Universidad Internacional de Andalucía

WORKSHOPS "CURRENT TRENDS IN BIOMEDICINE"

2023

SEDE ANTONIO MACHADO
BAEZA, SPAIN

MEMBRANE CONTACT SITES IN BIOLOGY AND DISEASE

Baeza, Spain • 7th-9th November 2023

Organized by:

Francesc Palau Barcelona, Spain.

Luca Scorrano Padova, Italy.

Antonio Zorzano Barcelona, Spain.

SCOPE

For decades studies in cell biology focused on the identification of the features of individual organelles as isolated entities. In the last ten years however researchers realized that multi way organelle interactions are crucial sites of cellular homeostasis. Organelles do not exist only as single units, but also as part of entities formed through contacts between them, known as membrane contact sites (MCSs). Thus, cells use these contacts as a cellular platform for hosting biological or regulatory processes, thereby allowing life to evolve complexity through tissue and cellular specialization. Such organelles interactions were observed already in the 1950s by electron microscopy studies. However, without an established biological relevance and known molecular components, those observations were mainly disregarded as artifacts. Founding work by Jean Vance and by Rizzuto and Pozzan in the early nineties established endoplasmic reticulum (ER)–mitochondria contacts (mitochondria-associated membranes, MAMs) as platforms for lipid synthesis and transfer and for the generation of Ca^{2+} microdomains essential to activate mitochondrial Ca^{2+} uptake. The field however remained largely observational until key proteins modulating the extent of the interface, such as mitofusin 2, were discovered.

MCSs are defined operationally as tethered proximity between two membrane-bound organelles, enabling the communication between these two compartments. MCSs are characterized by the presence of tethering forces that arise from protein–protein or protein–lipid interactions that creates micro- and macro-environments involved in (a) bidirectional transport of molecules such as Ca^{2+}, lipids, amino acids, and metals; (b) regulation of membrane trafficking for organelle biogenesis, dynamics, inheritance, positioning, fission; (c) autophagy; and (d) positioning in trans of enzymes to regulate their activity. Overall, MCSs create cellular microenvironments that are under tight spatial and temporal control, allowing the regulation of a wide variety of cellular functions. The membranes at MCSs have unique lipid composition, which define nano- and micro-domains within the organelle, and protein composition that includes tether and spacer protein, functional proteins with specific biochemical function, sorter/recruitment proteins, and regulator proteins Moreover, organelle contacts are not limited to membrane-bound organelles but also include membrane-less organelles such as RNA granules.

MCSs perturbations could be a contributing factor in disease progression by allowing disease-related dysfunction in one organelle or process to spread throughout the inter-organelle communication network. Studies on MCSs are shedding new light on various diseases that have been traditionally studied from a single-organelle perspective, such as cancer, neurodegeneration, diabetes, cardiovascular diseases. Understanding the key functions and pathways of disease associated MCSs will bring additional insight into the mechanisms underlying the pathogenesis of multiple human diseases. The aim of the workshop is to discuss and share experiences among internationally recognized researchers with different expertise on the fundamental cellular and molecular aspects of MCSs among multiple organelles, and their contribution to the pathophysiology, development, and definition of therapeutic targets of human disease.

FORMAT OF THE WORKSHOP

The workshop will bring together a maximum of 15 speakers and 35 participants, to form a group of around 50 people. The scientific programme will start in the morning of Tuesday, November 7th, and will end around noon on Thursday, November 9th. Ample time for informal discussion will be reserved. Participants will be invited to present a poster.

VENUE OF THE WORKSHOP

The workshop will be held in Baeza, at the "Sede Antonio Machado", a XVII century building turned into a Conference Centre of the Universidad Internacional de Andalucía (UNIA). This Seat includes a residence, where participants will be accommodated. Baeza is a World Historic Heritage town, renowned for its Renaissance and Gothic buildings.

SPEAKERS

Estela Area-Gómez Centro de Investigaciones Biológicas Margarita Salas CSIC. Madrid, Spain.

Anton I.P.M. de Kroon Membrane Biochemistry & Biophysics, Department of Chemistry, Utrecht University. Utrecht, The Netherlands.

Marta Giacomello Department of Biology, University of Padova. Padova, Italy.

Peter K. Kim Department of Biochemistry, University of Toronto / Cell Biology Program, The Hospital for Sick Children. Toronto, ON, Canada.

Francesc Palau Department of Genetic Medicine & IPER, Sant Joan de Déu Children's Hospital & Research Institute, and CIBERER, and Division of Pediatrics, University of BarcelonaSchool of Medicine and Health Sciences. Barcelona, Spain.

Jennifer Rieusset Laboratoire CarMeN, INSERM U-1060, INRA U-1397, Université Lyon, Université Claude Bernard Lyon 1. Pierre Bénite, France.

Carlos Santos-Ocaña Centro Andaluz de Biología del Desarrollo, and CIBERER, Instituto de Salud Carlos III, Universidad Pablo de Olavide-CSIC-JA. Sevilla, Spain.

Jean-Emmanuel Sarry Cancer Research Center of Toulouse, Inserm and Université de Toulouse. Toulouse, France.

Luca Scorrano Department of Biology, University of Padova / Veneto Institute of Molecular Medicine. Padova, Italy.

Hiromi Sesaki Department of Cell Biology, Johns Hopkins University School of Medicine. Baltimore, MD, USA.

Thomas Simmen Department of Cell Biology, Faculty of Medicine and Dentistry. Edmonton, AB, Canada.

Sven Thoms Department for Biochemistry and Molecular Medicine, Medical School EWL, Bielefeld University. Bielefeld / Department of Child and Adolescent Health, University Medical Center. Göttingen; Germany.

Jean E. Vance Department of Medicine, University of Alberta. Edmonton, AB, Canada.

Antonio Zorzano Department de Bioquímica i Biomedicina Molecular, Facultat de Biología / Institute for Research in Biomedicine (IRB Barcelona), the Barcelona Institute of Science and Technology / CIBER de Diabetes y Enfermedades Metabólicas Asociadas (CIBERDEM), Instituto de Salud Carlos III. Barcelona, Spain.

DEADLINE: 8th SEPTEMBER 2023

MORE APPLICATIONS WILL BE ACCEPTED IN CHRONOLOGICAL ORDER UNTIL COMPLETING THE WORKSHOP

MORE INFORMATION AND APPLICATION:

http://www.unia.es/biomedicine

workshops.biomed@unia.es

Universidad Internacional de Andalucía
Sede Antonio Machado
Palacio de Jabalquinto
Plaza de Santa Cruz, s/n. 23440 Baeza (Jaén), Spain
Tel: +34 953 74 27 75. Fax: +34 953 74 29 75. E-mail: baeza@unia.es

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