



Guest Lecture

Friday June 7th, 2024, 10:15 am
Department for Biochemistry and Molecular Biology (BMB)
- Seminar Room -

'microRNAs – size doesn't matter!'

Prof. Dr. Henriette Kirchner
Excellence Professor of the State of Schleswig-Holstein

Center for Brain, Behaviour and Metabolism (CBBM)
University of Lübeck, Germany

The Medical Need:

The global pandemic of obesity reaches a devastating magnitude and increases the risk for various comorbidities, including insulin resistance, type 2 diabetes and metabolic-associated steatotic liver disease (MASLD). Dysregulation of microRNA expression alters the expression of disease-related genes and plays a crucial role in the pathogenesis of metabolic diseases. Identifying novel molecular epigenetic disease-driving mechanisms and interventions to reverse these may unravel new drug candidates and diagnostic markers.

The topic:

We hypothesize that few microRNAs control hepatic homeostasis in obesity by targeting pathways of energy and lipid metabolism. Dysregulation of microRNAs leads to insulin resistance and MASLD. We studied the microRNA transcriptome in liver of humans with obesity, type 2 diabetes and/or MASLD. We identified two microRNAs, miR-182-5p and miR-149-5p that regulate major pathways of glucose, lipid and amino acids metabolism in liver. Both, microRNAs can be induced dynamically and reversed by weight loss intervention in mice. In summary, our work provides novel insights how two hepatic microRNAs are associated with the progression of MASLD and the development of insulin resistance in humans and mouse models, which could be exploited for the development of new therapies.

The speaker:

Henriette Kirchner is a nutrition scientist by training and has focused on metabolic diseases. She discovered with Prof. Matthias Tschöp that ghrelin prepares the organism for incoming nutrient loads rather than hunger. She tested the first dual incretins and developed mouse models of metabolic surgery, a treatment for obesity and type 2 diabetes. In 2011 Prof. Kirchner moved to Stockholm for her post-doctoral studies in Juleen Zierath's lab at the Karolinska Institute funded by a EMBO longterm fellowship. Still focusing on metabolic diseases, she identified epigenetic DNA methylation patterns in liver, muscle and adipose tissue that contribute to the development of obesity and type 2 diabetes. Funded by the Emmy-Noether Program of the DFG Prof. Kirchner returned to Germany in 2014 and joined the Center of Brain Behavior and Metabolism (CBBM) at the University of Lübeck where she leads the *Epigenetics & Metabolism* group. Beginning of 2024 she was awarded one of four professorships of excellence from the State of Schleswig-Holstein, Germany

Hosts:

Professor **Jan-Wilhelm Kornfeld** and **Rocio Valdebenito Malmros**
Functional Genomics & Metabolism Research Unit
Department for Biochemistry and Molecular Biology

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