

Introductory Remarks to Symposium 9

Neuronal circuits, energy state and eating disorders

Rachel Lippert and Robert Chesters, Potsdam-Rehbrücke

The brain is the central orchestrator of our eating behaviors; controlling our homeostatic need to eat, and our hedonic drive to eat. Understanding how the brain responds to differing energy states and the macronutrient composition of our food, whilst balancing competing physiological needs, is key to helping us understand how our eating behaviors are regulated. Through this we can gain insights in to the societal tendency towards obesity, as well as eating disorders.

In this symposium we bring together a collection of research programs from across the globe which focus on different aspects of the neuronal control of feeding. First, Robert Chesters will focus on the classical melanocortin system and present changes to the activity of melanocortin-3 receptor (MC3R) neurons of the paraventricular thalamus (PVT) during fasting and refeeding. Next, Chantal Wissing will show how competing physiological needs; eating, drinking, and socializing are regulated by neurons of the lateral hypothalamus. The remaining three speakers will then explore the diverse roles of the mesolimbic dopamine system in both homeostatic and hedonic feeding: James McCutcheon will demonstrate how protein restriction can alter neuronal activity, leading to altered dopaminergic signaling and macronutrient preference. Tim Gruber will highlight the epigenetic mechanisms responsible for hyperactivation of the midbrain dopamine neurons during binge eating of hyperpalatable foods. To conclude, Pierre Trifilieff will show us how dysregulated dopaminergic transmission in the nucleus accumbens can help explain the development of eating disorders.



NEUROCURE
Cluster of Excellence



Symposium 9

Thursday, March 27, 2025
10:30 - 12:30, Lecture Hall 105

Chairs: Rachel Lippert and Robert Chesters,
Potsdam-Rehbrücke

- 10:30 **Opening Remarks**
- 10:35 Robert Chesters, Potsdam-Rehbrücke
MELANOCORTIN 3 RECEPTOR NEURON ACTIVITY ACROSS NIGHT AND DAY, FED AND FASTED (S9-1)
- 10:55 Chantal Wissing, Cologne
LATERAL HYPOTHALAMIC NEUROTENSIN-EX-
PRESSING NEURONS SHAPE THE BALANCE
BETWEEN DRINKING, FEEDING AND SOCIA-
LIZING (S9-2)
- 11:10 James McCutcheon, Tromsø, Norway
ALTERATIONS IN NEURAL ACTIVITY AND DO-
PAMINE RELEASE INDUCED BY SPECIFIC NU-
TRIENTS DURING TIMES OF NEED (S9-3)
- 11:30 Tim Gruber, Grand Rapids, USA
FOOD REWARD THRESHOLDS AND BINGE-
EATING VULNERABILITY ARE EPIGENETICALLY
DETERMINED BY Tet1 DOSAGE IN DOPAMINE
NEURONS (S9-4)
- 11:50 Pierre Trifilieff, Bordeaux, France
A MAIN ROLE FOR THE NUCLEUS ACCUM-
BENS IN ENERGY BALANCE: RELEVANCE FOR
EATING DISORDERS (S9-5)
- 12:10 **Discussion and Concluding Remarks**

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