Module title			Abbreviation
Genes, Molecules, Technologies			07-3A3GMT-102-m01

Module coordinator	Module offered by
Dean of Studies Biologie (Biology)	Faculty of Biology

ECTS	Method of grading	Only after succ. compl. of module(s)
6	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	undergraduate	--

Contents

The module component *Spezielle Genetik* (*Special Genetics*) will build on *Einführung in die Genetik* (*Introduction to Genetics*) and will deepen the students' knowledge of topics from the following areas: structure and evolution of the eukaryotic genome, regulatory RNA, epigenetically and evolutionarily significant genetic mechanisms. The section will also focus on methods of gene expression profiling, reverse genetics and modern methods of gene function and gene sequence analysis. In the module component *Einführung in die Bioinformatik* (*Introduction to Bioinformatics*), students will acquire an overview of major areas in the field of bioinformatics: protein sequence and protein domain analysis, phylogeny and evolution of sequences, protein structure, RNA/DNA sequences and structures, cellular networks (regulation, metabolism) and systems biology. In the module component *Einführung in die Biotechnologie* (*Introduction to Biotechnology*), students will acquire an overview of the following topics: history of biotechnology, DNA and RNA technologies, recombinant antibodies, molecular diagnostics, nanobiotechnology, biomaterials, bioprocess engineering, microbial biotechnology, transgenic animals and plants, microfluidics. The module component *Einführung in die Pharmakokinetik* (*Introduction to Pharmacokinetics*) will provide students with an overview of the rational development of drugs and active agents. The module component will discuss an important aspect for biologists in more detail: the optimisation of the pharmacokinetics of small molecules and proteins. Pharmacokinetics describes the uptake, distribution, metabolism and elimination of a drug or xenobiotic in an organism.

Intended learning outcomes

Module component *Spezielle Genetik* (*Special Genetics*): Advanced knowledge on genome evolution and the regulation of gene expression. Essential knowledge on current methods in genetics. Module component *Einführung in die Biotechnologie* (*Introduction to Biotechnology*): Students will acquire an overview of both traditional and modern methods in biotechnology and will become familiar with fundamental topics in biotechnology. Module component *Einführung in die Biotechnologie* (*Introduction to Biotechnology*): Students will acquire an overview of both traditional and modern methods in biotechnology and will become familiar with fundamental topics in biotechnology. Module component *Einführung in die Pharmakokinetik* (*Introduction to Pharmacokinetics*): Students will acquire an overview of the fundamental principles of the development and review of active agents in research, clinical practice and the pharmaceutical industry. Optimisation of active agents with regard to absorption, distribution, metabolism and elimination takes place during the early stages of active agent development. The course will equip students with fundamental knowledge that will enable them to predict, on the basis of the structure and physicochemical properties of a small molecule or protein, whether the molecule or protein is suitable as an active agent as well as to predict the fate of the respective active agent in an organism.

Courses (type, number of weekly contact hours, language — if other than German)

This module has 4 components; information on courses listed separately for each component.

- 07-3A3GMT-1-102, 07-3A3GMT-2-102, 07-3A3GMT-3-102, and 07-3A3GMT-4-102: V (no information on language and number of weekly contact hours available)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

This module has the following 4 assessment components. Unless stated otherwise, students must pass all of these assessment components to pass the module as a whole.

Assessment in module component 07-3A3GMT-1-102: Genetik (Genetics), **in module component 07-3A3GMT-2-102:** Bioinformatik (Bioinformatics), **in module component 07-3A3GMT-3-102:** Biotechnologie (Biotechnology), and **in module component 07-3A3GMT-4-102:** Pharmakokinetik (Pharmacokinetics) **:**

- 1.5 ECTS credits, numerical grading
- written examination (approx. 30 minutes, including multiple choice questions)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Bachelor' degree (1 major) Biology (2011)
Bachelor' degree (1 major) Biology (2010)
Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)