LIMES
Life & Medical Sciences Institute

UNIVERSITÄT BONN
Rheinische
Friedrich-Wilhelms-
Universität Bonn

Seminar

First Bonn Limes Mini-Neuroscience Symposium

Wednesday, February 19, 2020
Limes Institute
Ground Floor Seminar Room
10:00-12:30

10:00 - 10:05 Introduction

10:05 - 10:35 Dr. Peter Soba, University of Hamburg

"Development and maintenance of escape circuits: what flies can teach us about survival, brain development and function"

Sensing and avoiding noxious cues is paramount for survival of any organism. The underlying sensory network thus has to develop early and remain functional throughout life. We study the molecular and functional requirements of building a nervous system able to encode and support these essential escape behaviors, with surprising parallels between flies and humans.

10:35 - 11:05 Dr. Katrin Vogt, Harvard University

"Internal state configures olfactory behavior and early sensory processing in *Drosophila* larvae"

Animals can respond differently to a sensory cue when in different states. The *Drosophila* larva avoids certain odors when fed but is attracted to the same odors when food deprived. We find that feeding state formats neural processing in an early olfactory circuit, the antennal lobe, to determine such behavioral response. Odor valence is assigned by switching between two separate projection neuron output pathways for opposite behavioral responses. The critical regulator here is the serotonergic CSD neuron which selects the appropriate output pathway by shifting patterns of serotonergic modulation and glutamatergic inhibition. The antennal lobe is a decision-making circuit for innate behavioral responses that determines an odor's valence depending on feeding state.

11:05 - 11:35 Dr. Armin Bahl, Harvard University

"Neural basis of perceptual decision-making in larval zebrafish"

To make appropriate decisions, animals need to accumulate sensory evidence, but the neural basis of such processes remains poorly understood. Here, we approach this problem by adapting a random dot motion discrimination paradigm, usually used in primate studies, to larval zebrafish. Characterizing accuracy and delay of individual swimming decisions, we find that larvae can temporally integrate motion over many seconds. Using brain-wide two-photon functional imaging, we identify several cell clusters in the anterior hindbrain that are well-suited to implement the underlying computations.

11:35 - 12:30 Open Discussion and Reception

Everybody is welcome

Hosted by: Michael Pankratz and Dietmar Schmucker