

DANDRITE Topical Seminar

Wednesday 9 November 2016
at 10.30 – 11.15

Building 1170, library
Ole Worms Allé, 8000 Aarhus C

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Seminar on Dopaminergic signalling in *Drosophila melanogaster* – Insights into the control of metabolism and behaviour

Key processes in physiological systems have been evolutionarily conserved from fruit flies to men. The endocrine and nervous system have central control functions that regulate physiological and ethological processes. By using the dopaminergic system of *Drosophila melanogaster* as a model, we are studying the neuronal circuits controlling metabolic output and behaviour. We are further investigating pathological processes affecting dopaminergic cells by employing the *Drosophila* Parkinson model.

The diuretic hormone 44 (DH44), the fly homolog of the mammalian corticotropin-releasing hormone, is a central regulator in a variety of physiological processes. However, we found the fly's D1 family dopamine receptor DopR to be expressed in DH44+ cells in the pars intercerebralis (PI), the major site of DH44 synthesis, suggesting an upstream regulatory role of dopamine in DH44 signalling. By using optogenetic tools, we manipulated second messenger levels to mimic receptor activation and could demonstrate numerous changes in metabolism and behaviour. Our results indicate that dopamine exerts some of its physiological actions via modulation of DH44 signalling in the PI.

The D2R, a D2 class receptor, is known to be involved in learning and activity. Mutant analyses revealed further implications in activity rhythm and metabolism.

Furthermore, we are employing transcriptomic studies on the *Drosophila* Parkinson model to identify candidate genes relevant for early disease onset. Subsequent experimental analyses of these genes might help to understand and modify the molecular pathological processes in affected neurons.

Host: Group Leader Anne von Philipsborn, DANDRITE, Dept. of Molecular Biology and Genetics, Aarhus University