

## 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 courses 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 involves 180 hours (6 CP), including 80 hours of practical training. The start and timing depend on available projects within each work group. Lab work (80 hours) can be a block project or spread out, coordinated with the respective department contact. Students should plan based on their interests and availability.

### Module Registration

Registration for these modules is not through Stud.IP.

#### Topics within the faculty 09:

- Contact the relevant department or individuals from FB09 for inquiries or more information.
- Include your pre-qualifications (practical and theoretical) and interests in your email.
- Once a topic is agreed upon, the supervisor will contact the examination office to obtain the examination sheet.

#### Topics outside the faculty 09:

- If the PI is not from the Faculty 09, the supervisor must contact Prof. Schäberle (till.f.schaeberle@agrار.uni-giessen.de) or Prof. Schetelig (marc.schetelig@agrار.uni-giessen.de) in advance to verify the research topic. If this is not done, the module cannot be credited with the framework of the Master program *Insect Biotechnology & Bioresources*.
- The supervisors need to include the following in the verification email:
  - Title
  - Short overview/abstract of the study
  - Confirmation of willingness to supervise the student under MP156/157 rules
- Prof. Schäberle or Prof. Schetelig will then send the presigned examination sheet (this verification is not required for topics with PIs from the Faculty 09).

## Examination Registration

Examination registration is **not** done in FlexNow. The **lecturer submits the examination protocol to the examination office** at FB09 after completing the module. The office then enters the grade into FlexNow.

## Topics

**Note:** The following **fields and topics are merely examples. You may choose from any professorships and PIs** within the Institute of Insect Biotechnology, Faculty 09, or other faculties, if they are available and interested in hosting you for a practical module. The **topic must also align with the study program of Insect Biotechnology & Bioresources**. If you select a PI from a different faculty, please follow the aforementioned rules.

### Examples:

**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/MS<sup>n</sup>
- 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](mailto:till.f.schaeberle@agrار.uni-giessen.de) ; Location: JLU Gießen, Heinrich-Buff-Ring 26-32, 35392 Gießen

**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](mailto: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: Dr. Irina Häcker, [irina.haecker@agrar.uni-giessen.de](mailto:irina.haecker@agrar.uni-giessen.de); Location: JLU Gießen, Department of Insect Biotechnology in Plant Protection, Winchesterstr. 2, 35394 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

Contact: Prof. Dr. Till F. Schäberle; [till.f.schaeberle@agrar.uni-giessen.de](mailto:till.f.schaeberle@agrar.uni-giessen.de); Location: JLU Gießen, Heinrich-Buff-Ring 26-32, 35392 Gießen