Proteomics Core Facility

What we do

Deeper insight in Wnt signaling

Wnt signaling is involved in the embryonic development and homeostasis and its deregulation causes serious health disorders. Thus, better understanding of related molecular mechanisms will have impact on treatment of these disorders. Researchers from the Faculty of Science, Masaryk University study Wnt signaling pathways, with special focus on Dishevelled (DVL) proteins, which are important signal integrators in the Wnt pathway. In this study, where our core facility characterized DVL phosphorylation status, they revealed novel function of DVL that creates a mechanistic basis for the novel crosstalk between Wnt signaling pathways and the centrosomal cycle. [Cervenka et al., PNAS, 113 (2016), 9304-9309]

Mystery of plant reproduction

Cell–cell communication plays a crucial role in male–female recognition during plant sexual reproduction. Peptides secreted from the female reproductive tissues guide pollen tubes towards ovules for fertilization. Researchers from the Institute of Experimental Botany, Czech Academy of Sciences in Prague in cooperation with our facility performed genome-wide quantitative analysis of a tobacco pistil-stimulated pollen tube secretome. In this pioneering study, first at this scale, we identified hundreds of novel genome-wide pollen tube-secreted proteins with potential functions in pollen tube guidance towards ovules extending our knowledge about the respective molecular mechanisms. [Hafidh et al., Genome Biology, (2016) 17:81]

Profiling of barley varieties for beer production

The identity and purity of malting barley varieties is one of key factors in beer production. Our core facility participated in development of MALDI-TOF MS profiling method of barley grains which represents simpler and faster alternative to currently used SDS-PAGE technique for assessment of malting barley varieties. [Šedo et al., Food Chemistry, 206 (2016) 124-130]

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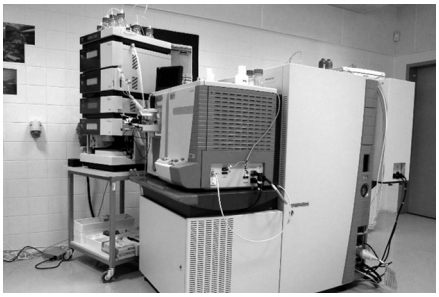
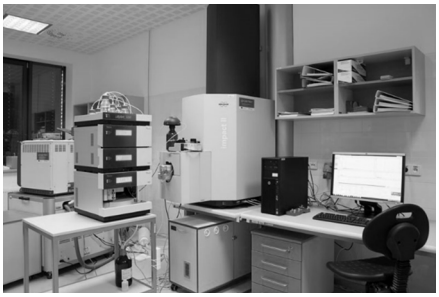
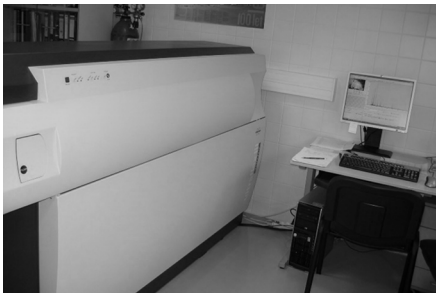


LC-MS/MS – Orbitrap Elite
https://www.ceitec.eu/orbitrap-elite-high-resolution-mass-spectrometer/e79



LC-MS/MS – Impact II
https://www.ceitec.eu/nanoesi-q-tof-ms/e293



MALDI-MS/MS – Ultraflextreme
https://www.ceitec.eu/maldi-tof-tof-mass-spectrometer/e285

Services and Methodologies Provided

We provide general proteomics services based on utilization of mass spectrometry in full service mode. Our expertise covers all steps of proteomic analysis: protein isolation from different types of samples (cells, tissues, membranes, plants, food etc.), variety of sample preparation procedures, enrichment techniques for particular types of PTMs, separation or fractionation of proteins or peptides using electrophoretic or liquid chromatographic techniques, different types of MS analyses and basic data processing which enables understandable reporting of results to users.

We provide consultations (e.g. planning of proteomic experiments) and participate in training of students.

Our services might be divided into four main groups:

- Intact mass analyses
- Protein identification
- Characterization of protein modifications
- Protein quantification

Equipment

We are comprehensively equipped for processing of protein samples, including instrumentation for sample preparation, electrophoretic and chromatographic separation of proteins and peptides. However, our key instrumentation is mass spectroctrometers. At present, we operate:

- LC-MS/MS – Orbitrap Elite
- LC-MS/MS – Impact II
- MALDI-MS/MS – Ultraflextreme

Contact and Location

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