THE COURSE

THE LEARNING OUTCOMES

- Synthesis of nanoparticles: gold, silica and magnetic ones.
- Decoration of Gold nanoparticles: attaching antibodies and proteins
- Use of nanoparticles in proteomics: Simplifying the proteome.
- Functionalized Magnetic@Silica Nanoparticles with Antibodies
- Profiling diseases.
- Tissue proteomics.
- Fishing proteins in tissues with nanoparticles.
- Protein identification: Shot Gun.
- Protein quantification using 18O
- Proteogenomics

COURSE OUTLINE

Proteomics I

- Protein extraction, clean-up and total protein quantification

Proteomics II

- 1D-SDS-PAGE and 2D-Gel Electrophoresis

Proteomics III

- Proteomics sample preparation: in-gel and in-solution digestion

Bioinformatics I

- 2D-Gel Analysis - Protein expression profiling
- Main databases for research of scientific literature, DNA, RNA and protein sequences genome and structure of the molecules

Bioinformatics II

- Identification, characterisation and quantitation of proteins using mass spectrometry data (ESI/MALDI)

Nano-characterization

- Characterization of Nanomaterials by UV-vis, Fluorescence, IR and DLS

Nano-immuno capturing

- Isolation and characterization of target proteins using Gold-nano-Antibodies

Mass Spectrometry I

- MS sample preparation

Mass Spectrometry II

- MALDI-TOF MS

Mass Spectrometry III

- LC-ESI MS/MS

Nano-synthesis I

- Synthesis of Gold, Magnetic Nanoparticles

Nano-synthesis II

- Functionalization of Gold, Magnetic and Magnetic Silica Layer Nanoparticles w/ Antibodies

Genomics I

- Genome projects and model organisms

Genomics II

- Comparative genomics and molecular evolution

Genomics III

- Phylogenetic analysis and data integration