DANDRITE
Danish Research Institute of Translational Neuroscience
Nordic EMBL Partnership for Molecular Medicine

AARHUS UNIVERSITY

DANDRITE TOPICAL MINI SYMPOSIUM

Talks about SOCIAL EXPERIENCE and VISUAL PROCESSING

Friday 29 March 2019
10.00 – 12.00
Venue: Sky lounge, building 1520, room 737
(Ny Munkegade 120, 8000 Aarhus C)

Professor Jean-Christophe Billeter, Groningen University
10.00 – 11.00

Modulation of individual behaviour by social experience in *Drosophila melanogaster*

Social interactions between members of the same species occur in all of life. Those interactions benefits individuals through facilitated reproduction and survival, but also cost them because of competition for limited mates and resources. Individuals must thus modulate their behaviour in response to their social environment, which they do through increased performance when in a group or search for others when alone. We however know little about the mechanisms that underlie these traits, for instance the sensory systems and neuronal circuits that allow individual to assess their social context and adapt to it. In this seminar, I will show that the fruit fly Drosophila melanogaster, a species with unrivalled genetics tool to assess the molecular and cellular basis of behaviour, does have a social life and that the mechanisms mediating this social life can be dissected down to the genetic, molecular and cellular levels.

Professor Marion Silies, Mainz University
11.00 – 12.00

A luminance-sensitive pathway in *Drosophila* is required for image processing in low light conditions

Visual systems have evolved to function optimally despite wide variations in illumination. Many visually guided behaviors rely on the processing of contrast, a change in luminance, initiated in the photoreceptors. Here, we show that luminance information is retained past photoreceptors in the *Drosophila* visual system and plays a crucial role in image processing. We use in vivo 2-photon imaging to show that distinct inputs to the OFF pathway encode contrast and luminance. The luminance-sensitive pathway is specifically required for behavioral responses to visual motion in dim light, when pure contrast-sensitivity underestimates the salience of a stimulus. Thus, luminance information refines contrast computation when adaptation mechanisms are insufficient. Contrast sensitivity depends on a circuit-dependent elimination of baseline, whereas luminance sensitivity depends on a cellular mechanism involving the transcription factor dFezf. Overall, our data demonstrate that retaining a peripheral visual feature in higher processing steps is required for robust behavioral responses.

Host: Associate Professor and DANDRITE Group Leader Anne von Philipsborn, Aarhus University