



**3-year PhD position
to study the cellular basis and functional impact of
anisotropic lateral inhibition in the olfactory system of
*Drosophila***

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The research group [Olfactory Coding](#), Dr. Silke Sachse, in the Department of Evolutionary Neuroethology at the Max Planck Institute for Chemical Ecology offers a

3-year PhD position to study the cellular basis and functional impact of anisotropic lateral inhibition in the olfactory system of *Drosophila*.

Background

The project is funded by the new priority program 2205 'Evolutionary optimization of neuronal circuits' of the DFG (German Research Foundation). In tandem with the lab of Prof. Dr. Veronica Egger, University of Regensburg, the project aims to unravel the cellular basis of anisotropic lateral inhibition in the rat olfactory bulb and fly antennal lobe, a feature that is highly relevant for olfactory coding. In the olfactory system, complex inhibitory circuits modulate the impact of sensory neuron input and mediate interactions between second order principal neurons. These pathways are assumed to regulate olfactory sensitivity depending on behavioral state, synchronize neural subnetworks, and enhance the spatial contrast of representations via decorrelation of similar response patterns. The architecture of the underlying network anatomy is astonishingly similar across insects and vertebrates - a prime example of convergent evolution.

We aim to clarify the cellular basis of defined inhibitory interactions across phylae, based on predictions inspired by findings in the respective tandem lab. As a key technique, we will employ two-photon functional imaging combined with the MARCM technique (Mosaic Analysis with a Repressible Marker) to monitor odor-evoked activities of individual inhibitory local interneurons in the *Drosophila* antennal lobe. We ultimately aim to assign specific inhibitory interactions to defined interneuron types in both rat and fly and integrate the these result into a new generic network model of the convergent olfactory system, in collaboration with other members of the priority program with computational/circuits expertise.

Payment will be based on the tariff contracts for the public service (65% E13). We provide an excellent research environment with enthusiastic scientists from different nationalities at the Max Planck Institute for Chemical Ecology in Jena, Germany (<http://www.ice.mpg.de>). The PhD student can be associated with the International Max Planck Research School (IMPRS <http://imprs.ice.mpg.de>).



Candidate requirements:

- Master's degree in Biology or related subject
- strong interest in Neuroscience
- interest in method development/refinement; ideally, prior experience in fly genetics and neurophysiology
- very good skills in English (both in speaking and writing)

How to apply:

The Max-Planck Society is an equal opportunity employer and strives to employ both genders equally, as well as to employ more individuals with disabilities. Therefore, we encourage all applicants, independent of their nationality, gender or disability, to apply for this position. Please send your application as a single pdf in English including a letter of motivation, summarizing your experience and future vision, CV, list of publications and relevant certificates (degree certificates, etc.) and the names of two referees (including email address) to

Dr. Silke Sachse

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