

Supporting Information

Thermal Stability of DNA Functionalized Gold Nanoparticles

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Table S1. DNA sequences used for constructing different DNA-AuNPs.

Probes	sequence	Complementary sequence
SP-1	5 prime- FAM - TTTCTGTCGCGCTTTTT- ThioMC3-D -3 prime	N.A.
SP-2	5 prime- FAM - TTTCTGTCGCGCTTTTT- ThioMC3-D -3 prime	N.A.
SP-3	5 prime- FAM - TTTCTGTCGCGCTTTTT- DTPA -3 prime	N.A.
DP-1	5 prime- FAM - TTTCTGTCGCGCTTTTT- ThioMC3-D -3prime	5 prime- ThioMC6-D -AAA AAG CGC GAC AGA-3 prime
DP-2	5 prime- FAM - TTTCTGTCGCGCTTTTT- DTPA -3 prime	5 prime- ThioMC6-D -AAA AAG CGC GAC AGA-3 prime
DP-3	5 prime- FAM - TTTCTGTCGCGCTTTTT- DTPA -3prime	5 prime- DTPA -AAA AAG CGC GAC AGA-3 prime

FAM: carboxyfluorescein

ThioMC3-D: Thiol Modifier C3 S-S

ThioMC6-D: Thiol Modifier C6 S-S

DTPA: Dithiolphosphoramidite

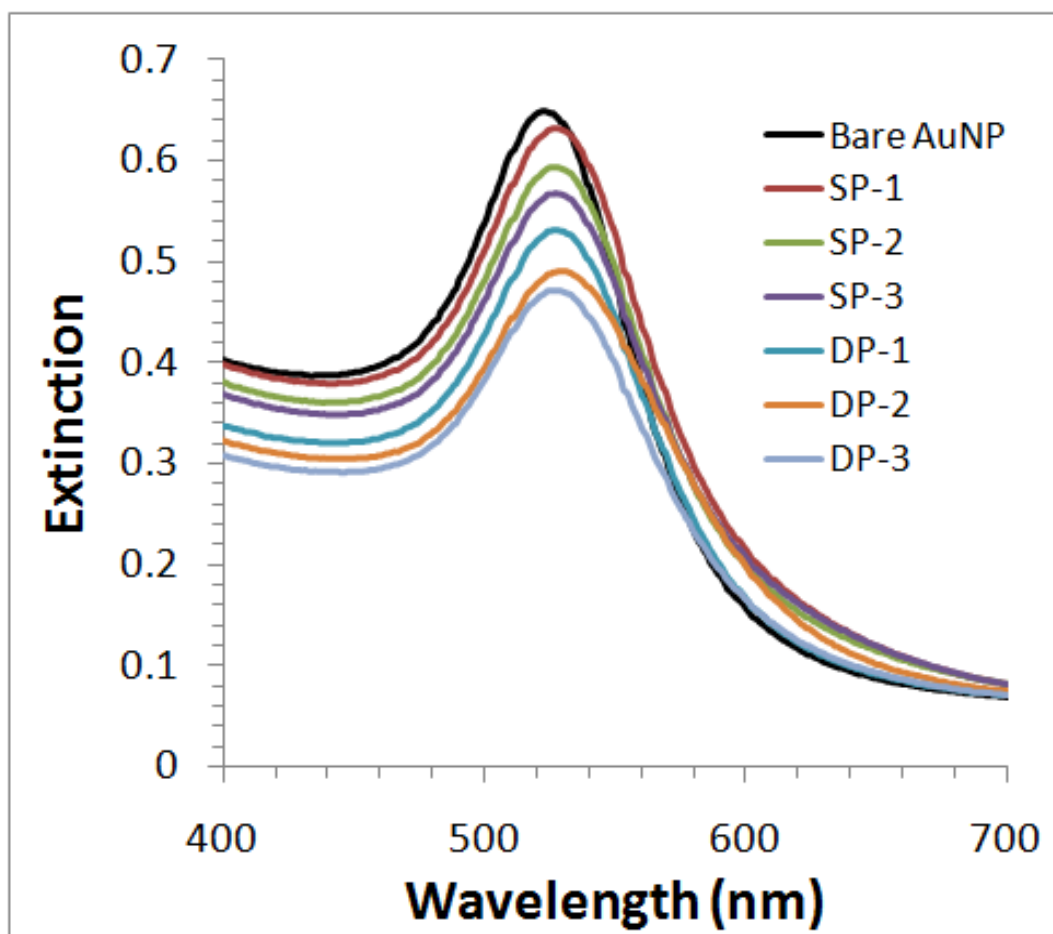


Figure S1. UV/Vis extinction spectra of bare gold nanoparticles (AuNPs) and DNA functionalized AuNPs (DNA-AuNPs). Unmodified AuNPs was dissolved in deionized water, and the solution showed a maximum absorption at 522 nm. The DNA-AuNPs were dissolved in $\frac{1}{2}\times$ PBS buffer containing 0.01% Tween20. A small red shift of 5 nm was observed for all six DNA-AuNPs formed with different thiol anchor groups, indicating successful conjugation of DNA oligonucleotides on AuNPs.¹ No extensive aggregation was observed for any of the DNA-AuNPs. The scanning rate was 120 nm/min and spectra resolution was 1 nm.

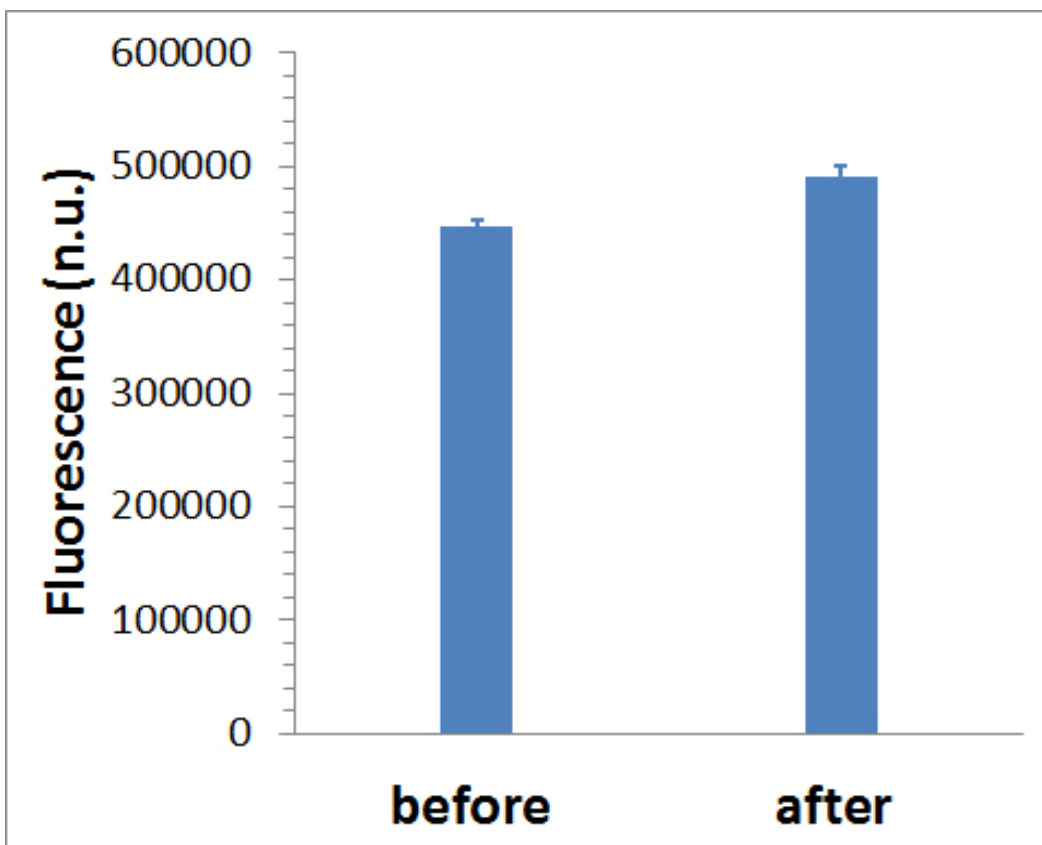


Figure S2. Evaluation of the inner filter effect from DNA-AuNPs. This effect was estimated by measuring fluorescence of the DNA-AuNPs solution before and after centrifugation. FAM-labeled DNA oligonucleotides (200 nM) was spiked to DNA-AuNP solution (1 nM). Half of the mixture was transferred into a 96-well microplate and its fluorescence was measured using a multi-mode microplate reader (**before** centrifugation). The other half was subject to centrifugation at 13,000 rpm for 30 min. The supernatant was then transferred to a 96-well microplate and its fluorescence was measured (**after** centrifugation). The inner filter effect was estimated to be less than 10%. Error bars represent one standard deviation from triplicate sample analyses.

Reference:

- (1) Jain, P. K., Qian, W., and El-Sayed, M. A. (2006) Ultrafast cooling of photoexcited electrons in gold nanoparticle-thiolated DNA conjugates involves the dissociation of the gold-thiol bond, *J. Am. Chem. Soc.* 128, 2426-2433.