

Electronic Supplementary Information

One-Step Seeded Growth of Monodisperse, Quasi-Spherical, Tris-Stabilized Gold Nanocrystals with Sizes from 17 to 325 nm

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Fig. S1 Histograms of the size distribution of the Au NCs obtained by seeded growth. The NC diameters are measured from the TEM images (200 particles) shown in Fig. 1. The average diameters of the NCs are 40 nm (a), 51 nm (b), 69 nm (c), 87 nm (d), 107 nm (e), 147 nm (f), 183 nm (g), 242 nm (h), and 325 nm (i), respectively.

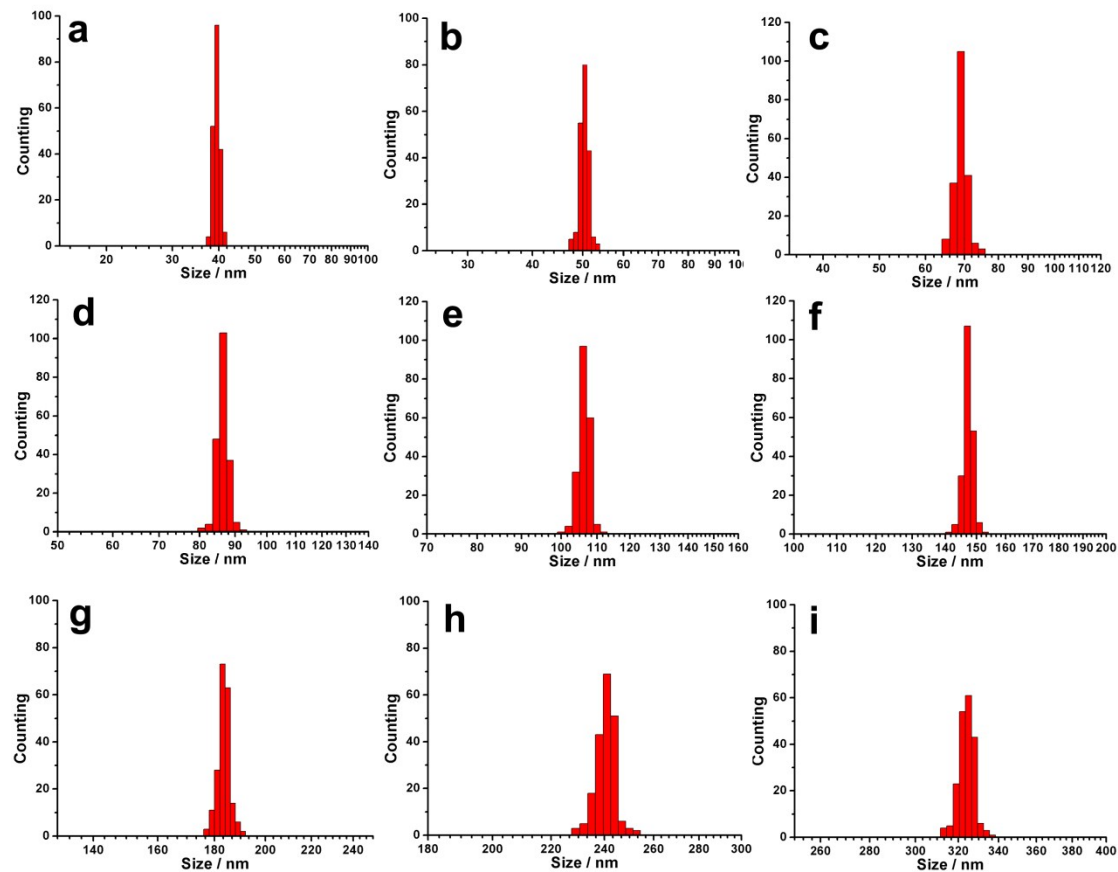


Fig. S2 Digital photos of dispersion solutions of Au NCs with sizes of: 17 nm (a), 40 nm (b), 51 nm (c), 69 nm (d), 87 nm (e), 107 nm (f), 147 nm (g), 183 nm (h), 242 nm (i), and 325 nm (j), respectively.

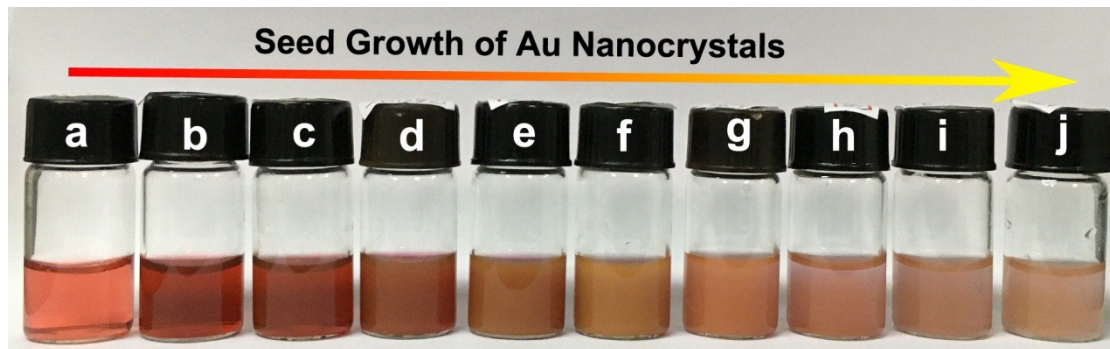


Fig. S3 Relationship between the size of Au NCs and the volume of Au seeds solution.

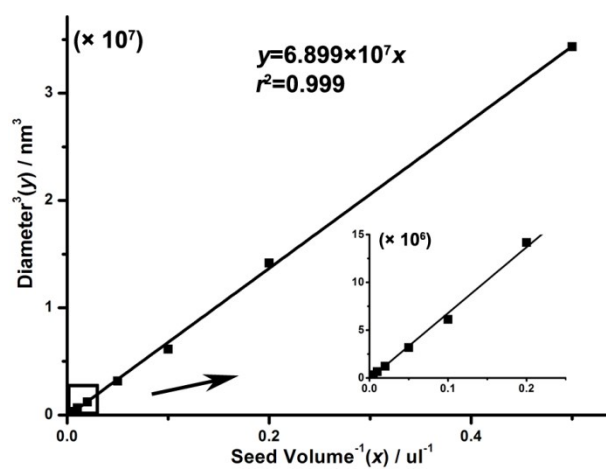


Fig. S4 TEM images (a-d) and extinction spectra (e) of Au NCs prepared with different H_2O_2 concentrations: 0.02 M (a), 0.20 M (b), 0.40 M (c), and 2.00 M (d). The concentrations of TB and $H AuCl_4$ are 2.5 mM and 0.625 mM, respectively. The volumes of added 17 nm Au seeds are 100 μL . The scale bars are 200 nm.

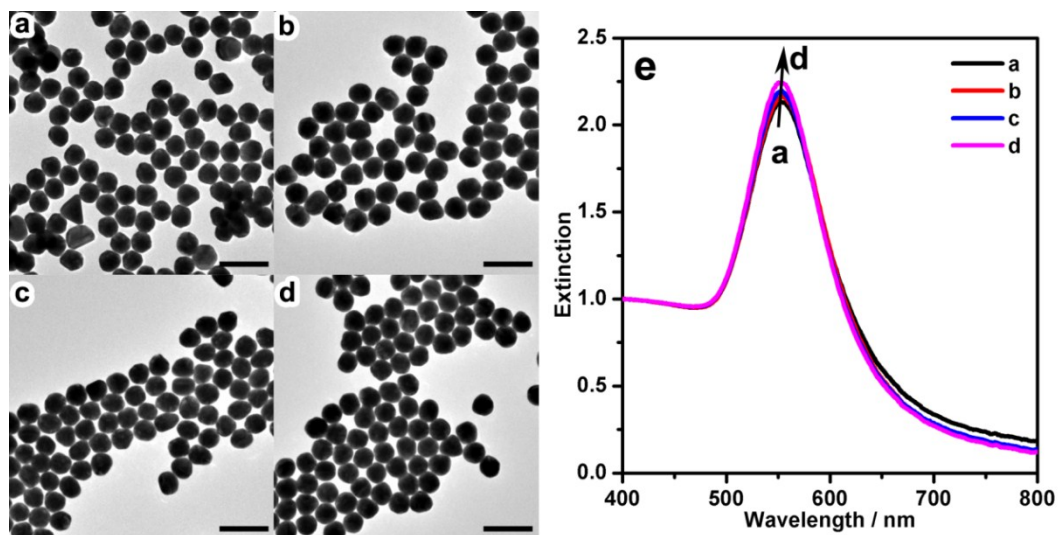


Fig. S5 TEM images (a-d) and extinction spectra (e) of Au NCs prepared with different citrate concentrations: 0 mM (a), 42.5 mM (b), 85 mM (c), and 170 mM (d). The concentrations of TB, H_{AuCl₄}, and H₂O₂ are 2.5 mM, 0.625 mM, and 200 mM, respectively. The volumes of added 17 nm Au seeds are 100 μ L. The scale bars are 200 nm.

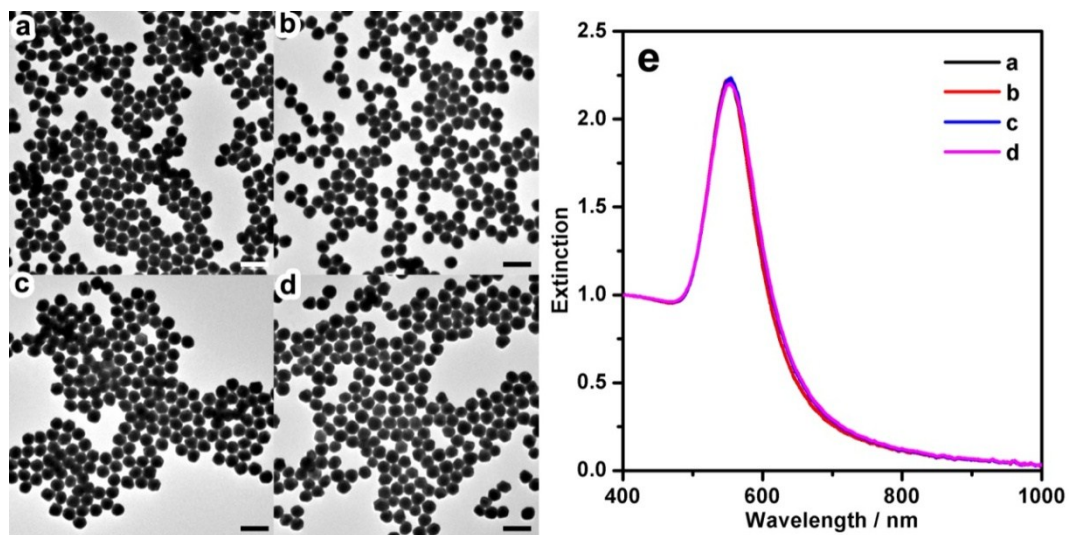


Fig. S6 Plots of the intensities of SPR absorption maxima of the resulting Au NCs vs reaction time during seeded growth of 87 nm Au NCs in the presence of Au seeds. The volume of added 17 nm Au seeds is 100 μ L.

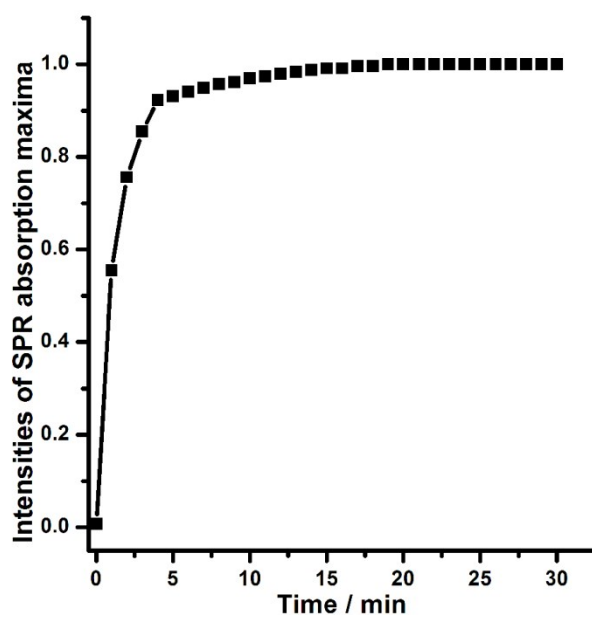


Fig. S7 TEM image (A) of Au NCs prepared in large scale. The extinction spectra (B) of Au NCs shown in A (a) and Au NCs shown in Fig. 1e (b).

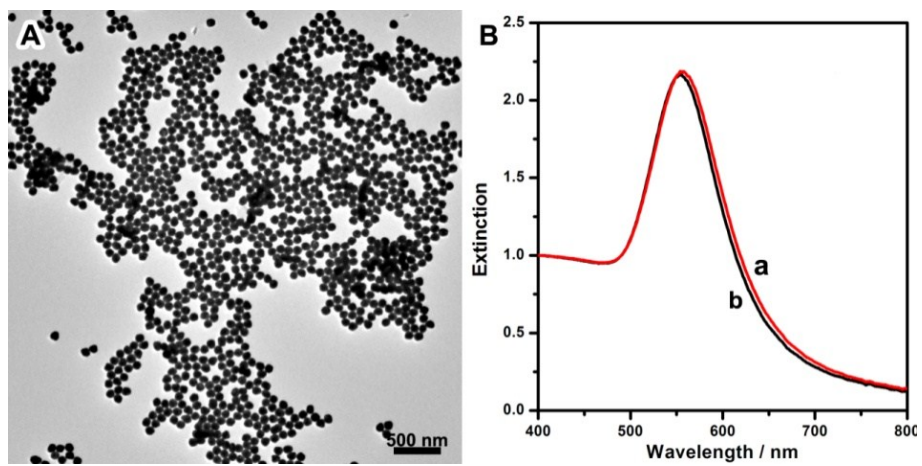


Fig. S8 Normal Raman spectrum of the neat film of 4-ATP molecule and SERS spectra of 4-ATP molecules adsorbed on the films of Au NCs of different sizes on glass substrates at the excitation wavelength of 638 nm.

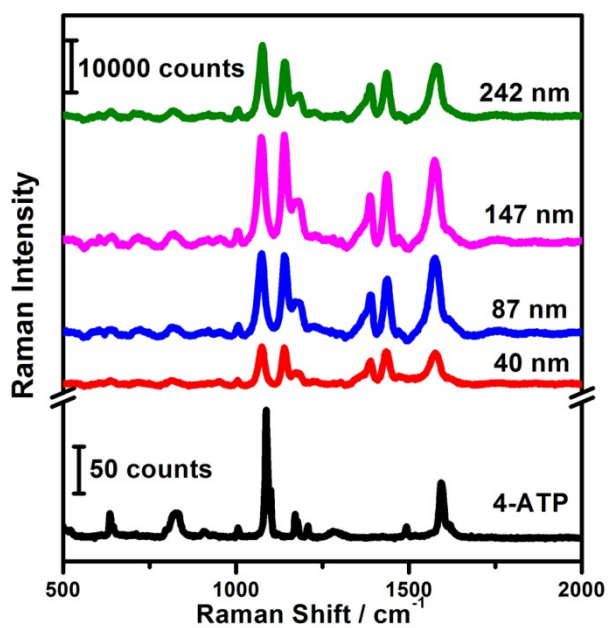


Fig. S9 Normal Raman spectrum of the neat film of flusilazole molecule and SERS spectra of flusilazole molecules adsorbed on the films of Au NCs of different sizes on glass substrates at the excitation wavelength of 638 nm.

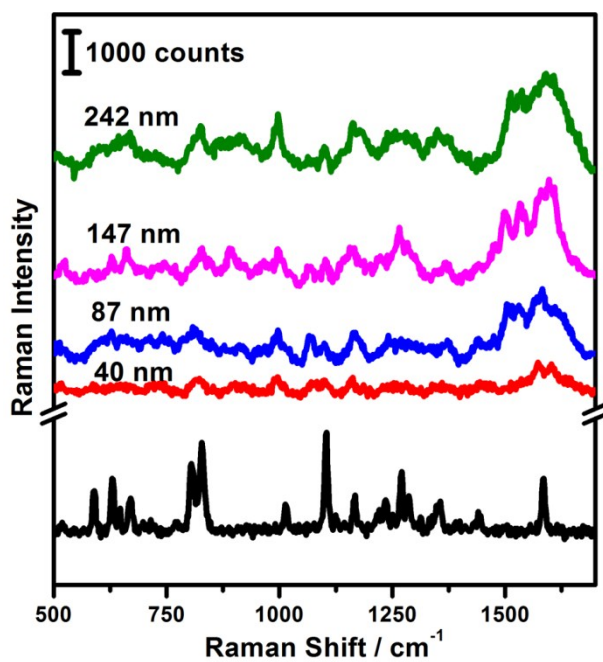


Table S1. Summary of the sizes and ellipticities of the Au NCs shown in Fig. 1 and the measured and calculated positions of their SPR bands.

Sample image	Fig. 1b	Fig. 1c	Fig. 1d	Fig. 1e	Fig. 1f	Fig. 1g	Fig. 1h	Fig. 1i	Fig. 1j
Diameter (D) / nm	40	51	69	87	107	147	183	242	325
Deviation ^a	5.5 %	5.8 %	6.5 %	6.9 %	7.5 %	9.7 %	9.7 %	10 %	10 %
Ellipticity ^b	1.05	1.05	1.07	1.08	1.10	1.10	1.11	1.11	1.12
Calculated D / nm	42	51	70	87	109	148	187	235	319
SPR mode	dipo. ^c	dipo.	dipo.	dipo.	dipo.	dipo. quadru. ^d	dipo. quadru.	dipo. quadru.	dipo. quadru.
Mie ^e / nm	525	531	543	557	582	635 546	723 552	- 593	696 573
EXP ^f / nm	524	530	542	557	580	640 542	738 566	- 596	685 569

^a Standard deviation of the Au NC diameter.

^b Ellipticity is estimated as the ratio of the major to minor axes.

^c Abbreviation of dipolar mode (nm).

^d Abbreviation of quadrupolar mode (nm).

^e SPR band positions calculated by using Mie theory.

^f SPR band positions measured by UV– vis spectroscopy