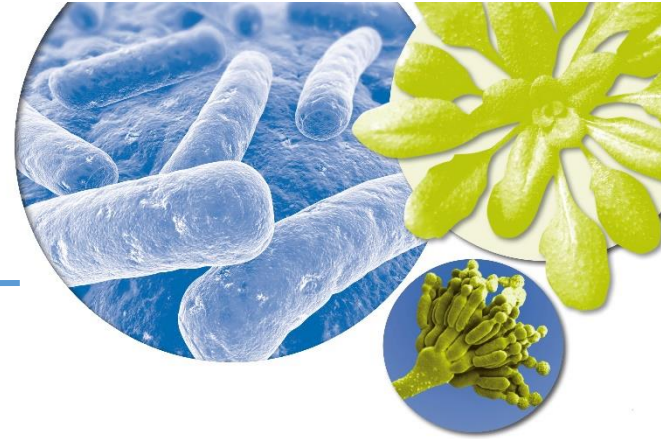


**Master Molecular Life Sciences –
Microbiology, Biotechnology and Biochemistry**



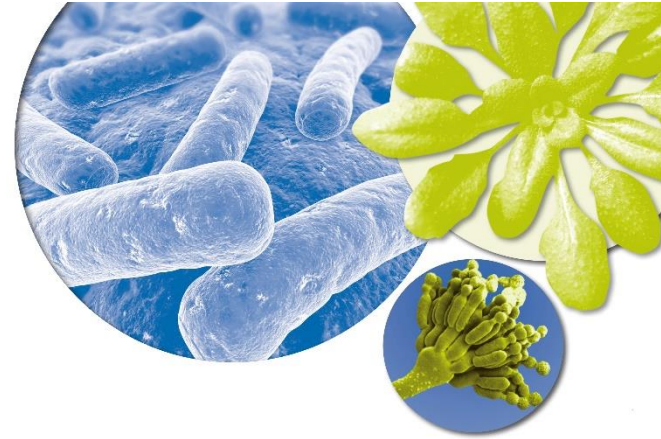
**MSc/PhD Program
Molecular Life Sciences -
Microbiology, Biotechnology and Biochemistry**

Prof. Dr. Kai Heibel

kheibel@gwdg.de

Core-Module: Molecular Genetics & Microbial Cell Biology

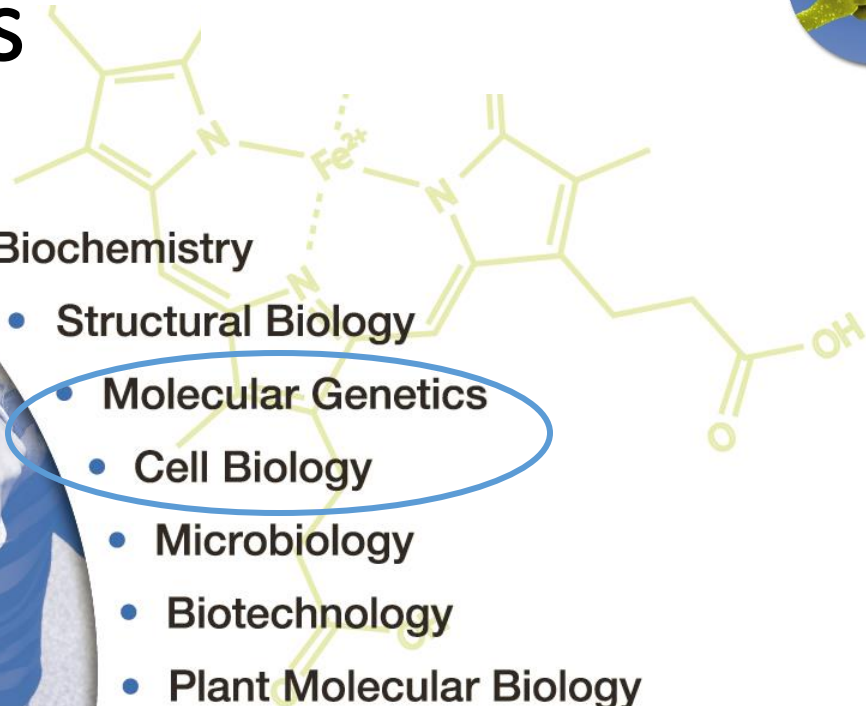
Master Molecular Life Sciences – Microbiology, Biotechnology and Biochemistry



Subjects



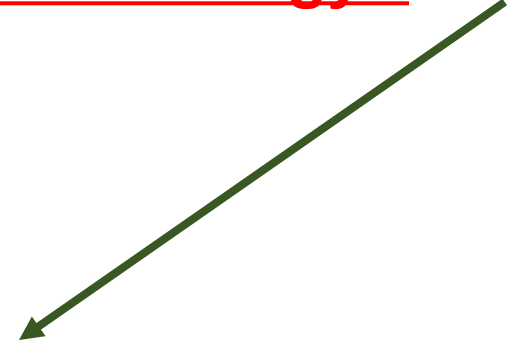
- Biochemistry
- Structural Biology
- **Molecular Genetics**
- Cell Biology
- Microbiology
- Biotechnology
- Plant Molecular Biology
- Plant-Microbe Interactions
- Chemical Biology
- -Omics
- Biophysics
- Bioinformatics



Winter term 2025-2026												
weeks	Lecture period - 14 weeks (27 Oct 2025 - 13 Feb 2026)											
	Oct	Nov				Dec				Jan		
	1	2	3	4	5	6	7	8	Xmas-break	9	10	
block	M.Bio.101 M.Bio.141/151/161 General and applied mcirobiology 27 Oct - 28 Nov 2025					M.Bio.102 M.Bio.141/162/172 Molecular genetics and microbial cell biology 1 Dec 2025 - 16 Jan 2026 (christmas break 22 Dec - 02 Jan)						

Master program (M.Bio.102)
Core module

“Molecular Genetics and Microbial Cell Biology“



Advanced knowledge of
Molecular Genetics and Microbial Cell Biology
through case studies of fungal model systems
(yeasts and filamentous fungi)

Master program (M.Bio. 102)

Core module (12C) **“Molecular Genetics and Microbial Cell Biology”**



Institute of Microbiology and Genetics



Grisebachstr. 8

WiSe 2025/2026. Block course (December - January)

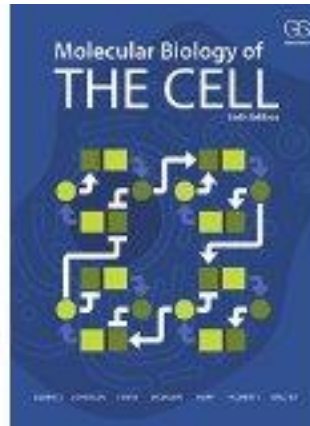
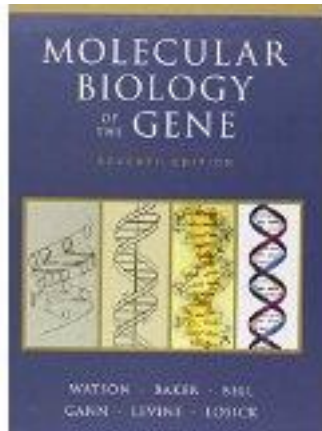
- **Lectures:** December 1st to 18th and January 5th to 8th each day: 8:15-9:45 a.m.
- **Seminars:** January 6th -9th: 13:00 to 15:00
January 12th to 14th 8:00-10 AND 13:00-15:00
- **Methods course:** December 1st – December 19th (3 experiments, Krebber, Heimele, Pöggeler)
- **Written Exam:** Jan 16th and March 13th
- **Excursion:** March 2026

Lectures (WiSe 2025/2026)



Recommmended books:

- (i) Watson, Molecular Biology of the Gene, Pearson, 7th Ed
- (ii) Alberts, Molecular Biology of the Cell, Garland, 6th Edition



Additional recommendation:
Cellular and Molecular Biology of
Filamentous Fungi
(Borkowich and Ebbole, ASM
Press, 2010)



CELL BIOLOGY: Fungi as models for Mol. Genetics & Cell Bio, Nucleus and Cytoplasm; Cellular traffic, Organelles, Signal transduction, from single cells to hyphae, Cytoskeleton, Polarity and Growth

GENETICS: Fungal Genomes and Gene expression, Repair & Recombination, Transposons, Silencing, Epigenetics and fungal secondary metabolism, Mitosis and Meiosis

MODEL SYSTEMS: Cell Differentiation, protein degradation, spores, Cell Differentiation & Mating Types, Other members of the fungal kingdom, Fungi in ecology, Photobiology and Circadian rhythm

FUNGAL INTERACTIONS: Fungi and Plants, Health & Fungi, Fungi and Biotechnology

Seminar (2026): Jan. 6th to Jan. 14th

January 6th to 9th: 13:00 to 15:00

January 12th to 14th 8:00-10 **AND 13:00-15:00**



20 min oral **presentations of research papers** on current aspects of lecture topics under individual guidance (Ph.D. students, postdocs or professors).

Methods Courses (2026)

- December 1st – December 19th
(3 weeks, 3 experiments, Krebber, Heimerl, Pöggeler)

M.Bio.102

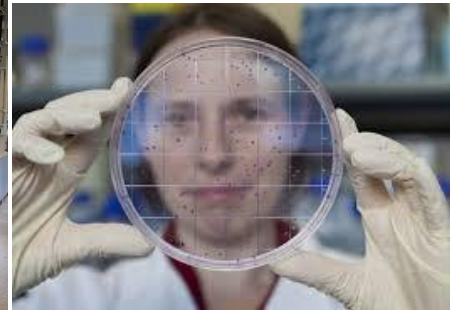
"Molecular genetics and microbial cell biology "

methods course

"Genetics and cell biology"

(24 participants)

10:00-17:00



Topics in current research projects:

- | | |
|-----------|--|
| Krebber: | Characterization of RNA export mutants in yeast |
| Heimerl: | Generation of gene deletion mutants in <i>Ustilago maydis</i> |
| Pöggeler: | Isolation and characterization of fungi from environmental samples |

Master program (M.Bio. 102)

Core Module “Molecular Genetics and Microbial Cell Biology 12C”



Institute of Microbiology and Genetics

Departments:

**Microbial
Cell Biology**



Prof. Dr.
Kai Heimel

**Molecular
Genetics**



Prof. Dr.
Heike Krebber

**Genetics of
eukaryotic
Microorganisms**



Prof. Dr.
Stefanie Pöggeler

**Teaching co-
ordinator**

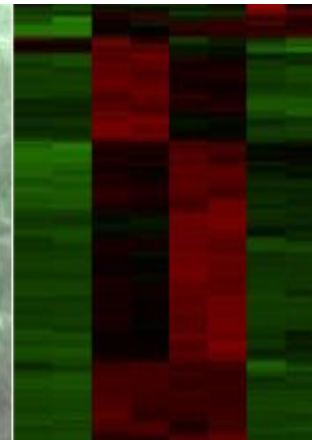
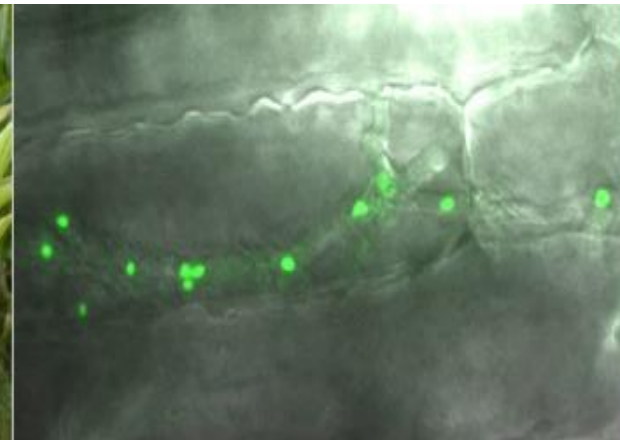
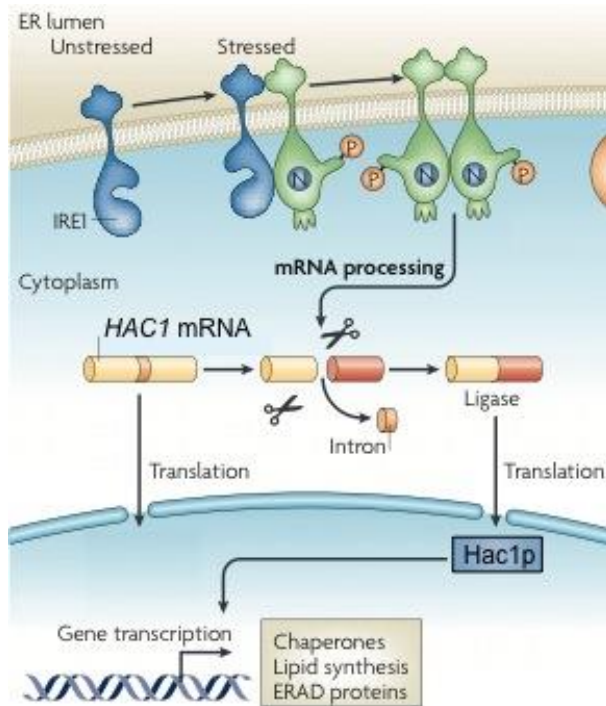


Dr.
Tanja Lienard

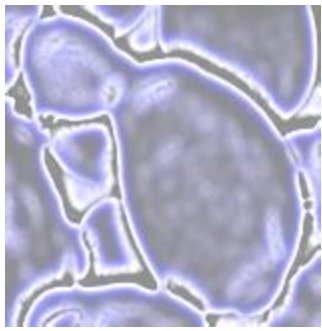
UPR, RNA export, cell-cell communication, fungal development



The unfolded protein response
in fungal/plant communication (sensing/secretion)
as model for higher eukaryotes (disease/development)



- Regulatory networks (RNAseq, ChIPseq)
- Interaction networks (genetic/protein-protein)
- Fluorescence microscopy
- Protein biochemistry
- Novel tools in organismic interactions



Department: Molecular Genetics

Prof. Dr. Heike Krebber



Topics in the lab:

mRNA quality control

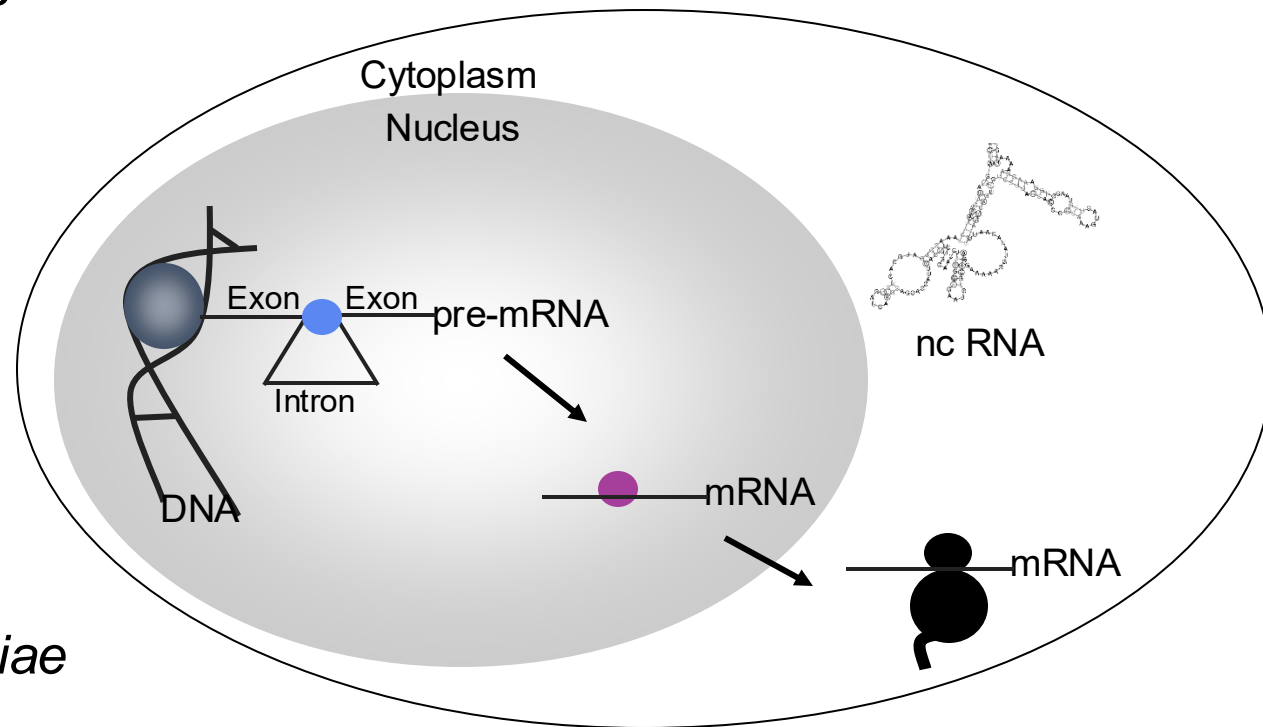
RNA export

RNA function

Telomerase

Methods in the lab:

Genetics, molecular biology,
cellular biology, biochemistry



model organism:

Saccharomyces cerevisiae

Department:
Genetics of Eukaryotic Microorganisms
Prof. Dr. Stefanie Pöggeler

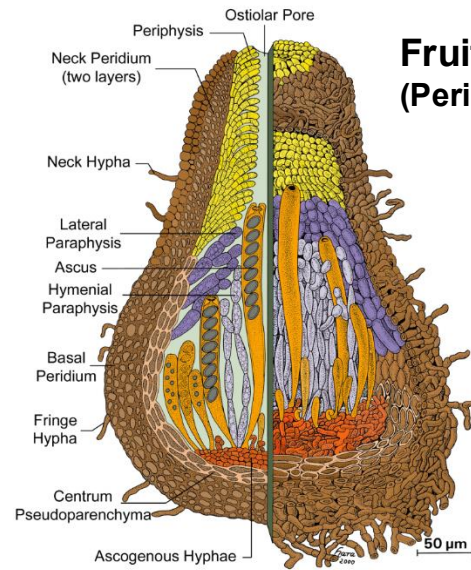
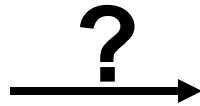


Fungal development: **Autophagy**, carbonic anhydrases, mating types

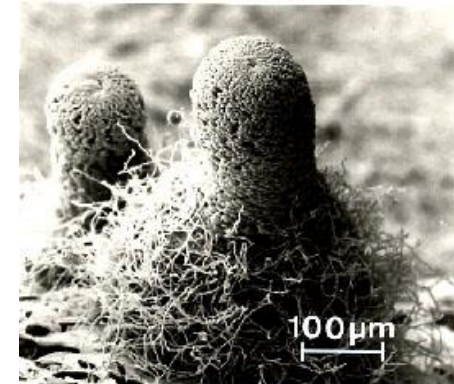
Model: *Sordaria macrospora*



vegetative Mycelium



Fruiting body
(Perithecium)



Sordaria macrospora

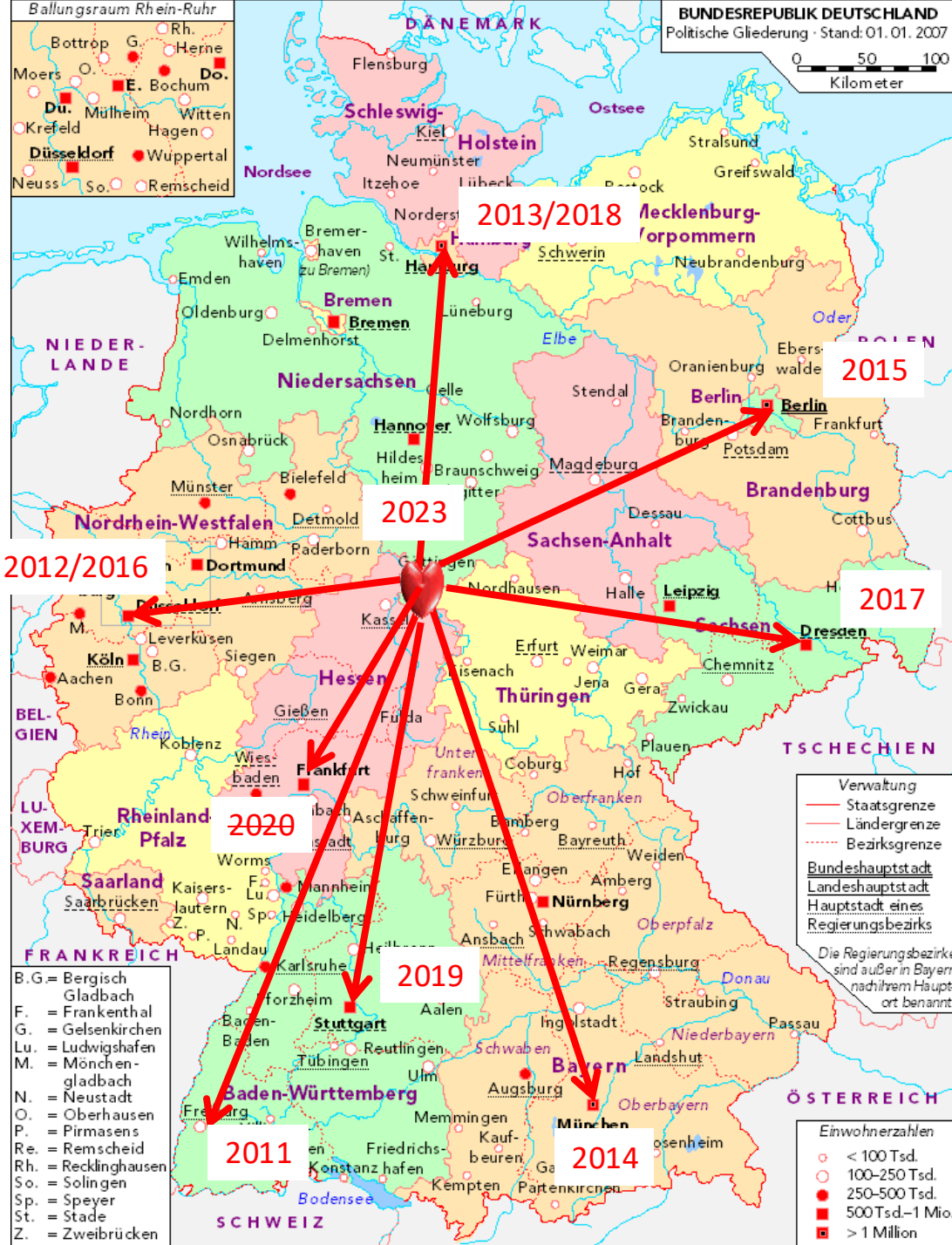
Pathogenicity of *Colletotrichum graminicola*

Molecular biology & genetics
Gene deletions, fluorescence microscopy
Expression analysis, protein-protein interactions

Dr. Daniela Nordzиеke



West
North
South
East
South-East



~~2020~~

~~2021~~

~~2022~~

Industry excursion 2023/24

Göttingen



Plant breeding and seed company
KWS Saat AG Einbeck



Pharmaceutical company
Evotec, Göttingen

SARTORIUS

Company for lab equipment, life
science, Sartorius, Göttingen

Bioreactors & Fermenters



Fluid Management

