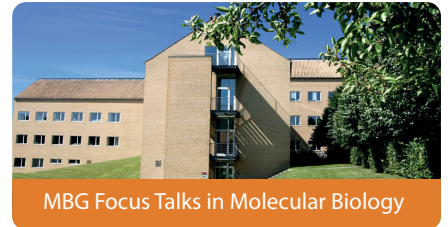


MBG FOCUS TALK

hosted by Erik Østergaard Jensen



Tuesday June 19 at 1:15 - 2:00 pm

MBG, Conference room (3130-303)

Frédéric Gachon

Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

Regulation of mammalian physiology by circadian and feeding rhythms

Circadian clocks have been conserved throughout the evolution, allowing bacteria, animals, and plants to adapt their physiological needs to the time of day in an anticipatory way. In mammals, these pacemakers regulate many physiological processes such as sleep-wake cycles, body temperature, heartbeat, and many other aspects of the physiology. While mechanisms allowing these controls by the molecular oscillator and feeding rhythms are not completely understood yet, it is accepted that they involved rhythmic transcription of genes coding for enzymes implicated in different aspects of animal metabolism. However, the potential role of post-transcriptional regulations in this process has been largely neglected for the moment. Based on our recent results using Circular Chromosome Conformation Capture (4C), high throughput RNA sequencing, and in vivo SILAC quantitative proteomic, we were able to characterize the rhythmic activation of several signaling pathways, as well as the mechanisms involved in their regulation by the circadian clock and feeding rhythms and their consequences for animal physiology and metabolism. In addition, our recent results pointed out a key role of the gut microbiota on the sexual-dimorphic circadian rhythmic gene expression and metabolism. Considering the fact that perturbation of the circadian clock and gut microbiota lead to numerous pathologies including obesity, type 2 diabetes and cancer, our results could contribute to the understanding of this phenomenon.