Wednesday May 21, 2025

Olympic Museum | Quai d'Ouchy 1, 1006 Lausanne

LIMNA
LAUSANNE INTEGRATIVE METABOLISM & NUTRITION ALLIANCE

INTER-ORGANELLE METABOLISM AND SIGNALLING

8h30-8h55 Welcome coffee and badge distribution

9h00 Opening
Chair: Francesca Amati

Session I

Chair: LIMNA committee

9h05 Wanda Kukulski, University of Berne, Switzerland
The architecture of membrane contact sites

9h40 Benoit Kornmann, University of Oxford, UK
A Journey on the Interorganelle Lipid Transportation Network

10h15 Short talk from submitted abstracts
TBA

10h30 Coffee Break

Session II

Chair: Marlen Knobloch

11h00 Stefanie-Kristin Wculek, Institute for Research in Biomedicine (IRB) Barcelona, The Barcelona Institute of Science and Technology (BIST), Barcelona, Spain
How innate immune cells adapt to environment and function: diverse tales of mitochondria

11h35 Lluis Fajas Coll, University of Lausanne, Switzerland
CDK4 remodels cytoskeleton and mitochondria- ER contacts to promote apoptosis and decrease migration in cancer cells

12h10 Short talk from submitted abstracts
TBA

12h25 Lunch & Poster session & Coffee

13h15-14h Presentation of posters with even numbers
14h00-14h45 Presentation of posters with odd numbers
Please remove your posters

Session III

Chair: Carles Cantó

15h00 A. Phillip West, The Jackson Laboratory, USA
Mitochondrial control of innate immune and inflammatory signaling

15h35 Short talk from submitted abstracts
TBA

15h50 Heidi McBride, Montreal Neurological Institute and Hospital, Canada
New insights into the mechanisms and functions of mitochondrial derived vesicles

16h30 Concluding remarks and award distribution
Chair: Francesca Amati

TALK ABSTRACTS

Session I

The architecture of membrane contact sites

Wanda Kukulski, University of Berne, Switzerland

Organelles interact through close apposition of their membranes. Such contact sites serve the exchange of lipid molecules, calcium transport and organelle biogenesis. The mechanisms by which molecules are transferred at membrane contact sites are poorly understood because little is known about the underpinning supramolecular organisation. We aim to reveal and dissect the architecture composed of proteins and apposing bilayers and thereby shed light on how functional microenvironments between the membranes of two organelles are formed. Towards this goal, we employ correlative light and electron microscopy approaches, which we complement with live fluorescence imaging, biochemical and cell biological experiments.

A Journey on the Interorganelle Lipid Transportation Network

Benoit Kornmann, University of Oxford, UK

How lipids are transported from their site of synthesis – the endoplasmic reticulum – to all other cellular membranes is a question that has defied understanding for years. The last two decades have shown fulgurant progress in this fundamental aspect of cell biology. The discovery of lipid transport proteins at membrane contact sites have provided an elegant mechanism to transport hydrophobic molecules across the aqueous cytosol, to reach all organelle membranes, including those that do not participate in intracellular exchange by vesicular ways. Nevertheless, our understanding of lipid transport is hampered by two plagues; the extensive redundancies in lipid transport routes and the dearth of methods to assess intracellular lipid fluxes. I will discuss our progress towards understanding lipid transport to mitochondria in yeast, and how it can be generalised to other membranes as well, I will describe the technologies that we developed to address redundancies and lipid flux measurements, and I will discuss our view of an integrated intracellular lipid trafficking network.

Short talk from submitted abstracts

TBA

Session II

How innate immune cells adapt to environment and function: diverse tales of mitochondria

Stefanie-Kristin Wculek, IRB Barcelona, Spain

My lab investigates tissue-specific adaptations of dendritic cells, neutrophils and macrophages in health and non-infectious conditions with a focus on immunometabolism. I will present how mitochondria and an active electron transport chain regulate the context-dependent functions of macrophages and dendritic cells via entirely distinct molecular mechanisms.

CDK4 remodels cytoskeleton and mitochondria- ER contacts to promote apoptosis and decrease migration in cancer cells

Lluis Fajas Coll, University of Lausanne, Switzerland

Cyclin-dependent kinase 4 (CDK4) is a pivotal regulator of cell cycle progression, traditionally recognized for its role in driving cell proliferation. Emerging evidence suggests additional, non-canonical functions for CDK4, including the regulation of cytoskeletal dynamics and metabolism. This presentation shows data about these novel roles of CDK4 in triple-negative breast cancer (TNBC). Using genetic and pharmacological approaches, we found that CDK4 deletion minimally impacts TNBC proliferation yet significantly enhances resistance to apoptosis by impairing mitochondrial apoptosis pathways. CDK4 inhibition was shown to reduce mitochondria-ER contact sites (MERCs) and disrupt mitochondrial dynamics, causing mitochondrial dysfunction and diminished metabolic flexibility. Moreover, phosphoproteomic analyses revealed that CDK4 regulates Protein Kinase A (PKA) activity at MERCs, essential for mitochondrial fission and calcium signaling. Additionally, we demonstrated that CDK4 modulates TNBC cell migration by attenuating RhoA activation through phosphorylation of Myo9b. Collectively, these findings highlight CDK4's broader regulatory role in TNBC progression, linking metabolic sensitivity, apoptosis resistance, and cellular migration. Targeting the CDK4-driven Myo9b-RhoA and MERC-associated pathways presents promising therapeutic opportunities to overcome TNBC aggressiveness and treatment resistance.

Short talk from submitted abstracts

TBA

Session III

Mitochondrial control of innate immune and inflammatory signaling

Phillip West, The Jackson Laboratory, USA

Dr. Phillip West received his PhD in Immunobiology from Yale University in 2011 and performed postdoctoral training at Yale School of Medicine with Gerald Shadel. His research group at The Jackson Laboratory studies how mitochondria regulate the mammalian immune system in health and disease. In this seminar, Dr. West will discuss his team's ongoing efforts to define how mitochondrial dysfunction and metabolic rewiring impact innate immune signaling nodes. He will share findings from new mouse models and discuss how differential alterations in mitochondrial homeostasis impinge on inflammatory signaling and cellular innate immunity.

New insights into the mechanisms and functions of mitochondrial derived vesicles

Heidi McBride, Montreal Neurological Institute and Hospital, Canada

The generation of mitochondrial derived vesicles (MDVs) is a tightly regulated process to select mitochondrial contents for removal in vesicular profiles that are delivered to either the endomembrane system or peroxisomes. Our lab pioneered our understanding of these pathways within the context of quality control and peroxisomal biogenesis. More recently we have been investigating the contribution of MDV transport during immune signaling pathways, where they play key roles in the transition between innate and adaptive immune pathways, and in the regulation of pyroptotic cell death. I will present our findings on the mechanisms, signaling, and functional impact of MDV transport within immune pathways.

Short talk from submitted abstracts

TBA