P-1.154

The Role of Perilipin 5 in Contact Sites Between Lipid Droplets and The Bilayer: Protein Tether or Lipidic Bridge?

Shima Asfia [1], Mahsa Mohammadian [1], Ralf Seemann [1], Jean-baptiste Fleury [1]

[1] Saarland University, Saarbrücken, Germany

Lipid droplets (LDs) play a crucial role in cellular energy storage and supplying components for the structure of organelle membranes. As the biology of LDs relies on close coordination and communication with other cellular organelles, it is important to understand these interactions. In this study, we investigate the role of PLIN5, a protein that regulates LD dynamics and metabolism, on the formation of the LD contact sites. Additionally, we examine how the LD monolayer phospholipid composition influences its fusion tendency at contact sites. Therefore, model LDs composed of DOPC and DOPE, with or without PLIN5, were brought into contact with large unilamellar vesicles (LUVs) mimicking the ER membrane composition. To detect different contact interactions of the LUVs with the LDs, the LUVs were double fluorescence labeled, rhodamine labeled phospholipid in the bilayer and the water-soluble dye Cy5 in the core. Protein tethers are indicated when LUVs remain attached to LDs, resulting in spots containing both fluorescent dyes on the LD surface. In contrast, LUV fusion with the LD monolayer forms the rhodamine ring, showing that the phospholipid dye has merged with the LD monolayer by formation of the lipidic bridge. These findings show the effective role of lipid composition and protein interactions in the formation of lipidic bridges and protein tethers between LDs and LUVs.