Supporting Information

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Hydrophobic Dendrimers as Templates for Au Nanoparticles

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(9 pages)

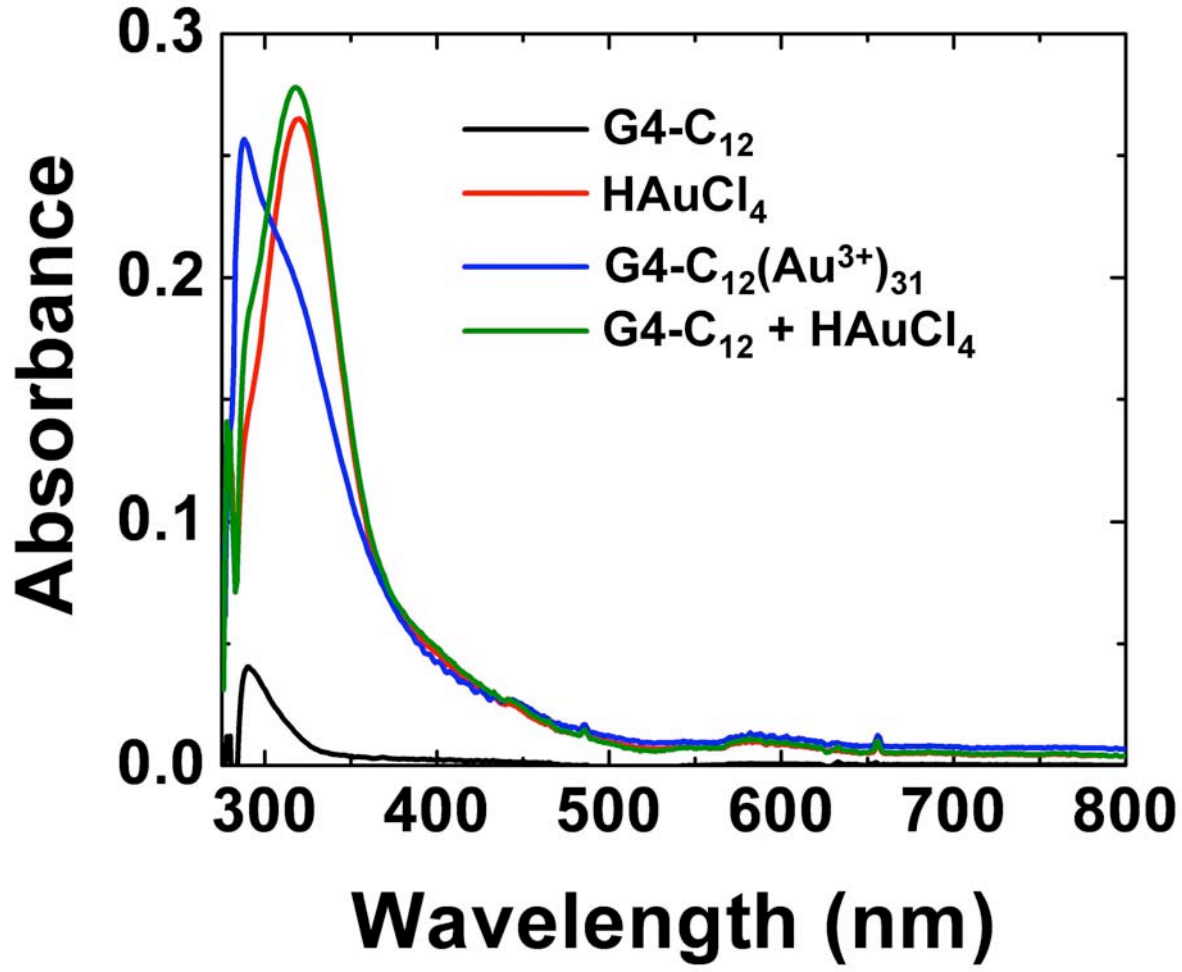

Figure S1. UV-vis spectral analysis of the formation of the G4-$C_{12}(Au^{3+})_{31}$ complex before reduction. Spectra of the dendrimer (2.00 μM) and $HAuCl_4$ (62.0 μM) are shown. A spectrum (green line) that is the sum of the dendrimer and $HAuCl_4$ spectra is also shown to highlight the difference between it and the spectrum of the dendrimer-Au^{3+} complex (blue line).

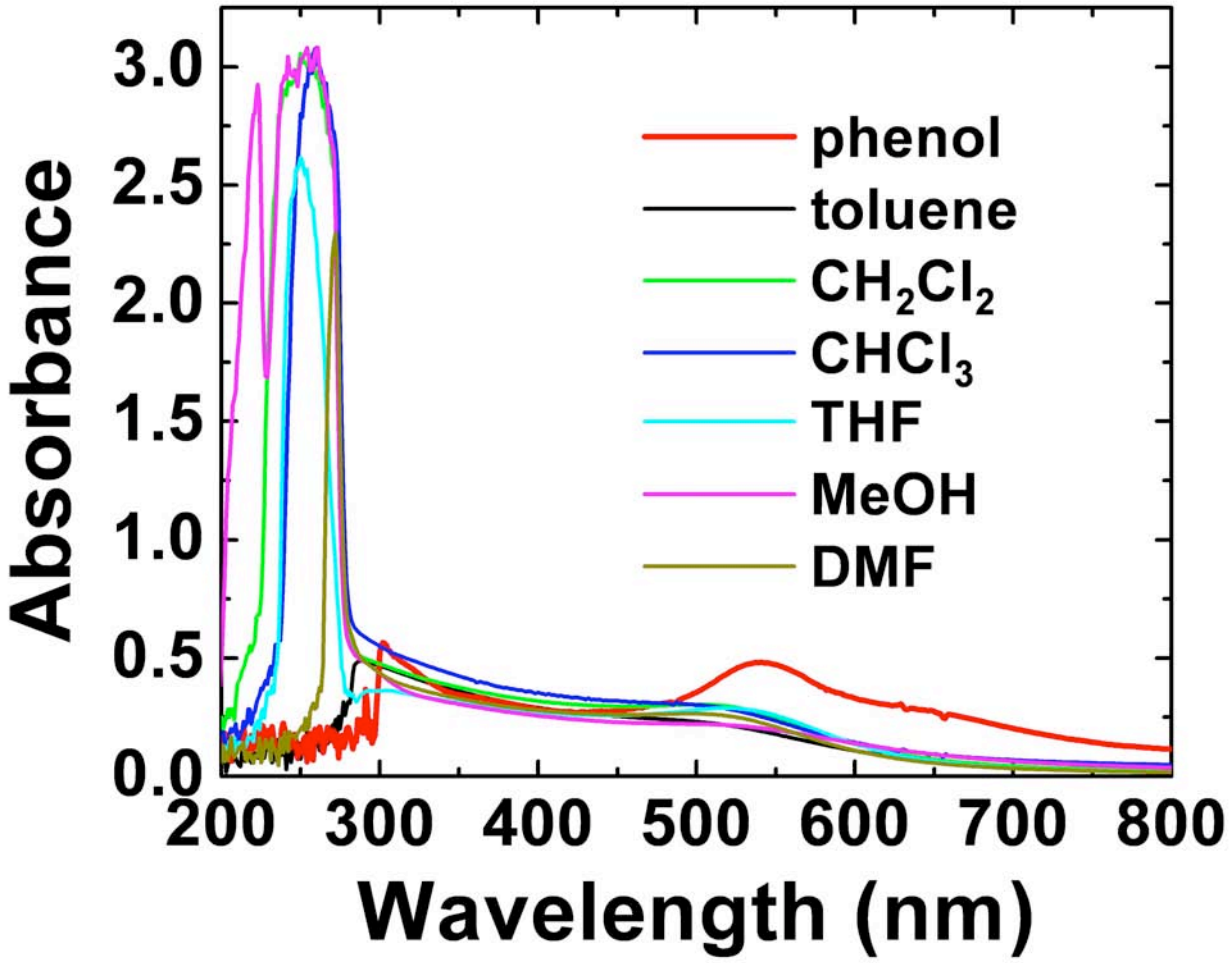

Figure S2. UV-vis spectra of G4-$C_{12}(Au_{55})$ DENs prepared in various solvents. All samples were analyzed at a dendrimer concentration of 2.00 μM.

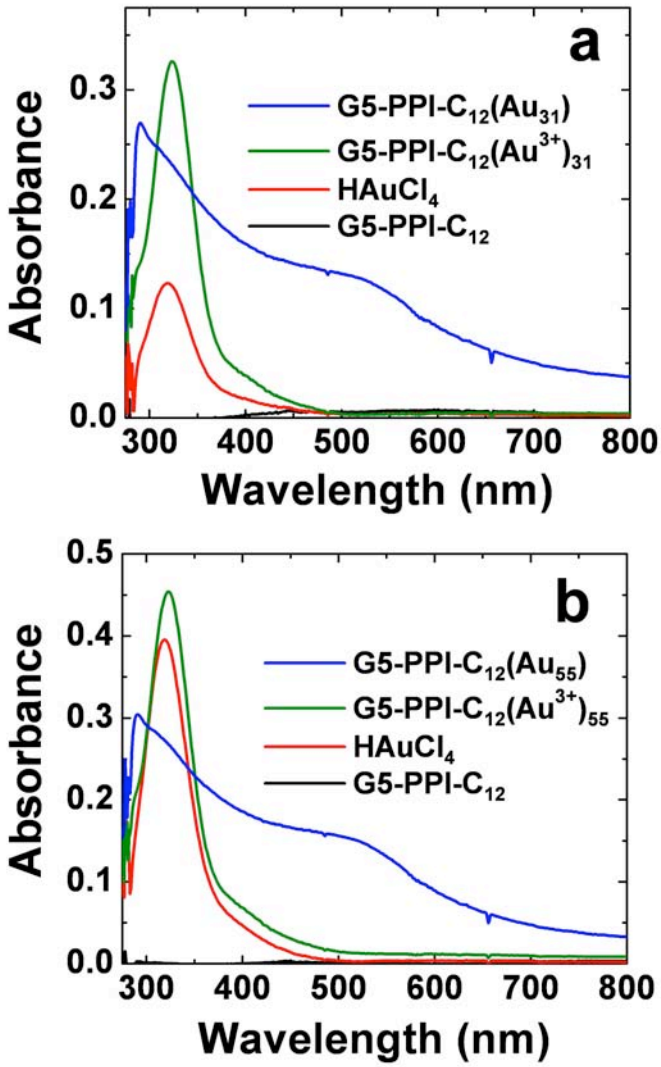

Figure S3. UV-vis spectra of (a) G5-PPI-$C_{12}(Au^{3+})_{31}$ and (b) G5-PPI-$C_{12}(Au^{3+})_{55}$ before and after reduction. Spectra of the dendrimer only and $HAuCl_4$ only ([$HAuCl_4$] = 62.0 μM for (a) and 110 μM for (b)) are also shown. The dendrimer concentration was 2.00 μM in all cases.

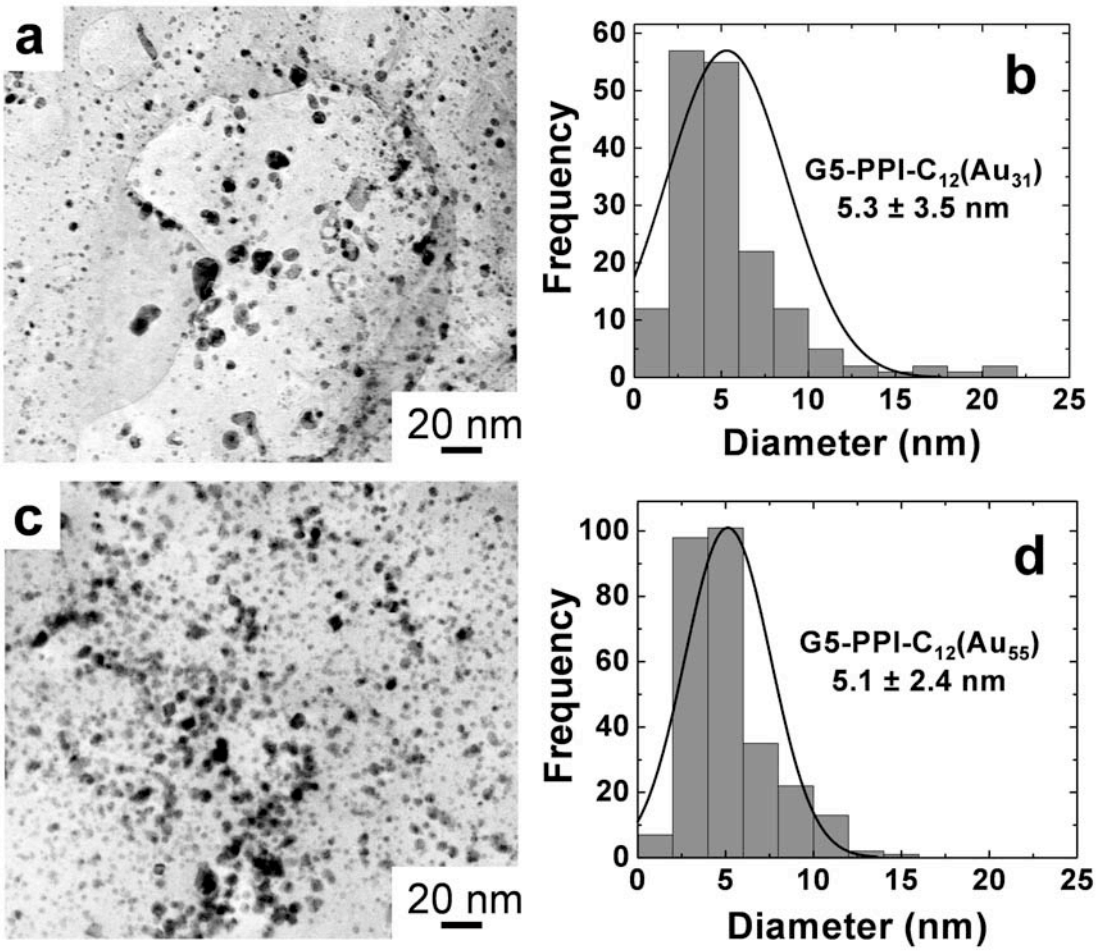

Figure S4. TEM micrographs and particle size distributions for G5-PPI-C_{12}(Au_{31}) ((a) and (b), respectively) and G5-PPI-C_{12}(Au_{55}) ((c) and (d), respectively) prepared in toluene.

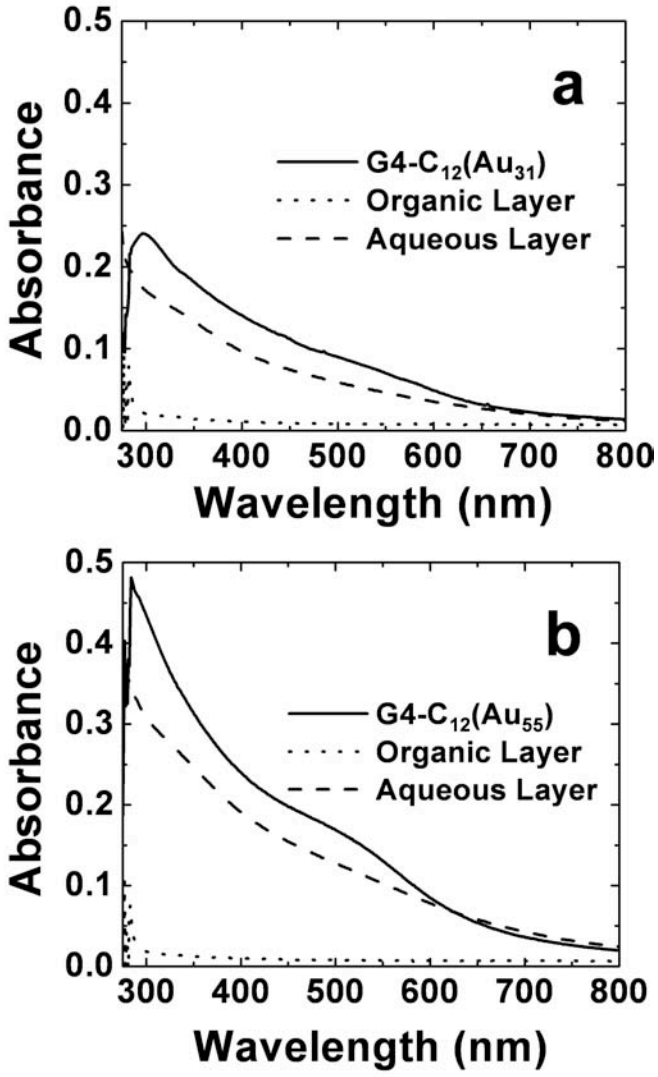

Figure S5. UV-vis spectra corresponding to the glutathione extraction of (a) Au_{31} and (b) Au_{55} from within G4-C_{12} dendrimers. The solid lines correspond to 2.00 μM toluene solutions of the DENs prior to extraction. The dotted line corresponds to the spectrum of the organic layer after extraction, and the dashed line corresponds to the spectrum of the aqueous layer after extraction. The shapes of the pre- and post-extraction spectra are nearly identical, but the intensities are lower following extraction. Such behavior has been observed previously and has been attributed to the pH-sensitivity of the stabilizing ligands.[27] Glutathione concentrations of 0.619 and 1.09 mM were used for the extraction of Au_{31} and Au_{55}, respectively. Note that after extraction and settling the empty dendrimers precipitate at the two-phase interface.

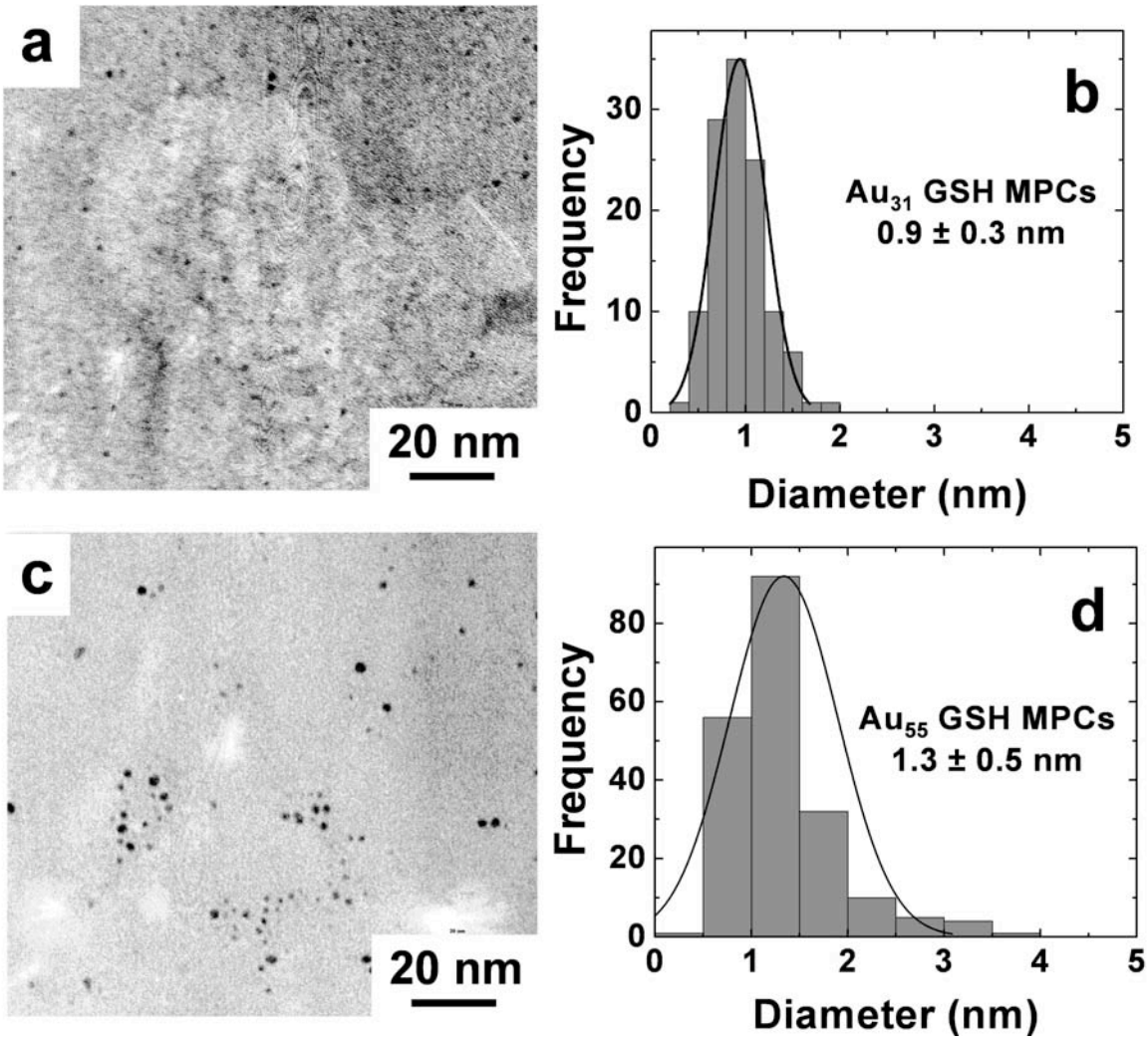

Figure S6. TEM micrographs and particle-size distributions for water-soluble glutathione MPCs extracted from G4-$C_{12}(Au_{31})$ ((a) and (b), respectively) and G4-$C_{12}(Au_{55})$ ((c) and (d), respectively) DENs.

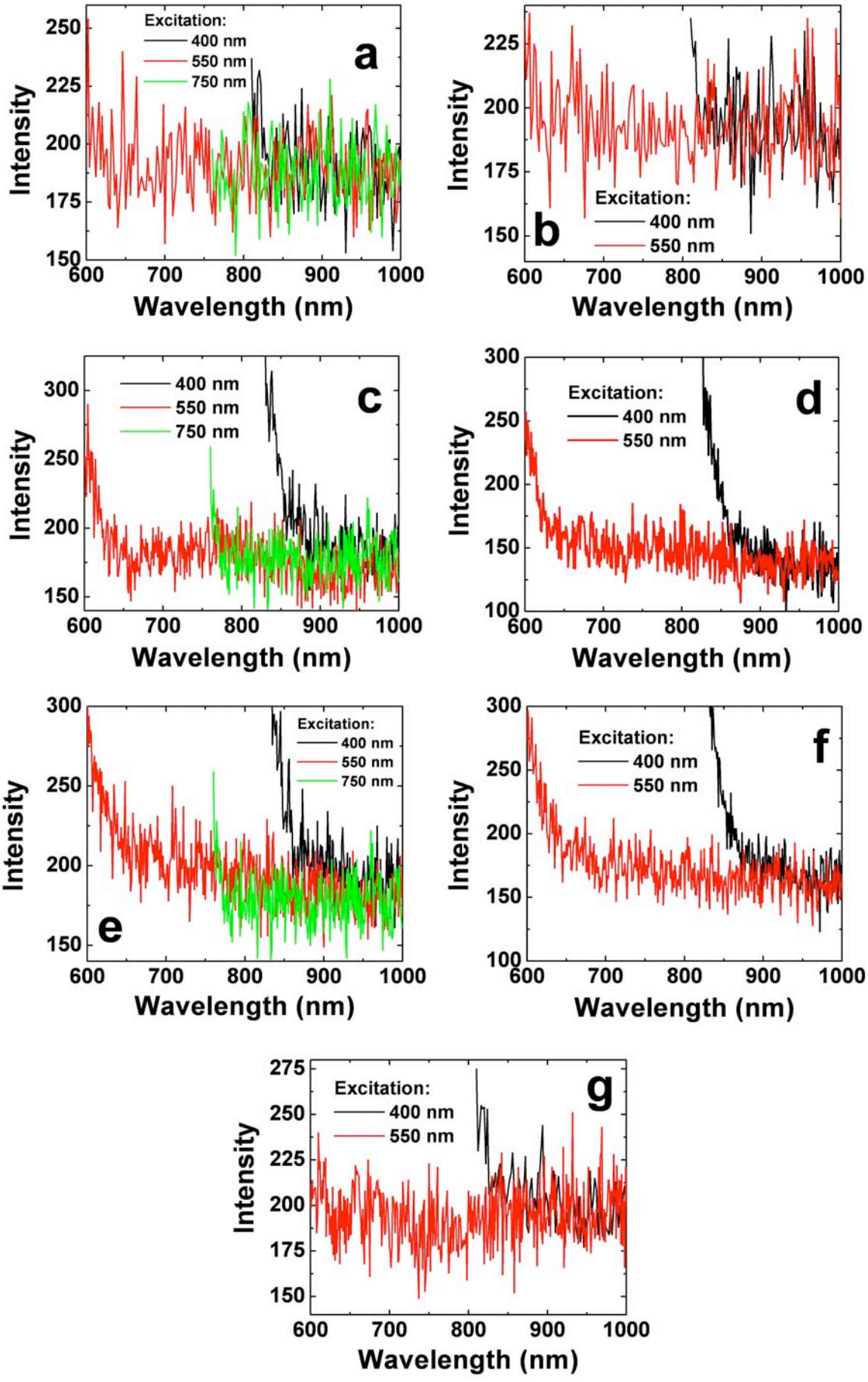
a
Excitation:
400 nm
550 nm
750 nm
Intensity
Wavelength (nm)
b
Excitation:
400 nm
550 nm
c
400 nm
550 nm
750 nm
d
Excitation:
400 nm
550 nm
e
Excitation:
400 nm
550 nm
750 nm
f
Excitation:
400 nm
550 nm
g
Excitation:
400 nm
550 nm

Figure S7. Fluorescence spectra of (a) G4-$C_{12}(Au_{31})$ DENs, (b) G4-$C_{12}(Au_{55})$ DENs, (c) Au_{31} tiopronin MPCs, (d) Au_{55} tiopronin MPCs, (e) Au_{31} glutathione MPCs, (f) Au_{55} glutathione MPCs, and (g) the organic layer after extraction of G4-$C_{12}(Au_{55})$ DENs using tiopronin. The hydrophobic samples were analyzed at a dendrimer concentration of 2.00 μM, while the water-soluble materials were analyzed without dilution following dialysis.