

Extracellular Vesicles: structure and interaction with model plasma membranes

Content

Extracellular vesicles (EVs) are a potent intercellular communication system, delivering biomolecules between cells and throughout the body, strongly influencing the fate of recipient cells. Due to their specific biological functions they have been proposed as biomarkers for various diseases and as optimal candidates for therapeutic applications. Despite of their extreme biological relevance, their mechanisms of interaction with the membrane of recipient cells are still hotly debated. We performed a multiscale investigation based on Atomic Force Microscopy, Small-Angle X-Ray and Neutron Scattering, Neutron Reflectometry and Calorimetry to reveal the structural features of EVs of different origin in order to investigate their interaction with model membrane systems of variably complex composition, to spot the role of different membrane phases on the vesicles internalization routes. Our analysis reveals dependence of interaction mechanisms on EVs nature. Our approach has clear implications on the modulation of EVs internalization routes by targeting specific domains at the plasma cell membrane and, as a consequence, on EVs-based therapies.

[F. Perissinotto & V. Rondelli et al., Nanoscale, 2021]

[M. Grava et al., Biomolecular Concepts, 2022]

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