Introductory Remarks to Symposium 14

Circuits for behavior: cross-species strategies for adaptation and plasticity

Graziana Gatto and Jan Gründemann, Cologne and Bonn

Animal behavior is shaped by internal state and environmental challenges. Animals continuously plan and update their actions in balance with internal state needs and under consideration of environmental constraints such as physical hurdles, nutrient availability, social pressure or predatory risk. Adaptation strategies modify behavior at different levels and time scales, shaping plans, actions and predictions based on dynamic interactions of distributed neuronal circuits that are species-specific or evolutionary conserved.

This symposium will address how diverse species including *Drosophila*, mice and mole-rats adapt behavioral strategies and how these processes map onto activity dynamics and plasticity of neuronal circuits and brain-wide networks. We will focus on recent conceptual and methodological advances in our understanding of state-dependent behavioral adaptation and the underlying neuronal circuits. Ilona Grunwald Kadow will delineate the neural underpinnings of how brain-body communication in fruit flies modulates decision-making in light of innate immune and glia signaling. Johanna Schweizer will discuss the dynamics of context-dependent extinction learning that enables update of associative memories without behavioral expression in the fruit fly. Pascal Malkemper, leveraging *in vivo* hippocampal recordings during spatial navigation in total darkness, will present how African mole-rats use a magnetic sense to navigate intriguing underground labyrinths. Tatiana Korotkova will describe how leptin-receptor and neurotensin-expressing neurons in lateral hypothalamus regulate feeding, social interactions and mating behaviors. Finally, Simon Musall will discuss how experience adapts the robustness of task-specific activity and the number of choice-selective neurons when mice learn multisensory tasks with increasing complexity using wide-field cortical imaging. In summary, this symposium will delineate across species how local and global neuronal circuit and network computations impact state-dependent adaptation of behavior and survival in complex environments.

This symposium is supported by the iBehave Network of the Land Nordrhein-Westfalen.

Symposium 14

Thursday, March 27, 2025
14:30 - 16:30, Lecture Hall 10

Chairs: Graziana Gatto and Jan Gründemann, Cologne and Bonn

14:30 **Opening Remarks**

14:35 Ilona Grunwald Kadow, Bonn
NEURAL CIRCUITS OF CONTEXT-DEPENDENT BEHAVIOR IN FLIES (S14-1)

15:00 Johanna Aurelia Schweizer, Basel, Switzerland
INTEGRATION OF INFORMATION IN THE ABSENCE OF ACTION IN *DROSOPHILA* (S14-2)

15:15 Pascal Malkemper, Bonn
TOWARDS THE NEURAL BASIS OF THE MAGNETIC SENSE IN SUBTERRANEAN MOLE-RATS: BEHAVIOR AND RECORDINGS (S14-3)

15:40 Tatiana Korotkova, Cologne
SIMPLE PLEASURES: REGULATION OF SOCIAL AND FEEDING BEHAVIORS BY LATERAL HYPOTHALAMIC NEURONAL POPULATIONS (S14-4)

16:05 Simon Musall, Jülich
EXPERIENCE-DEPENDENT MODULATION OF CORTICAL CIRCUITS FOR PERCEPTION AND BEHAVIOR (S14-5)