mar560 - Profile Module Fermentation

Module label: Profile Module Fermentation
Module code: mar560
Credit points: 6.0 KP
Workload: 180 h
Used in course of study: Master's Programme Microbiology > Mastermodule
Contact person:

Module responsibility
- Ralf Andreas Rabus

Authorized examiners
- Alle hier genannten

Module counseling
- Uwe Maschmann
- Kathleen Trautwein

Entry requirements:
- Lecture: Physiology and diversity of prokaryotes (successfully completed)
- Lecture: Molecular Microbiology

Skills to be acquired in this module:
The students are getting directly involved in actual scientific projects in the area of general physiology (under guidance). They understand the scientific rational and design of the experiment(s), get acquainted with state-of-the-art concepts and technologies for process-controlled cultivation and growth balancing, know how to write concise scientific protocols, know how to present/discuss their results in public.

Module contents:
"Fermentation": Daily lectures introduce the students to theory and concepts of process-controlled cultivation: (i) growth physiology and balancing, (ii) design and operating mode of laboratory fermenters, (iii) pH / pO2 electrodes and kLa-determination of O2-supply, (iv) on-line gas analysis (O2, CO2, etc.) by mass spectrometry.

Each student will prepare a seminar presentation on selected publications relevant for the actual scientific project.

The following sequence of experiments will be conducted:
- cultivation of bacterial pure cultures in Erlenmeyer flasks as inoculum for actual "fermenter"-cultures
- determination of optical density, the live count and dry weight of cells during cultivation in fermenter
- (dis)assembly and sterilization of fermentation devices
- operate process-controlled fermenters (incl. O2 and pH adjustments and sterile sampling)
- determine O2-consumption and CO2-production rates based on on-line GC-MS measurements
- quantitative determination and calculation growth balances

Reader's advisory

Language of instruction: English
Duration (semesters): 1 Semester
Module frequency: jährlich
Module capacity: unlimited
Reference text: 6 CP | SE; PR | 2. FS | Rabus
Modullevel: MM (Mastermodul)
Modulart: Wahlpflicht
Lern-/Lehrform / Type of program: Seminar (2 CP, 1 SPPW), practical course (4 CP, 4 SPPW)

Vorkenntnisse / Previous knowledge:

Examination:
Type of examination:
- Final exam of module
- Time of examination:
- One assessment of examination:
  - Portfolio (seminar presentation, written protocol)
  - Protocol (100 %), seminar presentation (no mark).
  - 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 of the course supervisor.)

Course type:
- Seminar

Comment:
- SWS: 1.00
- Frequency:
- Workload attendance: 14 h
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