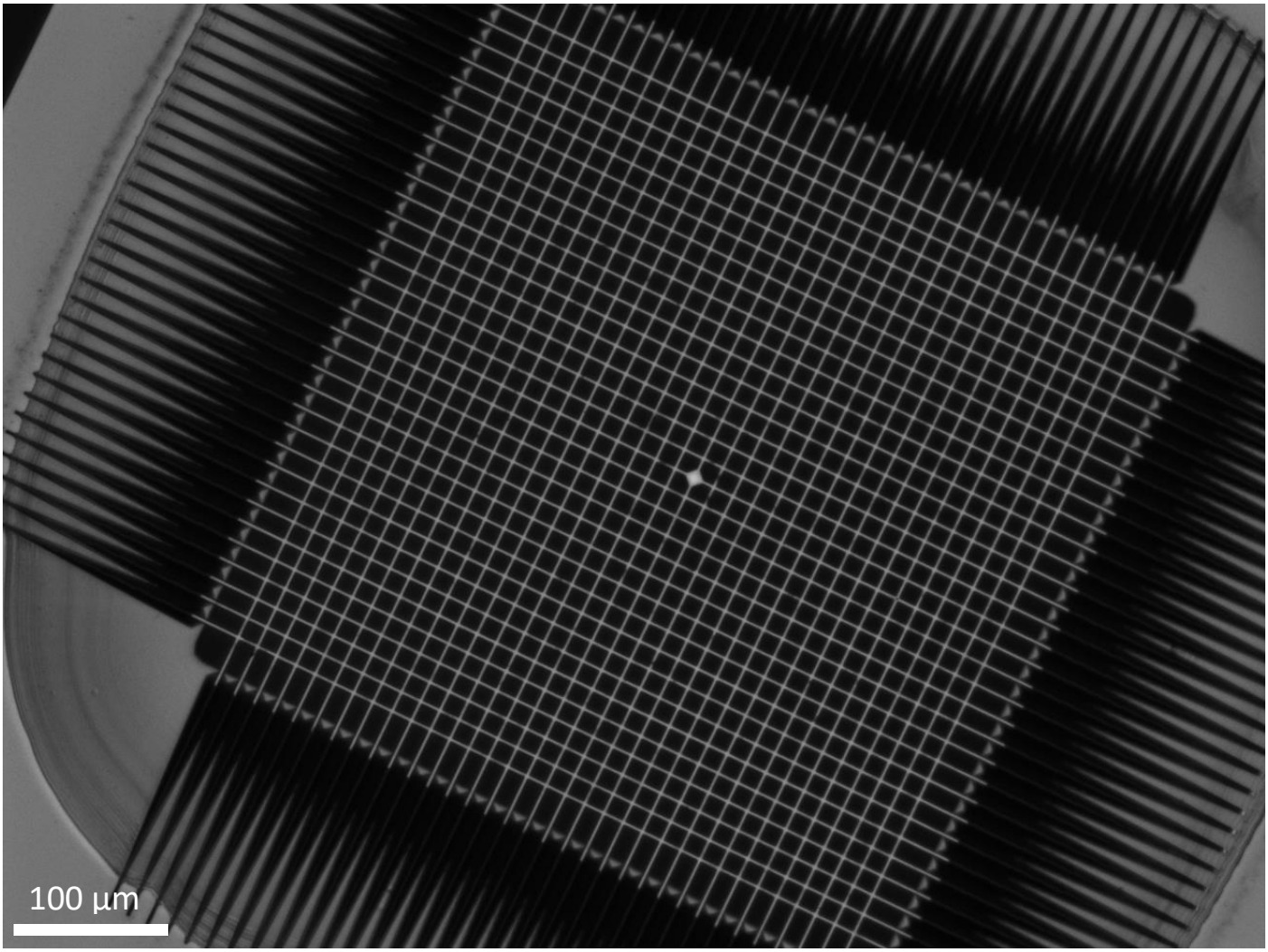
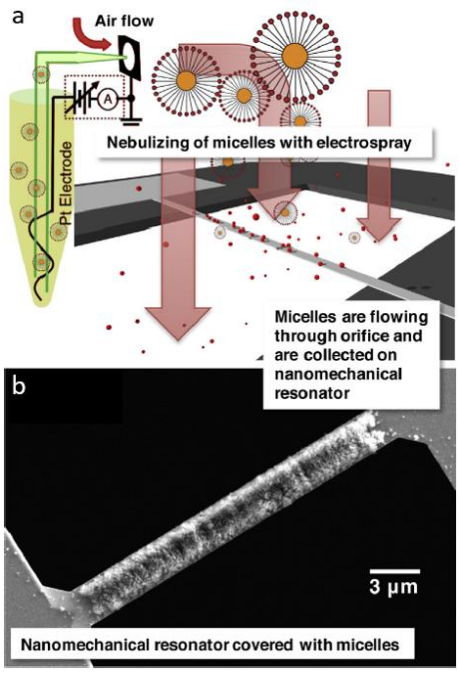
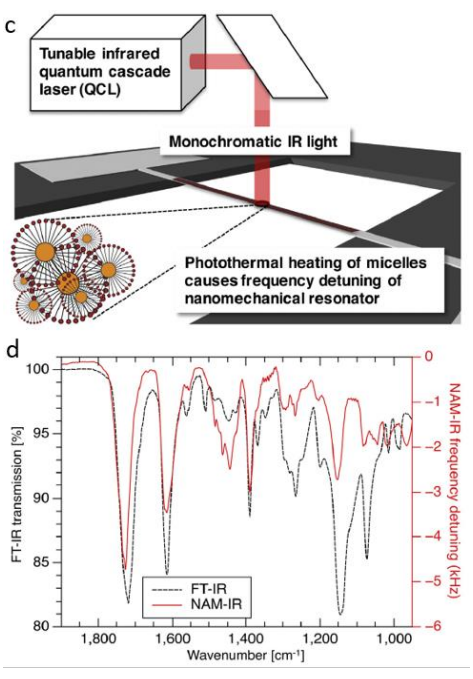


MASTER PROJECT

Nanomechanical resonators as breakthrough in protein quantification

Regarding most applications for life science, as enzymatic studies, quantitative proteomics or downstream monitoring in pharmaceutical research, require high sensitive and fast methods for determination of accurate protein concentrations. In contrast to all cutting-edge technologies, which still rely on transmission spectroscopy, the direct absorption analysis of chemical components by exploiting the thermal expansion of nanomechanical resonators enables outperforming sensitivities down to the femtowatt regime. By means of this so-called NAM-IR [1] spectroscopy, we propose an instrument based on a nanoelectromechanical system (NEMS) to enable a label-free protein quantitation, combining UV and IR spectroscopy, pushing the minimal necessary amount for detection from nanograms to single femtograms. Main objective of the proposed Thesis includes the development of a non-invasive aerosol setup and optimized resonator design for quantitive sampling of proteins.





TECHNISCHE UNIVERSITÄT WIEN

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Interested? Then contact us! ☺

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[1] A.J. Andersen et al., Sensors and Actuators B: Chemical, *vol.* **233 114** (2016), pp. 667 - 673