Doctoral Program MOBILES and SFB Lipid Hydrolysis

are happy to invite you to a guest lecture by

Sebastian Preissl

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Title: Decoding cell-type-specific gene regulation using single-cell multiomics

Date: **Thursday, May 15, 2025**

Time: **5 p.m.**

Place: **SR 44.31, Humboldtstrasse 48, 3rd floor, Institute of Molecular Biosciences (IMB), University of Graz**

We are looking forward to many interested participants! Please let us know, if online-access (e.g., via Zoom) is needed.

Abstract:
Transcriptional regulation plays a fundamental role in development and disease. Cis-regulatory elements (CRE) in the genome such as enhancers and promoters control cell-type-specific gene expression patterns. CRE and their activation status are characterized by distinct combinations of epigenetic marks. A large fraction of genetic variants associated with common traits and diseases overlap with CREs in the human genome. However, we still lack a comprehensive knowledge of cell-type-specific CRE dynamics and its role in disease pathogenesis. Thus, we have first optimized single cell chromatin accessibility and multiomics workflows to generate CREs atlases for a wide variety of tissues including deep profiling of brain and heart. These comprehensive maps revealed regulatory programs and key transcription factors in hundreds of cell types and enabled functional validation of noncoding variants associated with complex human traits and diseases. Next, we have applied single cell multiomics workflows to unravel the gene regulatory changes in disease including type 2 diabetes. Currently, we are optimizing workflows for joint profiling of histone modifications and transcriptomes from the same nucleus for cardiac cell types, to gain insight into the interplay of different epigenetic layers in cardiac development and heart failure.

https://doc-program-molecular-metabolism.uni-graz.at/de/
https://www.medunigraz.at/en/lipidhydrolyse