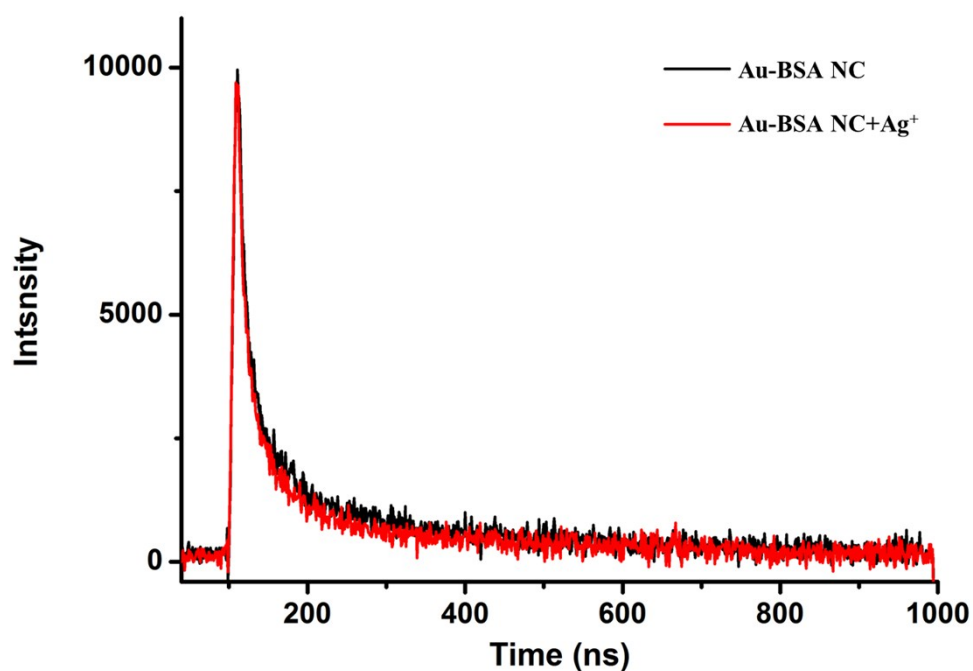


## Supporting Information

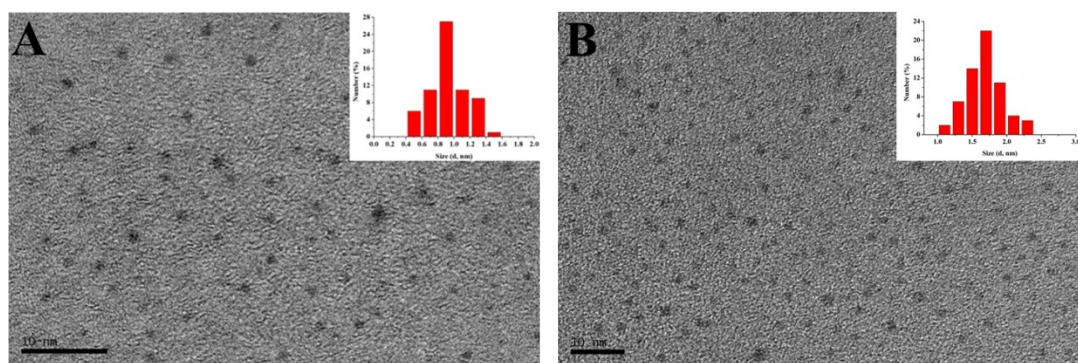
### Fluorescence Signal Amplification of Gold Nanocluster with Silver Ions

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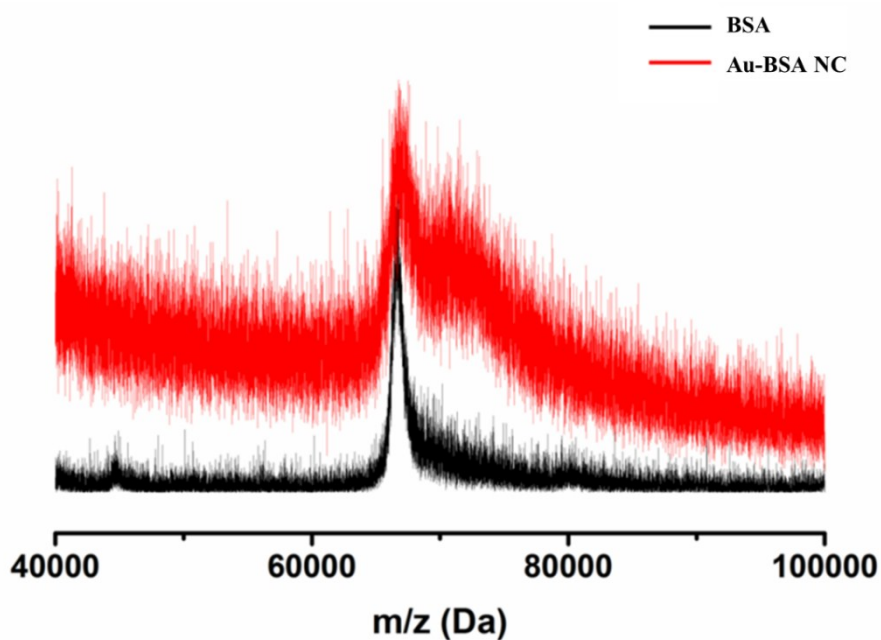
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**Figure S1.** Time-resolved emission-decay curves of Au NC (black line) before and after adding Ag<sup>+</sup> (red line).



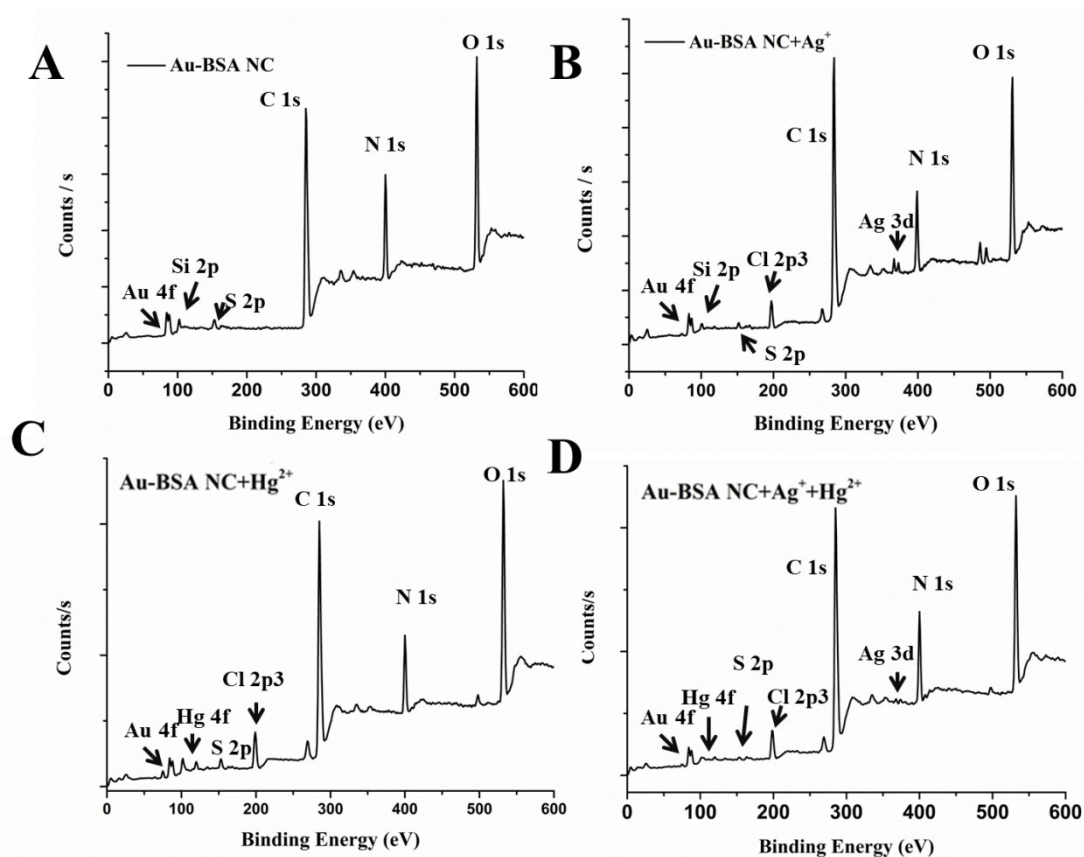
**Figure S2.** TEM images of (A) Au-BSA NCs and (B) Au-BSA NC+Ag<sup>+</sup>. The inset shows the size distribution histogram.



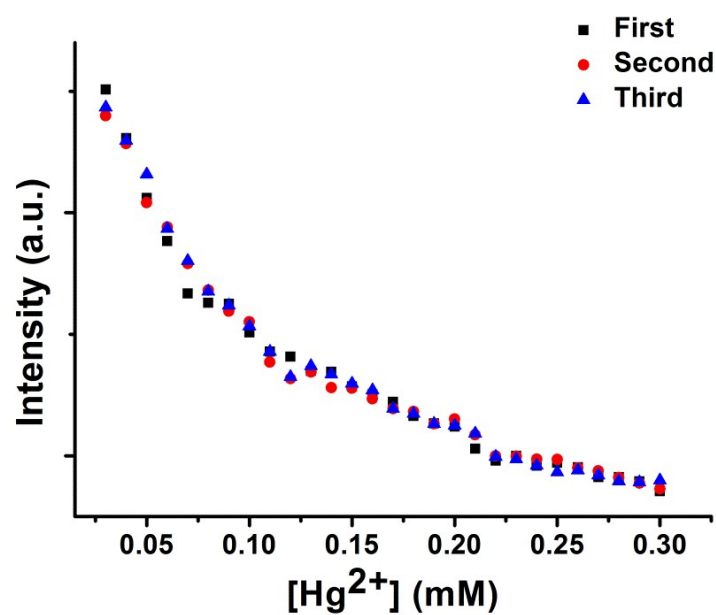
**Figure S3.** The MALDI-MS spectra of BSA molecule (black line) and Au-BSA NC (red line).

**Table S1.** Fluorescence decay parameters of Au NC before and after adding Ag<sup>+</sup>.

	$\tau_1$	$A_1$	$\tau_2$	$A_2$	$\tau_3$	$A_3$	$\langle\tau\rangle$ [ns]
<b>Au-BSA NC</b>	2.99	0.23	0.48	0.70	42.3	0.08	4.29
<b>Au-BSA NC+Ag<sup>+</sup></b>	3.80	0.23	0.59	0.71	57.6	0.06	4.58



**Figure S4.** The main elements for the Au-BSA NC (A), Au-BSA NC+ $\text{Ag}^+$  (B), Au-BSA NC+ $\text{Hg}^{2+}$  (C) and Au-BSA NC+ $\text{Ag}^+$ + $\text{Hg}^{2+}$  (D) after adding  $\text{Hg}^{2+}$  ions.



**Figure S5.** Three group parallel experiments of the luminescence amplification of  $\text{Ag}^+$  on the solution system containing Au-BSA NC and  $\text{Hg}^{2+}$ .