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Highlighting mitochondria-ER contact sites

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In recent years it has become clear that intracellular organelles are not isolated entities, but rather they interact to coordinate their function. Organelles crosstalk occurs at points of proximity between their surfaces, which are kept together by proteinaceous tethers. These closely juxtaposed membrane subdomains are known as membrane contact sites (MCS). The most studied MCS are those between the endoplasmic reticulum and the mitochondria (MERCs). MERCs play an important role in many physiological and pathological subcellular processes, including lipid and Ca 2+ homeostasis, mitochondrial dynamics and response to stress stimuli: altered MERCs structure and function contribute to severe pathological conditions including Alzheimer's and Parkinson's disease. Hence, understanding which conditions or treatments modulate the structure of MERCs could be of relevance for both basic and translational research. To this end, we developed a FRET-based mitochondria-ER proximity probe (FEMP) for the study of MERCs dynamics in living and fixed cells, and we miniaturized it to make it suitable for high-throughput screenings.

Presenter: Prof. GIACOMELLO, Marta (Department of Biology)

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