

PHYSICAL EFFECTS CATALYZING CELL ADHESION: FROM MIMETIC SYSTEMS TO TISSUES

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A number of cell functions rely on the formation of macromolecular platforms in the plasma membrane. While the functional role of these assemblies has been intensively investigated over the years, little is known about the mechanisms underlying their formation. In this presentation, several possible physical pathways will be explored by studying adhesion of mimetic vesicles, cells and epithelial tissue. Focusing on the formation of adhesion domains, the role of membrane elasticity, composition fluctuations, and the interactions with the cytoskeleton will be discussed. Furthermore, cooperative attachments of proteins with different length, flexibility and affinities will be analyzed, allowing the development of a hypothesis regarding the simultaneous repellent and catalytic roles of the glycocalyx in adhesion. In the closing, the relation between cell adhesion and mechanoresponse in cellular aggregates will be examined.