

# ADVANCED FUNCTIONAL MATERIALS

## Supporting Information

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Spatial Analysis of Metal–PLGA Hybrid Microstructures  
Using 3D SERS Imaging

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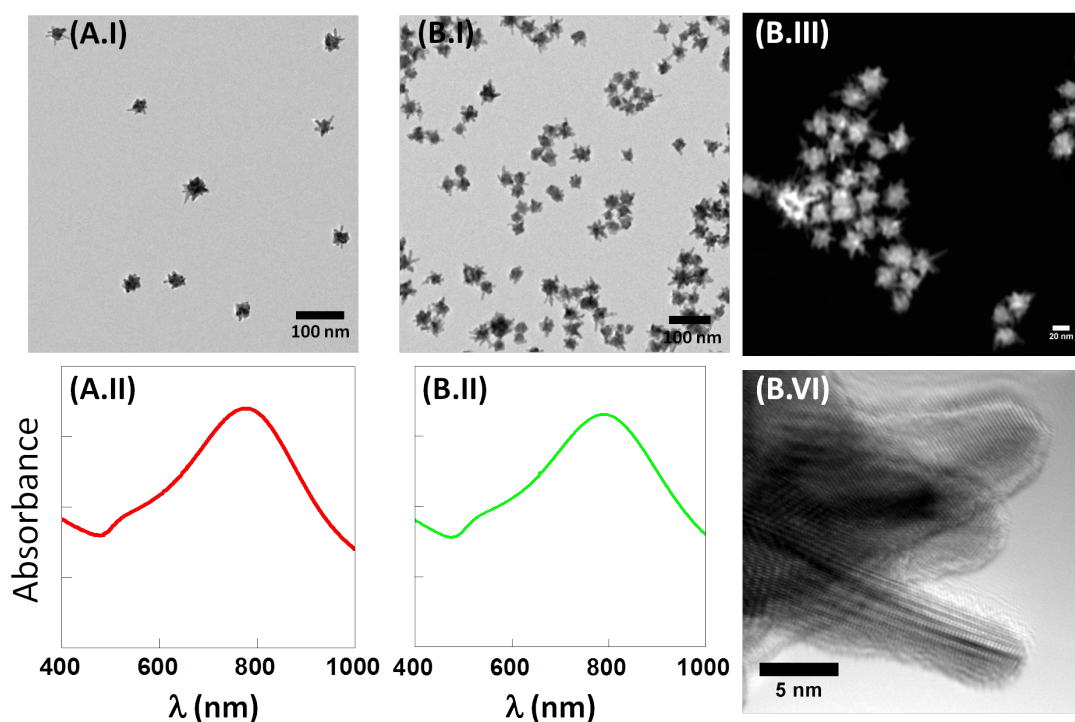
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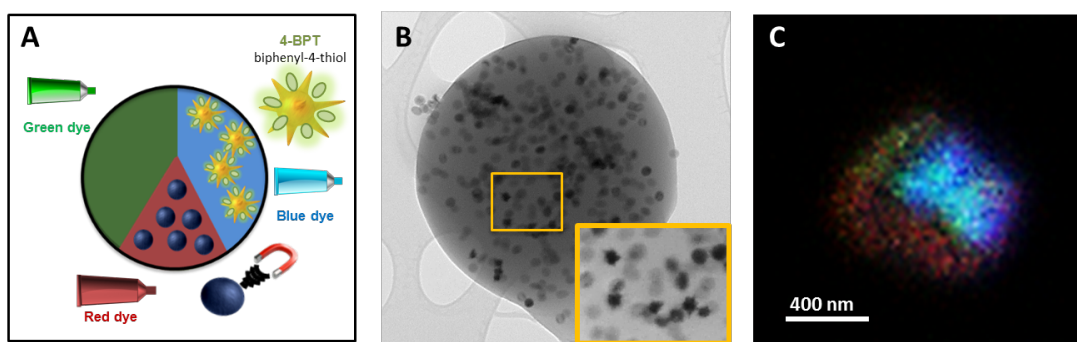
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## 1 Characterization of AuNSs

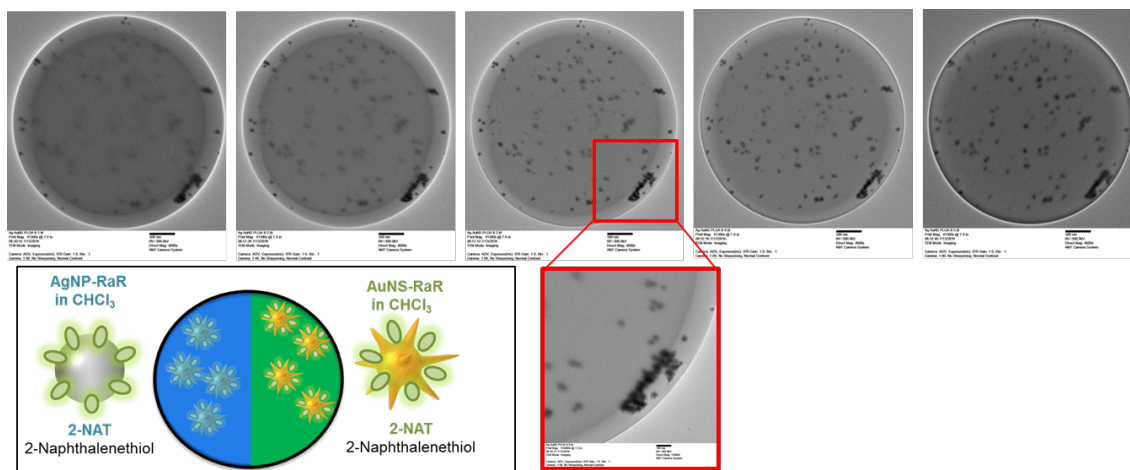


**Figure S1.** (A.I) TEM image and (A.II) Vis-NIR spectra of Au NSs labeled with 2- NAT; (B.I) TEM image (B.II) Vis-NIR spectra (B.III) STEM image and (B. IV) High resolution TEM image of Au NSs labeled with 4-BPT.

## 2 Additional metal-polymer particles

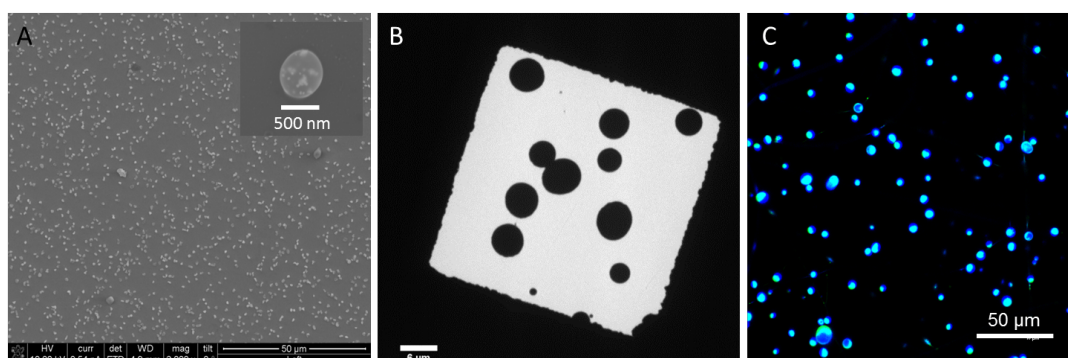


**Figure S2.** (A) ~500 nm tricompartmental PLGA (17 KDa) particles containing 50nm Au NSs labeled with 4-BPT together with a blue dye in one compartment, 40 nm iron oxide nanoparticles with a red dye in a second compartment and a green dye only in the third compartment. (B) TEM image showing both types of nanoparticles. (C) Fluorescence image showing the three compartments differentiated by the 3 dyes.



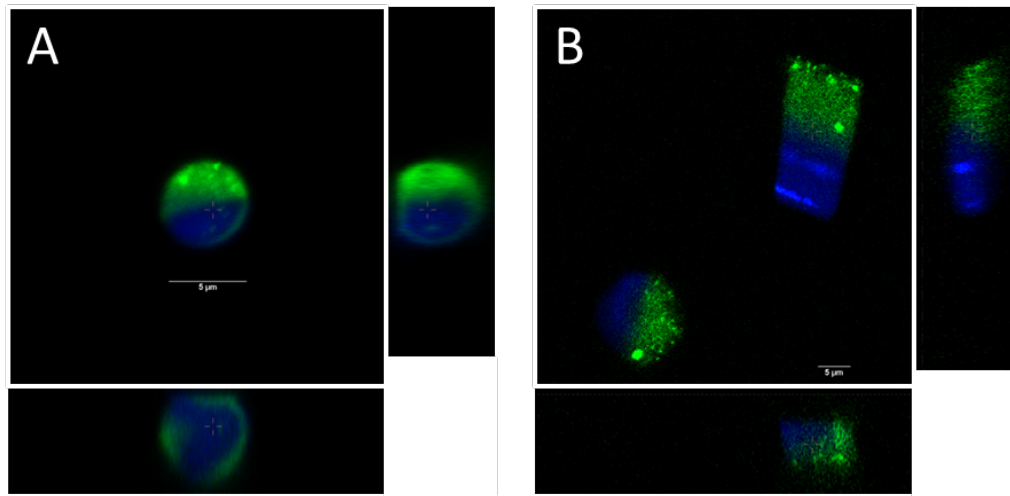
**Figure S3.** Bicompartmental PLGA (55-75 KDa)  $\sim 8 \mu\text{m}$  particles, containing 30 nm Ag NPs labeled with 2-NAT together with a blue dye in one compartment and 50 nm Au NSs labeled with 2-NAT and a green dye in a second compartment. TEM images at different focus confirm that particles are embedded onto the PLGA particles, not only at the surface.

### 3 Characterization at a large scale



**Figure S4.** Large scale images of bicompartmental nanoparticles containing two different SERS labeled Au NSs and two different dyes (blue and green), characterized by: (A) SEM; (B) TEM; (C) fluorescence confocal microscopy.

#### 4 Additional shapes and surface functionalization in PLGA microgels



**Figure S4.** Additional particles can also be produced. (A) Fluorescence images of particles with COOH surface groups, to be modified with antibodies or other molecules (30% of 5.9 kDa of PLGA with COOH added); (B) Fluorescence images of cylinder-shaped particles: Synthetized fibers can be cut into pieces to obtain cylinders of different sizes.