

## Introductory Remarks to Symposium 34

## Novel insights into hypothalamic mechanisms for adaptive control of homeostasis

Jan Siemens and Henning Fenselau, Heidelberg and Cologne

Mammalian organisms possess the remarkable ability to maintain a stable energy- and temperature-homeostatic landscape. This highly integrative neuro-regulatory feature is all the more impressive given that energy demand and supply as well as environmental temperatures and internal heat generating processes are constantly changing. The hypothalamus is the core region for homeostatic regulation. It senses caloric and thermal disturbances, integrates peripheral sensory and interoceptive information, and orchestrates in turn motivated behaviors and diverse physiological processes to maintain or re-establish homeostasis. Over the past years, research employing new neurobiological tools for cell type-specific manipulations, mapping, and monitoring has significantly advanced our understanding of the circuit and cellular mechanisms underlying hypothalamic control systems. Moreover, recent research has demonstrated that plastic changes—spanning glia, neuronal and synaptic levels—within these pathways are linked to both beneficial and pathological alterations in processing of energy- and temperature signals.

The symposium brings together experts, who have contributed to our current understanding of pathways mediating energy balance and body temperature. (1) Cristina Garcia Caceres will present her recent findings on hypothalamic astrocytes in food intake regulation. (2) Denis Burdakov will describe newly identified orexinergic pathways required for dietary homeostasis. (3) Mingran Cao will present her work on neuronal pathways that state-dependently connect hunger and parental behavior. (4) Silvana Valtcheva will show how rapid integration of hypothalamic oxytocin pathways coordinate behaviors and physiology. Finally, (5) Kazuhiro Nakamura, a renowned scientist from Japan, who has contributed on many levels to our understanding of body temperature regulation, will join our symposium. This symposium will stimulate a vivid exchange of ideas and future directions on the hypothalamic origins of homeostatic adaptations.

## Symposium 34

Friday, March 24, 2023  
13:00 - 15:00, Lecture Hall 102

Chairs: Jan Siemens and Henning Fenselau,  
Heidelberg and Cologne

- 13:00 **Opening Remarks**
- 13:05 Cristina Garcia Caceres, Neuherberg  
HYPOTHALAMIC ASTROCYTES IN THE NEUROENDOCRINE CONTROL OF METABOLISM (S34-1)
- 13:30 Paulius Viskaitis, Schwerzenbach, Switzerland  
SENSING AND CONTROL OF INGESTION BY OREXIN NEURONS (S34-2)
- 13:55 Mingran Cao, London, UK  
NEURAL CIRCUIT BASIS UNDERLYING A HUNGER-GATED, HORMONE-PRIMED PARENTAL SWITCH (S34-3)
- 14:10 Silvana Valtcheva, Cologne  
HYPOTHALAMIC CIRCUITS FOR OXYTOCIN RELEASE AND MATERNAL BEHAVIOR (S34-4)
- 14:35 Kazuhiro Nakamura, Nagoya, Japan  
A CENTRAL PIVOTAL CONTROLLER FOR THERMAL HOMEOSTASIS AND FEVER (S34-5)



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