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Supporting Information

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Supporting information for:

Loading of exponentially grown LBL films with Ag nanoparticless and their application for generalized SERS detection

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Details on sample preparation for TEM

e-LBL films were grown and infiltrated on glass slides. Cross-sectional TEM imaging was carried out in a JEOL JEM 2010F field emission gun transmission electron microscope, operating at 200 kV and equipped with scanning transmission electron microscopy (STEM) unit and a HAADF detector. TEM images were acquired in bright field, while STEM images were obtained in dark field.

The specimen for TEM was prepared by the liftout technique in a focused ion beam (FIB) workstation using a FEI Helios 400 nanolab dual beam microscope. The final thickness of the lamella was about 50 nm. In order to protect the delicate surface features of the sample, a first thin carbon layer, followed by a thicker Pt layer were deposited on the sample surface. Thereafter, machining and thinning were carried out. The lamella was ultimately transferred to the FEG-TEM for analysis.

Several images with different magnifications are shown below:

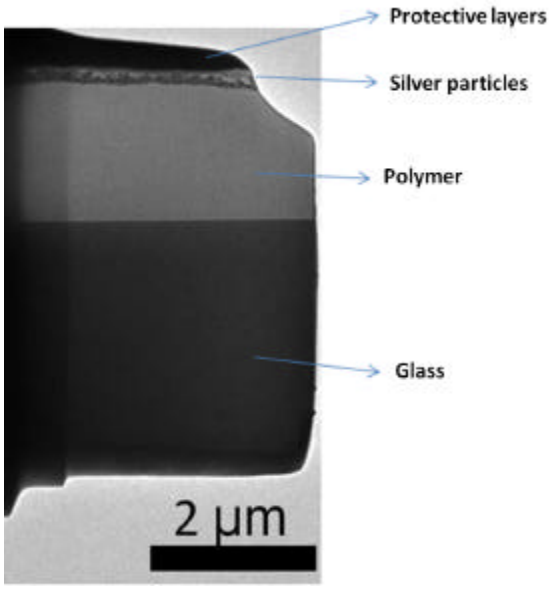

Figure S1. Low magnification TEM image showing the specimen lamella, the protective layers on top are a thin carbon layer and a platinum layer.

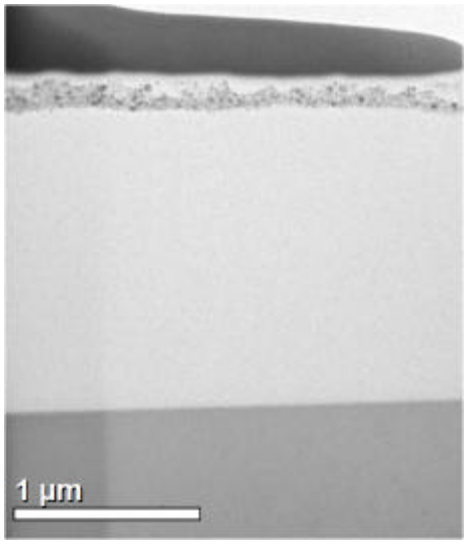

Figure S2. TEM image showing the silver nanoparticles layer in more detail, the polymer layer and the glass substrate.

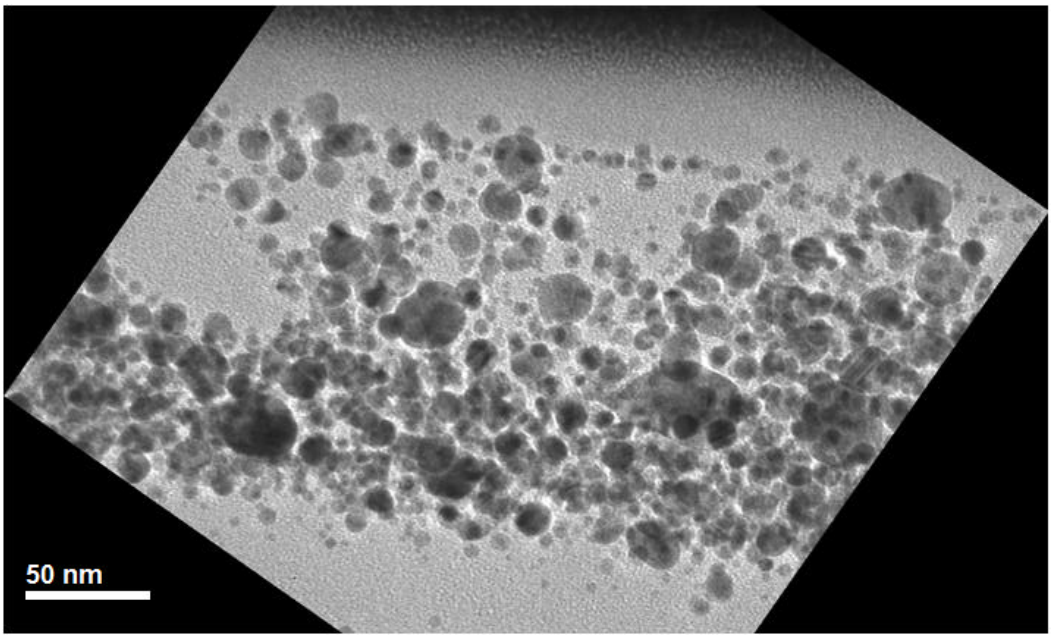

Figure S3. TEM image of the silver nanoparticles layer. The thickness of the layer is around 150 nm.

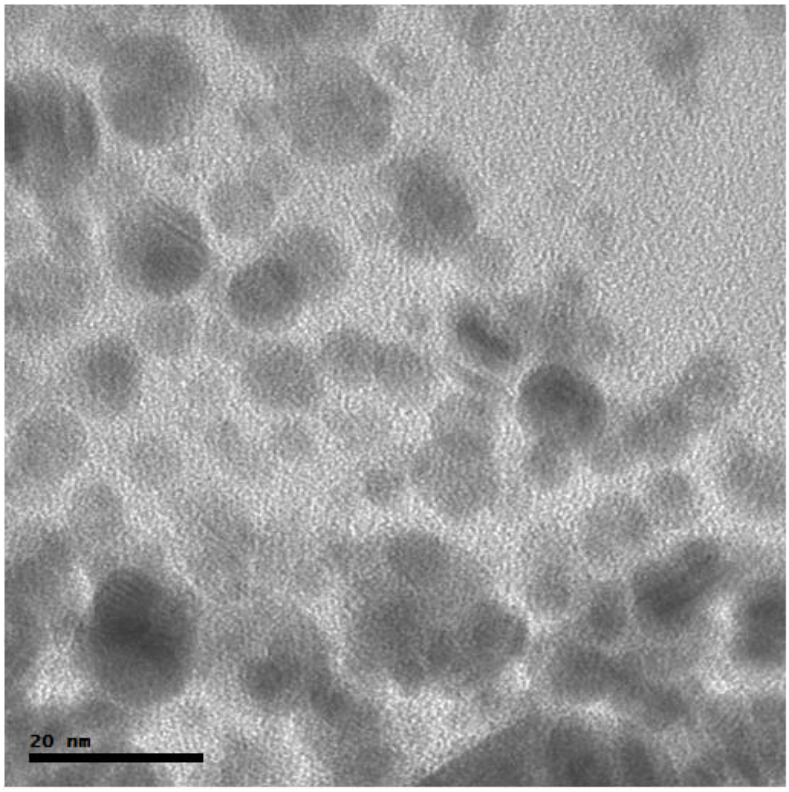

Figure S4. High resolution TEM image of the silver particles.

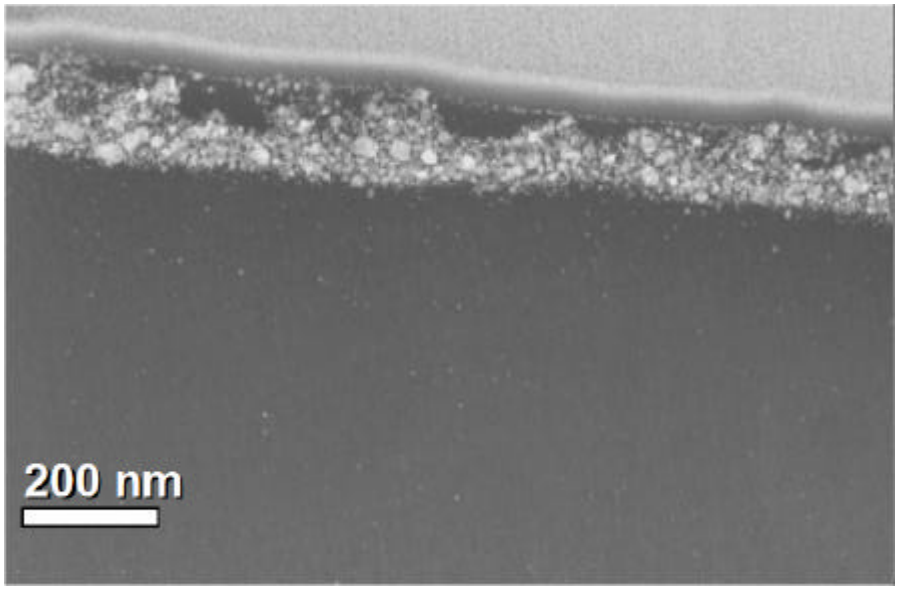

Figure S5. Dark field STEM image providing better contrast between particles and polymer film.

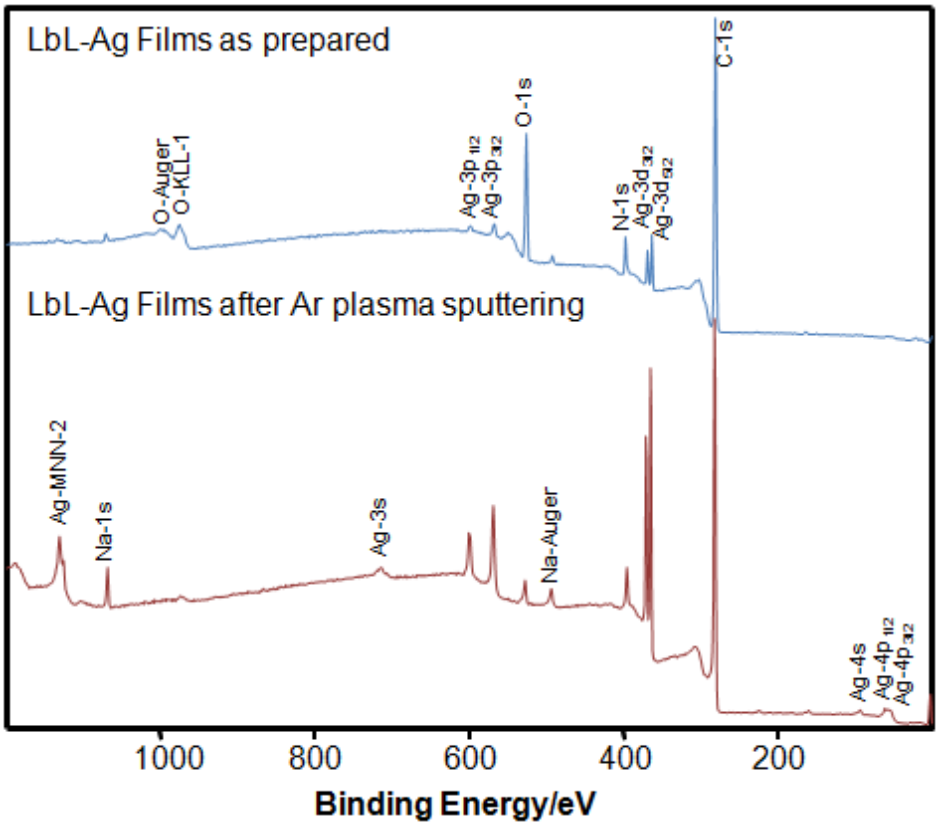

Figure S6. XPS chemical analysis of the e-LBL Ag NP film after 24 h of immersion, as prepared and after sputtering with an argon ion plasma for 120 s.

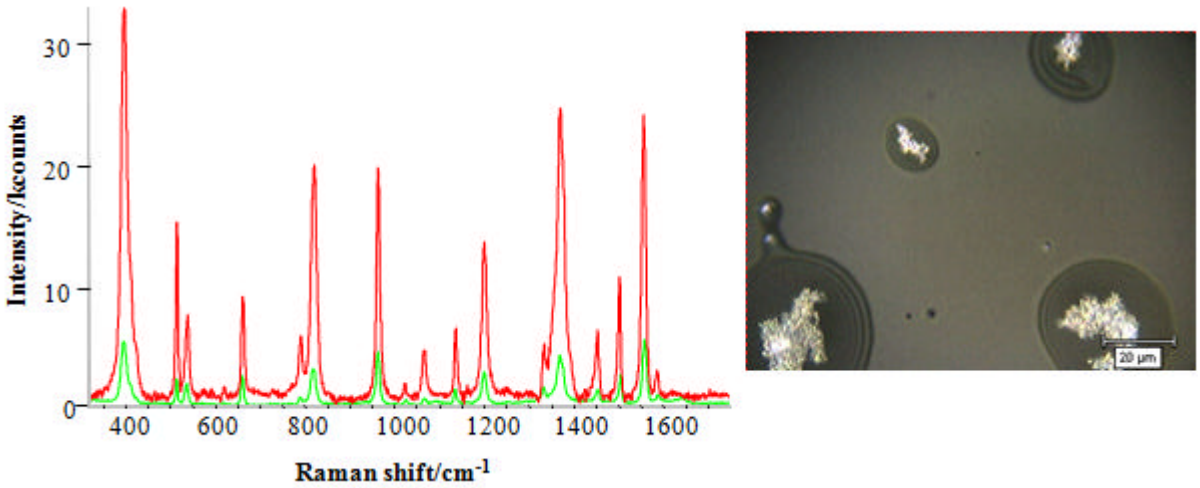

Figure S7. SERS intensity obtained for 1NAT on LBL-Ag film (red) and on aggregated silver citrate colloids (green, optical image).

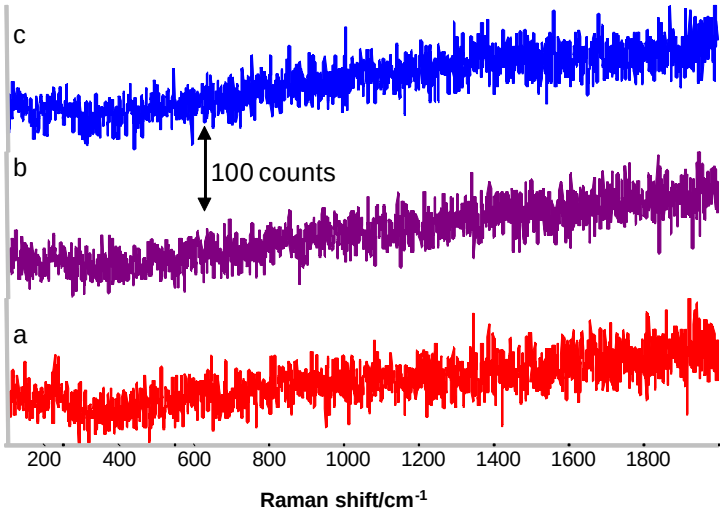

Figure S8. Raman spectra of: (a) LbL film without nanoparticles or analyte; (b) LbL film without nanoparticles but with analyte (10^{-5} M 1NAT); and (c) LbL film with nanoparticles but without analyte. Spectra were collected under the same conditions as SERS spectra shown in Figure 3, i.e. ~1 μW of power at the sample and acquisition times of 10 s, upon excitation with the 785 nm laser line.