Jennifer Kefauver (CIBER)

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ICFO Auditorium

"Visualizing membrane organization in mechanosensitive cellular structures"

Abstract:

Biological membranes are partitioned into functional zones termed membrane microdomains, which contain specific lipids and proteins. The yeast eisosome, composed of the BAR-domain proteins Pil1 and Lsp1, scaffolds a membrane compartment that senses and responds to mechanical stress by flattening and releasing sequestered factors. We use cryo-EM helical reconstruction and gentle biochemistry to isolate near-native eisosomes bound to plasma membrane lipids to resolve their structures. These structures reveal striking organization of membrane lipids, allowing us to visualize the positioning of individua lipid molecules sequestered beneath the Pil1/Lsp1 coat. Using a computational approac called 3D variability analysis, we can see a dynamic stretching of the Pil1/Lsp1 lattice tha affects the sequestration of these lipids. Collectively, our structures support a mechanism i

which stretching of the Pil1/Lsp1 lattice liberates lipids that would otherwise be anchored b the Pil1/Lsp1 coat, revealing how eisosome BAR-domain proteins create a mechanosensitiv membrane microdomain.

Bio:

Jennifer Kefauver is a Marie Sk?odowska-Curie Postdoctoral Fellow within the ARISTOS program at CIBERER (The Spanish Network for Research on Rare Diseases). Her research focuses on rare genetic disorders, employing a multidisciplinary approach that integrates molecular genetics, cellular biology, and omics technologies to better understand disease mechanisms and contribute to the development of novel therapeutic strategies.

She has a strong international background, having collaborated with leading research institutions across Europe. Her work bridges fundamental science and translational medicine, with a particular interest in how laboratory findings can inform clinical practice and improve patient outcomes.

Jennifer is passionate about open science, scientific communication, and fostering interdisciplinary collaboration. At CIBERER, she plays an active role in advancing research on rare diseases and strengthening their visibility within the European biomedical research landscape.