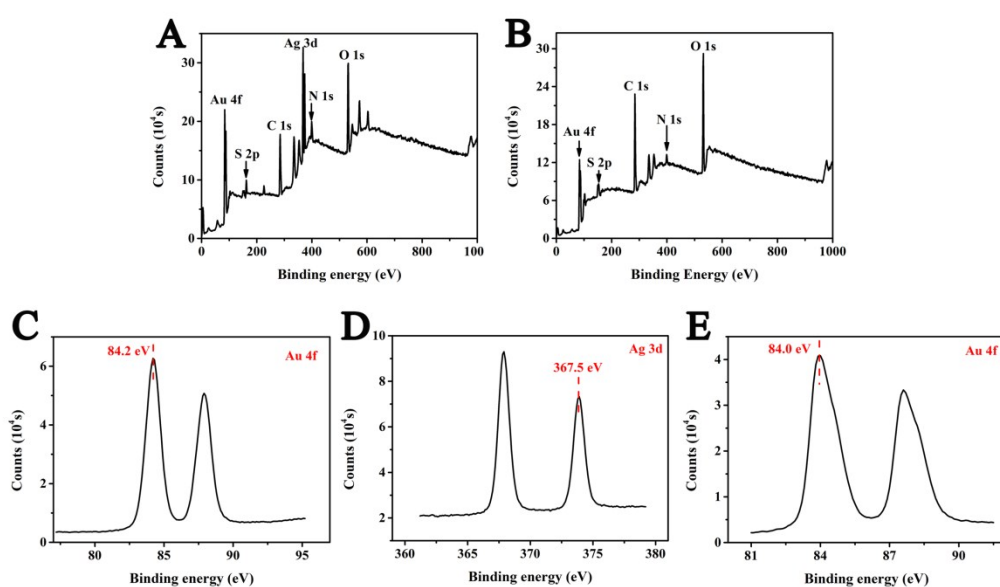**Fig. S1.** FTIR spectra of the GSH-Au NCs and GSH.

Fig. S2. (A-B) The XPS spectra of GSH-Ag/Au NCs (A) and GSH-Au NCs (B). (C-D) The XPS spectra of Au 4f (C) and Ag 3d (D) in GSH-Ag/Au NCs. (E) The XPS spectrum of Au 4f in GSH-Au NCs.
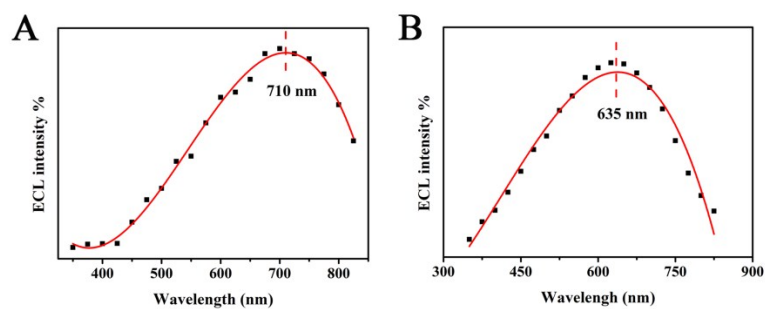

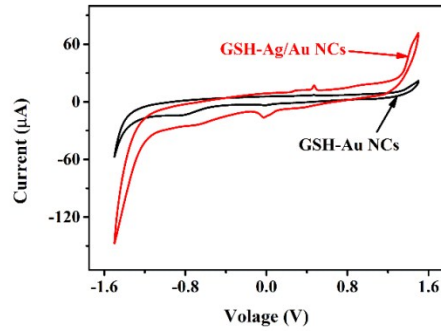**Fig. S3.** ECL spectra of GSH-Ag/Au NCs (A) and GSH-Au NCs (B).

Fig.S4. Cyclic voltammetry of GSG-Au NCs modified GCE and GSH-Ag/Au NCs modified GCE in 0.1M PBS.
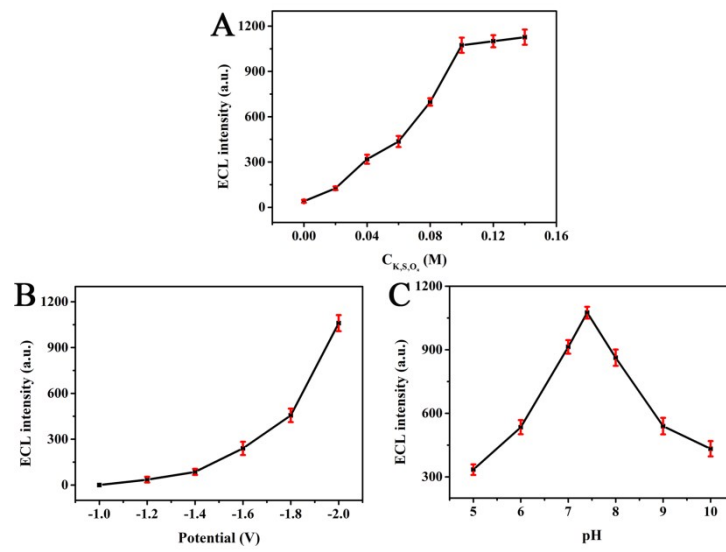

Fig. S5. Effects of $K_2S_2O_8$ concentration (A), applied potential (B) and pH (C) on ECL intensity of GSH-Ag/Au NCs.
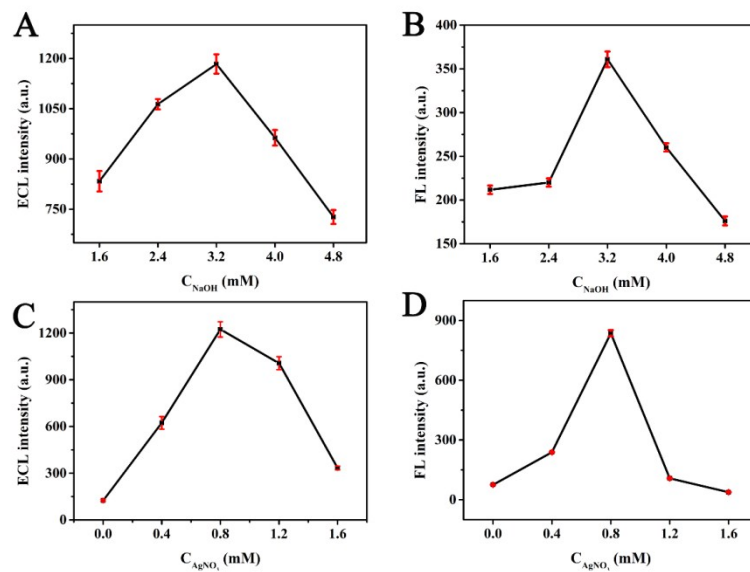

Fig. S6. (A-B) The ECL (A) and FL (B) intensities of GSH-Ag/Au NCs preparing upon different

NaOH concentration. (C-D) The ECL (C) and FL (D) intensities of GSH-Ag/Au NCs preparing upon different AgNO$_3$ concentration.
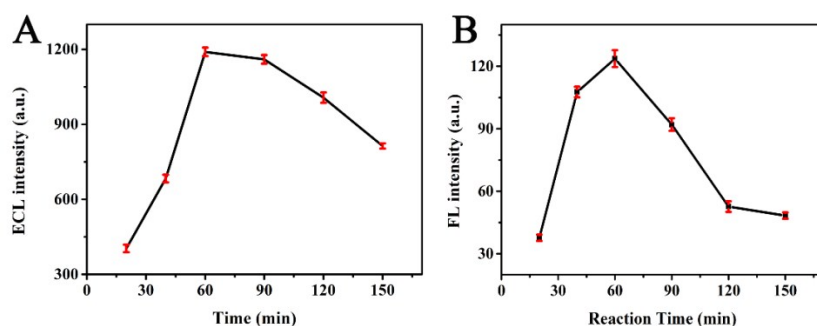

Fig. S7. The ECL (A) and FL (B) intensities of GSH-Ag/Au NCs preparing upon different heating time.

Table S1. Comparison of different methods for dopamine detection.

Detection technique	Sensor	Linear range (M)	Detection limit (M)	References
ECL	rGO/MWCNTs/AuNPs	$2\times10^{-7} \sim 7\times10^{-5}$	6.7×10^{-8}	1
ECL	Ag$_2$Se QDs	$5\times10^{-7} \sim 1.9\times10^{-5}$	1×10^{-7}	2
ECL	BSA-AuNCs/ITO	$2.5\times10^{-6} \sim 4.75\times10^{-5}$	2.5×10^{-6}	3
ECL	CdSe QDs.	$3.7\times10^{-6} \sim 4.5\times10^{-4}$	1×10^{-7}	4
DPV[a]	Mn$_3$O$_4$ NPs	$1.0\times10^{-5} \sim 7.0\times10^{-5}$	1×10^{-7}	5
SWV[b]	SWCNT/Fe$_2$O$_3$	$3.2\times10^{-6} \sim 3.18\times10^{-5}$	3.6×10^{-7}	6
FL	ZnSe QD-ferritin	$1\times10^{-7} \sim 6\times10^{-7}$	1×10^{-7}	7
ECL	GSH-AuAgNCs	$1\times10^{-8} \sim 1\times10^{-3}$	2.3×10^{-9}	This work

[a]DPV, differential pulse voltammetry

[b]SWV, square wave voltammetry.

References

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