

EINLADUNG

Kolloquium
Sommersemester 2022

Prof. Dr. Bernd Grünewald

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hält am Dienstag, den **14.06.2022**, um 16:15 Uhr, im Hörsaal 1 des Biologicums, einen Vortrag über

„Neurons to Environment: Multiscale approaches of Honeybee research at the Bee Research Institute Oberursel“



Honeybees are essential pollinators in most terrestrial ecosystem. Thus, they provide important ecological and economical functions. As eusocial insects they also show amazing cognitive abilities and highly complex communication skills. Therefore, honeybees are model organisms for biological research. In my group at the *Institut für Bienenkunde*, we combine neurobiological and behavioral research with molecular biological and cellular approaches. Recently, we expanded our studies to include environmental science projects to investigate potential threats to honeybees and bumble bees. One example of such a multiscale approach is the role of the transmitter acetylcholine

(ACh) for honeybees. ACh is an excitatory transmitter in the bee brain and we characterized several nicotinic ACh receptors on bee neurons. Cholinergic synaptic transmission is involved in olfactory information processing and learning. ACh, however, is also essential for larval development and is fed by nurse bees to queen and worker larvae. Young worker bees produce ACh in their hypopharyngeal glands and it is found in high (millimolar) concentration in both worker and royal jelly. Insecticides such as neonicotinoids interfere with cholinergic signaling. Accordingly, we identified insecticide effects on orientation and navigation as well as effects on nurse-larval interactions within the hive and an increased brood mortality within bee colonies. This way we span the arc from molecules to environment using a single model organism, the honeybee within its colony.

In addition to basic research, the Bee Research Center of the Polytechnische Gesellschaft maintains a state-of-the-art beekeeping facility and is very active in science communication in Frankfurt and the Rhein-Main area. I will, therefore, also discuss the future development of the *Institut für Bienenkunde* and the status of the new construction of the Institute that will be completed around the end of 2024.

Einladender: Prof. Dr. Ernst H. K. Stelzer