BDR SEMINAR via Zoom

Robert H. Henning

Department of Clinical Pharmacy and Pharmacology
University of Groningen

Tuesday, December 15, 2020

16:30-17:30

Meeting URL will be announced on the event day by e-mail.

※This seminar is open only to BDR members.

Hibrainination – impact of daily hibernation on neuroplasticity in mouse

This seminar is a part of the QMIN project seminar series.

Summary

Hibernation is a highly effective strategy to survive periods of low resource availability. The core of hibernation are torpor periods, during which animals actively reduce their metabolism, resulting in a more or less pronounced decrease in body temperature. Throughout hibernation, torpor bouts are alternated with arousals: periods with full restoration of metabolism and body temperature. The alternation between these extremes of physiology challenges almost every physiological system, apparently without causing organ damage.

Yet, upon close examination, torpid hibernators reveal signs of organ damage. In brain, torpor induces neurodegeneration-like changes, including dendritic retraction, reduction of spine numbers and widespread hyper-phosphorylation of the microtubule-associated protein Tau. Remarkably, these are all fully and rapidly restored during arousal. Thus, hibernation offers access to unexplored brain plasticity mechanisms with relevance to the treatment of neurodegenerative diseases.

We explored post-torpor plasticity in a daily hibernation model of fasted mice. I will discuss unpublished findings regarding changes in morphology, memory formation (LTP and behavioural testing) and molecular pathways. Collectively, these data demonstrate strongly enhanced neuroplasticity involving specific post-synaptic mechanisms. Also, I will discuss their impact on memory in the APP/PS1 mouse model of Alzheimer's disease and implications for treatment.

Host: Genshiro Sunagawa
Laboratory for Molecular Biology of Aging, BDR
genshiro.sunagawa@riken.jp
Tel: 078-306-3305 (ext:95-3305)