Supporting Information

UV-Laser Interference Lithography for Local Functionalization of Plasmonic Nanostructures with Responsive Hydrogel

*Nestor Gisbert Quilis[a], Simone Hageneder[a], Stefan Fossati[a], Simone K. Auer[a], Priyamvada Venugopalan[a,b†], Anil Bozdogan[b], Christian Petri[c], Alberto Moreno-Cencerrado[d], Jose Luis Toca-Herrera[d], Ulrich Jonas[c] and Jakub Dostalek[a]**

[a]BioSensor Technologies, AIT-Austrian Institute of Technology GmbH, Konrad-Lorenz-Strasse 24, 3430 Tulln, Austria

[b]CEST Kompetenzzentrum für elektrochemische Oberflächentechnologie GmbH, TFZ, Wiener Neustadt, Viktor-Kaplan-Strasse 2, 2700 Wiener Neustadt, Austria

[c]Macromolecular Chemistry, Department Chemistry-Biology, University of Siegen, Adolf Reichwein-Strasse 2, Siegen 57076, Germany

[d]Institute for Biophysics, Department of Nanobiotechnology, University of Natural Resources and Life Sciences Vienna (BOKU), Muthgasse 11, Vienna 1190, Austria

Observation of the interference field profile formed by the phase mask. A thin layer of the S1805 positive photoresist (diluted 1:2 with propylene glycol monomethyl ether acetate) with a thickness of 120 nm was deposited by spin-coating (4500 rpm, 45 s) on top of a BK7 substrate. Afterward, the sample was mounted in a home-built set-up together with the phase mask to verify the recording pattern. The distance of the photoresist-coated substrate in respect with the phase mask (recording plane) was kept to 5.6 mm. At this distance the first order diffraction gratings overlap at the center of the mask for a Λ=690 nm. Thus, the samples were irradiated once to 27 mJ cm^{-2} and developed for 35 sec.

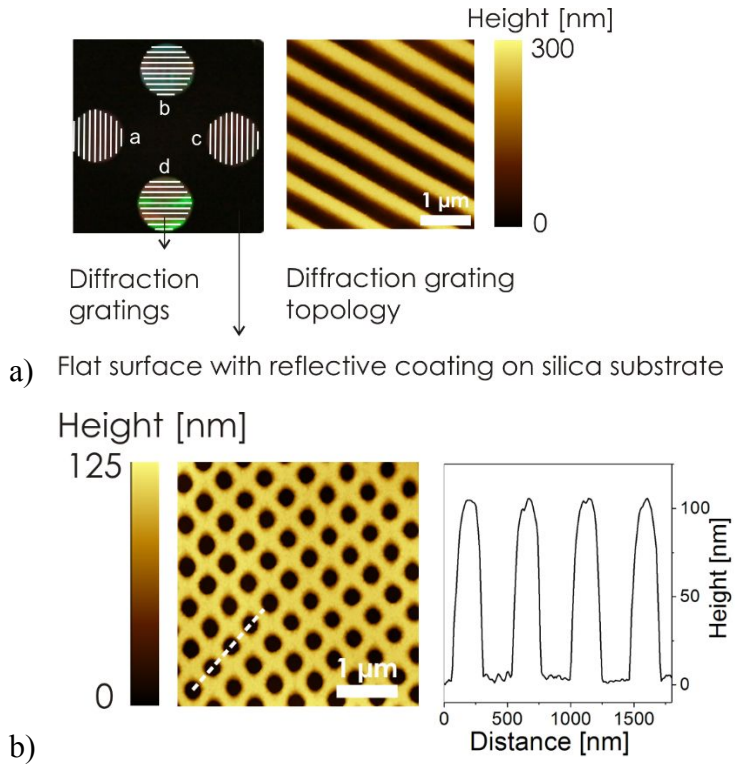

Figure S1. (a) Schematics of the prepared phase mask with orientation of the transmission gratings (left) and their topography obtained by AFM (right). (b) Recorded interference pattern into the S1805 positive photoresist using the prepared phase mask.

Plasmon-enhanced fluorescence readout of model assay

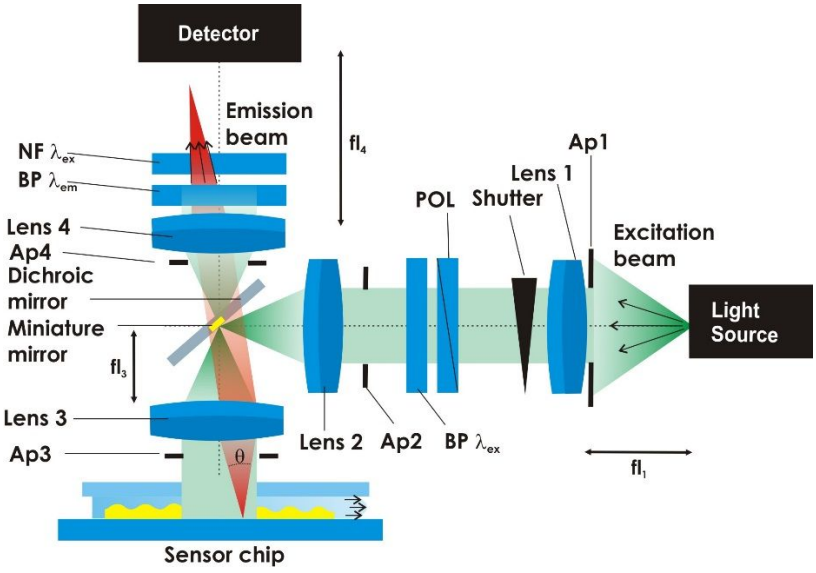

Figure S2. Schematics of the optical setup configuration of the reader that enables in situ readout of fluorescence signal kinetics from the sensing spots on a sensor chip: NF – notch filter, BP – bandpass filter, Ap – aperture, POL – polarizer, fl – focal length.

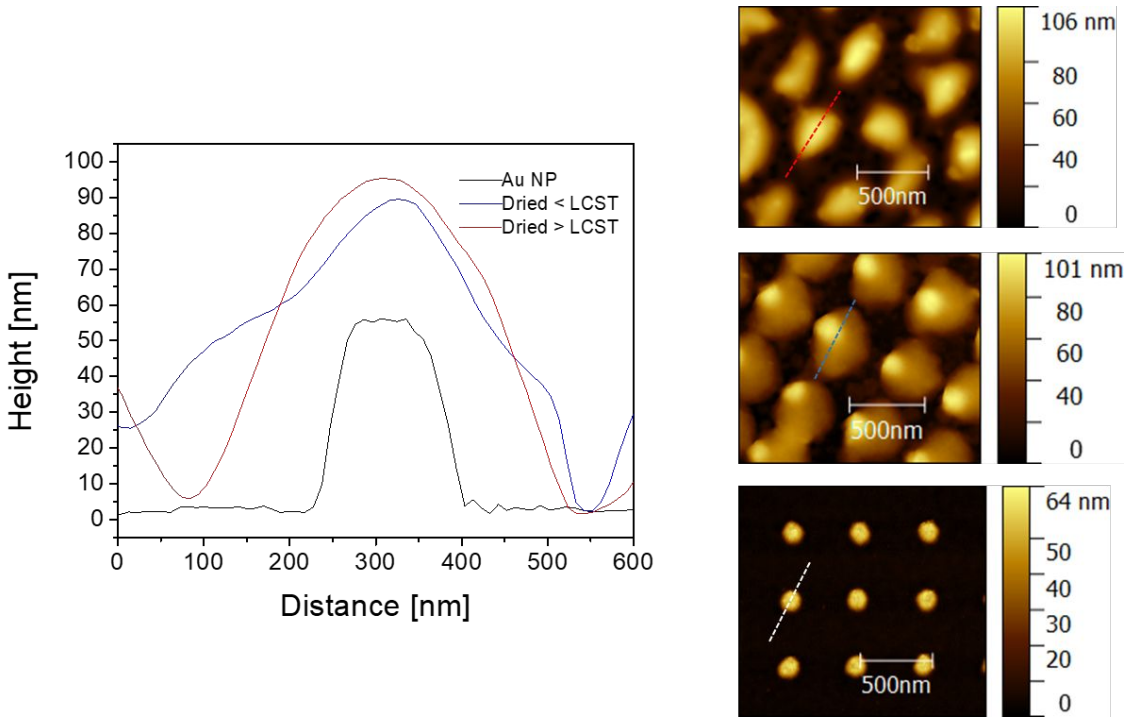

Figure S3. Cross-sections of representative areas of AFM topography showed in Figure 5 for bare gold nanoparticles (black curve), gold nanoparticles capped with pNIPAAm-based hydrogel dried below its LCST (blue curve) and above its LCST (red curve) and associated AFM images.