

Universitätsmedizin Essen
Universitätsklinikum Essen
Hufelandstraße 55
45147 Essen

Tel. +49 (0)201-723-0
Web www.uk-essen.de

Westdeutsches Tumorzentrum

Seminar

Dr. Dominic Winter

Research Group Leader, Institute for Biochemistry and Molecular Biology (IBMB), Medical Faculty, University of Bonn

Mass Spectrometry Reveals the Dynamic Nature of the Lysosomal Proteome

Monday, 27.05.2024, 2 pm - Universitätsklinikum, Medizinisches Forschungszentrum, R.0.019, ground floor

Abstract. Lysosomes, the main degradative organelles of almost all mammalian cells, have been regarded for decades as unregulated cellular “waste bags”. In the recent years, this view changed drastically, and lysosomes are by now established to play a crucial role in the regulation of a plethora of cellular functions and to be involved in major diseases, including several types of cancer. While the role of individual lysosomal proteins has been addressed in diverse studies, systemic analyses that provide a holistic view on lysosomal proteome dynamics are often lacking, which is mainly due to analytical challenges. We optimized approaches for lysosome enrichment and mass spectrometry-based proteomics, enabling comprehensive characterization of the lysosomal proteome in cultured cells. With this toolbox, we were able to demonstrate lysosomal heterogeneity across cell lines, characterize protein structures, identify novel interaction partners, and to unravel a regulatory mechanism for the cholesterol-dependent regulation of lysosomal motility by phosphorylation. To further facilitate the direct analysis of the lysosomal proteome in cells, tissues, and body fluids, we developed targeted proteomics assays, enabling its relative and absolute quantification with unprecedented sensitivity; providing evidence for tissue-specific lysosomal composition, response to disease pathology, and regulation of degradative pathways.

All colleagues are cordially invited. Please send an email if you like to meet the speaker and/or join for dinner.

Prof. Dr. Kathrin Thedieck: kathrin.thedieck@uk-essen.de, www.metabolic-signaling.eu

Department Metabolism, Senescence and Autophagy, Research Center One Health Ruhr & University Hospital Essen

Biosketch

Dominic Winter is a research group leader at the Institute for Biochemistry and Molecular Biology of the Medical Faculty of the University of Bonn, Germany. He received his PhD and postdoctoral training in mass spectrometry-based proteomics at the German Cancer Research Center (Heidelberg, Germany) and Children's Hospital/Harvard Medical School (Boston, USA), respectively. His group focuses on the analysis of lysosomes, the main degradative compartments of eukaryotic cells, following a highly interdisciplinary line of research with a strong emphasis on the development and application of mass spectrometry-based proteomics approaches. Their research deals with the investigation of fundamental cellular processes, disease pathology in cellular and mouse models, and the analysis of human tissues and body fluids, supported by funding from various sources such as the DFG, DAAD, EU, and NIH. Furthermore, Dominic serves as co-chair of the European Study Group on Lysosomal Diseases (ESGLD), published > 60 scientific articles, and acted as reviewer for > 30 journals and funding agencies.