



FACULTY OF SCIENCE
Charles University

School of Chemistry, Faculty of Science (FoS)
would like to invite you to attend the lecture



Quo Vadis Chemie

Heyrovsky-Ilkovic-Nernst-Lecture

organized jointly by
Czech Chemical Society, Slovak Chemical Society and German Chemical Society

Label-Free Sensing Strategies Using Impedance Spectroscopy, SPR and Protein Electrochemistry



which will be delivered by

Prof. Dr. habil. Fred Lisdat

Technical University Wildau, Biosystems
Technology, Institute of Life Sciences and
Biomedical Technologies

on October 22, 2019 at 14:00

the Lecture Hall CH2, the School of Chemistry Building, FoS CU, Hlavova 8, Praha 2

Label-free methods are valuable tools during the development of sensors and biosensors since they allow to optimize the conditions for surface modifications and biomolecule binding. However, these methods have also increasingly be used as transduction methods in the sensing process itself. The presentation will address different directions of our research demonstrating the potential but also drawbacks of label-free techniques.

Electrochemical impedance spectroscopy (EIS) can be used for the detection of nucleic acids exploiting their highly charged character. This can be applied for concentration analysis, mismatch detection or the analysis of binding events of molecules to nucleic acids. SPR exploits changes in the optical density near the surface. Limitations occur when only small changes happen. It can be shown however, that even conformational changes such as the formation of G quadruplex structures can be detected when a proper capture strand design is used. Furthermore, the potential of online binding detection can be used for the discrimination of structurally similar proteins.

A focus point of our research is the development for efficient enzyme-electrode coupling strategies allowing the electrochemical detection of enzymatic conversions. Application is not limited to analytics, but also directed to the construction of biofuel cells. A more recent development includes light-sensitive electrodes since they allow not only a light-directed read out, but also provide an attractive potential behaviour.

A handwritten signature in red ink, appearing to read 'Zarek', is centered on the page.

President of the Division of analytical chemistry of the Czech Chemical Society
