

Guide Laboratory Courses (MP-156-EN/MP-157-EN)

The master program Insect Biotechnology and Bioresources (IBB) provides two lab research modules, namely MP-156-EN and MP-157-EN. These modules are practical and focus on specific topics within different workgroups. Students gain hands-on experience in modern laboratory techniques and develop autonomous lab skills.

Students can choose from all fields and all laboratories in the study program related to Insect Biotechnology & Bioresources, but have to contact the lab of interest themselves to arrange the course. Exemplary a few fields are described below.

Workload

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 depending on available projects in the respective group you are contacting. Lab work (80 h) can be conducted as a block project or spread over a longer period depending on the chosen topic and available projects. This is coordinated directly with a respective contact person from each Department. Students must plan this module depending on their interests and free capacities.

Module Registration

It is not possible to register for these two modules via Stud.IP. For concrete inquiries or more information, please contact the persons of your interest or any related Department of the Master's program. The email should contain information about your pre-qualifications (practical and theoretical experiences related to the research modules) and interests.

Examination Registration

For these modules, there is no examination registration through FlexNow! The lecturer fills in the examination protocol after completing the module and a form of exam at the end and forwards it to the examination office. The examination office then enters the grade into FlexNow.

Topics

Insect pest control systems

As a prerequisite for participating in this topic, students must have an excellent theoretical background in integrated pest management (MK-089-EN) and understanding of insect biotechnology strategies and molecular techniques (e.g., MP-090-EN).

- topic-specific literature research and presentation upfront
- Get practical insight into insect pest rearing and control systems for integrated pest management, potentially applicable for a master thesis project
- lab training and autonomous lab work in special topics of integrated pest management,
- presentation, discussion of literature, and lab work are part of the lab module

Contact: Dr. Ying Yan, ying.yan@agrار.uni-giessen.de

Location: JLU Gießen, Department of Insect Biotechnology in Plant Protection, Winchesterstr. 2, 35394 Gießen

Molecular techniques

Students must have an excellent theoretical background in molecular techniques (e.g., MP-149-EN) as a prerequisite for participating in this topic. Understanding insect biotechnology strategies is helpful (e.g., MP-090-EN).

- topic-specific literature research and presentation upfront
- get practical insight into main molecular techniques for cloning, insect transformation, and/or genome modification; potentially applicable for a master thesis project
- 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

Contact: Prof. Dr. Schetelig, marc.schetelig@agrار.uni-giessen.de

Location: JLU Gießen, Department of Insect Biotechnology in Plant Protection, Winchesterstr. 2, 35394 Gießen

Chemistry of specialized metabolites

As a prerequisite for participating in this topic, students need knowledge about natural products (e.g. MK-087-EN, MK-090-EN). Interest in compound separation (HPLC, LC-MS) and structure elucidation (NMR) is helpful.

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

Students

- get an overview of the origin, biosynthesis, eco-physiological role, and practical importance of natural products
- know the most important classes of natural products
- perform sampling, isolation, separation, purification, and analysis of natural products by state-of-the-art chromatographic and instrumental-analytical techniques, including various chromatographic and mass spectrometric techniques, e.g. MPLC, HPLC, high-resolution UPLC/MS, and UPLC/MSⁿ
- perform biological activity assays of crude extracts and isolated compounds, e.g. antibacterial activity assay

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

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

Natural Products from Microorganisms: Discovery and Application

Students should be familiar with molecular and microbiological techniques (e.g., MP-149-EN) for this topic. Interest in the production of new natural products is an asset.

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

Students

- get 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 and/or insights into molecular biology tools for the discovery of biosynthetic gene clusters

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