Supporting Information for

Photochemical strategies for the seed-mediated growth of gold and gold-silver nanoparticles

by

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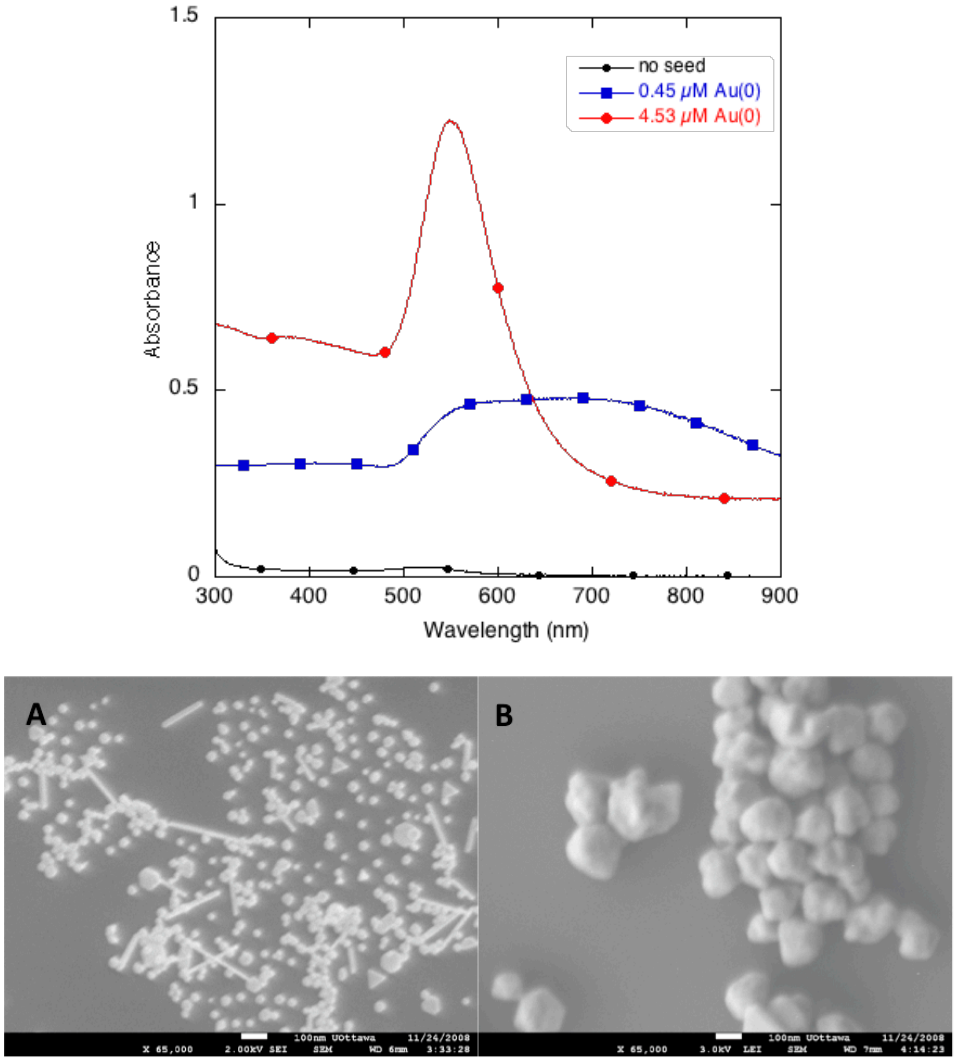

Figure S1. Absorption spectrum of AuNP prepared from NH_2OH-HCl seeding at different concentrations of seed particle added to a growth solution containing 0.25 mM $HAuCl_4$ and 0.4 mM NH_2OH-HCl. SEM images of AuNP prepared via thermal seeding, as illustrated in the corresponding UV-VIS spectra. Images reflect samples prepared from seed concentrations (expressed in atoms of gold) of 4.53 μM Au^0 (A) and 0.45 μM Au^0 (B). Scale bars each represent 100 nm.

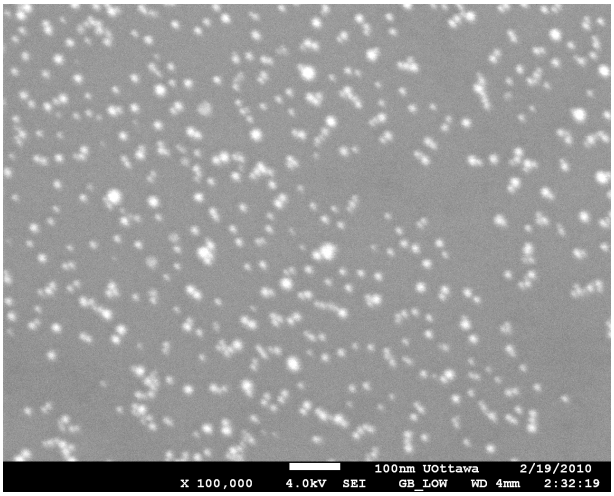

Figure S2 – SEM image of AuNP prepared from 15 minute UVA photolysis of 0.33 mM $HAuCl_4$ and 1.90 mM I-2959. These photochemically generated AuNP were used as seeds for further photochemical growth.

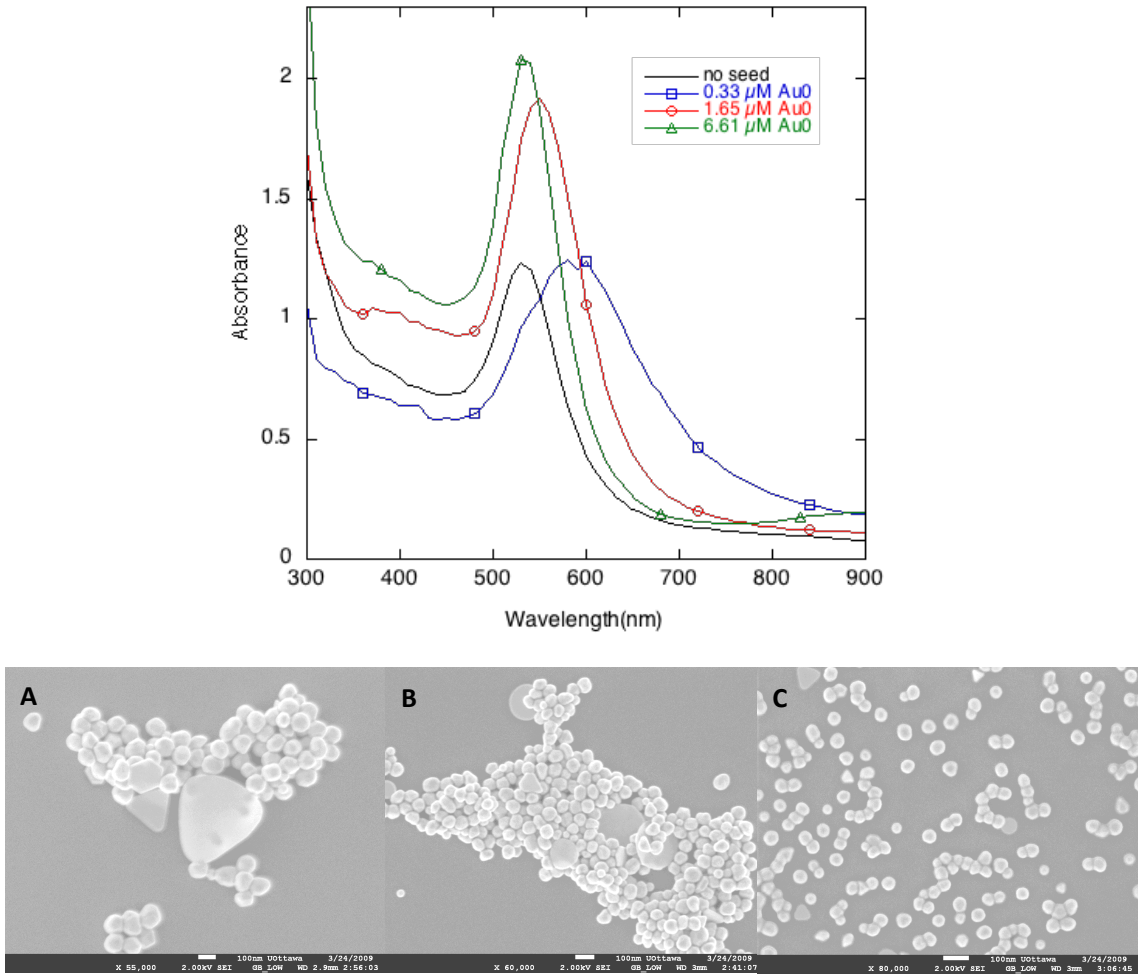

Figure S3 - Absorption spectrum of AuNP prepared from I-2959 seeding at different concentrations of seed particle added to a growth solution containing 0.25 mM $HAuCl_4$ and 0.4 mM I-2959 followed by 30 minutes photolysis. SEM Images reflect samples prepared from seed concentrations (expressed in atoms of gold) of 6.61 μM Au^0 (A), 1.65 μM Au^0 (B) and 0.33 μM Au^0 (C). Scale bars all represent 100 nm.

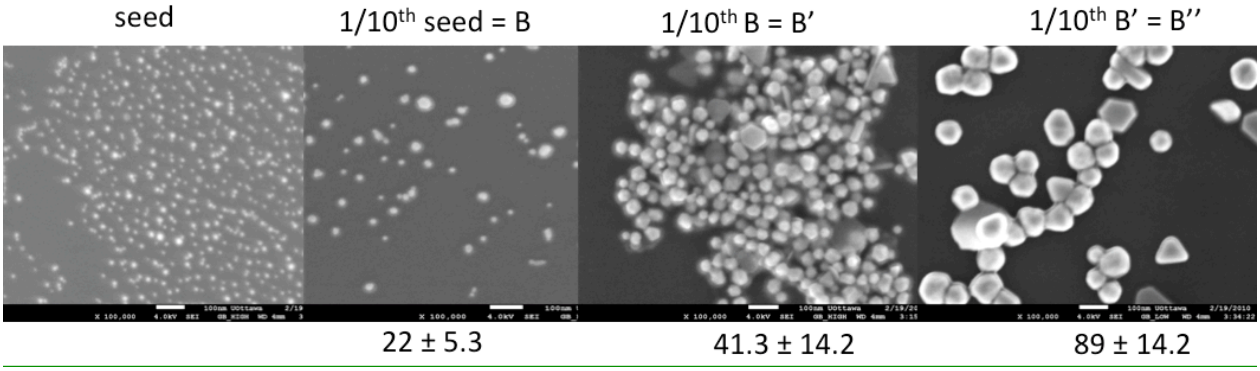

Figure S4 – SEM images of AuNP prepared from subsequent seeded growth following the I-2959 method and protocol B. 1/10th vol. AuNP seed is added to 9/10th volume growth solution containing 0.5 mM $HAuCl_4$ and 0.25 mM I-2959. Scale bars represent 100 nm.

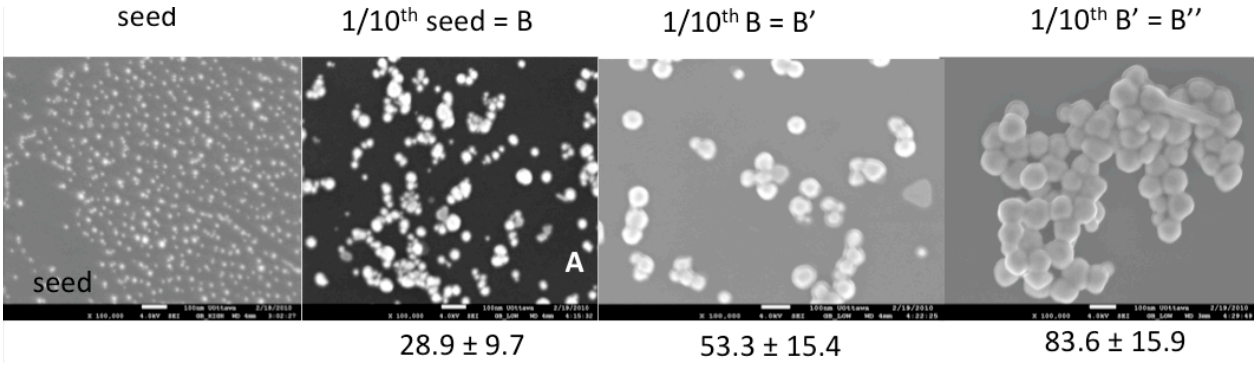

Figure S5 – SEM images of AuNP prepared from subsequent seeded growth following the H_2O_2 method and protocol B. 1/10th vol. AuNP seed is added to 9/10th volume growth solution containing 0.5 mM $HAuCl_4$ and 0.5 mM H_2O_2. Scale bars represent 100 nm.

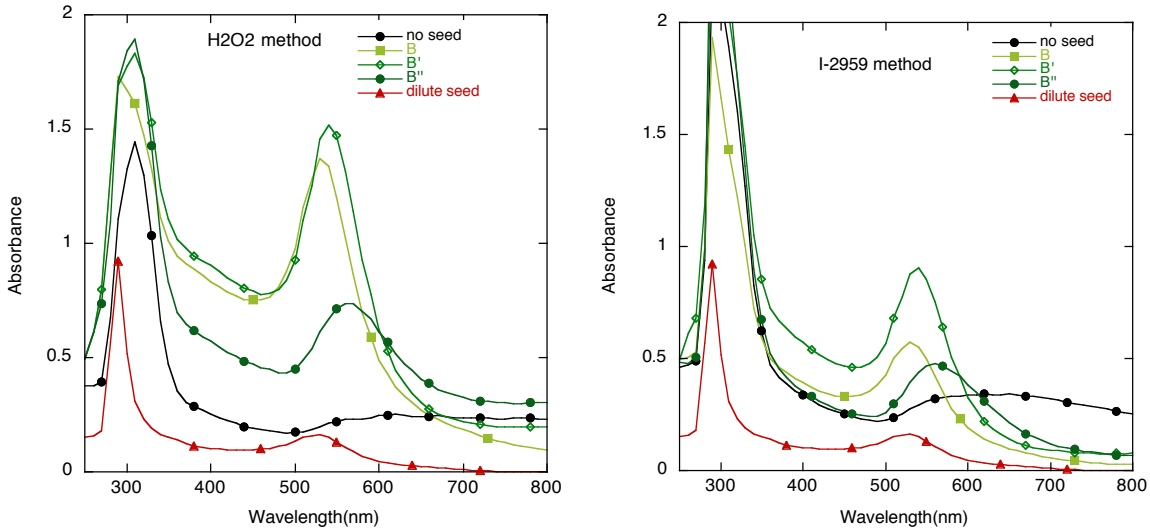

Figure S6. UV-Vis absorbance of seeded AuNP following protocol B following the H_2O_2 method (left) and the I-2959 method (right). Significant abs at 300 nm is observed in all seeding solutions, relative to the traces of the thermal approach of Figure S3.

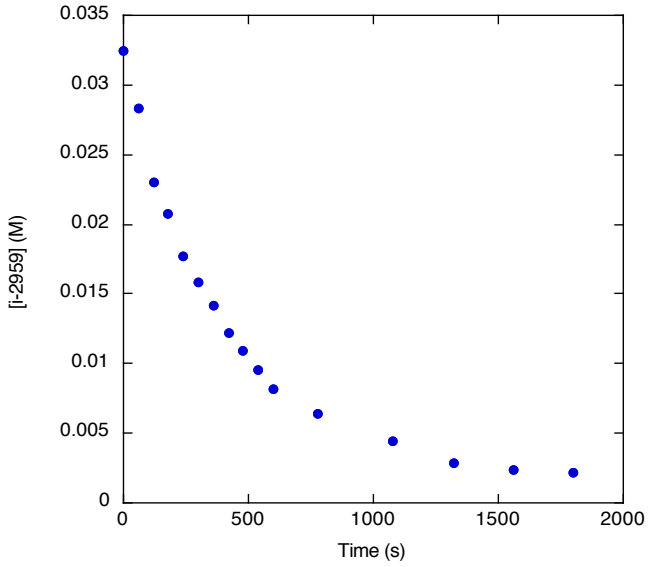

Figure S7. UV-Absorption at 272 nm vs time for the decay of I-2959. A 6.0 mM I-2959 solution in acetonitrile was photolyzed with 35.9 W/m^2 UVA for 30 minutes, and aliquots were taken out periodically for analysis by HPLC. All samples were then analyzed by HPLC.

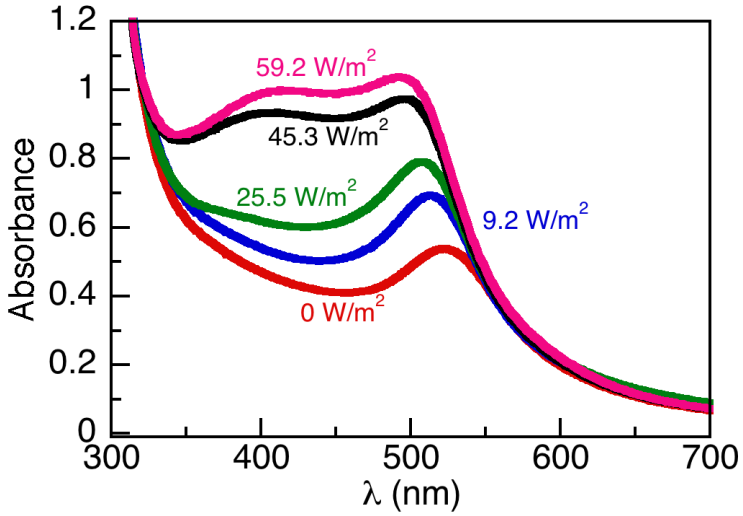

Figure S8. UV absorption spectra of 50:50 Au/Ag core shell after 2 min irradiation at different light irradiances.

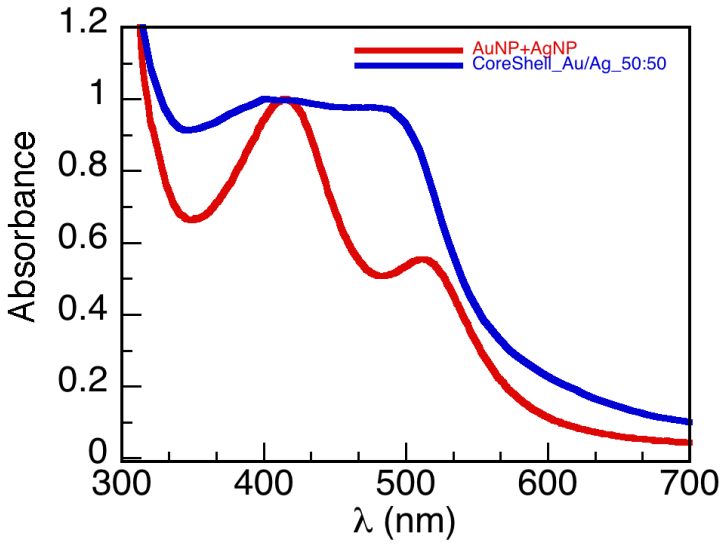

Figure S9. Normalized UV absorption spectra of 50:50 Au/Ag core shell (blue trace) and the mixture of AuNP and AgNP (red trace).