

**08 S70 – S -**  
**Techniques in proteomics**

Lecture outline

Proteomics, definition, meaning and goals, fundamentals of protein and peptide separation technique, proteomic approaches (gel based and non-gel based), sample preparation, one dimensional electrophoresis (SDS-PAGE), two-dimensional gel electrophoresis (2D-PAGE), 2D Differential gel electrophoresis (DIGE), various staining techniques, absolute quantification method, interpretation of results, mass spectrometry, peptide fragmentation mechanism, mass spectra and identification of proteins, mass-spectrometry search engine-Mascot. Proteomics of un-sequenced organisms (denovo sequencing approach), Interactional proteomics- Gene Ontology (GO) annotation, proteomics database and their applications.

Laboratory course outline

Sample preparation, SDS-PAGE, 2D electrophoresis and staining (Commassie and silver staining), DIGE and gel scanning, introduction to Decyder gel analysis software, Gel spot cutting, tryptic digestion of protein spots, sample spotting on MALDI target plate. Peptide Mass Finger-printing (PMF) and MASCOT searching, ID mapping for protein accession number. Usage of online proteomics software to extract the content from the list of the proteins identified.

Reading lists:

1. 2D-PAGE electrophoresis online overview and manual.(Prof. Dr. Dr. Angelika Görg)
2. <http://expasy.org/sprot/> (Swiss-Prot)
3. [http://www.matrixscience.com/search\\_form\\_select.html](http://www.matrixscience.com/search_form_select.html) (MASCOT)

Futher information

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