# Real-Time DNA Detection on a Plasmonic Nanoparticle Spot

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Noble metal nanoparticles are well known for their unique optical properties. By an external incident light beam, density oscillations of the nanoparticle's conduction electrons are induced at a specific frequency, which is known under the term Localized Surface Plasmon Resonance (LSPR). The spectral position of the resonance band can be adjusted by shape, size and material of the nanoparticle and influenced by changes of the local refractive index of the surrounding medium. Latter gives the opportunity to use noble metal nanoparticles as label-free bioanalytical sensors. Biomolecules can be bound directly on the nanoparticle's surface, which leads to a change of the local refractive index and a shift of the maximum peak detected by absorbance-spectroscopy.

A bioanalytical sensing platform for real-time measurements in-situ will be presented. A dense layer of noble metal nanoparticles is immobilized on a glass substrate and implemented in a microfluidic chamber. Both the biofunctionalization of the nanoparticles with capture DNA as well as the binding of the analyte are performed under flow. The extinction spectra of the nanoparticle layer are measured continuously, which leads to a real-time tracing of the maximum peak position change - respectively of the binding kinetics. As example of use the hybridization of the DNA sequences of the water pathogen *Legionella pneumophila* and the potential sepsis pathogen *Aspergillus fumigatus* will be presented.

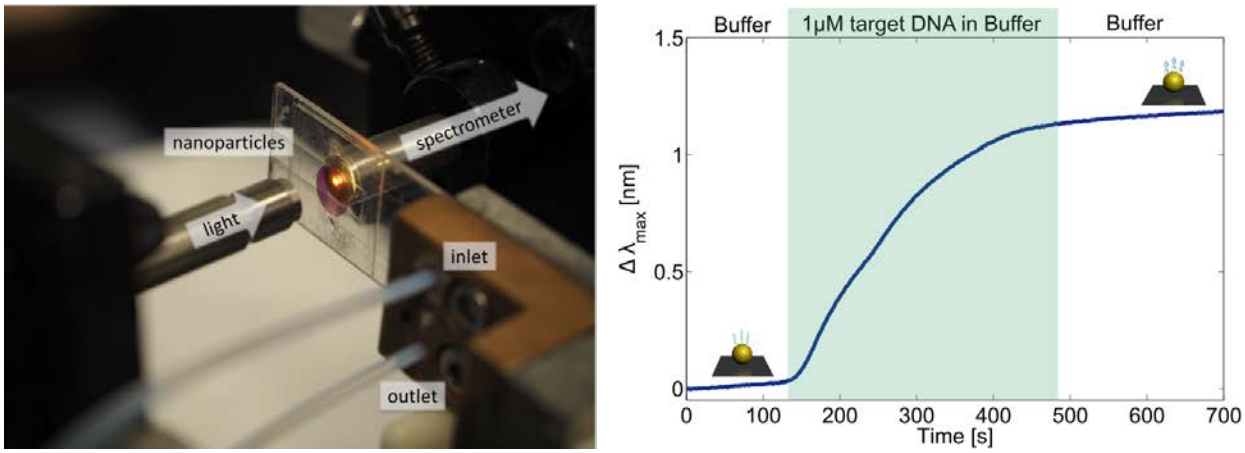


***Figure:*** *Left: Image of the detection setup including a microfluidic chamber with a layer of 80 nm spherical gold nanoparticles (red spot). Right: Sensogram of online target DNA detection.*

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