SUPPORTING INFORMATION

Fractal Shaped Periodic Metal Nanostructures Atop Dielectric-Metal Substrate for SERS Applications

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Supporting information contains 10 pages and 10 figures.

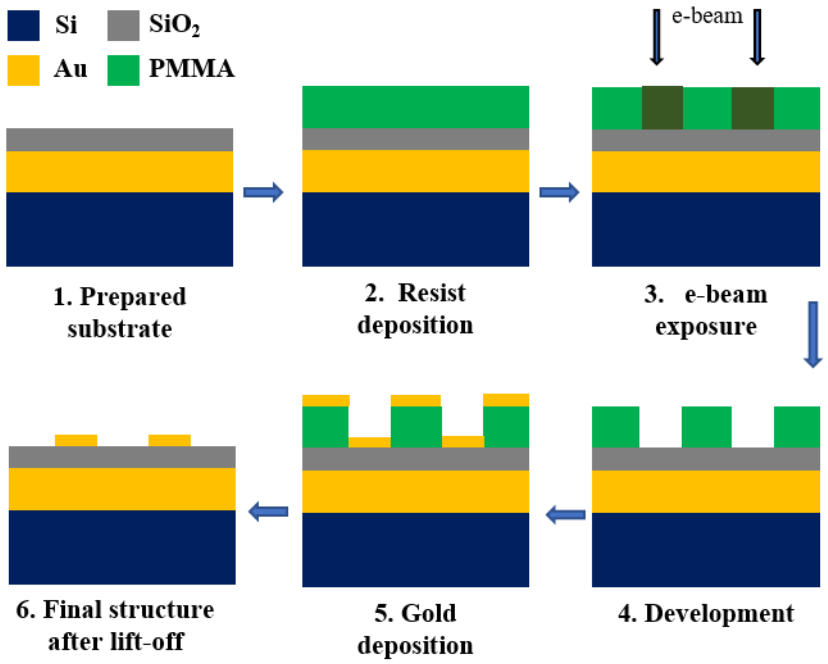

Figure S1. Schematic illustration the process fabrication of the metal-dielectric-metal structures.

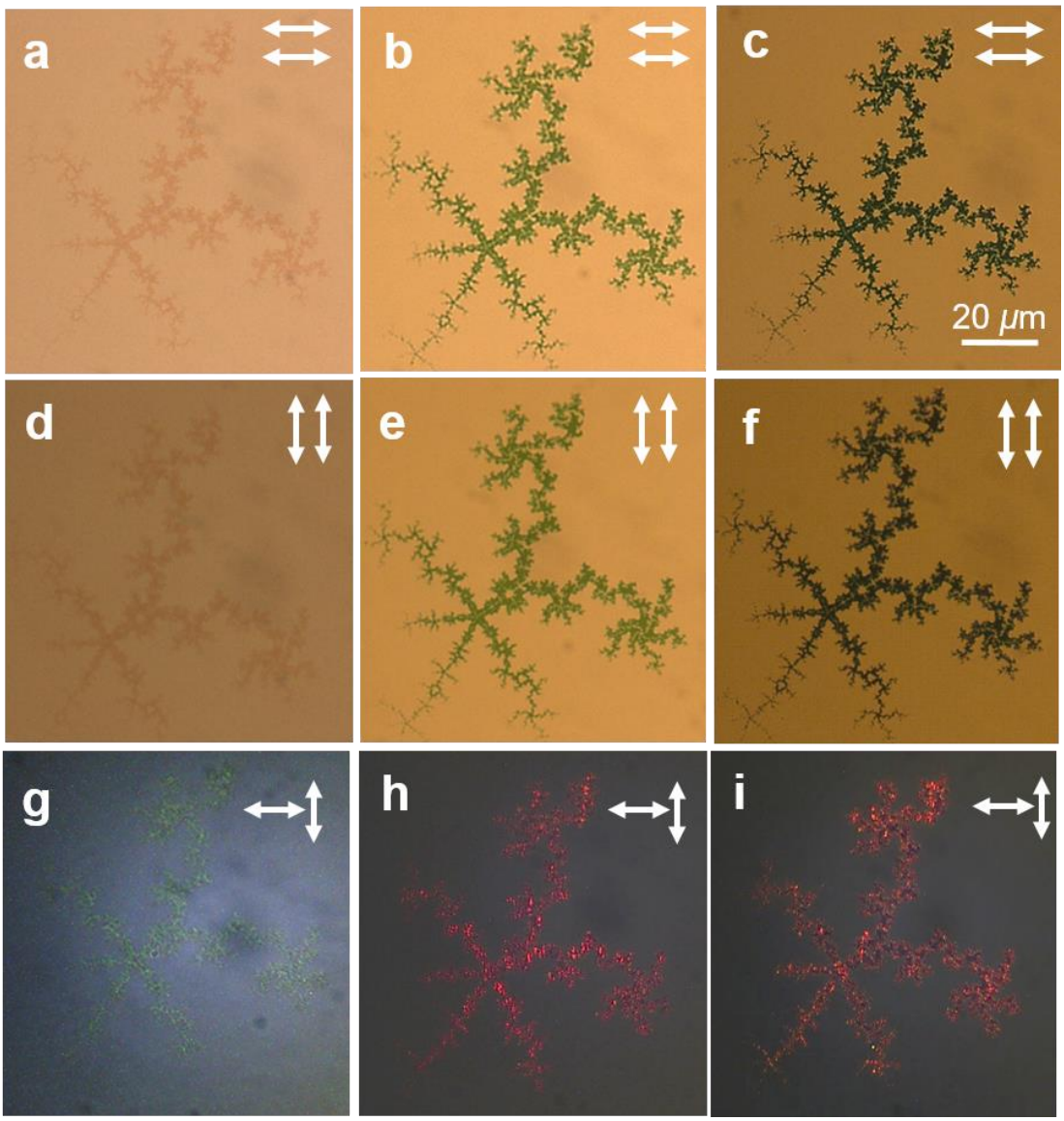

Figure S2. Bright-field optical microscopy reflection images obtained in the co-polarized configuration: a, d) 0 nm gap, b, e) 20 nm gap, c, f) 40 nm gap; and in the cross-polarized one: g) 0 nm gap, h) 20 nm gap, i) 40 nm. The scale bar is 20 μm.

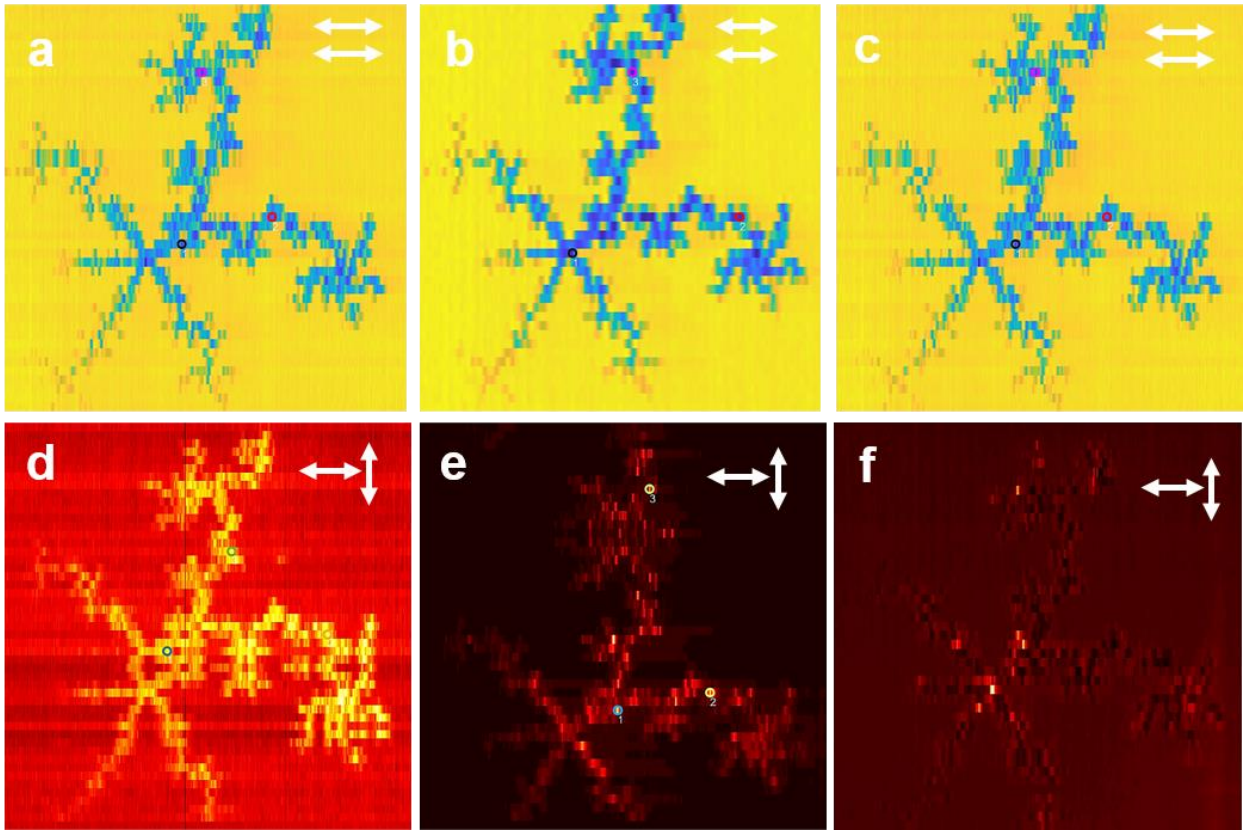

Figure S3. Pseudo-color image of fractal co-polarized a) 0 nm gap, λ= 540 nm b) 20 nm gap, λ= 674 nm and c) 40 nm gap, λ= 645 nm; and cross-polarized; d) 0 nm gap, λ= 550 nm e) 20 nm gap, λ= 715 nm f) 40 nm, λ= 720 nm. The images are given for resonance cases

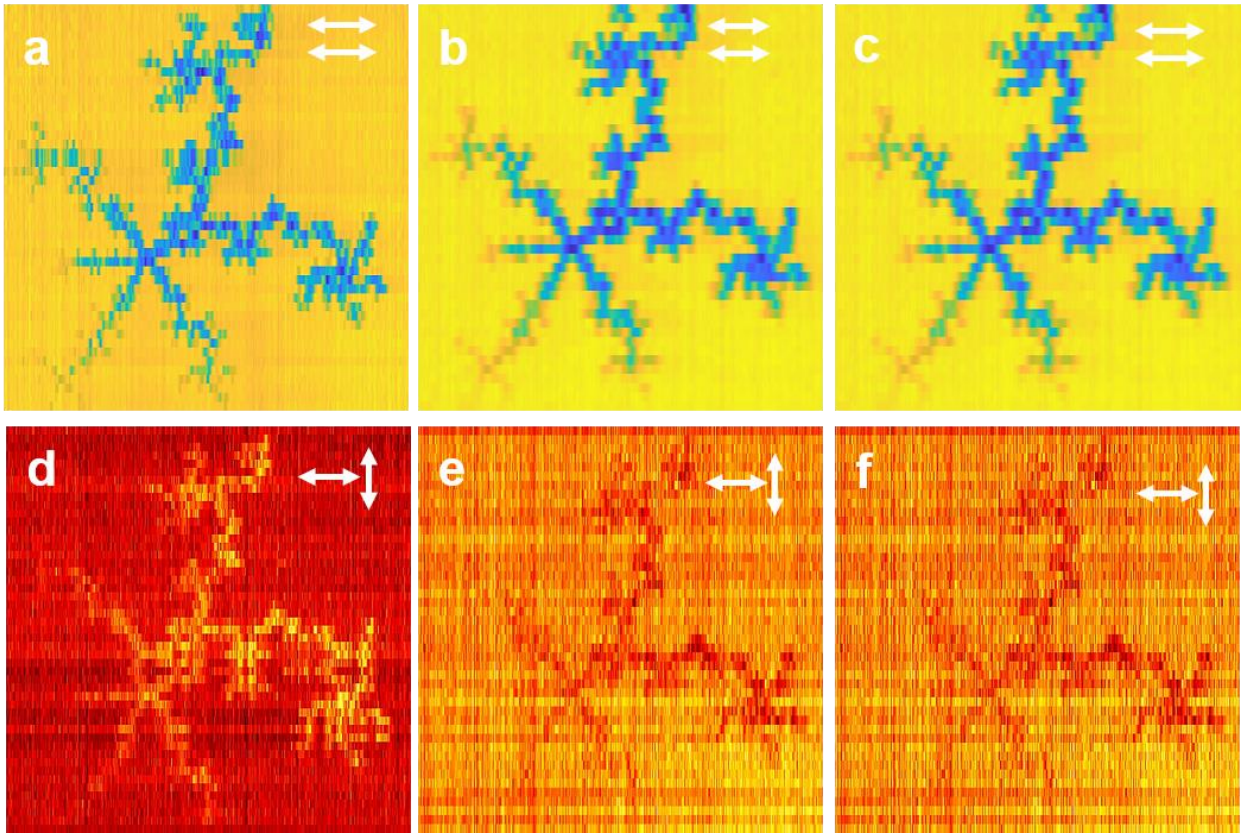

Figure S4. Pseudo-color image of fractal co-polarized a) 0 nm gap b) 20 nm gap c) 40 nm gap, and cross-polarized; d) 0 nm gap, e) 20 nm gap f) 40 nm/ Images presented for the wavelength of laser λ= 532 nm

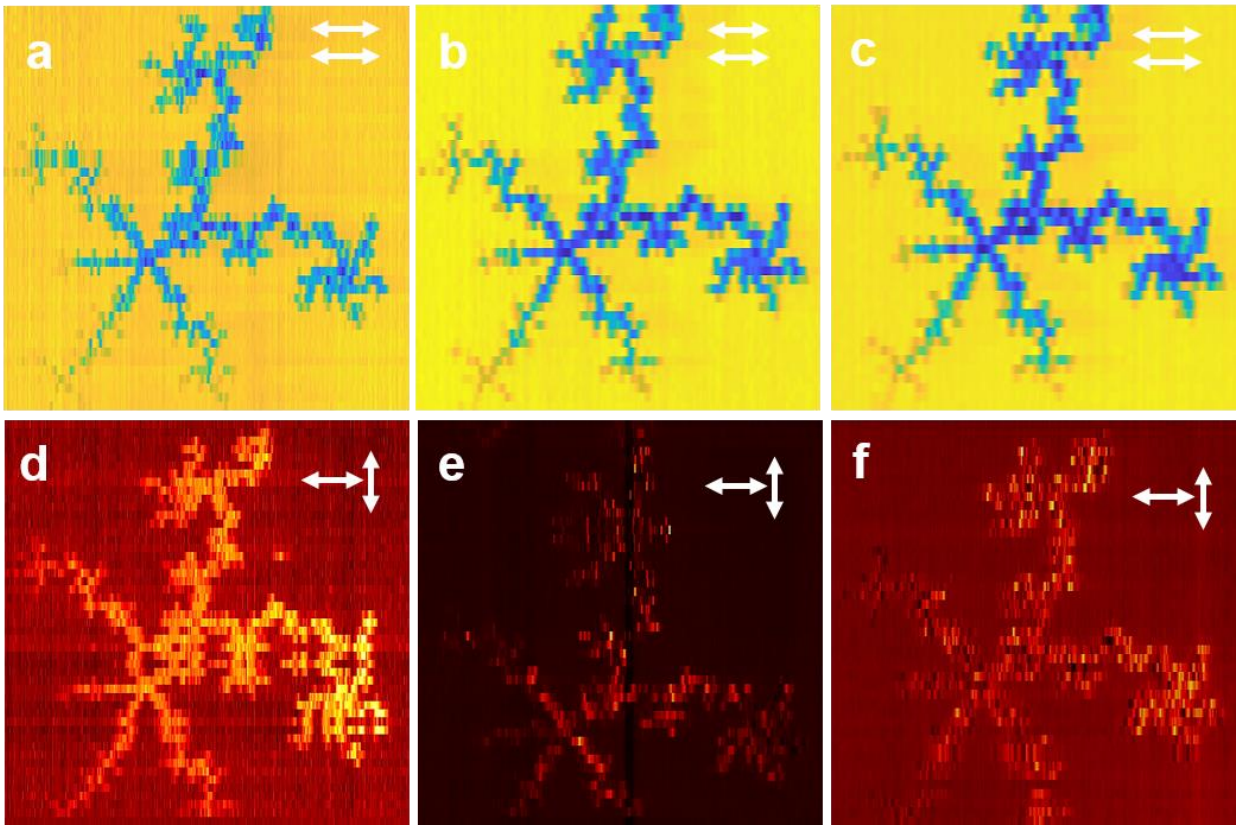

Figure S5. Pseudo-color image of fractal co-polarized a) 0 nm gap b) 20 nm gap c) 40 nm gap, and cross-polarized; d) 0 nm gap, e) 20 nm gap f) 40 nm/ Images presented for the wavelength of laser λ= 632.8 nm

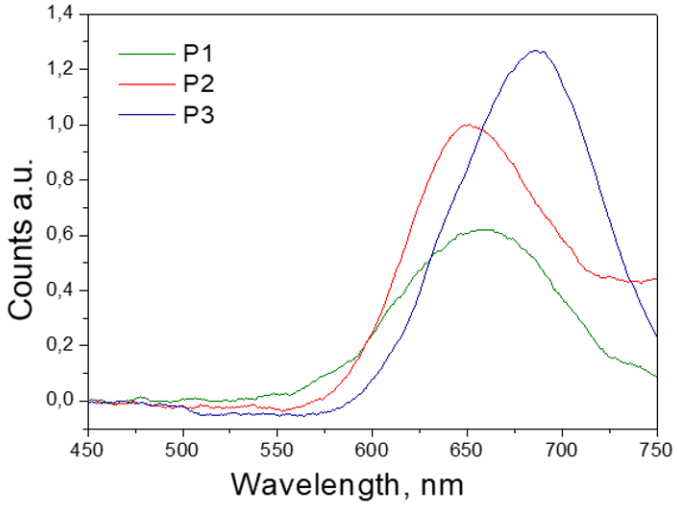

Figure S6. Linear spectra fractals obtained with cross-polarization from the fractal with gap 40 nm far from the bright spots in points. (P1-P3 are points on the fractal outside of bright spots).

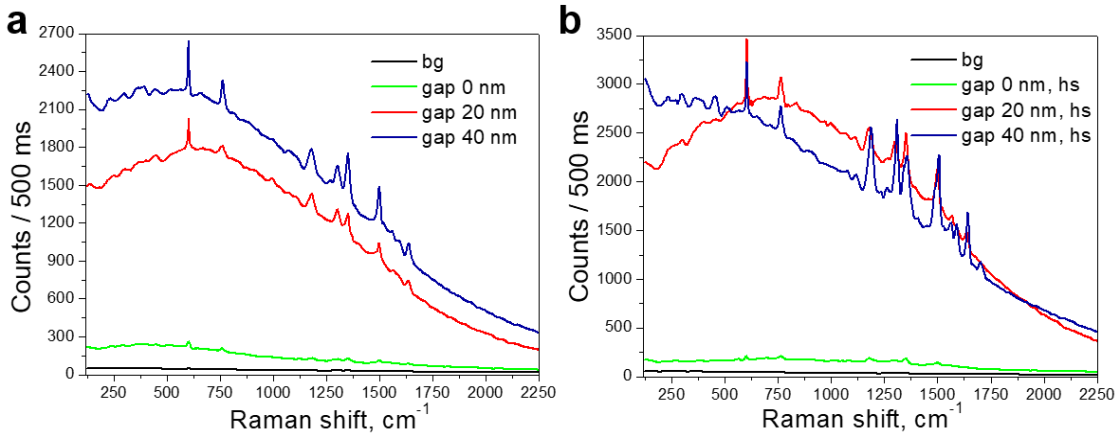

Figure S7. Typical Raman spectra recorded from the fractals with different gaps a) at the points far from the hot spots, b) from the hot spots. Reference spectra (bg - in the legend) were obtained from the gold film. Raman spectra obtained with the wavelength 632.8 nm.

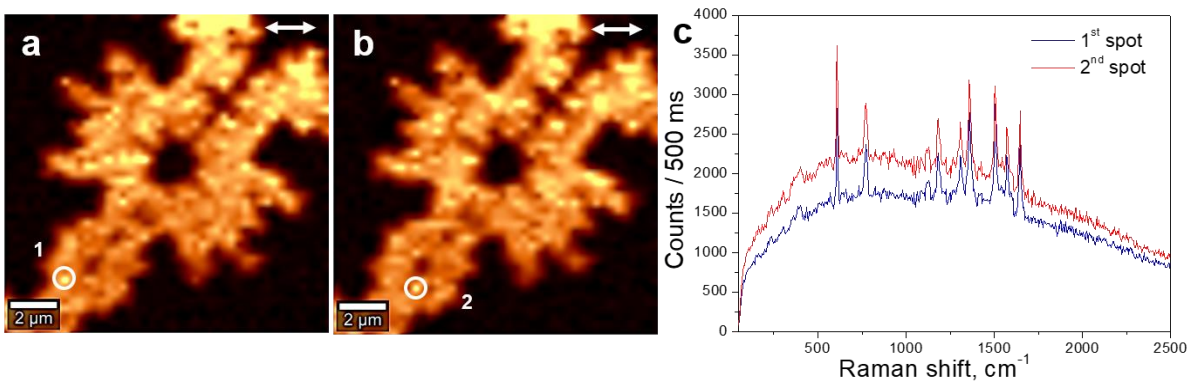

Figure S8. a, b) Raman images obtained by mapping the Raman signals integrated over (a) 610–625 cm^{-1} and (b) 1465–1620 cm^{-1} from R6G adsorbed on the fractal with the 40-nm-thick spacer c) Raman spectra of selected hot spots, marked with white circles on a) and b).

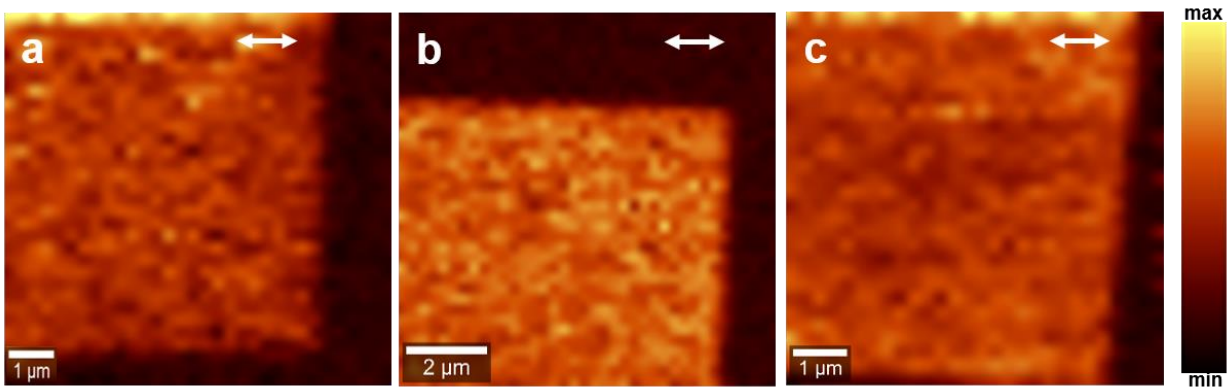

Figure S9. Raman images obtained by mapping the Raman intensity integrated over 1468–1614 cm^{-1} from R6G adsorbed on a test sample (smooth edges) with the gaps a) 0 nm, b) 20 nm and with c) 40 nm. Images were obtained with the wavelength 532 nm

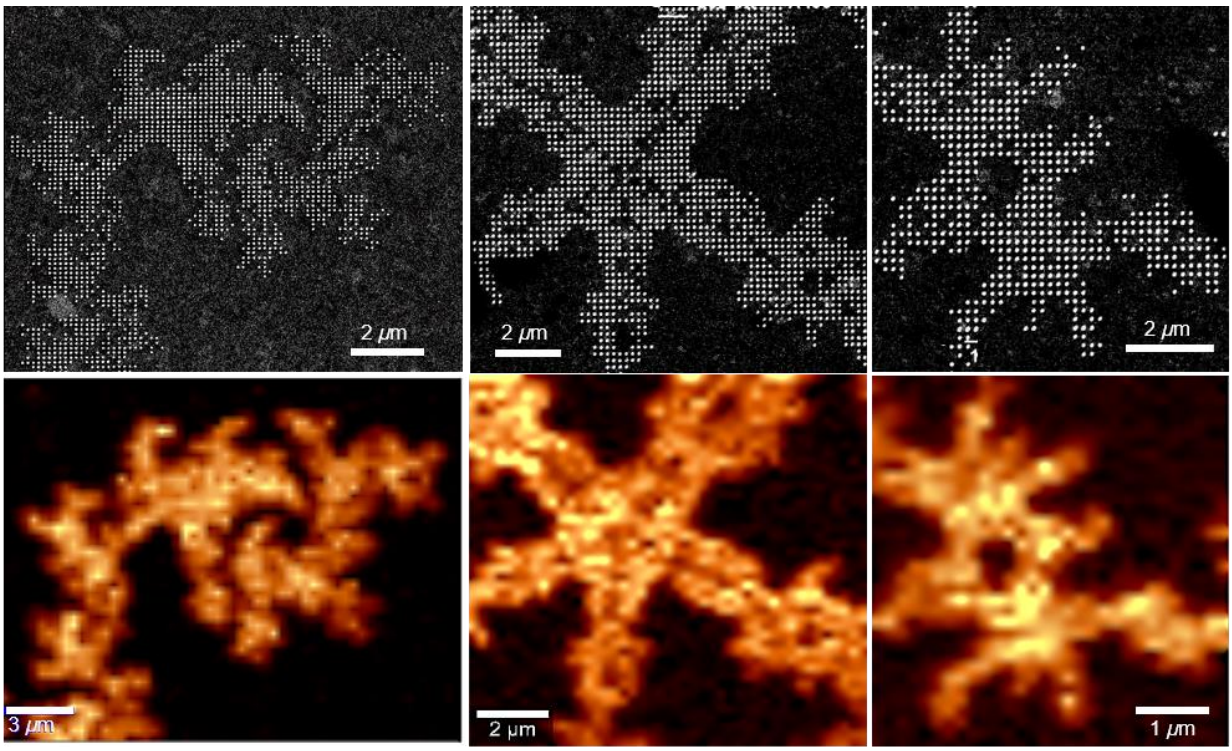

Figure S10. Examples of well correlated SEM and Raman images.