Chair for Molecular Nutritional Medicine
TUM School of Life Sciences
Technical University of Munich

Three PhD positions on crosstalk of brown fat and brain

3 years, TVL-E13 65%, immediately available

Our projects

We are pleased to announce three open Ph.D. positions in DFG funded research projects investigating the multifaceted role of the gut hormone secretin beyond the enteric system. We identified secretin as a key mediator of meal-induced thermogenesis in brown adipose tissue (BAT), impacting hunger and satiation (*DOI: 10.1016/j.cell.2018.10.016*). Contrary to previous beliefs, our research suggests a gut-BAT-brain axis, challenging the idea of secretin's central action in the brain. Our goal is to determine the relative contributions of central and direct effects of secretin by employing conditional knockout models. We will uncover afferent pathways of BAT-brain communication, including heat transfer, neuronal transmission or endocrine signaling. Our findings in humans underscore secretin's role in BAT activation, affecting both homeostatic and hedonic-driven food intake.

1) Project 1 will investigate significance of the gut-BAT-brain axis in homeostatic and hedonic control of food intake. Continuous recordings of brown fat temperature and food intake will be conducted to elucidate the link between brown fat thermogenesis, feeding behavior and energy balance.
2) Project 2 will focus on the role of heat transfer from brown fat to brain as a signal controlling energy balance. Establishing a method for simultaneous recording of brown fat and brain temperature, the effects of brown fat activation on feeding behavior will be investigated in different feeding paradigms.
3) Project 3 will focus on the neuronal cross-talk of brown fat and brain. Viral tracing methods will be applied to elucidate the neuronal connectivity of brown fat and brain. Brain regions targeted by sensory nerves will be identified. Electrophysiological recordings will reveal the peripheral stimuli triggering afferent neuronal communication between brown fat and brain.

All three doctoral candidates will work with genetically modified mouse models and gain expertise in various methods applied to study metabolism and neurophysiology.

Your profile

- High scored degree in Biology (Physiology, Neurophysiology Molecular Biology, Microbiology and/or Cell Biology), Nutritional Science, Biochemistry, Molecular Biotechnology or related disciplines
- Profound laboratory experience
- Fluency in spoken and written English
- Scientific commitment and creativity
- Excellent communication and teamwork skills

About us

The Chair of Molecular Nutritional Medicine is located at the TUM School of Life Sciences Weihenstephan, Technical University of Munich. Our research addresses the effect of nutrition on energy balance aiming to identify adaptive components of energy expenditure. We study models ranging from the molecular, organellar, cellular to the in vivo level. You will conduct research in a collaborative environment with well-equipped laboratories, excellent cooperation opportunities and a stimulating scientific atmosphere.
Research at the Chair of Zoology (TUM School of Life Sciences Weihenstephan) focuses on sensory processing in the central nervous system, using different animal model system and a wide range of methodological approaches including in-vivo and in-vitro electrophysiology, imaging and neuroanatomy.

The close interdisciplinary cooperation of the two chairs enables an extraordinary exchange of knowledge from which all participating scientists will benefit enormously.

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Application deadline: January 31st 2024

The Technical University of Munich is striving to increase the overall proportion of female employees and thus explicitly urges qualified women to apply. Handicapped, equally qualified candidates are preferred.