

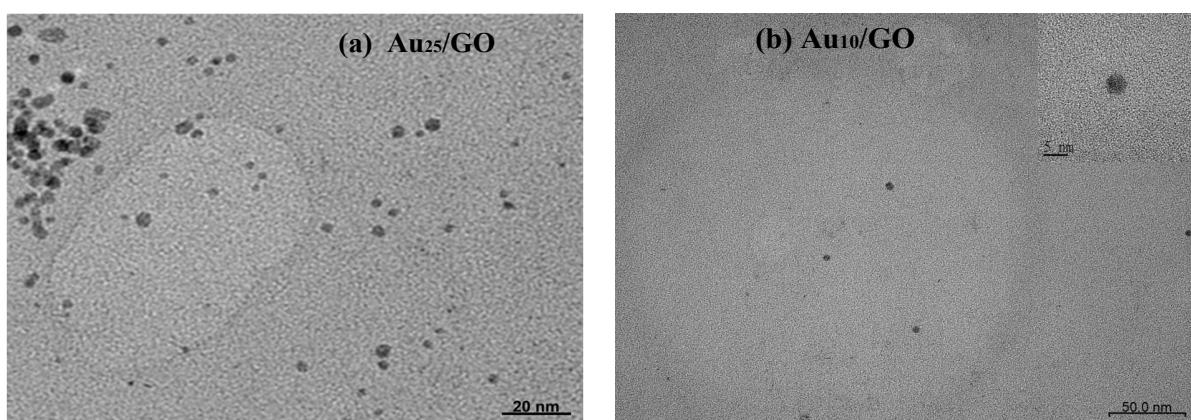
Supporting information for

## Ultrafast Electron Transfer in Nanocomposite of Graphene Oxide/Au Nanocluster with Graphene Oxide As a Donor

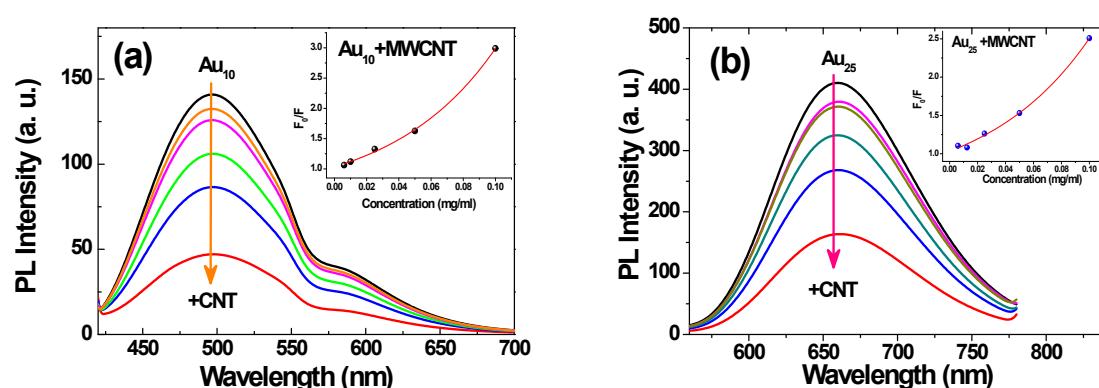
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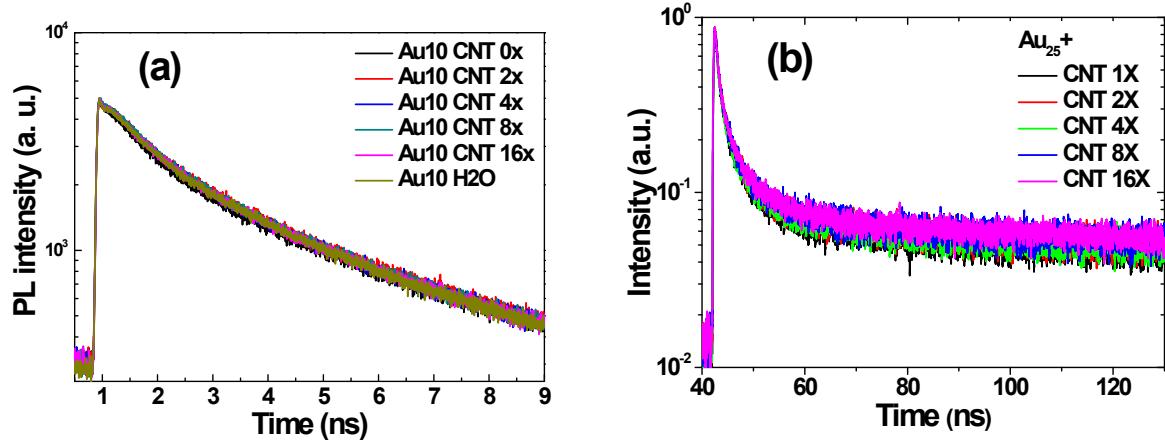
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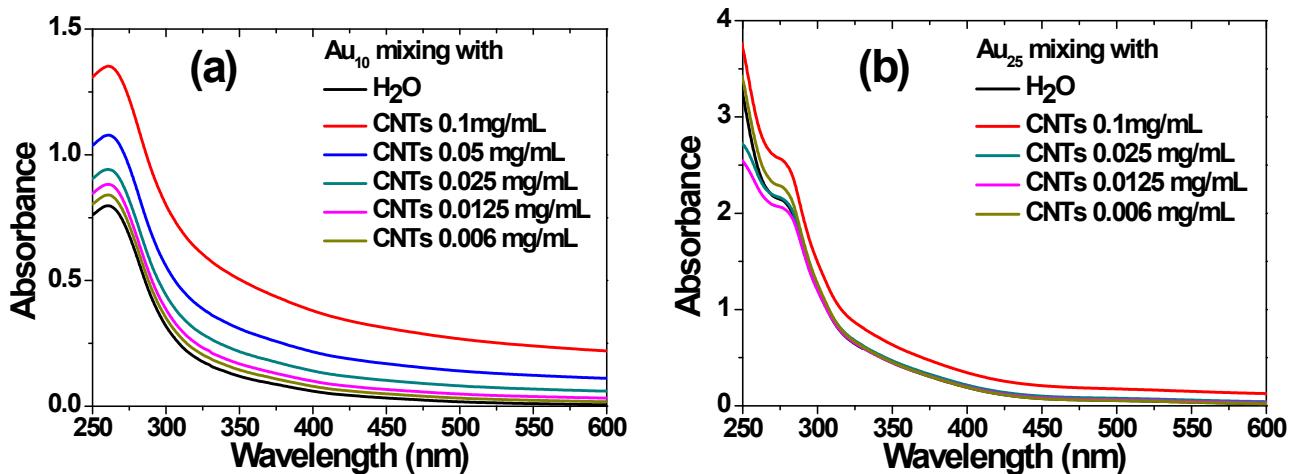
**Figure S1.** TEM images for (a) Au<sub>25</sub> NCs/GO and (b) Au<sub>10</sub> NCs/GO.



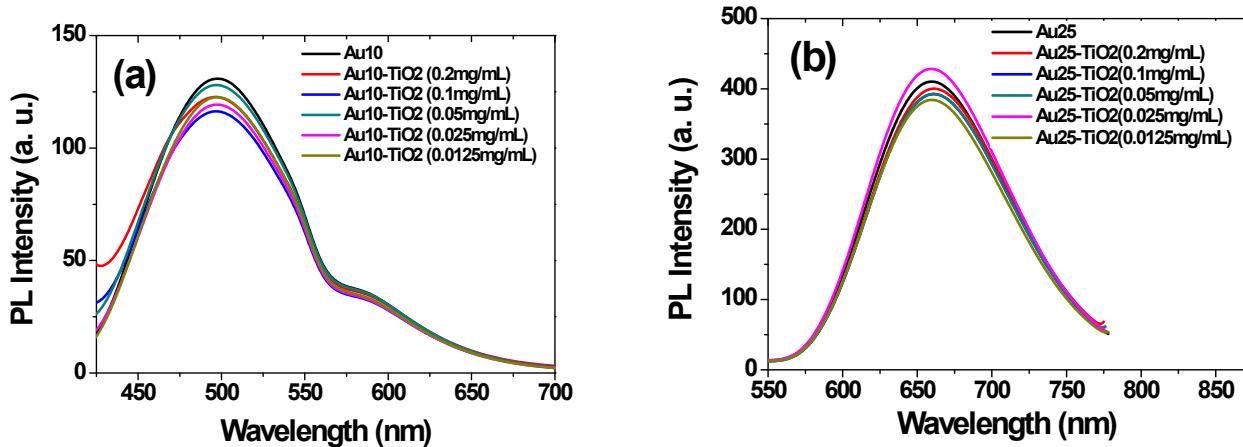
**Figure S2.** The PL spectra of (a) Au<sub>10</sub>NCs and (b) Au<sub>25</sub>NCs mixed with various MWCNT concentrations; inset: the Stern-Volmer plot.



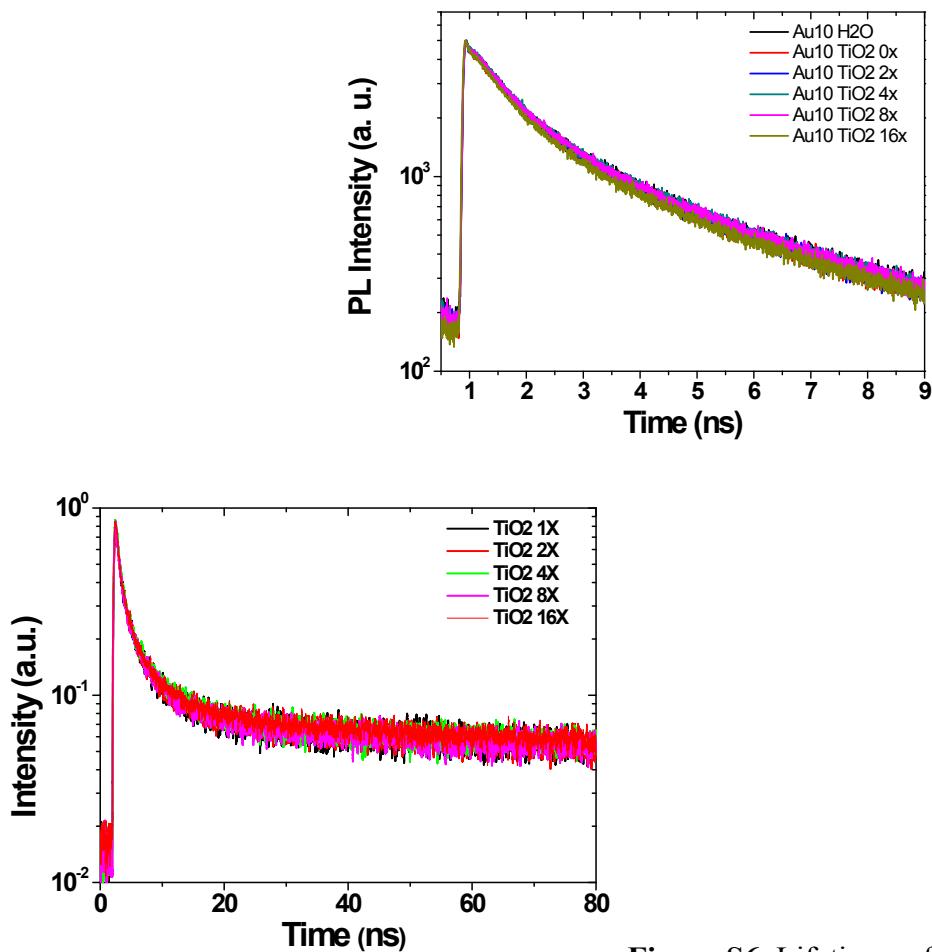
**Figure S3.** PL evolutions of (a)  $\text{Au}_{10}$  NCs and (b)  $\text{Au}_{25}$  NCs with various MWCNT concentrations at 500 and 650 nm measured by TCSPC technique, respectively.



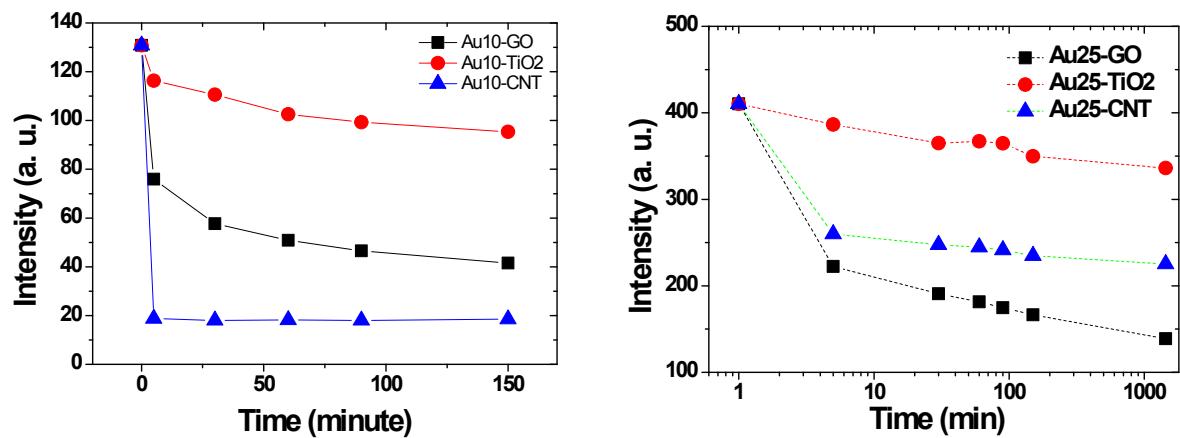
**Figure S4.** Absorption spectra of (a)  $\text{Au}_{10}$ @his and (b)  $\text{Au}_{25}$ @BSA NCs with various concentrations of MWCNT.



**Figure S5.** The PL spectra of (a)  $\text{Au}_{10}$  NCs and (b)  $\text{Au}_{25}$  NCs mixed with various concentrations of  $\text{TiO}_2$  NPs.



**Figure S6.** Lifetimes of (a)  $\text{Au}_{10}$  NCs and (b)  $\text{Au}_{25}$  NCs mixed with  $\text{TiO}_2$  NPs in ns timescale.



**Figure S7** PL quenching of (a) Au<sub>10</sub>@His and (b) Au<sub>25</sub>@BSA NCs by GO, MWCNT and TiO<sub>2</sub> NPs after being incubated with target as a function of time.