CRBM
Centre de Recherche en Biologie Cellulaire de Montpellier

CRBM external seminar 2024
BIOLuM
Thursday, June 20th 11:00 am Salle Marcel Dorée

The fourth element of the cytoskeleton: insights into animal septin organization and function.

Manos MAVRAKIS

Group leader at Institut Fresnel, Marseille

Manos MAVRAKIS was initially trained as a chemist/lipid biochemist at the University of Athens (Greece), and then as a protein biochemist/structural biologist during his PhD (EMBL Grenoble, Université Grenoble I, France). During his postdoctoral research at the National Institutes of Health (Bethesda, MD, USA) he was trained in cell and developmental biology.
Manos MAVRAKIS is the head of the Cell Morphogenesis Lab at the Institut Fresnel. His lab is embedded in the MOSAIC Group, an inter-disciplinary research group bringing together biologists and physicists with expertise in the development of customized, cutting-edge optimal imaging techniques for studying biological processes.

Abstract

Septins comprise a family of cytoskeletal proteins conserved from algae and protists to mammals. Septins were discovered in budding yeast in the early 1970s as essential for cytokinesis, and follow-up studies established that they are also required for animal cell division. However, septins are expressed in practically all human tissues, including in non-dividing neurons. There is compelling evidence that septins play roles in a wide range of biological processes including cell motility, sperm integrity, neuron development, tissue morphogenesis, and host-pathogen interactions. Despite their essential roles in human pathophysiology, the way septins organize and function at the molecular scale in cells and tissues remains elusive. In this talk I will present our recent work on the organization and function of human septins in cells.

Selected publications

Human septins organize as octamer-based filaments and mediate actin-membrane anchoring in cells.
Journal of Cell Biology 222 (3), e202203016 (2023). PMID: 36562751

Septin-microtubule association requires a MAP-like motif unique to Sept9 isoform 1 embedded into septin octamers.
Journal of Cell Science 135(1): jcs.258850 (2022). PMID: 34854883

Insights into animal septins using recombinant human septin octamers with distinct SEPT9 isoforms.
Journal of Cell Science 134 (15): jcs258484 (2021). PMID: 34350965

Membrane binding controls ordered self-assembly of animal septins.
eLife 10:e63349 (2021). PMID: 33847563

Septins promote F-actin ring formation by cross-linking actin filaments into curved bundles.
Nature Cell Biology 16 (4), 322-334 (2014). PMID: 24633326