mar510 - Molecular Mechanisms and Interactions

Module label: Molecular Mechanisms and Interactions
Module code: mar510
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:
- Lehrende der Mikrobiologie

Entry requirements:
No entry requirements

Skills to be acquired in this module:
The students know the molecular mechanisms of metabolism, genetics and evolution. They know regulatory mechanisms on the molecular level and feedback mechanisms between organisms. They know the basics of microbial ecology and the biogeochemistry of important microbial habitats. They know molecular and chemical-analytical methods of microbiology. They know the field study of microorganisms.

Module contents:
Lecture + exercises: Molecular Microbiology
Part I on DNA: structure, DNA-proteins, DNA-replication, recombination, transposition, mutation, repair, plasmids and DNA-exchange
Part II on gene expression: transcription, regulation of transcription, translation
Part III on enzymes: protein structures, basic concepts and kinetics, catalytic and regulatory strategies
Part IV on regulatory networks: diauxie and catabolite repression, oxygen regulation, chemotaxis

Lecture + exercises: Microbial Ecology
Principles of biogeochemistry, global element cycles, mineralization of organic substances, chemotaxis, aquatic habitats, terrestrial habitats, deep subsurface biosphere, syntrophy and symbiosis, microbes in earth history, methods in microbial ecology, isotope fractionation, applied microbiology, bioremediation

Broadening Lecture: Scientific writing and presentation
Presentation and analysis of structure and style of scientific publications, presentation and discussion of own written elaborations

Excursions into the field

Reader’s advisory:
Molecular Microbiology:
- Stryer – Biochemistry
- Voet – Biochemistry
- Knippers – Molekulare Genetik
- Snyder – Molecular Genetics of Bacteria
- Brock - Microbiology

Language of instruction: English
Duration (semesters): 1 Semester
Module frequency: jährlich
Module capacity: unlimited
Reference text: 12 CP | VL; Ü; KO; EX | 2. FS | Rabus
Modullevel: MM (Mastermodul)

Lern-/Lehrform / Type of program:
- Lecture + Exercises: Molecular microbiology, (2 +1 SPPW, 3 CP)
- Lecture + Exercises: Microbial ecology (2 + 1 SPPW, 3 CP)
- Broadening lecture: Scientific writing and presentation (2 SPPW, 3 CP)
- Excursion (1 CP)
- Microbiological + ICBM Colloquium (2 CP)

Vorkenntnisse / Previous knowledge:

Examination:
Time of examination:
Type of examination:
Two written tests about the contents of the lectures 'Molecular Microbiology’ and 'Microbial Ecology'.

At least 50 % of the reachable points in written tests about the two lectures mentioned above. Active participation (Active and documented participation in practical courses (labs, exercises, seminars, field trips) and courses.
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<th>Examination</th>
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<td>These include e.g. the delivery of exercises, writing a lab report or seminar presentations according to the advice of the course supervisor.</td>
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<th>Course type</th>
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<tr>
<td>Lecture</td>
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<td>4.00</td>
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<td>Exercises</td>
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<td>Seminar</td>
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<td>Study trip</td>
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**Total time of attendance for the module**: 126 h