

M 4452		Integrative Topics in Microbiology		
Coordinator Prof. Dr. Michael Feldbrügge (feldbrue@hhu.de)				
Lecturers Prof. Dr. Axmann, Prof. Dr. Bott, Dr. Drepper, Dr. Eisenhut, Prof. Dr. Feldbrügge, Prof. Dr. Fleig, Dr. Göhre, Dr. Gould, Prof. Dr. Hegemann, Prof. Dr. Jaeger, Dr. Kalscheuer, Dr. Möl- ken, Dr. Nowack, Prof. Dr. Schaal, Dr. Schipper, Prof. Dr. Schmitt				
Contact and organization Dr. Eva Nowack (e.nowack@hhu.de)				
Work load 420 h	Credit points 14 CP	Contact time 300 h	Self-study 120	Duration 1 semester
Course components Practicals: 18 SWS Lectures: 2 SWS		Frequency Each winter semester		Group size 16 students
Learning outcomes/skills Students have learned the concepts and methods of modern microbial science and are capable of using them. They have adopted genetic, molecular biological and biochemical techniques and can apply these techniques independently. Students are familiar with the major scientific equipment and are capable of using the instruments precisely and independently.				
Forms of teaching Lectures, practicals				
Contents <u>Lectures:</u> Microbial cell biology: Cell biology of eukaryotic microorganisms - Filamentous fungi - RNA biology - Membrane traf- ficking - Cytoskeleton - Yeast - From endosymbionts to cellular organelles - Cyanobacteria Microbial pathogenicity Chlamydia - Bacterial and fungal pathogens - Plant microbe interactions - Virology and splicing - Mycobacteria Microbial biotechnology Corynebacterium biology and applied sciences - Bacterial biotechnology and lipases - Lov do- main proteins: bacterial sensing and signaling - Heterologous protein expression in fungi - Structural biology and protein expression in E. coli - Cyanobacteria <u>Practical course:</u> <i>The practical course will cover modern methods in molecular biology:</i> e.g. DNA – and RNA isolation methods, fluorescence microscopy, gel-electrophoresis, PCR; <i>and biochemistry:</i> e.g. immuno-localization and purification of proteins, analysis of enzyme kinetics and regulato- ry properties of proteins. The practical course will consist of research projects in the laboratories of the participating lec- turers. The laboratory can be chosen according to the student's interest. The methods to be learned will depend on the research project.				

<p>Requirements for admission</p> <p>Formal: None;</p> <p>With regards to content: Students must be familiar with elementary molecular microbiological and biochemical techniques and the basics of gene regulation and signal transduction.</p>
<p>Type of examination</p> <p>(1) Knowledge base (70% of final grade): oral examination on the contents of lectures and the background of practicals</p> <p>(2) Documentation (30% of final grade): protocol or oral presentation (analysis and discussion of the experiments)</p>
<p>Requisites for the allocation of credit</p> <p>(1) Passing the knowledge test</p> <p>(2) Participating regularly and actively in the practical course</p> <p>(3) Delivering a report that meets the minimum standards of scientific documentation</p>
<p>Relevant for following study programs / major (only MSc program)</p> <p>MSc program in biology; International MSc program in biology;</p> <p>Major: "Molecular Systems Biotechnology", "Molecular Life Sciences"</p>
<p>Compatibility with other curricula</p> <p>MSc program in biochemistry</p>
<p>Significance of the mark for the overall grade</p> <p>The mark given will contribute to the final grade in proper relation to its credits.</p>
<p>Course language</p> <p>English</p>
<p>Additional information</p> <p>Enrolling into the module is granted by the central study office of the Department of Biology. The practical course will be done as an independent research project (6 weeks) in the laboratory of one of the participating lecturers. The laboratory can be chosen according to the student's interest and the timing is flexible. However, note that the practical part can only be started after the lecture series is completed.</p>