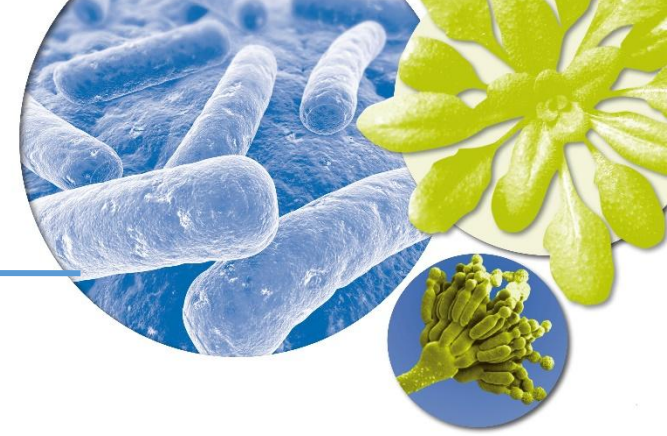


**Master Molecular Life Sciences –
Microbiology, Biotechnology and Biochemistry**



MSc/PhD Program

Molecular Life Sciences - Microbiology, Biotechnology and Biochemistry

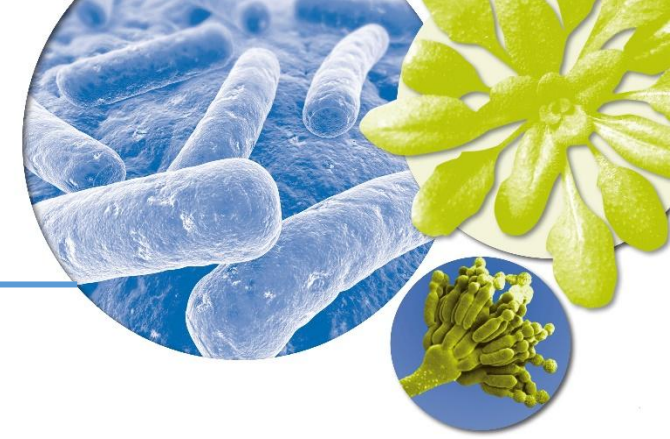
Prof. Dr. Stefanie Pöggeler

spoegge@gwdg.de



**UNIVERSITÄT
GÖTTINGEN**

12_03_2026



Key feature:

Research-oriented Studies

Primary Model Organisms:

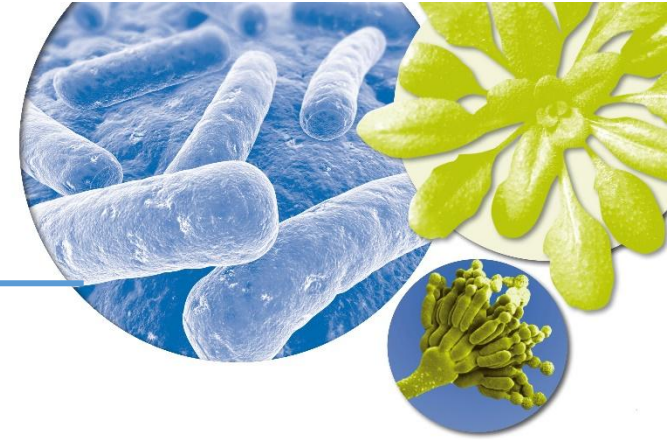
Microorganisms (single cell, multicellular)



Plant-Microbe Interactions

Plants

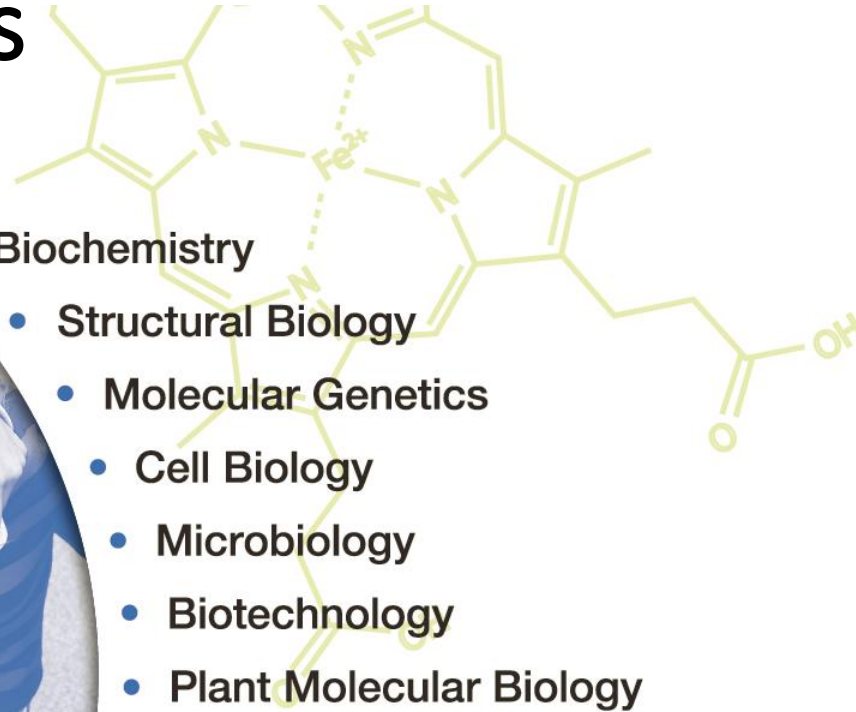
Master Molecular Life Sciences – Microbiology, Biotechnology and Biochemistry



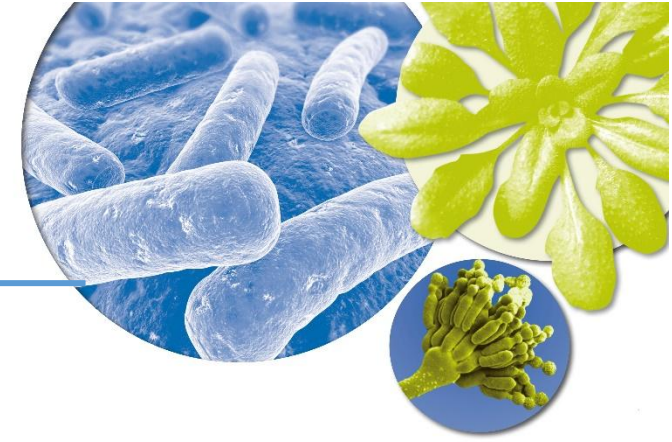
Subjects



- Biochemistry
- Structural Biology
- Molecular Genetics
- Cell Biology
- Microbiology
- Biotechnology
- Plant Molecular Biology
- Plant-Microbe Interactions
- Chemical Biology
- -Omics
- Biophysics
- Bioinformatics



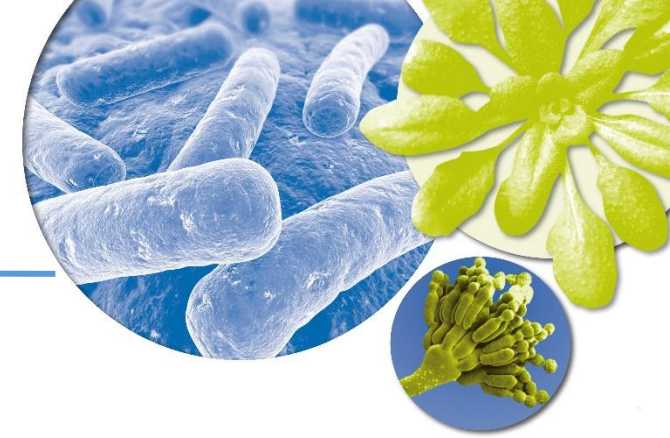
Master Molecular Life Sciences – Microbiology, Biotechnology and Biochemistry



Key features

- from BSc to MSc in 2 years (4 semesters)
 - consistent focused program
- 120 credits according to the European Credit Transfer System (ECTS)
 - program limited to 48 students
 - English as main teaching language
- practical training in small groups with state of the art equipment
 - inspiring international research environment
 - complementary training (“soft skills”)
- direct access to the PhD programs of the faculty for excellent students

Master Molecular Life Sciences – Microbiology, Biotechnology and Biochemistry



Basic structure

module	number	structure and options		C/ module	C total
core module	3	lecture + seminar/tutorial + methods course	choice of 7 different modules	12	36

Seven Core Modules

"General and Applied Microbiology"

"Molecular Genetics & Microbial Cell Biology"

„Applied Bioinformatics in Molecular Bioscience“

"Enzyme Catalysis and Chemical Biology"

WS

"Molecular cell biology of plant–microbe interactions and stress adaptation"

"Structural Biochemistry"

"Biochemistry & Biophysics"

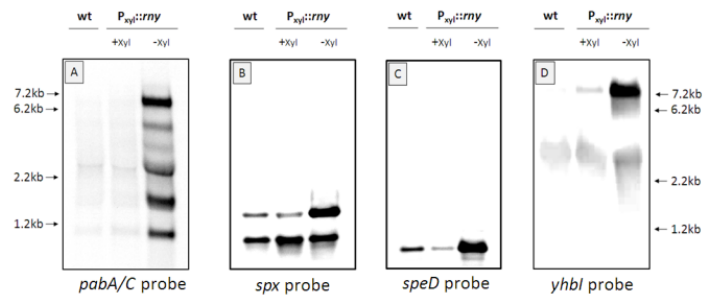
„M.Bio.101 General & Applied Microbiology“



Prof. Jörg Stülke

**Metabolic and
Regulatory
Patterns in Bacterial
Cells**

**Regulated protein-RNA
Interaction**



PD Dr. Michael Hoppert

Biominerals formation

**Terrestrial microalgal
biofilms**



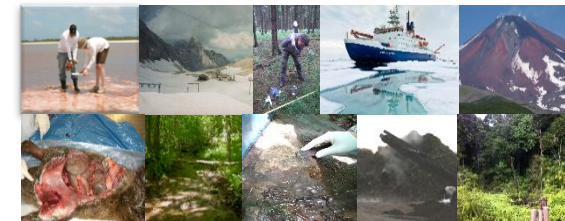
Prof. Rolf Daniel

PD Dr. Heiko Liesegang

(Meta)genomics

**Applied Microbiology
Synthetic Microbiology**

**Genes and enzymes
for biotechnology**

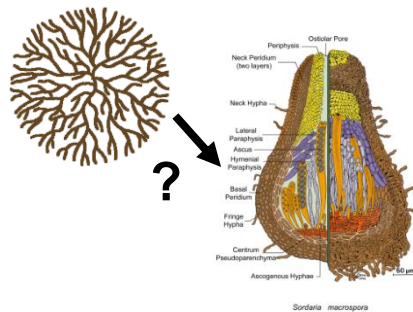


„M.Bio.102 Molecular Genetics & Microbial Cell Biology“



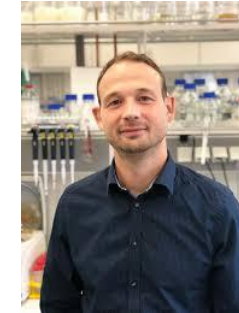
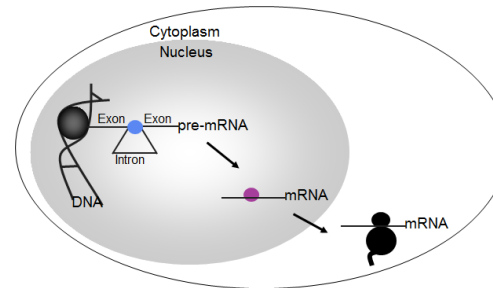
Prof. Stefanie Pöggeler

**Fruiting-body
Development in
Filamentous Ascomycetes**



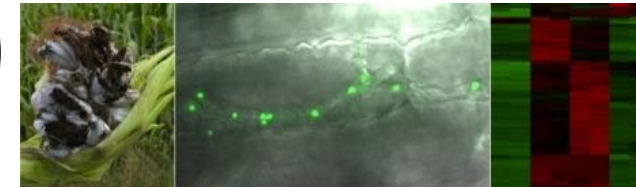
Prof. Heike Krebber

**Nucleocytoplasmic
Transport**



Prof. Kai Heimel

**Unfolded Protein Response
in Filamentous Fungi**



„M.Bio.105 Applied Bioinformatics in Molecular Bioscience“



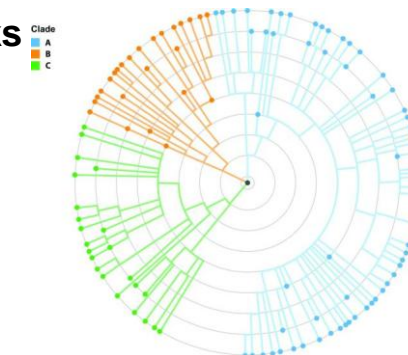
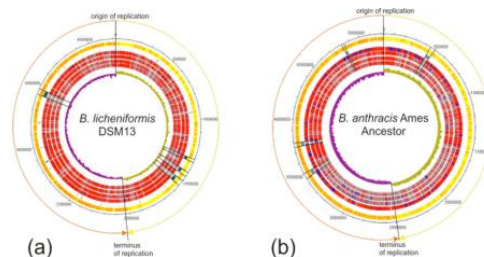
Prof. Rolf Daniel



PD Dr. Heiko Liesegang

Handling of programs, bioinformatic tools and databases with respect to data-driven Omics-based research

- Application of bioinformatic approaches in molecular phylogeny, evolution, genome dynamics und (meta)Omics
- Bioinformatic analysis of RNAs and proteins
- Identification of motifs and genes
- Generation and analysis of metabolic models and networks



„M.Bio 108 Enzyme Catalysis & Chemical Biology“



Prof. Nadja Simeth-Crespi
Molecular Labelling Chemistry
PhotoBioOrgChemistry

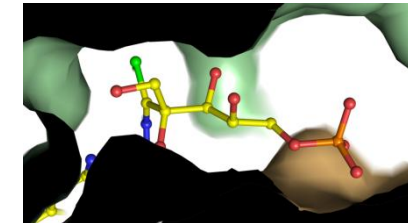
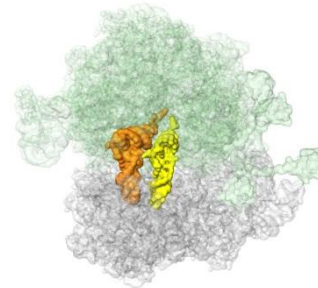
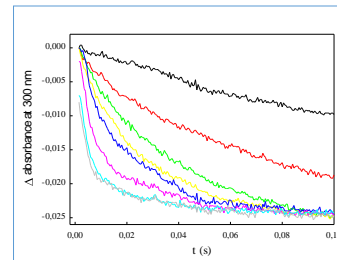
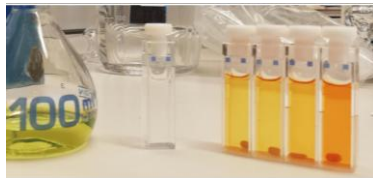


Prof. Kai Tittmann
Reaction mechanisms of
thiamin-dependent enzymes
and flavoenzymes



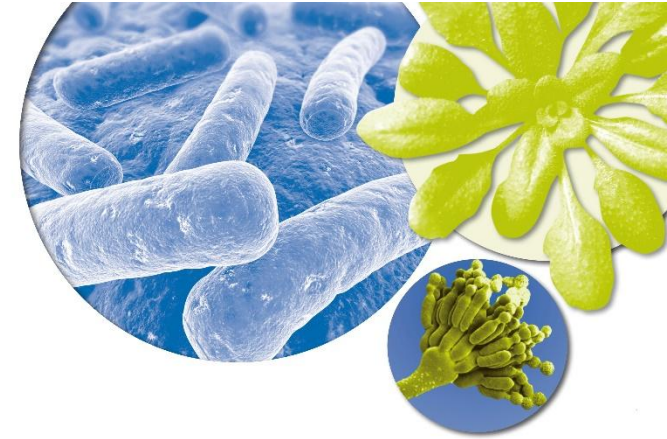
MPI for Multidisciplinary Science

Prof. Marina Rodnina
Kinetics of
Bacterial Translation



- Reaction mechanisms of enzymes and macromolecular machines
- Kinetics and thermodynamics of biochemical reactions
- Synthesis of biooligomers and ligands, attachment of labels to peptides and proteins
- Chemical model systems of enzymes

Master Molecular Life Sciences – Microbiology, Biotechnology and Biochemistry



Basic structure

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Seven Core Modules

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"Molecular Genetics & Microbial Cell Biology"

„Applied Bioinformatics in Molecular Bioscience“

"Enzyme Catalysis and Chemical Biology"

" Molecular cell biology of plant–microbe interactions and stress adaptation"

"Structural Biochemistry"

"Biochemistry & Biophysics"

} SS

„M.Bio.104 „Molecular cell biology of plant–microbe interactions and stress adaptation“



Prof. Volker Lipka

Signal perception & dynamic cellular defence in plant innate immunity



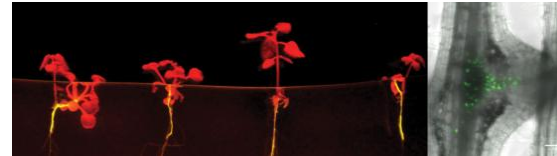
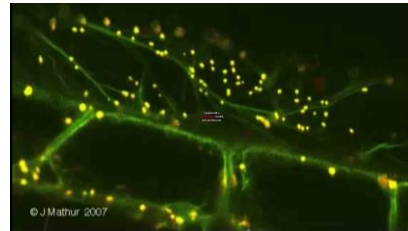
Dr. Thomas Spallek

Plant Biotic Interactions

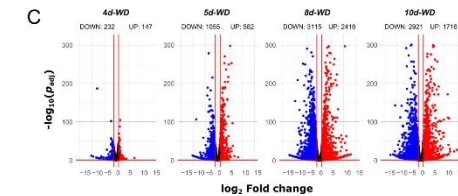
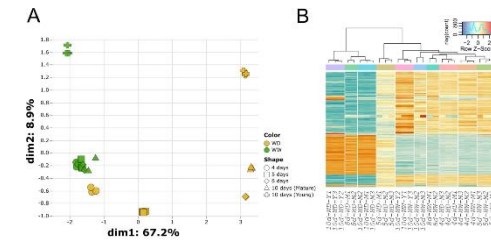


Prof. Dr. Salma Balazadeh

Molecular Stress Physiology



Phtheirospermum japonicum (hemiparasitic plant)
Model to study plant parasitism



„M.Bio.107 Biochemistry & Biophysics“



Prof. Ivo Feussner



Prof. Claudia Steinem

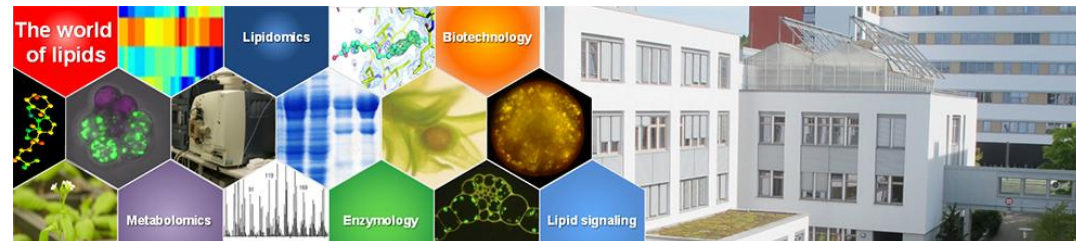


Prof. Andreas Janshoff

**Biochemical analysis of
carbohydrates, lipids, proteins and nucleic acids
(HPLC / GC / GCMS / UPLCMS / ESIMS)
Plant biotechnology for production of renewable resources**

**Spectroscopy of biomolecules
(fluorescence, FT-IR, CD, UV/Vis),
optical microscopy, scanning probe techniques**

- Plant primary and secondary metabolism → Metabolomics
- Lipid metabolism, enzymes of lipid metabolism and lipids as signal molecules
 - Modern biophysical methods for analysis of biomolecules
- Molecular biochemistry and biophysics of different classes of biomolecules
 - Functional analysis of membrane proteins

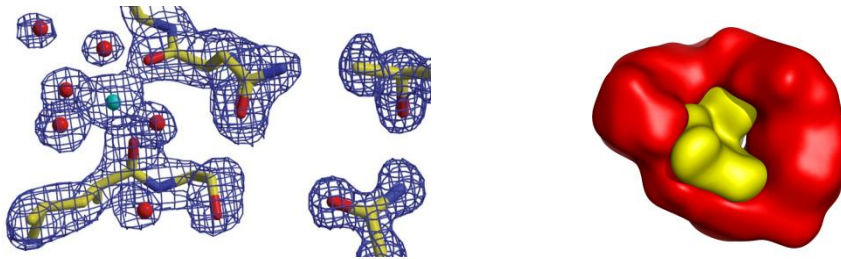


„M.Bio.106 Structural Biochemistry“



Prof. Ralf Ficner

Molecular structural biology
RNA processing & transport



Structure-function relationship
Protein-Protein interaction
Protein-RNA-DNA recognition
Structure-based drug design

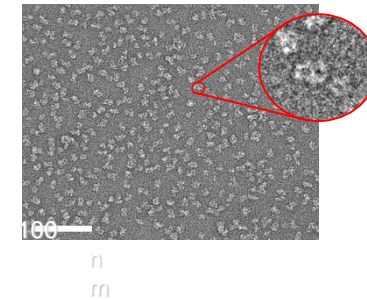
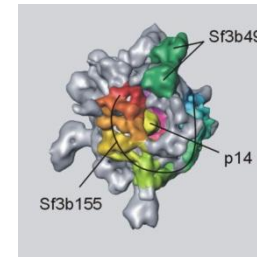


MAX-PLANCK-GESELLSCHAFT

MPI for Multidisciplinary Science

Prof. Holger Stark

3D Electron Cryomicroscopy



Methods in Structural Biology
X-ray crystallography
NMR spectroscopy
Electron Microscopy
Computational Methods

Profile module (12C)



module	number	structure and options		C/ module	C total
core module	3	lecture + seminar/tutorial + methods course	choice of 7 different modules	12	36
profile module	1	additional core module MLS core module DNB, MSc Chemistry interdisciplinary courses*		12	12

(flexibility option)

* permission of examination board required

examples for approved external profile modules:

University Uppsala, **Sweden**
University of Queensland, Brisbane, **Australia**
Sanford Burnham Medical Research Institute, San Diego, **USA**
Donnelly Center, Toronto, **Canada**
Sainsbury Laboratory, Norwich, **United Kingdom**
University of Exeter, **United Kingdom**
University of Aberdeen, **United Kingdom**
Massey University, **New Zealand**

Module M.MM.101 "Biomolecules and Pathogens" of Master program "**Molecular Medicine**" in **Göttingen**

Internships in departments of the **MPI for Multidisciplinary Science, Göttingen**

Internship in pharmaceutical or chemistry industry:

Henkel AG & Co, **Düsseldorf**, Bayer Crop Science, **Monheim**, DSM Nutritional Products, **Basel**, BASF, **Ludwigshafen**

Key Competence Module (2-12C)



module	number	structure and options		C/ module	C total
core module	3	lecture + seminar/tutorial + methods course	choice of 7 different modules	12	36
profile module	1	additional core module MLS core module DNB, MSc Chemistry interdisciplinary courses*		12	12
key competence module		course offer cross faculty, ZESS course offer MLS, Chemistry, DNB, BEE interdisciplinary courses*		2-12	12

e.g.
language courses
German language courses (6 C)
„Industry excursions“ (3C)

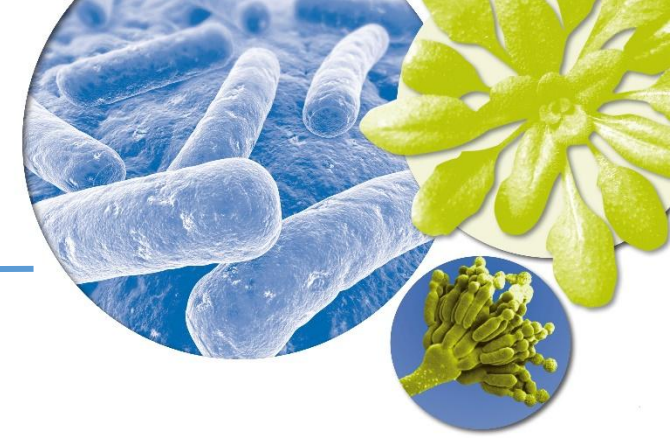
MLS = Master „Molecular Life Sciences – Microbiology, Biotechnology and Biochemistry“

DNB = Master "Developmental, Neural, and Behavioral Biology"

BEE = Master "Biodiversity and Ecology"

ZESS = "Zentrale Einrichtung für Sprach- und Schlüsselkompetenzen,, (e.g. language courses)

Master Molecular Life Sciences – Microbiology, Biotechnology and Biochemistry



Basic structure

module	number	structure and options		C/ module	C total
core module	3	lecture + seminar/tutorial + methods course	choice of 7 different modules	12	36
profile module	1	additional core module MLS core module DNB, MSc Chemistry interdisciplinary courses*		12	12
key competence module		course offer cross faculty, ZESS course offer MLS, Chemistry, DNB, BEE interdisciplinary courses*		2-12	12
advanced module	1	7 weeks lab course I		12	30
	1	7 weeks lab course II		12	
	1	scientific project management		6	
Master thesis (26 weeks)					30

* Permission of examination board required

MLS = Master Molecular Life Sciences: Microbiology , Biotechnology and Biochemistry

DNB = Master Developmental, Neural and Behavioral Biology

BEE = Master Biodiversity, Ecology and Evolution

ZESS = Zentrale Einrichtung für Sprach- und Schlüsselkompetenzen

Curriculum

exemplary study plan	
core I	12
core II	12
key competence	6

profile	12
core III	12
key competence	6

advanced I	12
advanced II	12
scientific project management	6

Master thesis	30
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PhD (GAUSS)



Thank you for your
attention!