CRBM external seminar
July 10th 2023 14:00 Salle Marcel Dorée

The MOSPD2 protein connects the endoplasmic reticulum to other organelles (endosomes, mitochondria…) … and to lipid droplets

Fabien ALPY

Institute of Genetics and Molecular and Cellular Biology (IGBMC), Illkirch, France

Fabien Alpy is an Inserm researcher working at the Institute of Genetics and Molecular and Cellular Biology (IGBMC) in Illkirch. He received his PhD in 2002 from the University of Strasbourg under the supervision of Marie-Christine Rio. He is a cell biologist interested in the architecture of the cell, and more particularly in contacts between organelles. Inter-organelle contacts, which do not lead to membrane fusion, are scaffolded by protein bridges connecting the two membranes. Using a combination of imaging and biochemical approaches, his group is characterizing tether proteins that attach the membrane of organelles and simultaneously shuttle lipids between them. His main focus is on contacts between the endoplasmic reticulum, endosomes and lipid droplets

Abstract

Membrane contact sites are regions where heterologous membranes from two distinct organelles are in close apposition. These discrete subcellular structures are effective platforms with specialized functions such as the exchange of material, organelle fission and positioning, and communication. In this network, the Endoplasmic Reticulum (ER) plays a central role as it makes multiple contacts with other organelles. Using a proteomic approach, we identified an ER protein, named MOSPD2 (motile sperm domain containing 2), that mediates the attachment of the ER to different organelles such as endosomes, mitochondria etc... and Lipid Droplets. I will discuss the role of MOSPD2 in building contact sites between the ER and other organelles, and why contacts between the ER and lipid droplets stand out in the landscape of contacts established by MOSPD2.

Selected publications

Zouiouich M, Di Mattia T, Martinet A, Eichler J, Wendling C, Tomishige N, Grandgirard E, Fuggetta N, Fromental-Ramain C, Mizzon G, Dumesnil C, Carpentier M, Reina-San-Martin B, Mathelin C, Schwab Y, Thiam AR, Kobayashi T, Drin G, Tomasetto C, Alpy F. **MOSPD2 is an endoplasmic reticulum-lipid droplet tether functioning in LD homeostasis.** J Cell Biol. 2022 Jun 6;221(6):e202110044.

Di Mattia T, Martinet A, Ikhlef S, McEwen AG, Nominé Y, Wendling C, Poussin-Courmontagne P, Voilquin L, Eberling P, Ruffenach F, Cavarelli J, Slee J, Levine TP, Drin G, Tomasetto C, Alpy F. **FFAT motif phosphorylation controls formation and lipid transfer function of inter-organelle contacts.** EMBO J. 2020 Dec 1;39(23):e104369.

Voilquin L, Di Mattia T, Alpy F. **Another hijack! Some enteroviruses co-opt the c10orf76/PI4KB complex for their own good.** EMBO Rep. 2020 Feb 5;21(2):e49876. Wilhelm LP, Wendling C, Védie B, Kobayashi T, Chenard MP, Tomasetto C, Drin G, Alpy F. **STARD3 mediates endoplasmic reticulum-to-endosome cholesterol transport at membrane contact sites.** EMBO J. 2017 May 15;36(10):1412-1433.