Supporting Information

Small Angle X-ray Scattering Coupled With *in-situ* Electromechanical Probing of Nanoparticle-Based Resistive Strain Gauges

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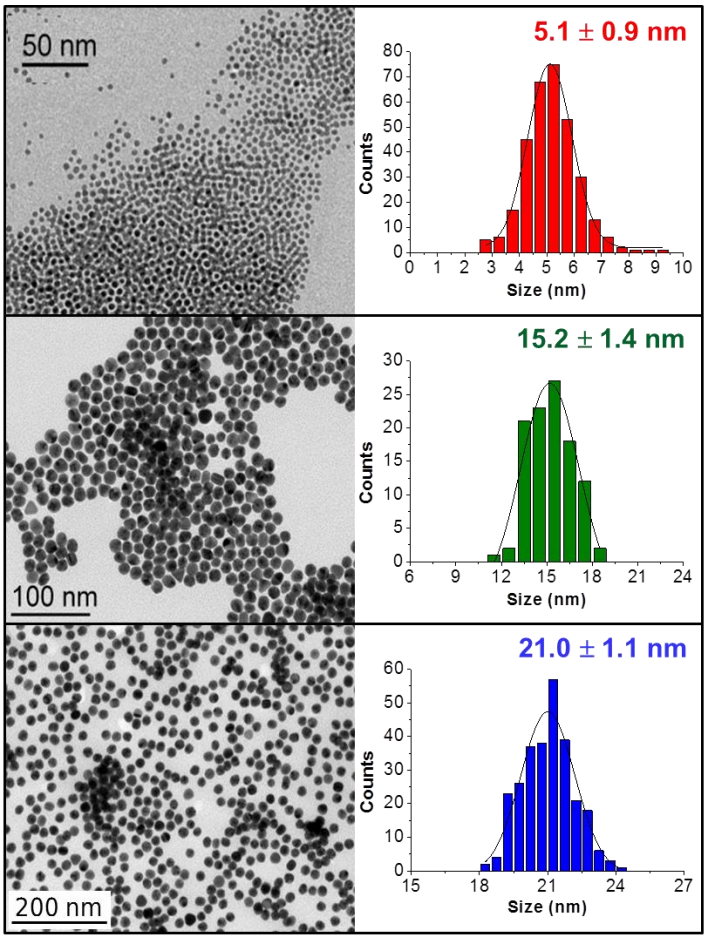

Figure S1. TEM images and size histograms of TDSP-stabilized gold nanoparticles.

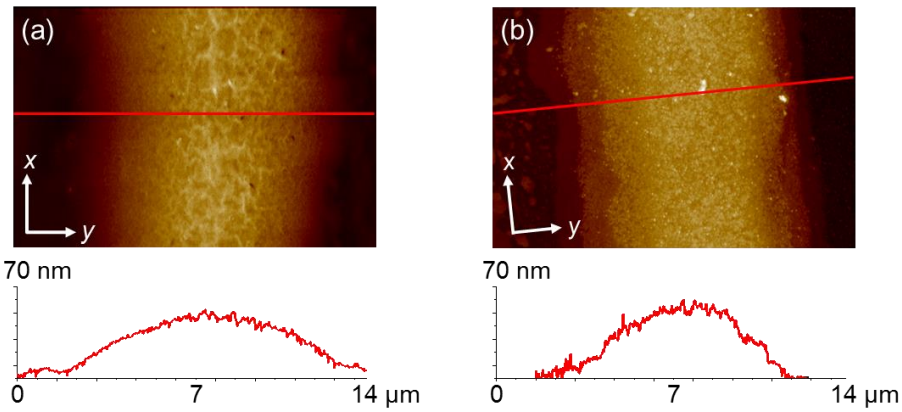

Figure S2. Top-view AFM images and associated cross-sections of wires made of (a) 5 nm and (b) 21 nm TDSP-stabilized nanoparticles on PET substrates.

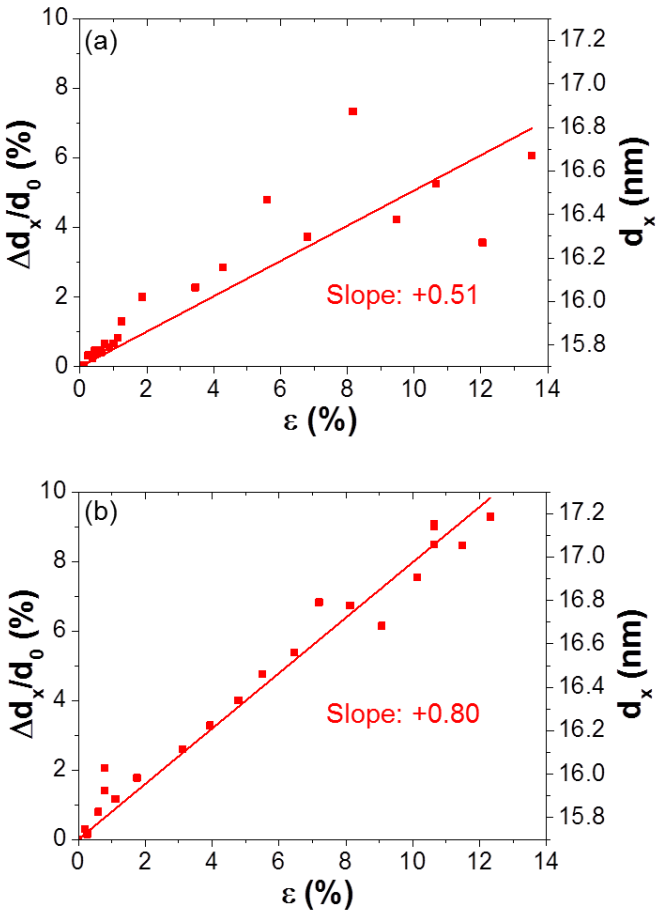

Figure S3. Evolution of the relative NP center-to-center distance $\Delta d_x/d_0$ measured by GISAXS with respect to the strain ε applied along the x axis, for 15 nm NP-based strain gauges on (a) PET and (b) PI substrates.

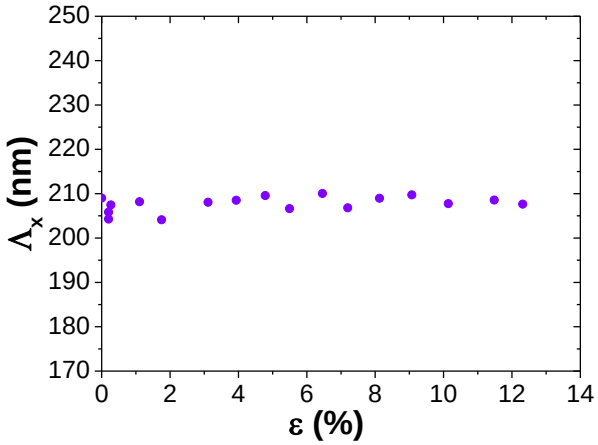

Figure S4. Evolution of the correlation length Λ_x measured by SAXS with respect to the strain ε applied along the x axis, for a 15 nm NP-based strain gauge on PI substrate.

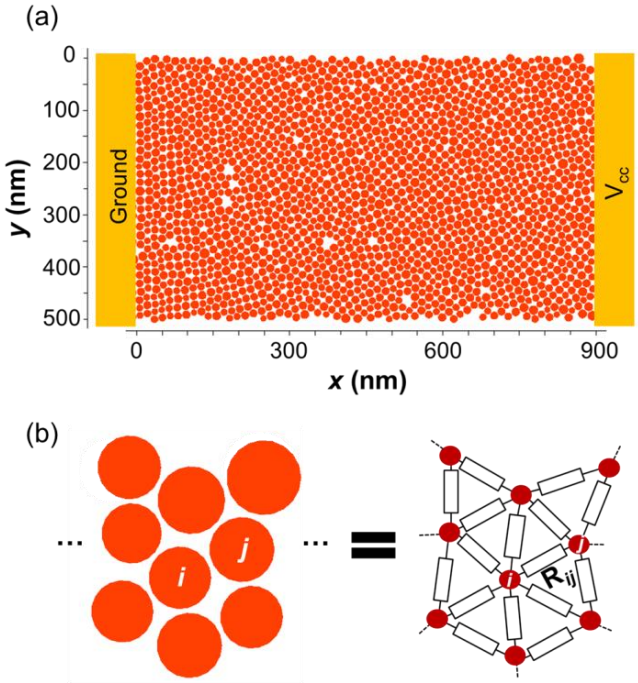

Figure S5. (a) Model hexagonally-packed assembly of gold nanoparticles with a mean diameter of 15 nm and a size dispersion of 10%, separated from each other by a distance of 0.8 nm at zero strain, (b) zoom-in of the hexagonally-packed assembly of gold nanoparticles presented in (a) and the associated resistor network, used for modeling.