ADLERSHOFER KOLLOQUIUM Analytik

Topic: **New Perspectives for Proteomics, Biomedical and Biomolecular Recognition Analysis by Combination of Affinity Tools and Mass Spectrometry**

Presenter: **Prof. Dr. Dr. h.c. Michael Przybylski**
Steinbeis Center for Biopolymer Analysis & Biomedical Mass Spectrometry, Rüsselsheim & Department of Chemistry, University of Konstanz

Chair: Dr. Rudolf Schneider (BAM)

Date: 3 May, 2016 2:00 PM

Location: Bundesanstalt für Materialforschung und -prüfung (BAM)
Branch Adlershof, Richard-Willstätter-Str. 11, 12489 Berlin
Building 8.05 / Lecture Hall

Summary: Bioaffinity-based technologies such as ELISA, Western Blot and biosensor determination are long established in the analysis of biomolecular interactions, but their combination with mass spectrometry (MS) is only beginning to be explored. Bioaffinity and MS technologies are recently emerging as powerful “hybrid” tools for detection, chemical structure determination and quantification of biomolecular interactions, particularly recognition epitopes. New developments of MS for the characterization of biopolymer interactions will be reviewed by combination with biochemical affinity techniques; affinity-separation, affinity determination and quantification; identification of antigen epitopes and antibody paratopes; clinical applications of affinity-proteomics. These technologies are currently gaining high interest in many application areas such as pharmacology, clinical diagnostics and the development of antibody-based drugs.
Bioaffinity analysis using biosensors such as surface plasmon resonance (SPR) has become an established technique for the detection and quantification of biomolecular interactions. However, a principal limitation of biosensors is their lack of providing chemical structure information of affinity-bound ligands. Using both surface acoustic wave (SAW) and SPR biosensors, we have developed an online biosensor-MS combination with electrospray ionization mass spectrometry (Biosensor-ESI-MS) that enables the simultaneous affinity capture/isolation, chemical structure determination and affinity quantification of biopolymer ligands. Key tool of the biosensor-MS combination is a new integrated, automated interface that provides sample concentration and in-situ desalting for MS analysis of the ligand eluate.
ESI-MS systems from all major manufacturers and a wide range of biosensors can be coupled. Recent applications of the online biosensor-MS show broad bioanalytical potential for interaction studies from biological material, as diverse as antigen-antibody and lectin-carbohydrate complexes; affinity binding constants (KD) are determined from milli- to nanomolar ranges. First applications to the direct analysis of biological samples, such as cell lysate and tissue homogenate will be described.