Electronic Supplementary Information for

Controlled Overgrowth of Pd on Au Nanorods

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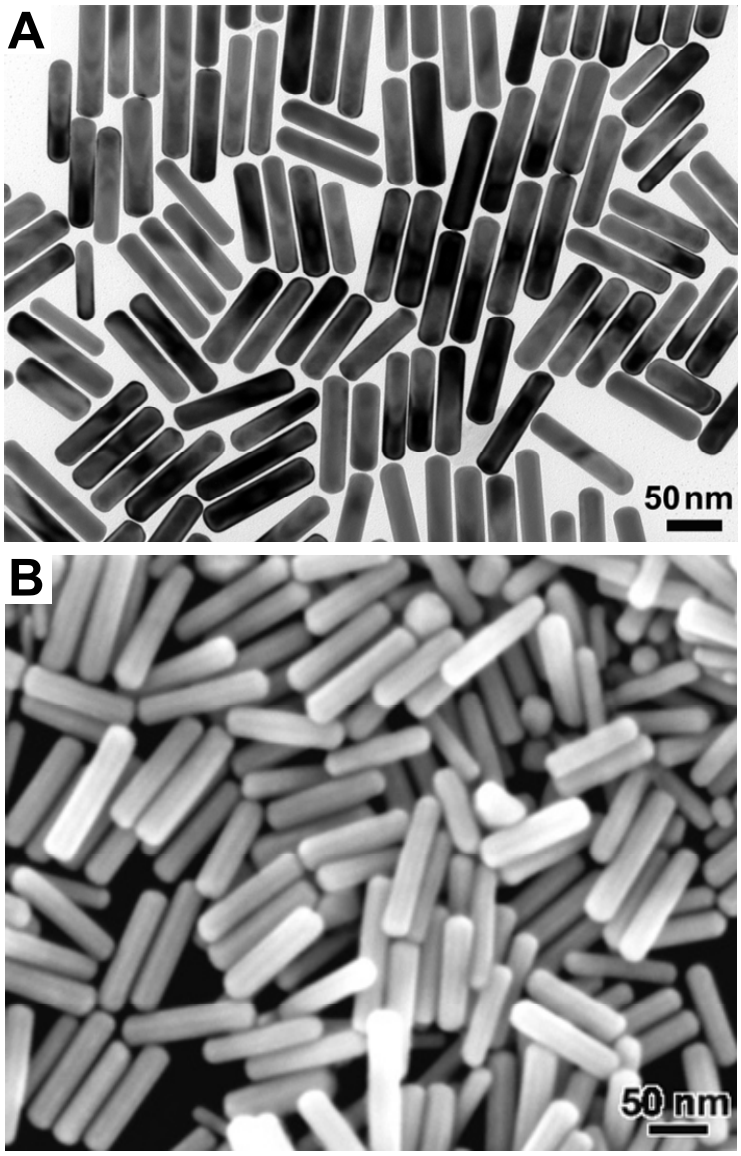

Figure S1. (A) TEM and (B) SEM images of cylindrical Au nanorods.

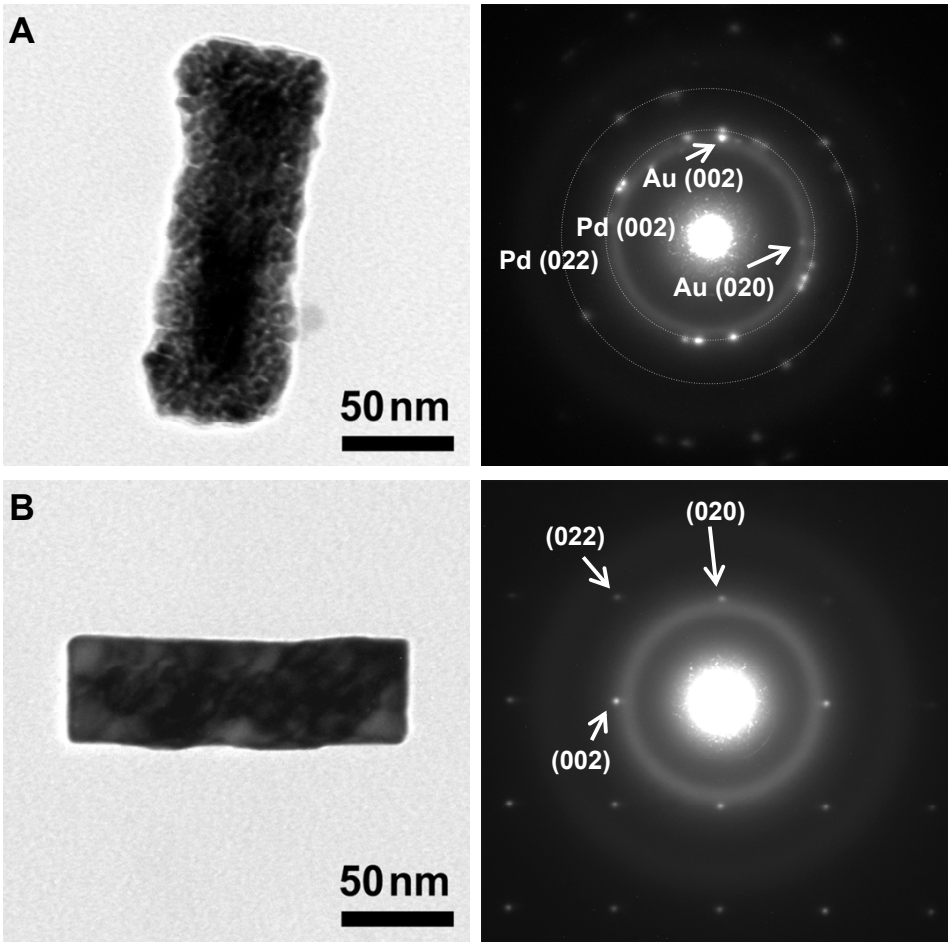

Figure S2. TEM images (*left panels*) and SAED patterns (*right panels*) of (A) an individual Au@Pd core-shell nanorod with a polycrystalline Pd shell formed in CTAC and (B) an individual Au@Pd core-shell nanocuboid with a conformal single-crystalline Pd shell formed in CTAB.

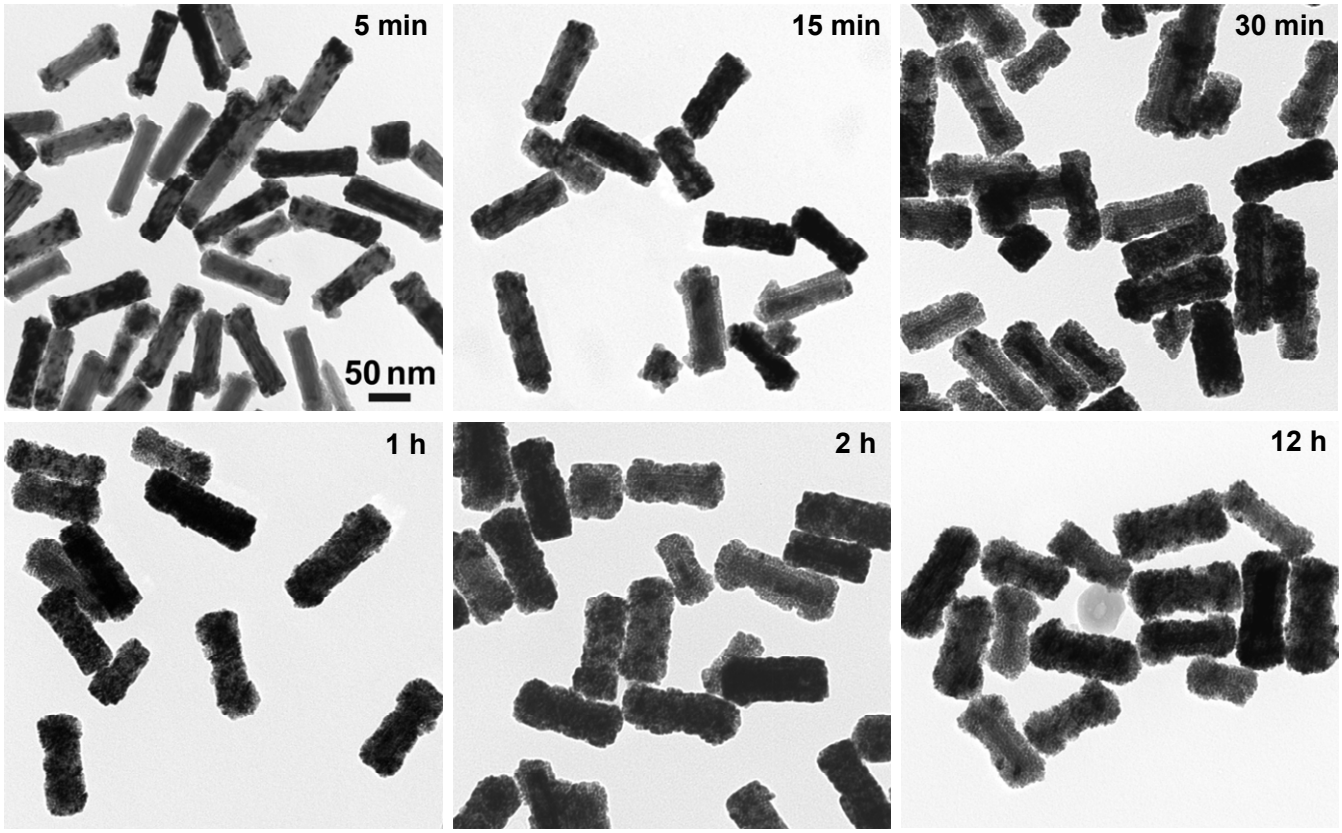

Figure S3. TEM images of Au@Pd core-shell nanorods obtained at 5 min, 15 min, 30 min, 1 h, 2 h and 12 h during the Pd overgrowth on Au nanorods in the presence of CTAC at 30 °C. The molar ratio of AA to H_2PdCl_4 was 1.0. All the TEM images share the same scale bar in panel A.

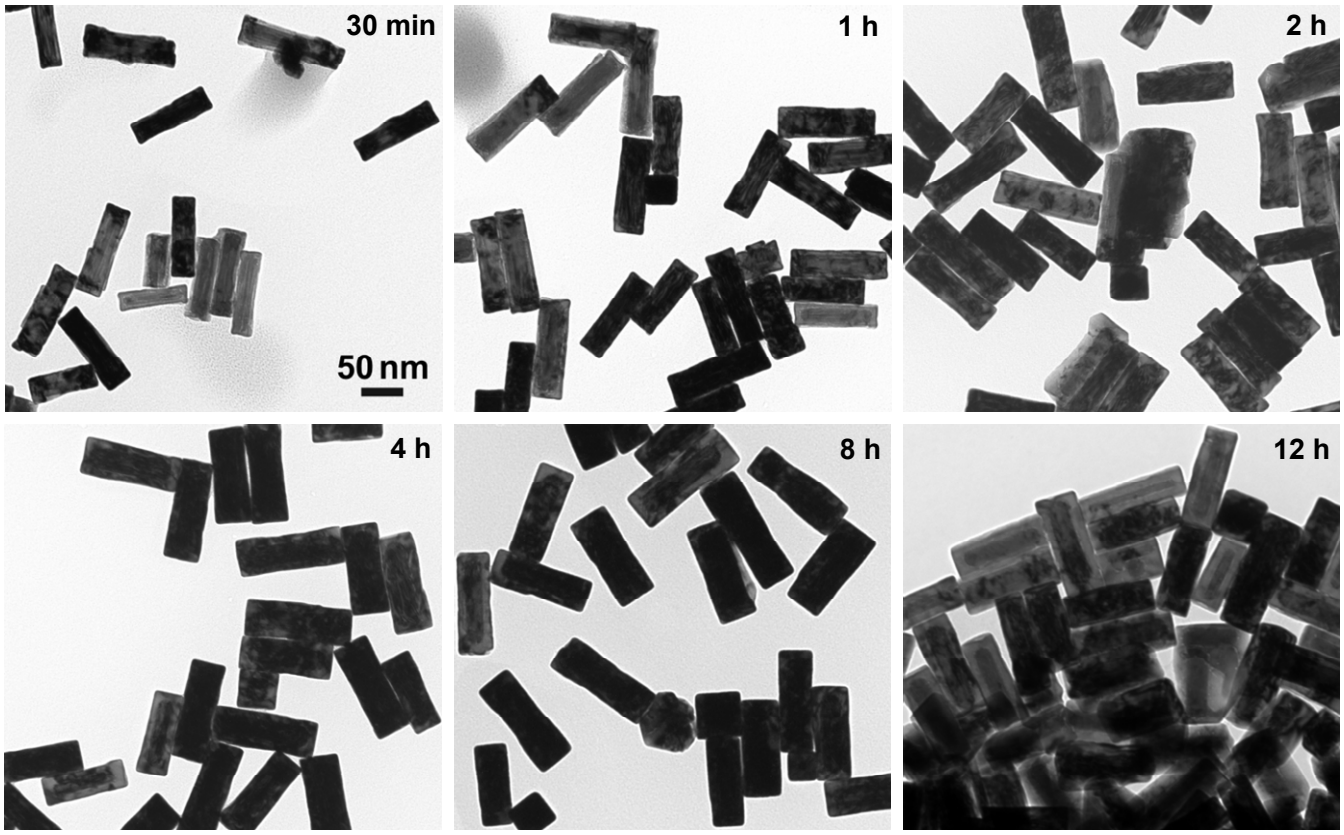

Figure S4. TEM images of Au@Pd core-shell nanocuboids obtained at 30 min, 1 h, 2 h, 4 h, 8 h and 12 h during the Pd overgrowth on Au nanorods in the presence of CTAB at 30 °C. The molar ratio of AA to H_2PdCl_4 was 1.0. All the TEM images share the same scale bar in panel A.

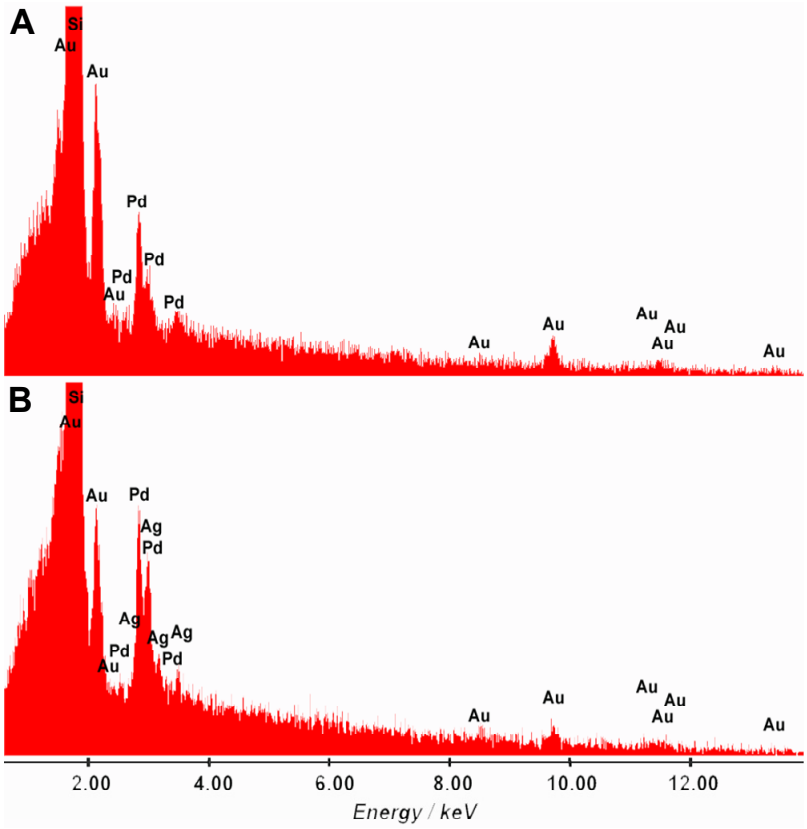

Figure S5. EDS spectra of Au@Pd core-shell nanostructures obtained through Pd overgrowth in CTAC at 30 ^{o}C (A) in the absence of Ag^{+} and (B) in the presence of Ag^{+}. The molar ratio of AA to H_2PdCl_4 was 0.5.

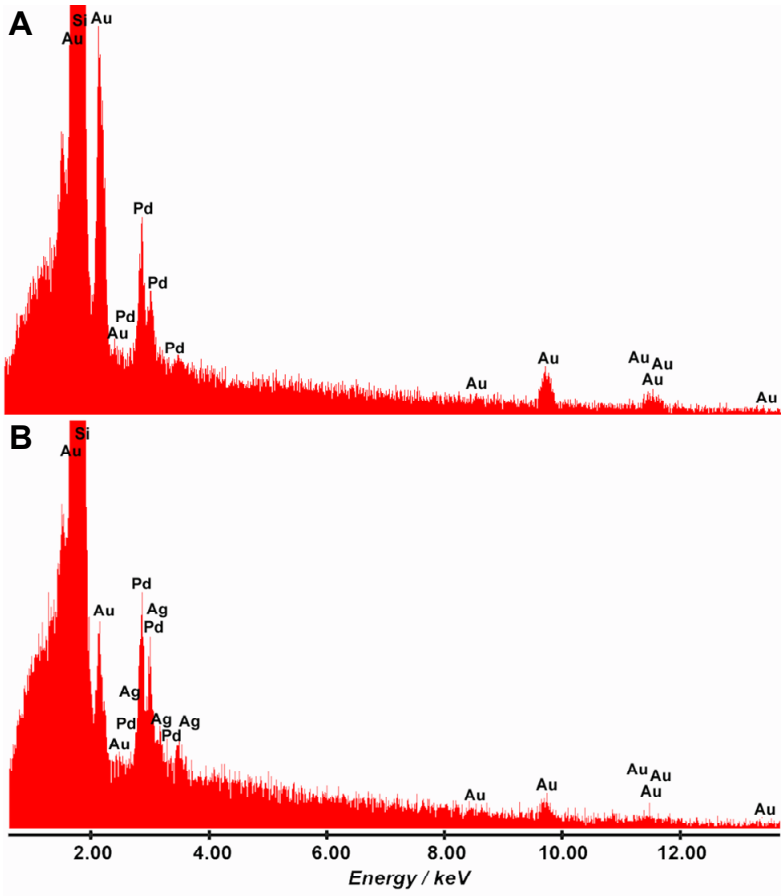

Figure S6. EDS spectra of Au@Pd core-shell nanostructures obtained through Pd overgrowth in CTAB at 30 ^{o}C (A) in the absence of Ag^{+} and (B) in the presence of Ag^{+}. The molar ratio of AA to H_2PdCl_4 was 0.5.

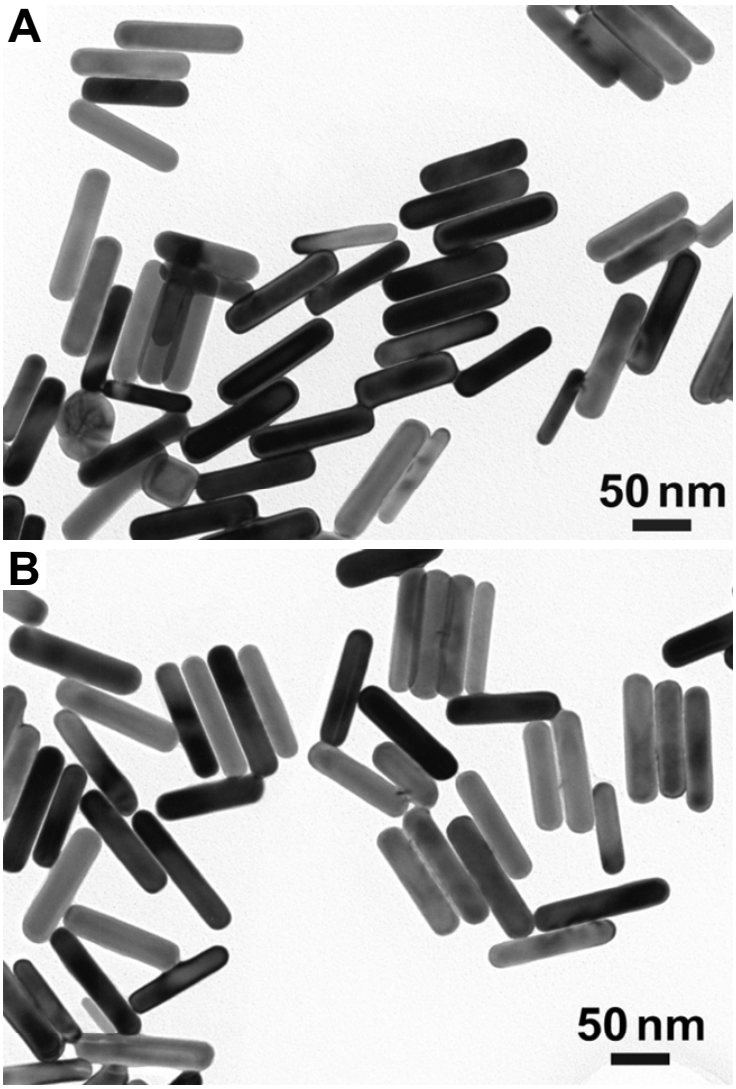

Figure S7. TEM images of Au@Ag core-shell nanorods obtained after Ag UPD in (A) CTAC and (B) CTAB for 9 hours.

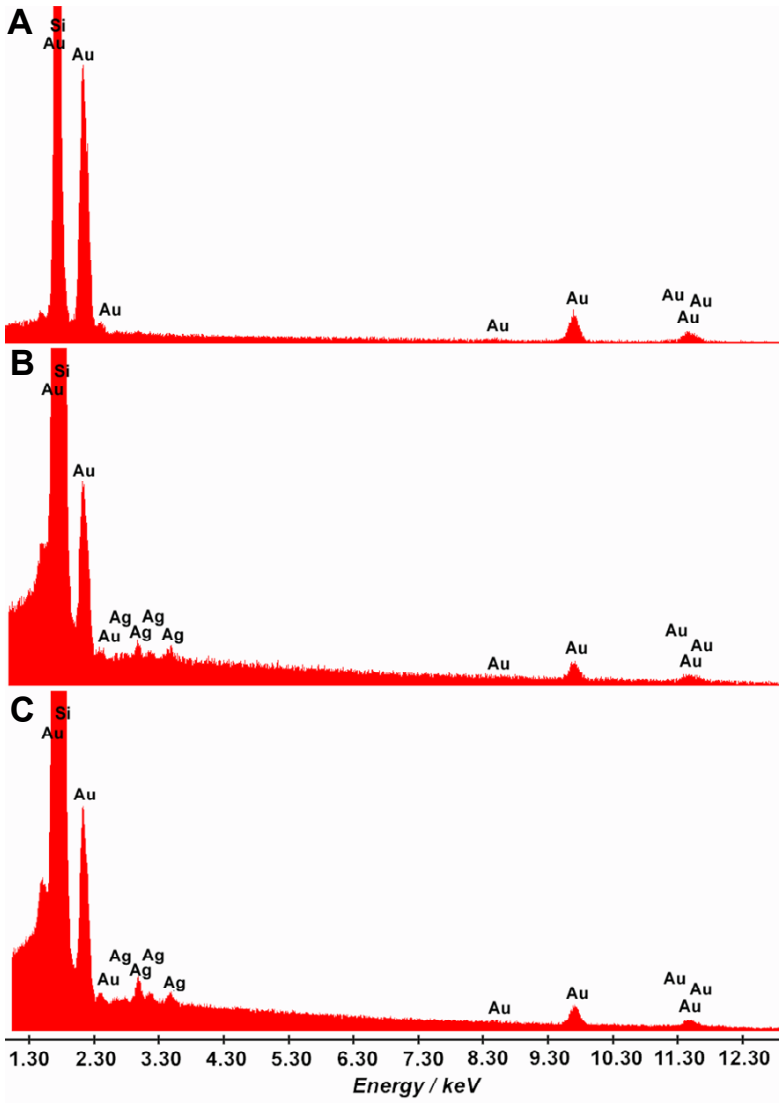

Figure S8. EDS spectra of (A) Au nanorods and Au@Ag core-shell nanorods after Ag UPD in (B) CTAC and (C) CTAB for 9 hours.

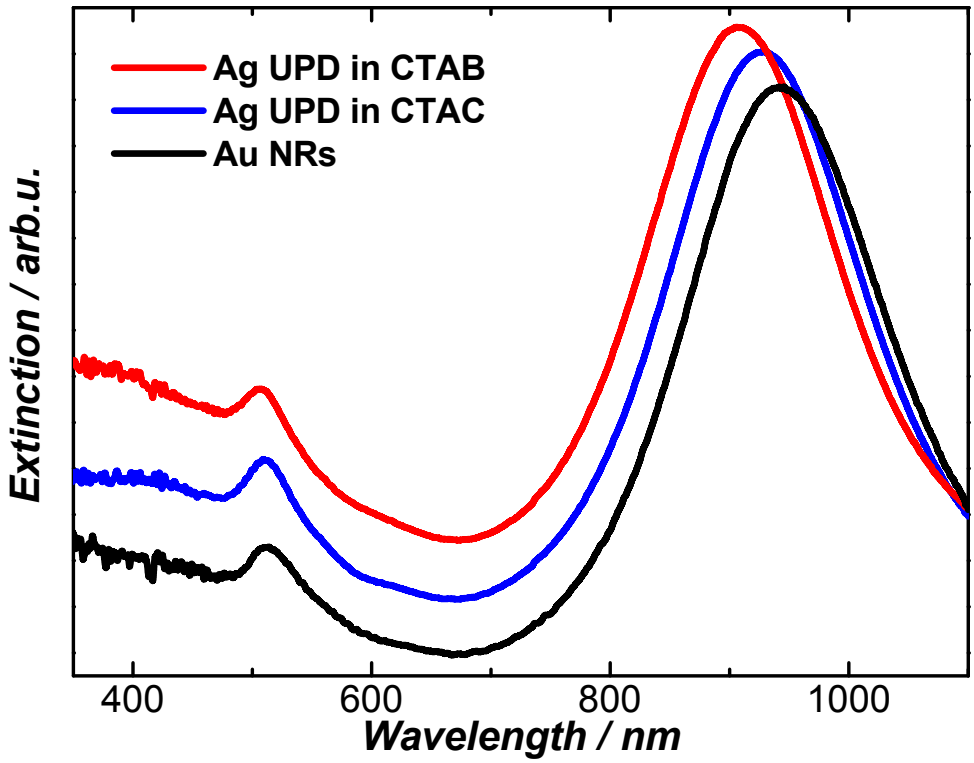

Figure S9. Optical extinction spectra of colloidal Au nanorods and Au@Ag core-shell nanorods obtained after Ag UPD in CTAC and CTAB for 9 hours.

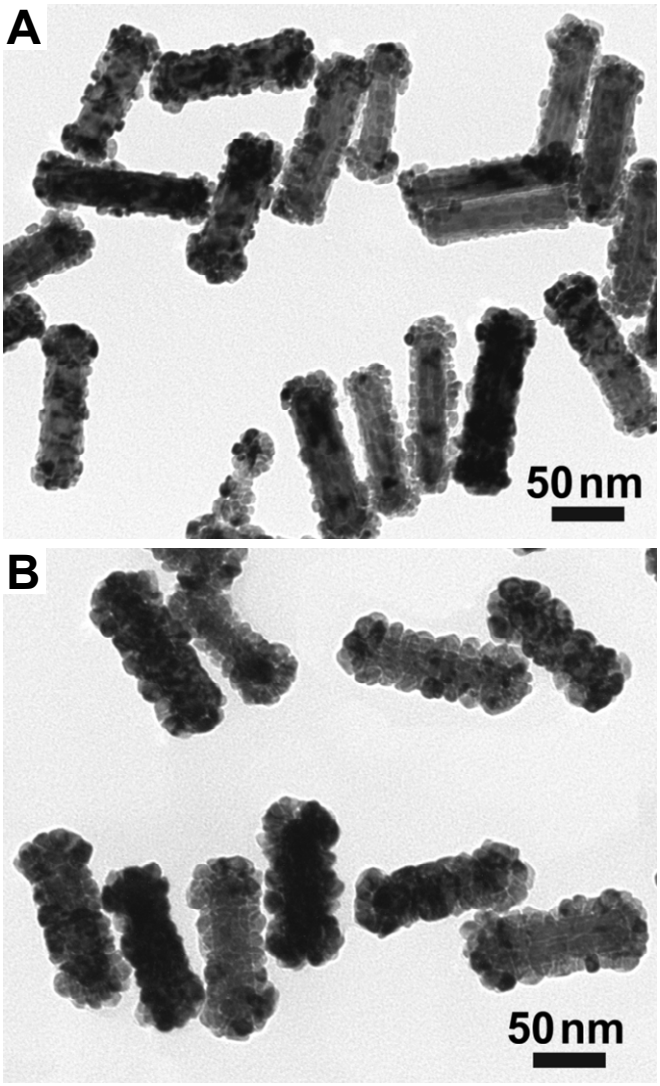

Figure S10. TEM images of Au@Pd core-shell nanostructures synthesized with the addition of 400 μL of 1 mM Ag^{+}, 300 μL of 10 mM H_2PdCl_4, and 30 μL of 50 mM AA into the solution of Au@Ag core-shell nanorods (pre-formed through Ag UPD on Au nanorods) in (A) CTAC and (B) CTAB.