Technische Universität München

3.06.2025

# PhD position: Evolution of Chemoreception in Parasitoids

## *Project description*

Chemical signaling, the most ancient and widespread form of communication, can play a crucial role in maintaining species boundaries through exclusive communication channels that potentially drive speciation. Cuticular hydrocarbons (CHCs), long-chained lipids found on the surface of insects, serve as an excellent example of this. CHCs have been shown to encode species-specific sexual signals across various chemical communication systems in insects. However, how insects perceive, discriminate, and process the biological information encoded in CHC profiles is still poorly understood. This PhD project aims to address these knowledge gaps by focusing on *Nasonia*, a species complex of parasitoid wasps that serves as an evolutionary and ecological model system.

## ***PhD Position:***

The PhD candidate will investigate the chemoreception networks involved in CHC perception, particularly in the context of prezygotic reproductive isolation within the *Nasonia* species complex. Our previous research has already deciphered the patterns of sexual attractiveness in *Nasonia* CHC profiles. Expanding on this foundation, the PhD candidate will employ a suite of advanced techniques—single-sensillum recording (SSR), gas-chromatography/mass spectrometry (GC-MS), electro-antennographic detection (EAD), RNAi knockdowns, and behavioral olfactometer assays—to elucidate how divergence in CHC perception has potentially contributed to prezygotic reproductive isolation. This will largely advance our still limited knowledge on the intricate mechanisms of CHC perception in particular and on speciation mechanisms mediated by chemosensory evolution in general. The successful candidate will join the newly established Heisenberg group "**Evolution of chemical communication**" (**PD Dr. Jan Buellesbach**) at the **Plant-Insect Interactions group (Prof. Sara D. Leonhardt)** as part of the **TUM Department of Life Science Systems. Starting date is fall 2025.** The position is fixed-term (36 months). Salary scale: TV-L 13, 65%. As part of the assigned duties, there will be ample opportunity to conduct the independent scientific research necessary for the completion of a doctorate. The limitation complies to § 2, 1 WissZeitVG.

## *Job profile – We require*

- Strong interest and motivation in conducting evolutionary and chemical ecological research at different levels.
- MSc/diploma in a relevant field (*e.g.,* evolutionary biology, chemical ecology, sensory biology).
- Strong experience with chemoreception and sensory biological techniques (SSR, GC-EAD, EAG).
- Experience in analytical chemistry (GC-FID, GC-MS).
- Experience in or willingness to learn statistical data analyses, data processing and analytical chemical analyses.
- Excellent command of English language (written & oral) and experience with scientific writing.

## *We offer*

- Friendly and inspiring working atmosphere in a highly international young research group, as part of a vivid ecological department.
- Graduate Education at an excellent university ranked number 1 in Germany and 12$^{th}$ worldwide.
- Free access to transferable skill and statistical courses as part of the TUM Graduate School and the Biodiversity Exploratories.

## *Salary & Conditions*

TUM strives to raise the proportion of women in its workforce and explicitly encourages applications from qualified women. Applications from disabled persons with essentially the same qualifications will be given preference. As part of your application, you provide personal data to the Technical University of Munich (TUM). Please view our privacy policy on collecting and processing personal data in the course of the application process pursuant to Art. 13 of the General Data Protection Regulation of the European Union (GDPR) at https://portal.mytum.de/kompass/ datenschutz/Bewerbung/. By submitting your application you confirm to have read and understood the data protection information provided by TUM. Find out more about us at www.tum.de.

We invite applications from highly motivated candidates with passion for and experience in chemical ecological research, and ideally with experience in chemoreception and chemical analyses. Please **send your application via eMail to Jan Buellesbach (jan.buellesbach@tum.de)** as a single PDF document until the **3$^{rd}$ of July 2025**. Applications should include a motivation letter, a short summary of research interests and experience, CV, and contacts of two potential referees.