

## **OMICS Core Facility – Proteome and Metabolome Unit (under construction)**

Contact Information:

Dr. Marcus Persicke

Mail to: [marcus.persicke@uni.bielefeld.de](mailto:marcus.persicke@uni.bielefeld.de)

Phone: 12252

### **List of Instruments:**

#### **Proteomics Instruments:**

##### **Bruker MALDI-ultrafleXtreme**

The ultrafleXtreme is a MALDI ToF/ToF system for the analysis of proteins, peptides, small molecules or even tissue samples (MALDI-Imaging). It is possible to analyze samples up to 500kDa in mass and a high resolution of up to 40,000 can be achieved over a wide mass range. Bruker's LIFT technique is used to acquire MS/MS spectra from low fmol levels. Samples can be run in linear or reflectron mode to enhance mass resolution.



##### **Nano-LC-ESI-Orbitrap-MS/MS – Thermo nUHPLC coupled to an Orbitrap Q Exactive Plus**

The Q Exactive Plus is a hybrid quadrupole-Orbitrap mass spectrometer coupled to an UltiMate 3000 nUHPLC. Through a combination of scan speed, high resolution, mass accuracy, spectral quality, and sensitivity it is ideally suited for shotgun/bottom-up proteomics, which means to routinely and confidently identify, quantify, and confirm in a single analysis thousands of proteins and their post-translational modifications (PTMs).



## Metabolomics Instruments:

### GC-MS/MS – Thermo Trace GC coupled to a TSQ9000

The GC-MS/MS system from Thermo Scientific is a coupling of a gas chromatograph with a triple quadrupole mass spectrometer. Ionization takes place via EI (Electron Ionization) source and the system is equipped with a derivatization robot from Gerstel. The device is frequently used for the analysis of the central metabolism and fatty acids methyl esters (FAMES).



### GC-MS/MS – Shimadzu GC coupled to a TQ8050

The GC-MS/MS system from Shimadzu is a coupling of a gas chromatograph with a triple quadrupole mass spectrometer. Ionization takes place via EI (Electron Ionization) source and the system is equipped with a derivatization robot from Gerstel. The device is frequently used for the analysis of the central metabolism, FAMES. Additionally, due to its high sensitivity it is suitable for trace analysis.



### LC-ESI/MALDI-MS/MS – Bruker UHPLC coupled to a tims TOF flex M2

The LC-ESI/MALDI-TOF system consists of a high-resolution mass spectrometer. It is characterized by a wide mass range ( $m/z$  20 - 40,000) and a high resolution of up to 60,000. The special features of this device are the two application areas: cell-internal metabolomics and spatial metabolomics of thin sections. An additional feature is the trapped ion mobility spectroscopy (tims), which enables the measurement of ion mobility and generates clean MS/MS spectra at the same time. Another highlight is the double laser for imaging, which enables post-ionization leading to enhanced sensitivity.



### **LC-ESI-Orbitrap-MS/MS – Thermo UHPLC coupled to an Orbitrap Exploris 120**

The LC-ESI-Orbitrap system consists of a high-resolution mass spectrometer. It is characterized by a mass range of 20 - 2,000 m/z. The special feature of the device is the high mass accuracy of <1 ppm with internal calibration, which together with the very high resolution of up to 120,000 facilitates unknown metabolite identification.



### **LC-ESI/APCI-MS/MS – Shimadzu UHPLC coupled to Sciex 6500+ triple quadrupole MS/MS**

The LC-ESI/APCI-MS/MS system consists of a highly sensitive triple quadrupole mass spectrometer of the latest generation. It is characterized by a mass range of 5 - 2,000 m/z and a high scan rate of up to 20,000 Da/s. The instrument has two ionization sources, electrospray ionization (ESI) and atmospheric pressure chemical ionization (APCI), which extends the range of applications to metabolites that are difficult to ionize. Due to the high linear dynamic range of up to 6 orders of magnitude, the device is perfectly suited for the quantification of low-concentration metabolites.



### **Nano-electrospray ionization device – Advion TriVersa NanoMate**

This device is a chip-based nano-ESI source with an automatic sample application unit. The device operates by direct infusion and uses a separate emitter for each sample, eliminating sample contamination. It is characterized by the fact that 15 minutes of stable spray can be generated from 3µl of sample. The source can currently be operated on both Orbitrap devices, the QExactive Plus and the Exploris 120.



### **Further Equipment**

Further equipment for sample preparation is available. Sample extraction can be carried out using the Precellys or Precellys Evolution homogenizers, which can be used for refrigerated or non-refrigerated disruption. A lyophilizer is available for gentle drying of cell or plant material. A nitrogen evaporation unit can be used to dry extracts.