PhD position in evolutionary biology at the Johannes Gutenberg University of Mainz, Germany

--- Parasite interference with host gene regulation ---

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The Institute of Organismic and Molecular Evolution **IOME** is seeking a candidate for a PhD position (starting October 1st 2019) to study the molecular regulation of parasite interference within a social host located in the **DFG Research Training Group 2526 GenEvo** (https://www.imb.de/about-imb/joint-research-initiatives/genevo/). This initiative is centered around the core question of how complex and multi-layered gene regulatory systems have evolved. This structured PhD programme brings together scientists with expertise in evolutionary and molecular biology to train a new, interdisciplinary generation of PhD students and to solve innovative research questions.

Project description: Parasite interference with gene regulation of a social host
Parasites with complex life cycles often manipulate the behaviour of their intermediate hosts to increase transmission to the definite host and we hypothesise that they do so by interfering with host gene regulation. Infection of *Temnothorax nylanderi* ant larvae with the parasitic cestode *Anomotaenia brevis* strongly alters the adult phenotype. Parasitized workers exhibit altered behaviour, morphology, chemical profile and a lifespan extension (Scharf *et al.* 2012 *American Naturalist*, Beros *et al.* 2015 *Proc Roy Soc*). Indeed, the long-term survival rates of infected workers matches that of queens, which can reach lifespans of 20 years in these ants. These changes are linked to transcriptomic alterations (Feldmeyer *et al.* 2016 *Molecular Ecology*), which might be caused by the parasite. The cestode, residing in its cysticercoid stage in the ants' gaster is transcriptionally active and releases many proteins into the host. The aim of this project is to demonstrate how parasite-induced changes in host phenotype are promoted by the parasite. We therefore will study how the cestode parasite interferes with the hosts' gene regulation, which gene-regulatory mechanisms are utilized and whether these alterations are permanent or have to be actively maintained. This project will reveal genetic and epigenetic underpinnings of behaviour and longevity in social insects and will uncover the mechanisms of across-species interference in gene regulation.

We are looking for a highly motivated student with a Master degree (or equivalent) in biology, good English skills, and a keen interest in evolutionary biology. Previous experience with social insects, statistics and bioinformatics is advantageous, but not required. Successful applicants will join an international, interactive, dynamic and English-speaking scientific environment in a brand new building with access to state-of-the-art, newly equipped laboratories and climate-controlled rooms. The JGU of Mainz hosts many excellent scientific institutions, and Mainz is a historic city located on the Rhine River with a large student population and a rich social and cultural life.

Interested candidates should apply to foitzik@uni.mainz.de until **August 4th 2019**. The best candidates will be invited to the selection days of the IPP Mainz, **26-28 August 2019 https://www.imb.de/students-postdocs/international-phd-programme/**. The starting date of the PhD position will be **October 1st 2019**. The Johannes Gutenberg University of Mainz is interested in increasing the number of women in science. Applications from women are therefore strongly encouraged. Similarly, qualified candidates with disabilities will be preferred.

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