GDCh

GESELLSCHAFT DEUTSCHER CHEMIKER
ORTSVERBAND SIEGEN

UNIVERSITÄT SIEGEN

Ankündigung

Am Dienstag, **18. Juni 2019**, spricht um **16:30 Uhr**
im Hörsaal AR-F 002, Department Chemie und Biologie

Prof. Dr. Bernhard Spengler

Universität Gießen

über das Thema

„High-Resolution Mass Spectrometry Imaging of Biological Tissue and Cells“

Kaffeerunde ab 16 Uhr im Foyer des Hörsaals AR-F 002.

Alle interessierten Kolleginnen und Kollegen, Mitarbeiterinnen und Mitarbeiter und Studierende sind zu diesem Vortrag herzlich eingeladen.
Gäste sind herzlich willkommen.

Der Ortsverbandsvorsitzende
PD Dr. Stephan Bäurle
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High-Resolution Mass Spectrometry Imaging of Biological Tissue and Cells

Detection of lipids, peptides, drugs and metabolites in tissues and cells is a key issue for the understanding of biological processes. Mass spectrometry imaging is an advantageous tool in this context, as it allows to visualize compounds with cellular resolution in an untargeted and unbiased approach, i.e. without having to label expected compounds prior to analysis. Recent improvements in spatial resolution and sensitivity will be reported for the so-called atmospheric-pressure scanning microprobe MALDI mass spectrometry imaging technique (APSMALDI MSI). The method has gained significant attention especially due to its capability to disclose morphologic distributions of substances in complex biological samples with high sensitivity under ambient pressure, thus avoiding vacuum-induced analyte losses or morphological artefacts [1]. High resolution in mass and space has been used to derive distinct molecular information from sub-cellular structures.
Several dedicated imaging ion sources are used in our lab in combination with orbital trapping mass spectrometers (Q ExactiveTM, Thermo Fisher Scientific,

Bremen, Germany) for imaging drugs, metabolites, phospholipids and peptides. A new high-speed system now includes autofocusing and 3D-surface analysis with a lateral resolution down to 5 µm per pixel. Recent improvements allowed us to increase the resolution further to 1.4 µm per pixel in a special setup [2]. The method allows to visualize bioactive compounds in e.g. human, animal, and plant tissue, in vectors of infection or in parasites, from planar sections or from non-planar 3D surfaces [3]. The high mass resolution and accuracy of the orbital trapping mass spectrometers at the same time allow to clearly assign and distinguish metabolites within the highly complex samples. Beyond that, MS/MS imaging allows to characterize and identify known or unknown compounds during image analysis.

1. Spengler B (2015) Mass Spectrometry Imaging of Biomolecular Information. Anal. Chem. 87, 64−82.

2. Kompauer M, Heiles S, Spengler B (2017) Atmospheric pressure MALDI mass spectrometry imaging of tissues and cells at 1.4-µm lateral resolution. Nature Methods 14, 90-96.

3. Kompauer M, Heiles S, Spengler B (2017) Autofocusing MALDI mass spectrometry imaging of tissue sections and 3D chemical topography of nonflat surfaces. Nature Methods 14, 1156-1158.