

SUPPLEMENTARY DATA

Controlled Assembly of Gold Nanoparticles through Antibody Recognition: Study and Utilizing the Effect of Particle Size on Interparticle Distance

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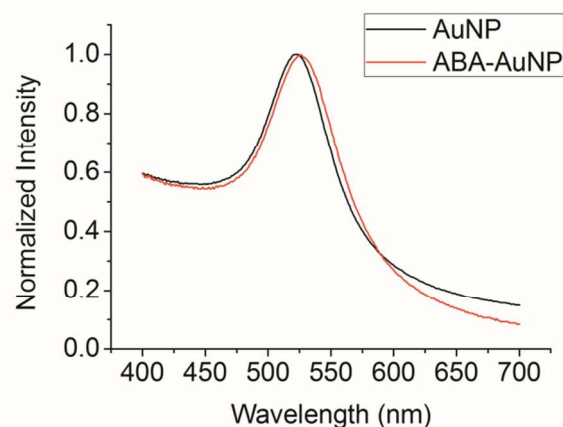


Figure S1. Normalized UV-vis absorbance spectra of AuNP and ABA-functionalized AuNP in size of 30.3 nm. 1 nm red shift of the SPR band was observed after functionalizing with peptide.

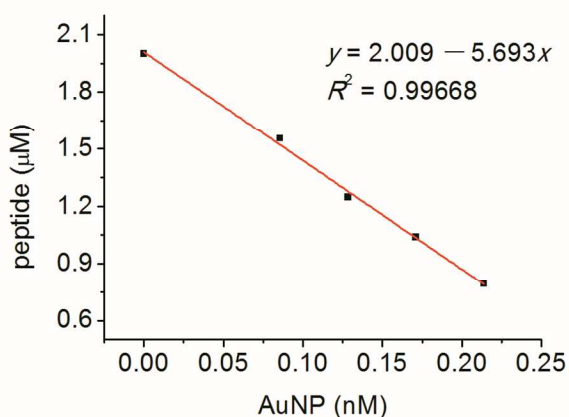


Figure S2. Titration of the CALNN peptide on the surface of 30.3 nm size AuNP with increasing concentration of AuNP.¹ Six solutions with the same 11 μM CALNN concentration but with different concentrations of citrate stabilized AuNP (from 0 to 0.21 nM) were prepared. After one hour, the AuNPs were removed by centrifugation and the concentration of remaining free peptide in solution was measured by the absorbance at 196 nm. The supernatant of citrate stabilized AuNP being centrifuged served as the control in UV absorbance measurement. After linear fitting of the data obtained, a peptide-to-AuNP ratio of 5693 ± 164 peptides/particle (1.9 peptides/ nm^2) was obtained.

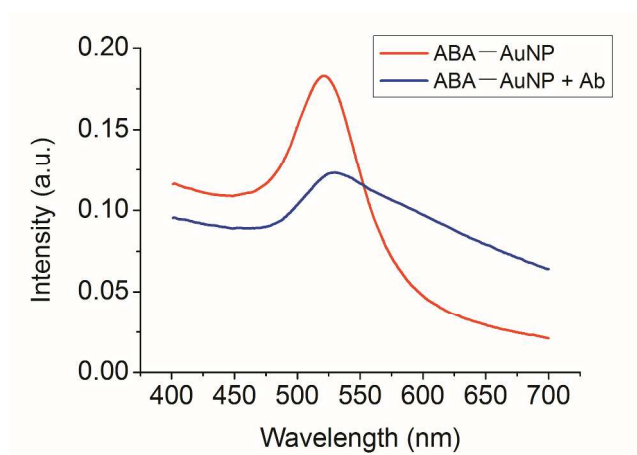


Figure S3. UV-vis absorbance spectra of ABA-AuNPs in the absence and presence of antibody. With the addition of antibody, the absorption of ABA-AuNPs at the SPR band was decreased, while the absorption at long wavelength was raised.

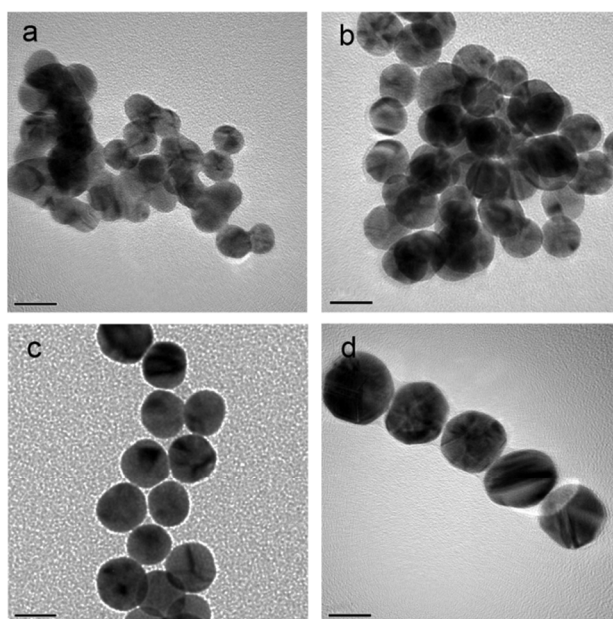


Figure S4. Transmission electron microscope images of AuNPs in sizes of a) 14.1 nm, b) 20.3 nm, c) 24.3 nm and d) 30.3 nm, respectively. The scale bars in images are 20 nm.

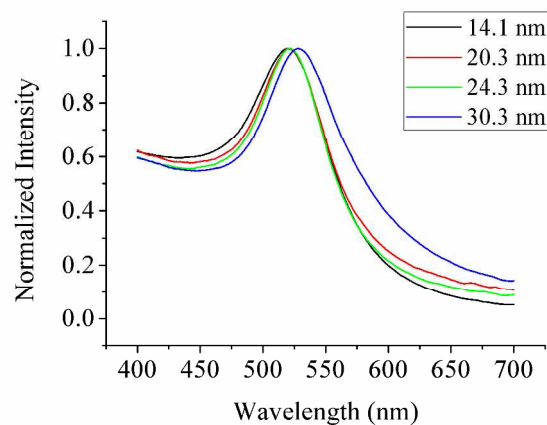


Figure S5. Normalized UV-vis absorbance spectra of AuNPs in different sizes. The SPR band of AuNPs red shifts with the increase of AuNPs size.

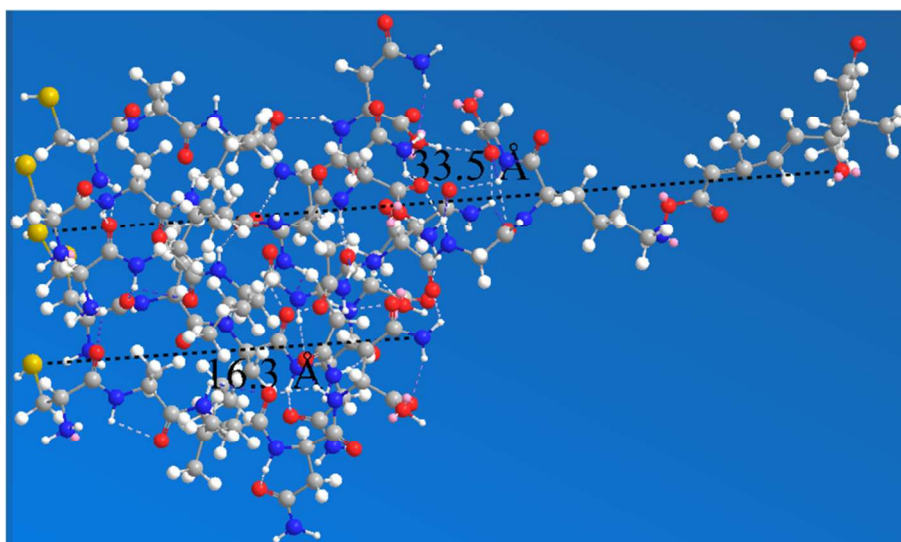


Figure S6. Ball-stick model of assembled peptide ligands. CALNNGK_(ABA)G was surrounded by CALNN to simulate the environment on the surface of AuNPs. The length of CALNN and CALNNGK_(ABA)G were measured to be ≈ 1.6 nm and ≈ 3.4 nm, respectively, after running MM2 minimization.

Reference for the Supplementary Information:

(1) Lévy, R.; Thanh, N. T. K.; Doty, R. C.; Hussain, I.; Nichols, R. J.; Schiffrin, D. J.; Brust, M.; Fernig, D. G., Rational and Combinatorial Design of Peptide Capping Ligands for Gold Nanoparticles. *J. Am. Chem. Soc.* **2004**, 126, (32), 10076-10084.