# Setup of inflammation induced permeability measurements by gold nanoparticles and optical biosensor

In the framework of this project, we have successfully synthesized positively and negatively charged gold nanoparticles stabilized by thiols and citrate, respectively. We carried out experiments with biosensors and investigated the interaction between cells and nanoparticles. We monitored the penetration of positively charged nanoparticles into adhered HeLa cells by using Optical Waveguide Lightmode Spectroscopy in a real-time and completely label-free manner. We carried out also control kinetic experiments using citrate-capped (negatively charged) gold nanoparticles, and we proved that their cellular uptake is less effective. This finding supports our hypothesis that the cell membrane and nanoparticle interaction plays a crucial role in the penetration of the charged particles since the membrane composition of the cells are negatively charged, thus attractive electrostatic interaction can help nanoparticles to be internalized into the cells. In order to increase the sensitivity of the biosensor experiments, other types of nanoparticles will be used.