

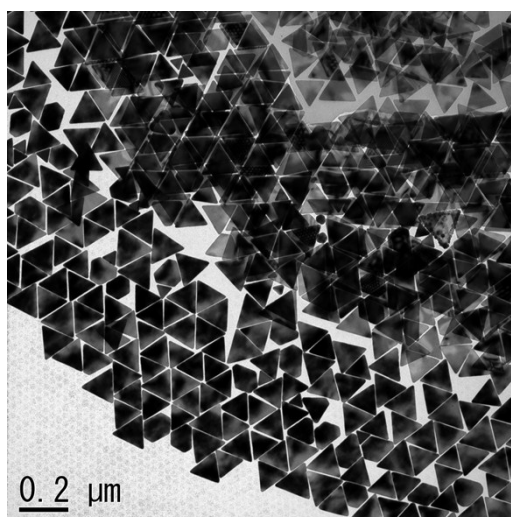
## Supporting Information

### Plasmonic hot electron transfer in anisotropic Pt-Au nanodisks boosting electrochemical reaction in visible-NIR region

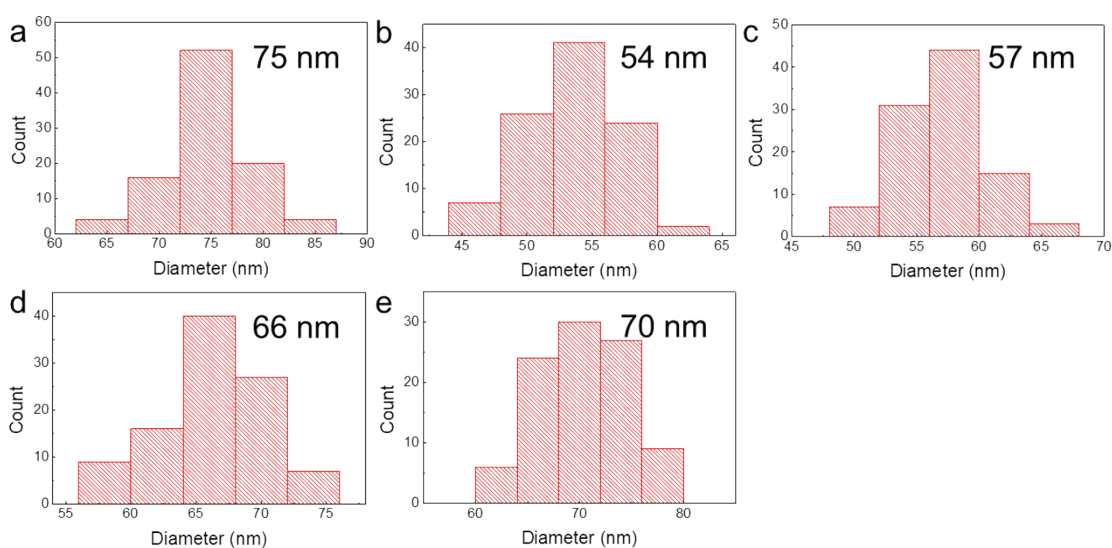
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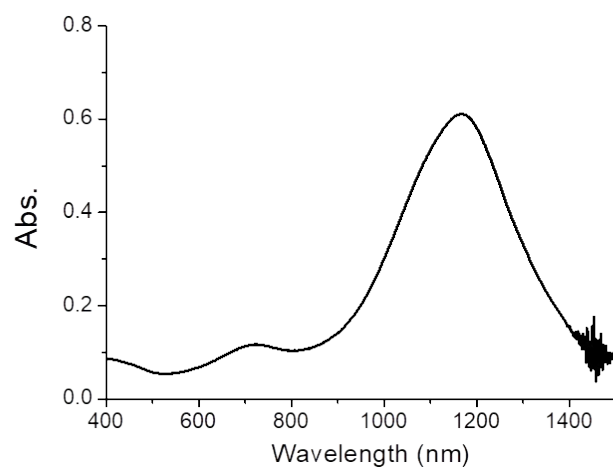
<sup>b</sup>. School of Environment, Jinan University, Xingye Avenue East 855, Guangzhou 511443, China



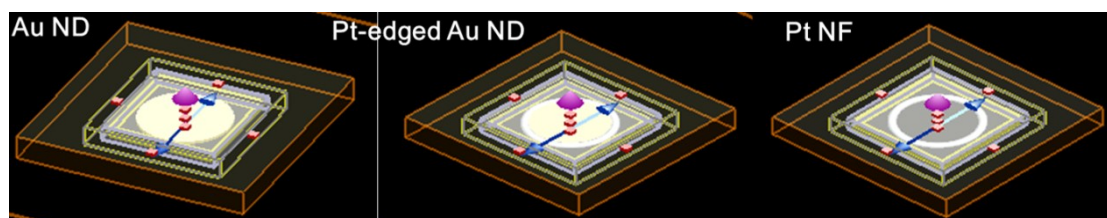
**Fig. S1.** TEM image of Au triangular nanoprisms



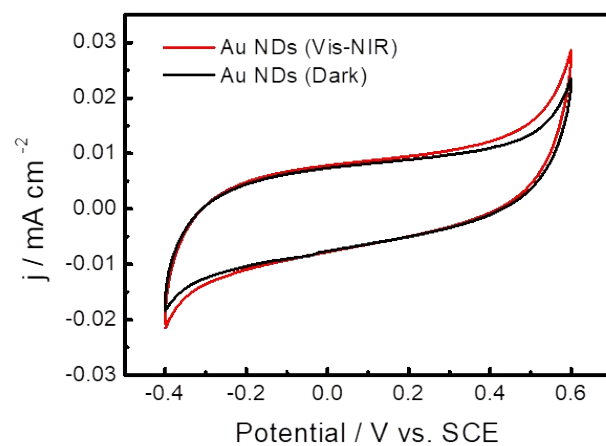
**Fig. S2.** Size distribution diagram of different Au NDs.



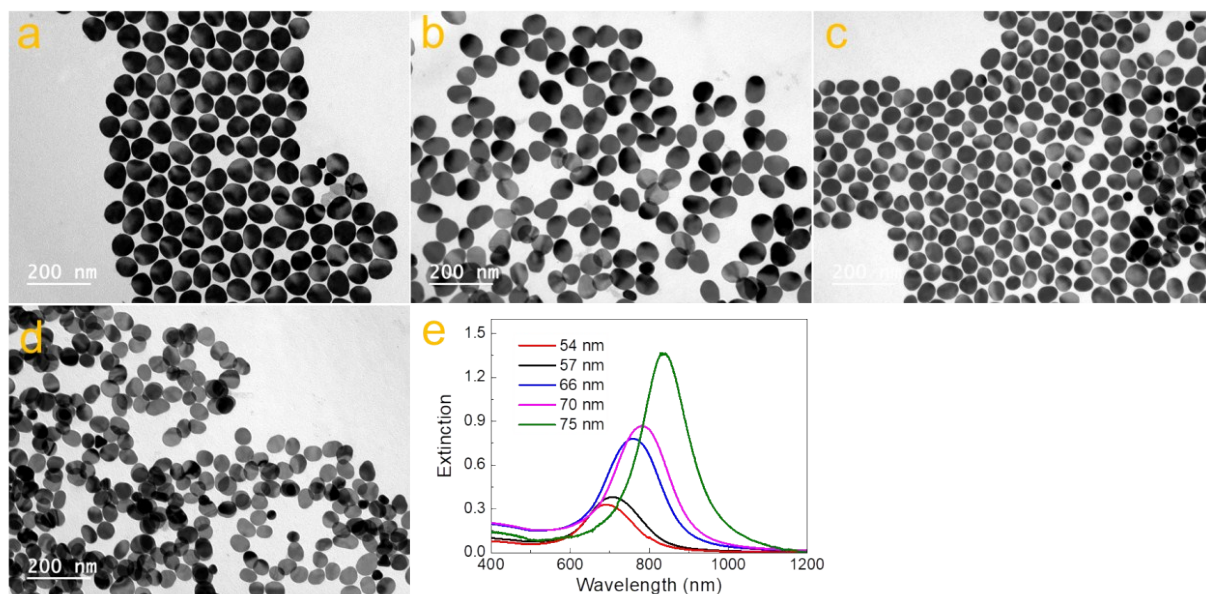
**Fig. S3.** UV-visible extinction spectra of Au triangular nanoprisms.



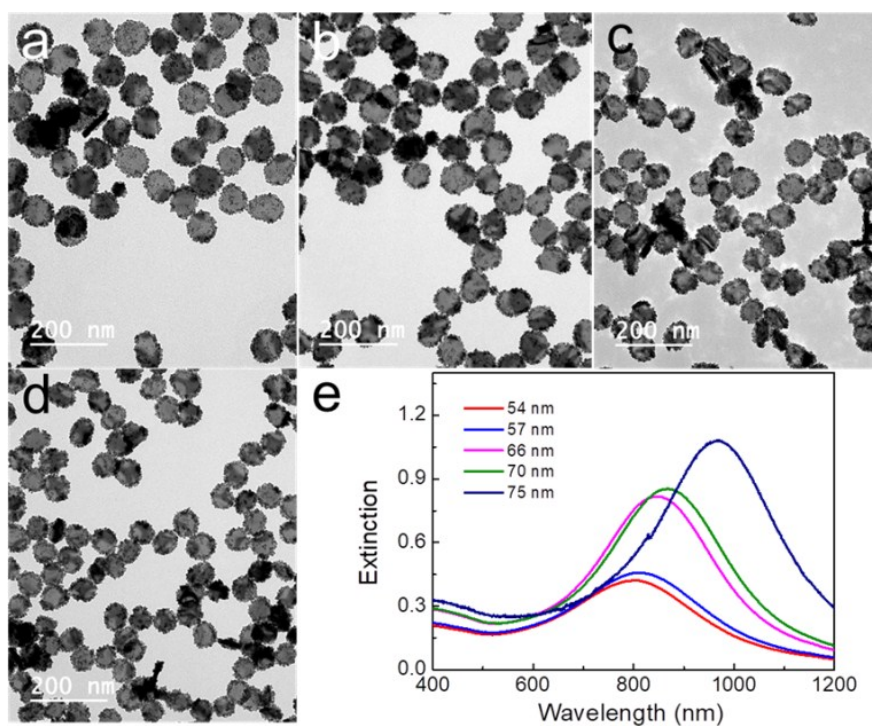
**Fig. S4.** Au ND, Pt-edged Au ND and Pt NF modes for FDTD simulations.



**Fig. S5.** Methanol electrocatalytic oxidization CVs over Au NDs on visible-NIR light and in dark.



**Fig. S6.** TEM images (a-d) of Au NDs with different sizes of 70, 66, 57 and 54 nm, respectively, and their extinction spectra (e).



**Fig. S7.** TEM images (a-d) of Pt-edged Au NDs synthesized by Au NDs with different sizes of 70, 66, 57 and 54 nm, respectively, and their extinction spectra (e).

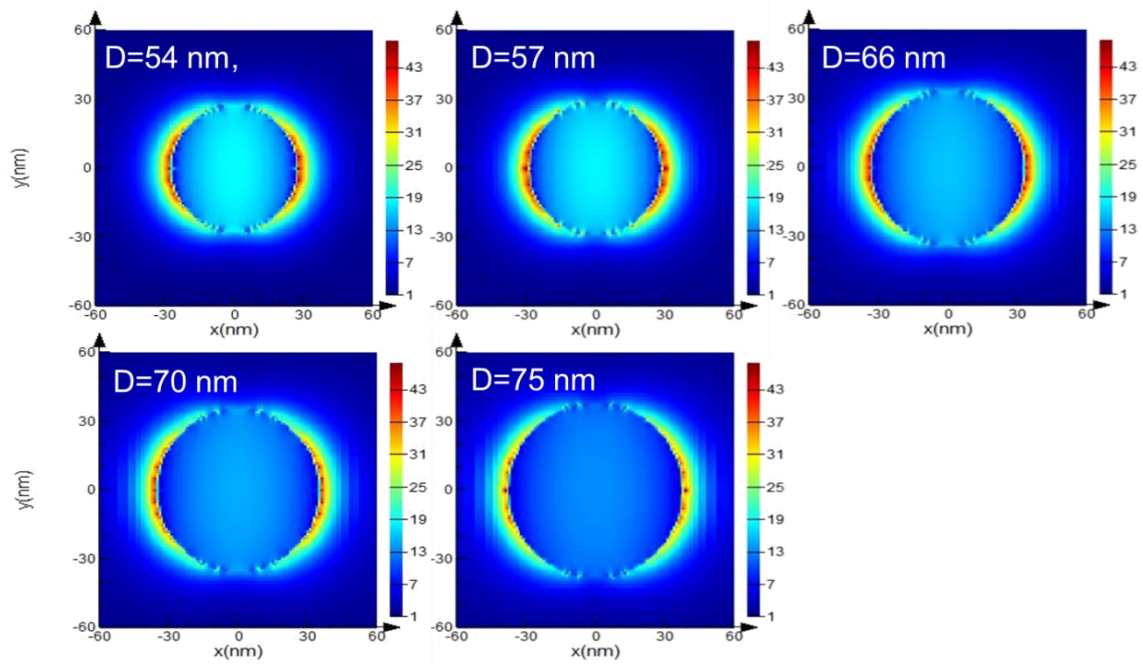


Fig. S8. FDTD simulated plasmon-induced electrical field around Au NDs with different sizes.

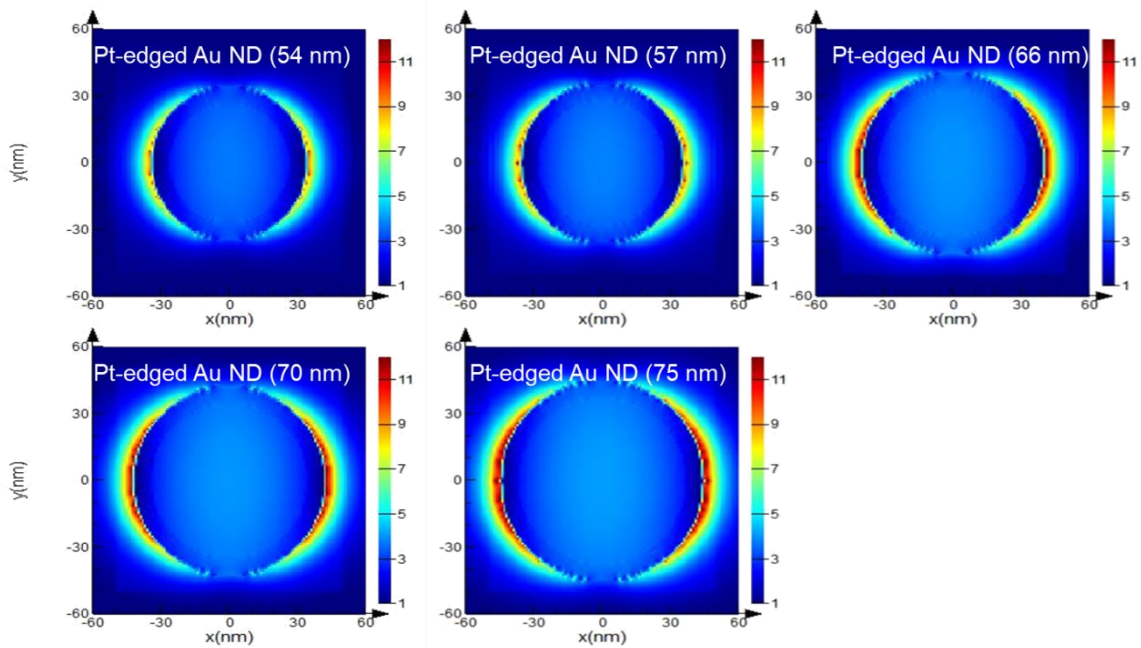
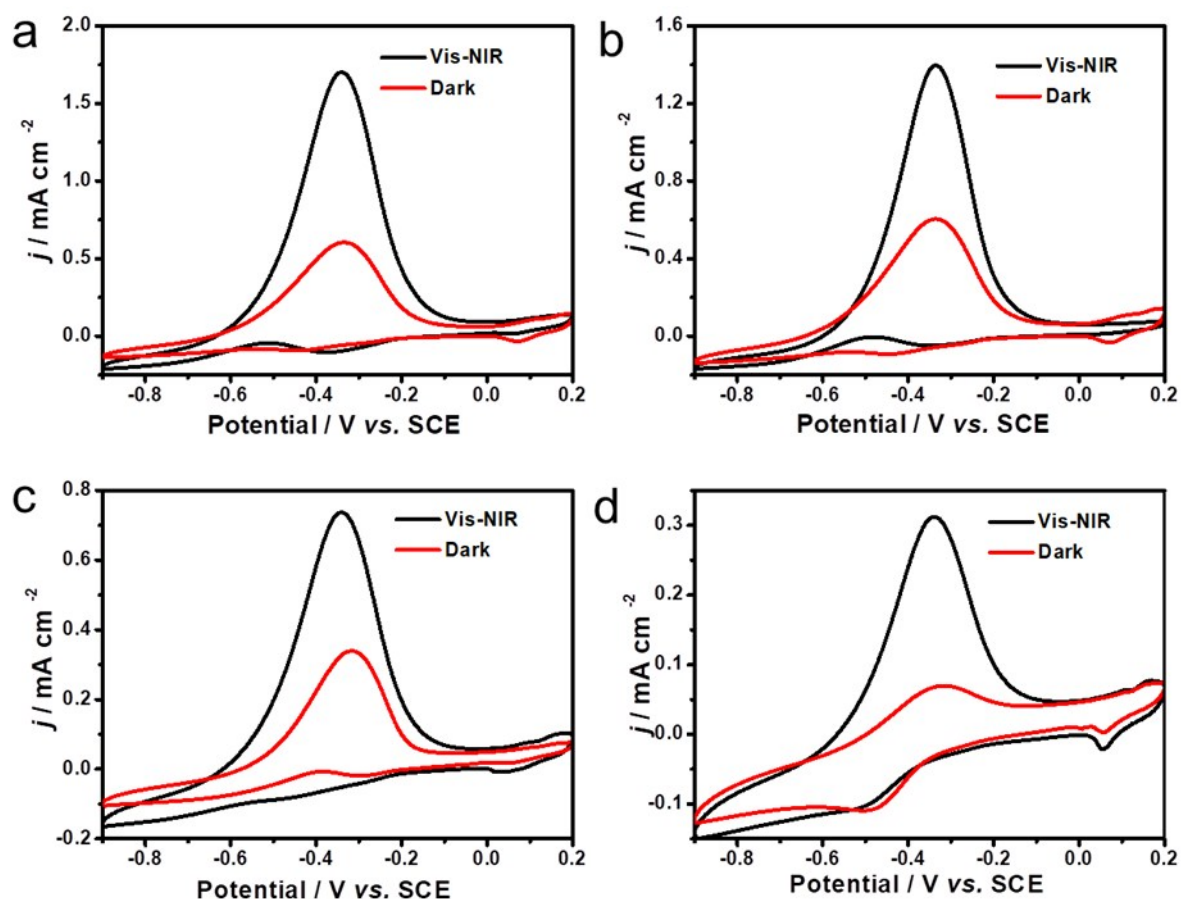
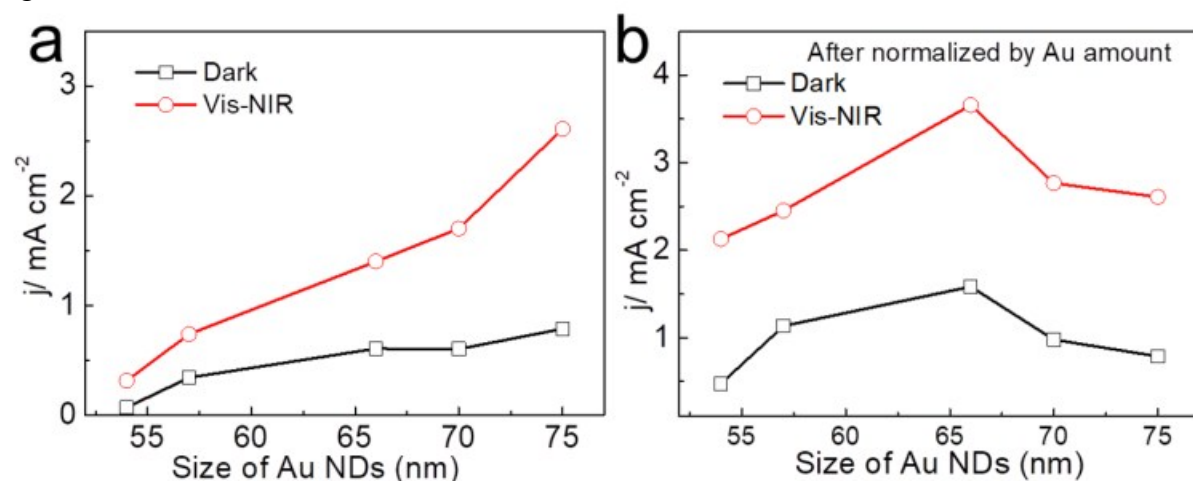


Fig. S9. FDTD simulated plasmon-induced electrical field around Pt-edged Au NDs with different sizes.

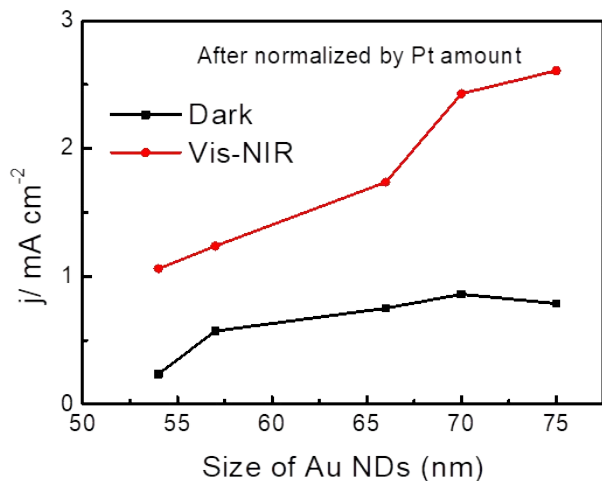




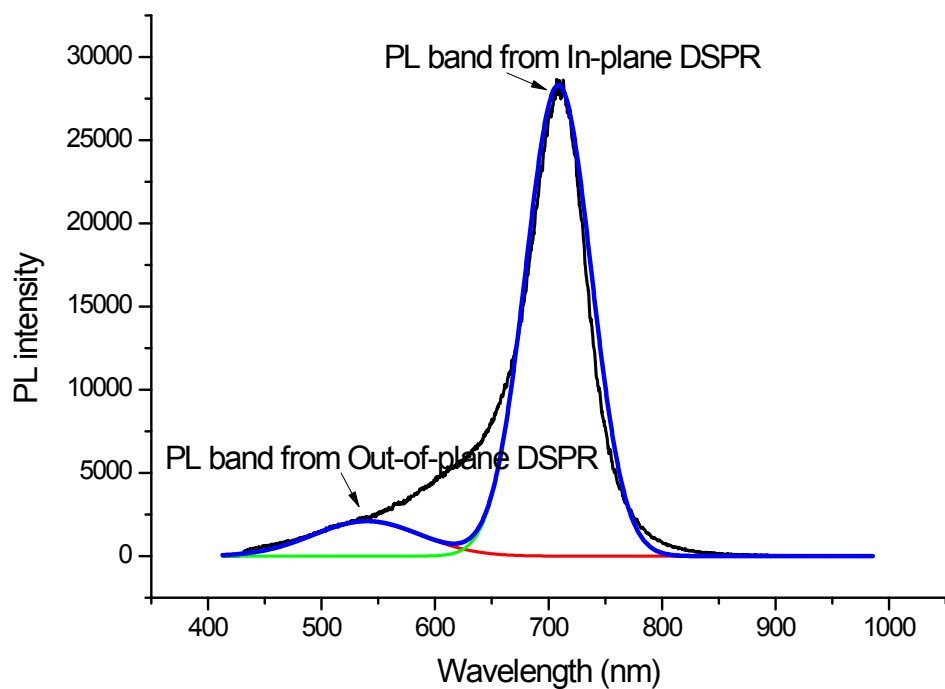
**Fig.S10.** Methanol electrocatalytic oxidation CV over different catalysts of Pt-edged Au NDs with different size 70 (a), 66 (b), 57 (c) and 54 nm (d), respectively, under visible-NIR light and dark condition.



**Fig. S11.** Methanol oxidation CV peak current density (a) and normalized current density (b) over Pt-edged Au NDs synthesized by Au NDs with different sizes of 75, 70, 66, 57 and 54 nm, respectively, under Visible-NIR light and dark.



**Fig. S12.** Methanol oxidization CV peak current density normalized current density over Pt-edged Au NDs synthesized by Au NDs with different sizes of 75, 70 , 66 , 57 and 54 nm, respectively, under Visible-NIR light and dark.



**Fig. S13.** Single-particle PL spectra of Au ND corresponding to number 7 of Fig. 5a