

MP 156/ MP 157 – Laboratory Course I / II

Two dedicated lab research modules (MP 156 and MP 157) with practical orientation are offered in the master program “Insect Biotechnology”.

Students acquire modern laboratory techniques and autonomous lab work in specific topics within different work groups. Students can choose one of the following six fields from the attached pdf description. Each module comprises a total workload of 180 hours (6 CP) including 80 hours of practical training. Possible dates for the beginning and the exact timing depends on available projects.

Lab work (80 h) can either be conducted as a block project during the non-lecture period or spread over a longer period of time depending on the chosen project. This is coordinated with the respective contact person. Students have to plan this module depending on personal interests and their free capacities.

For concrete enquiries or more information please **send a meaningful email to the contact persons described below**. The email should contain information about your pre-qualifications (practical and theoretical experiences) and interests.

For more details, please have a look at the module list on the webpage of faculty 09 and the short overview of the six fields listed in the pdf below.

Lab Research I - Insect pest control systems

Students need to be familiar with integrated pest management (MK 089) and an understanding in insect biotechnology strategies and molecular techniques is helpful (e.g. MP090)

- Get practical insight into insect pest rearing and control systems for integrated pest management.
- lab training and autonomous lab work in special topics of integrated pest management
- presentation, discussion of literature and lab work is part of the lab module
- topic specific literature research and presentation

Contact: Dr. Sabine Otto, sabine.otto@uni-giessen.de

Location: JLU Gießen, Winchesterstr. 2, 35394 Gießen

Lab research II - Molecular techniques

Students need to be familiar with molecular techniques (e.g. MP 149) and an understanding in insect biotechnology strategies is helpful (e.g. MP090)

- get practical insight into main molecular techniques for cloning, insect transformation, and/or genome modification
- lab training and autonomous lab work in special topics of molecular techniques
- presentation, discussion of literature and lab work is part of the lab module
- topic specific literature research and presentation

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Lab research III - Chemistry of specialized metabolites

As a prerequisite for participating in this topic, students need knowledge about natural products (e.g. MK87, MK90), and interest in compound separation (HPLC, LC-MS) structure elucidation (NMR) is helpful.

Our lab applies tools from bioinformatics, analytical chemistry, molecular and microbiology including state-of-the-art genomics and metagenomics.

- get an overview of origin, biosynthesis, ecophysiological role, and practical importance of natural products
- know the most important classes of natural products
- perform sampling, isolation, separation, clean-up, and analysis of natural products by state-of-the-art chromatographic and instrumental-analytical techniques, including thin-layer chromatography, HPLC, GC, GC/MS, and LC/MS
- perform biological activity assays of crude extracts and isolated compounds, e.g. antibacterial

Contact: Prof. Dr. Till F. Schäberle; till.f.schaeberle@agrar.uni-giessen.de

Location: JLU Gießen, Heinrich-Buff-Ring 26-32, 35392 Gießen

Lab Research IV - Natural Products from Microorganisms: Discovery and Application

As a prerequisite for participating in this topic, students should be familiar with molecular and microbiological techniques (e.g. MP 149). Interest in new natural product production is an asset. Our lab applies tools from bioinformatics, analytical chemistry, molecular and microbiology including state-of-the-art genomics and metagenomics.

- hands-on training in microbial-based drug discovery including standard microbiological methods, molecular techniques and screening for biological activities
- theoretical insights into the application of natural products (focus on antibiotics)
- genetic manipulation of different microorganisms
- insights into analytical tools for natural product identification or insights into molecular biology tools for the discovery of biosynthetic gene clusters

Contact: Prof. Dr. Till F. Schäberle; till.f.schaeberle@agrar.uni-giessen.de
Address: JLU Gießen, Heinrich-Buff-Ring 26-32, 35392 Gießen

Lab research V - Pharmaceutical Biotechnology

The students

- have a basic knowledge in the field of concepts for process development for topics of relevance in biopharmaceutical industry
- gain basic literature-based insight into a special topic, potentially applicable for a master thesis project
- have insights into tools and methods applied in process development as used in pharmaceutical biotechnology serving as a basis for a potential master thesis project

Module contents: Lab training and autonomous lab work in special topics of pharmaceutical biotechnology, especially in the fields of process development in up- and downstream of biologicals and in pharmaceutical technology integrated into current application orientated scientific projects

Contact: Prof. Dr. Peter Czermak; peter.czermak@kmub.thm.de
Location: THM University of Applied Sciences, Wiesenstraße 14, 35390 Gießen

Lab Research VI - Industrial Biotechnology

The students

- have a basic knowledge in the field of concepts for bioprocess development for topics of industrial relevance
- gain basic literature insight into a special topic, potentially applicable for a master thesis project
- have insights into tools and methods applied in process development as used in industrial biotechnology serving as a basis for a potential master thesis project

Module content: lab training and autonomous lab work in special topics of industrial biotechnology, especially in the fields of process development in cell and bacterial culture systems integrated into current application orientated scientific projects

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