02
FÉV.
2012

de 11h à 12h

SÉMINAIRE

Cold tolerance plasticity in Drosophila melanogaster: molecular correlates and metabolomic fingerprints

herve colinet
Unité d'Écologie et de Biogéographie, Université catholique de Louvain

Temperature affects all aspects of organism's biological organization and this is particularly true for cold-blooded animals. These organisms possess diverse responses for dealing with thermal stress, they can adapt genetically (i.e. long evolutionary process) and/or they can acclimate (i.e. short-term phenotypic adjustments). Adaptive responses to thermal stress typically involve a range of plastic responses and the mechanisms underlying these processes are complex and not fully understood. A common physiological response of organisms to environmental stresses is the increase in expression of heat shock proteins (Hsps). This has been widely examined for heat stress, but the response to cold stress has been far less studied in insects. In addition, the molecular basis of thermal adaptation is not well understood, although a number of candidate genes have been proposed. However, a functional link between these candidates and cold tolerance has rarely been established. In this presentation I will describe transcriptional patterns of some genes (Hsps, Frost and Stravin) with respect to cold stress and I will discuss their roles in cold tolerance of Drosophila melanogaster. The functional significance of some of these genes was assessed by gene silencing. Cold tolerance is highly a plastic trait that can vary according to numerous endogenous and exogenous factors, including thermal acclimation. This process allows organisms to enhance thermotolerance when exposed to sub-lethal temperatures before thermal stress. I will also discuss how distinct forms of cold acclimation promote differential molecular responses and affect system-wide metabolite variations. This presentation intends to provide insights into the mechanisms by which cold adaptation and acclimation is achieved in chill susceptible D. melanogaster flies.complete affiliation for HC: Unité d'Écologie et de Biogéographie, Biodiversity Research Centre, Université catholique de Louvain, Louvain-la-Neuve, Belgium. UMR CNRS 6553 Bât 14A, Université de Rennes1, 263 Avenue du Général Leclerc CS 74205, 35042 Rennes Cedex, France.