Seminars in Zoophysiology at Aarhus University

Thermal acclimation of drosophila flies : from genes to active molecules

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Ectotherms possess diverse responses for dealing with thermal stress, they can adapt genetically and/or they can acclimate trough phenotypic adjustments. The underpinnings of thermal acclimation are still poorly elucidated. Over the past years, the 'omics' techniques have emerged as powerful tools for studying organism–environment interactions. Here, I present data from several studies on thermal acclimation in *Drosophila melanogaster*. I show that thermal acclimation deeply promotes thermal tolerance and I present physiological correlates of this response. At the gene level, I provide evidence of a plasticity of stress genes expression according to thermal history and I show how altering the expression of these stress genes via RNAi affects thermal tolerance. I show that heat acclimation induces a marked proteomic remodeling associated with a range of putative biomarkers, whereas proteomic changes associated with cold acclimation are surprisingly subtitle despite marked organismal response. I also present evidence that cold acclimation allows maintenance of system-wide metabolic homeostasis following cold stress, while severe perturbations are observed in non-acclimated phenotypes. Finally, I present recent data showing that cold stress induces proteolytic activity and cold acclimation reduces this effect, suggesting that acclimation allows maintenance of protein integrity. The variety of these processes suggests that a number a regulated pathways are involved in thermal acclimation response.

Tuesday September 3rd at 10.15
Room 127 (zoofys kaffestue), building 1131