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Actin-induced shape changes on giant unilamellar vesicles, effects of membrane composition and gel structure.

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Cell shape changes are crucial for many biological processes, including cell division and motility. Such shape changes are fueled by the dynamics of the actin cortex, which can reshape the cell membrane. The mechanisms of these shape changes are difficult to decipher in the complex environment of the living cell. Therefore, biomimetic experiments coupling reconstituted membranes and actin networks allowed for deciphering how actin dynamics can reshape biological membranes. In this talk, we will present how the deformations induced by Arp2/3 actin networks on GUVs (Simon, 2019) are modulated when the mechanical properties of their lipid membrane (its bending rigidity and the presence of lipid domains) are tuned and when the gel structure is modified in the presence of crosslinking proteins. These studies highlight how membranes and actin networks synergistically interact for the emergence of a variety of shape changes.

Affiliation de l'auteur principal

LAMBE, UMR 8587, Université d'Evry, CNRS CEA, Université Paris Saclay, 91025, Evry, France

Auteur principal: M. LOPES DOS SANTOS, Rogério

Co-auteur: CAMPILLO, Clément (Université d'Evry Paris Saclay)

Orateur: CAMPILLO, Clément (Université d'Evry Paris Saclay)

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