

module code /  
module title

## D-BG / Bacterial Genomes: Bioinformatics, Mutant Construction and Proteomics

 date / version of the module  
description

26.10.2021

1 INFORMATION ON THE MODULE	
1a	module code D-BG
1b	module title (German title) Klicken Sie hier, um Text einzugeben.
1c	module title (English title) Bacterial Genomics: Bioinformatics, Mutant Construction and Proteomics
1d	credit points 6
1e	responsible for the module Prof. Dr. Barbara Reinhold-Hurek
1f	type of module elective module
1g	programs using the module M.Sc. Biochemistry and Molecular Biology (eligible module for Microbial Systems specialization )
1h	organizational unit offering the module Klicken Sie hier, um Text einzugeben.
1i	content-related prior knowledge or skills Successful attendance in the mandatory BMB-courses in term 1 is recommended.
1j	learning contents The course is research-oriented, each student will work on his own construct / gene/ task. Experiments will directly benefit the research of our lab. Bacterial signal transduction cascades, genome analysis, biological nitrogen fixation and principles of mutational analysis will be covered theoretically. Experiments include: Mutational analysis: Gene inactivation by insertional mutagenesis in <i>Azoarcus</i> sp. (PCR, cloning, restriction analysis of clones, conjugation), analysis of the mutation (Southern blot analysis), expression analysis using transcriptional reporter gene studies (fluorescence microscopy). Bioinformatic analysis of putative protein functions.

Protein identification: Expression of tagged protein in *Azoarcus* sp., protein-protein-interaction assays: Affinity chromatography, analysis by SDS-PAGE and Western blot analysis, mass spectrometric identification of proteins (MALDI-TOF analysis).

1k

learning outcomes/  
competencies/  
targeted competencies

Students can bioinformatically analyze protein functions, can design and carry out mutagenesis strategies (directed mutagenesis for gene knockouts) and can design and construct transcriptional and translational fusions. They are proficient in understanding the principles of the methods used and in identifying necessary experimental controls. They can present and discuss their scientific findings.

1l

calculation  
of student workload  
*(part a: calculation of presence  
time and working hours)*

**The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).**

a) detailed calculation:

**SWS / presence time/working hours in each course of the module**

<input checked="" type="checkbox"/>	1	lecture(s) with	3	SWS/ contact hours	42	hours of presence time
<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		hours of presence time
<input type="checkbox"/>		exercise(s) with		SWS/ contact hours		hours of presence time
<input type="checkbox"/>		internship(s) with		sum of working hours		
<input type="checkbox"/>		seminar(s) with		SWS/ contact hours		total hours of presence time
<input checked="" type="checkbox"/>	1	laboratory/laboratories with	4	SWS/ contact hours	56	total hours of presence time
<input type="checkbox"/>		tutorial(s) with		SWS/ contact hours		
<input type="checkbox"/>		excursion(s) with		SWS contact hours in total		working hours
<input type="checkbox"/>		other form of course (e.g. block seminar), namely this:				
Klicken Sie hier, um Text einzugeben.						
	with	SWS / with totaly		contact hours	<input type="checkbox"/>	presence time <input type="checkbox"/> working hours
<b>= sum of presence time and working hours:</b>						
98						

	<p>calculation of student workload</p> <p><i>(part b: preparation time and follow-up work/self-study)</i></p>	<p><b>b) working hours for preparation/follow-up work of the course(s) and/or self-study</b></p> <p>= sum of working hours:</p> <p>52</p>
	<p>calculation of student workload</p> <p><i>(part c: exam preparation etc.)</i></p>	<p><b>c) exam preparation (incl. examination)</b></p> <p>= sum of working hours:</p> <p>30</p>
	<p>calculation of student workload</p> <p><i>(total amount of hours including a) - c))</i></p>	<p><b>Total amount of the presence time and working hours a) to c):</b></p> <p>180</p>
1m	<p>description of possible optional courses in the module</p>	<p><u>Can a student choose between different courses within the module?</u></p> <p>NO</p> <p><u>Short description of selection option</u></p> <p>Klicken Sie hier, um Text einzugeben.</p>
1n	<p>language(s) of instruction</p>	<p><input type="checkbox"/> German      <input checked="" type="checkbox"/> English      <input type="checkbox"/> Spanish      <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p> <p>Klicken Sie hier, um Text einzugeben.</p>
1o	<p>frequency</p>	<p><i>(regular cycle module is offered) e.g.: winter semester, yearly or summer semester, yearly or each semester</i></p> <p>summer semester yearly</p> <p>Klicken Sie hier, um Text einzugeben.</p>
1p	<p>duration</p>	<p>one semester module</p> <p>Klicken Sie hier, um Text einzugeben.</p>
1q	<p>Literature <i>(optional)</i></p>	<p>Klicken Sie hier, um Text einzugeben.</p>
1r	<p>more information on the module <i>(optional)</i></p>	<p>With Dr. Andrea Krause</p>
<b>2</b>	<p><b>INFORMATION ON THE MODULE EXAMINATION</b> (see also AT Art. 5 section 8)</p>	
2a	<p>type of examination</p>	<p><input checked="" type="checkbox"/> module exam; i.e. exam with only one component (MP)</p> <p><input type="checkbox"/> combination exam, i.e. exam with several components (administered by instructors) (KP)</p> <p><input type="checkbox"/> partial exam; i.e. exam with several components (administered by registrar) (TP)</p>

2b	exam components or prerequisites (type, number)	<p><i>PL</i> = graded component of the examination  <i>SL</i> = ungraded component of the examination, coursework  <i>PVL</i> = prerequisite of the examination (see AT Art. 5 Section 10)</p> <p><input checked="" type="checkbox"/> PL   1                      SL                        <input type="checkbox"/> PVL   justification</p> <p>If necessary, further explanations:</p> <p>PL = Portfolio, consisting of: oral presentation (35%) on bioinformatic analysis of gene/protein and cloning/mutagenesis strategy, oral exam (65%) and lab-book like protocols for training purposes (ungraded)</p>
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	<p>PL 1:</p> <p>PL 2:</p> <p>PL 3: <a href="#">Klicken Sie hier, um Text einzugeben.</a></p> <p>PL 4: <a href="#">Klicken Sie hier, um Text einzugeben.</a></p> <p>If necessary, further comments:</p>
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	<p><input type="checkbox"/> Assignment                      <input type="checkbox"/> Oral examination (single)                      <input type="checkbox"/> Presentation, oral</p> <p><input type="checkbox"/> Written examination                      <input type="checkbox"/> Group examination, oral                      <input type="checkbox"/> Presentation and written assignment</p> <p><input checked="" type="checkbox"/> Portfolio                      <input type="checkbox"/> Project report                      <input type="checkbox"/> Bachelor Thesis</p> <p><input type="checkbox"/> Internship report                      <input type="checkbox"/> Colloquium                      <input type="checkbox"/> Master Thesis</p> <p><input type="checkbox"/> Other (concrete definition is given in the examination regulations):</p> <p><a href="#">Klicken Sie hier, um Text einzugeben.</a></p>
2e	language(s) of instruction	<p><input type="checkbox"/> German                      <input checked="" type="checkbox"/> English                      <input type="checkbox"/> Spanish                      <input type="checkbox"/> French</p> <p><input type="checkbox"/> Other, namely this:</p> <p><a href="#">Klicken Sie hier, um Text einzugeben.</a></p>