

M4405		Microbiology		
Coordinator (responsible lecturer) Prof. Dr. Michael Feldbrügge (feldbrue@hhu.de)				
Lecturers Prof. Dr. Michael Feldbrügge, Prof. Dr. Julia Frunzke				
Contact and organization Prof. Dr. Michael Feldbrügge (feldbrue@hhu.de)				
Workload 420 h	Credit points 14 CP	Contact time 300 h	Self-study 120 h	Duration 1 semester
Course components Practicals: 18 PPW Lectures: 2 PPW		Frequency Every winter term		Group size 12 students
Learning outcomes/skills Students deepen their theoretical and practical knowledge previously acquired in microbiological V-Modules. They are able to describe, apply and analyse the molecular biology of microorganisms of prokaryotic as well as eukaryotic origin. Students will be able to combine, explain, modify and analyse (protocol) information from the lecture and the practical course. Students will have learned to independently and accurately handle laboratory equipment and instruments. Thus, after completion of the course students will be in a position to competently apply techniques and methods currently used in microbiological research.				
Forms of teaching Lecture, practical course, presentation, protocol writing				
Contents <u>Lectures:</u> Phylogeny, comparative genomics, microbial cell division, microbial, cell differentiation, horizontal gene transfer, protein secretion in bacteria and fungi, organelles and import mechanisms; protein modifications and folding; signal transduction pathways; transcriptional regulation, posttranscriptional regulation; pathogenic fungi; virulence mechanisms, actin and microtubule cytoskeleton, molecular transport of endosomes and mRNAs <u>Practical course:</u> Gene amplification and virtual cloning of plasmids, protein tagging, immunofluorescence localisation, sequence-based phylogeny, transformation, gene disruption and expression profiling; construction and detection of reporter gene fusions in pathogenic fungi; DNA isolation, Southern blot, PCR methods, cell fractionation, SDS-PAGE, immuno blotting; vital stains, reporter proteins (GFP fusions), microscopy; protein-RNA binding studies by yeast three-hybrid system, RNA-structure determination, data mining in electronic data bases and other internet resources for molecular and micro-biology; live imaging of actin and microtubule cytoskeleton				
Requirements for admission Formal: With regards to content: Sound basic knowledge in microbiology comparable to knowledge communicated in V-modules				
Type of examination (1) competence in “knowledge“ (60% of final mark): written exam covering content from lecture and practical course (2) competence in “documentation“ (30% of final mark): Scientific protocol: problem, procedure, analysis and discussion of scientific experiments (3) competence in “application of acquired knowledge“ (10% of final mark): review				

assignments on selected genes
<p>Requisites for the allocation of credit</p> <p>Final mark and, therefore, the awarding of credit points consists of</p> <p>(1) Passing competence area „knowledge“</p> <p>(2) Regular and active participation in the practical course</p> <p>(3) Handing in a scientifically acceptable protocol</p>
<p>Relevant for following study programmes/major (only MSc programme)</p> <p>M.Sc. Biology</p> <p>M.Sc. Biology International;</p>
<p>Affiliation with the following Major (only for master study programme)</p>
<p>Compatibility with other curricula</p> <p>B.Sc. 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>M.Sc. Biology International: 14/44 CP</p>
<p>Course language</p> <p>English</p>
<p>Additional information</p> <p>Enrolment for the module is granted by the central study office of the Department of Biology.</p>