mar520 - Main Module Proteomics

Module label: Main Module Proteomics
Module code: mar520
Credit points: 12.0 KP
Workload: 360 h
Used in course of study: Master's Programme Microbiology > Mastermodule

Module responsibility:
- Ralf Andreas Rabus

Module counseling:
- Lars Wöhlbrand
- N. N.

Entry requirements:
- Lecture: Physiology and diversity of prokaryotes
- Lecture: Molecular Microbiology

Skills to be acquired in this module:
The students are getting directly involved in actual scientific projects in the area of physiological and/or meta-proteomics (under guidance). They
- get acquainted with state-of-the-art proteomic concepts and technologies,
- know how to write concise scientific protocols,
- know how to present/discuss their results in public.

Module contents:
Functional proteomics: Daily lectures introduce the students to theory and concepts of modern proteomics: (i) separation of cellular compartments and protein extraction, (ii) gel-based and -free protein separation, (iii) gel-staining, protein detection and quantification by image analysis, (iv) integrative mass spectrometry-based protein identification, (v) meta-proteomics, and (vi) focused genomic analysis. Each student will prepare a seminar presentation on selected publications relevant for the actual scientific project. The following sequence of experiments will be conducted:
- extraction and quantification of total protein from prepared cell samples (incl. separation of compartments),
- protein separation by SDS-PAGE and staining with Coomassie, silver and/or fluorescent dyes,
- digital image acquisition and analysis,
- manual and/or automated band excision,
- protein identification by nanoLC-ESI-MS/MS,
- nanoLC-MALDI-coupling and protein identification by MALDI-TOF-MS/MS,
- Physiological interpretation of predicted protein functions and relevant genomic context.

Reader's advisory:
Lottspeich - Bioanalytik

Links:

Language of instruction: English
Duration (semesters): 1 Semester
Module frequency: yearly
Module capacity: unlimited
Reference text:
- 12 CP | SE; PR | 2. FS | Rabus

Modulelevel:
- je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program:

Vorkenntnisse / Previous knowledge:

Examination:
- Time of examination: Announced at the beginning of the course.

Final exam of module:

Type of examination:
One assessments of examination: Portfolio: Written protocol and contribution to the seminar (seminar presentation) Seminar presentation (25%), written protocol (75 %). Active participation (Active and documented participation in practical courses (labs, exercises, seminars, field trips) and courses. These include e.g. the delivery of exercises, writing a lab report or seminar presentations according to the advice or the course.

Course type:
- Seminar: 2.00
- Practical: 8.00

Total time of attendance for the module:

Workload attendance:
- 28 h
- 112 h
- 140 h