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Structural studies of lipid-protein interactions on cushioned bilayers S.K. GHOSH, UC-San Diego, La Jolla, CA, M.K. MUKHOPADHYAY, SINP, Kolkata, India, Y. MA, I. LOPEZ, UC-San Diego, La Jolla, CA, S. BERA, L.B. LURIO, NIU, DeKalb, IL, A. CHAKRABARTI, SINP, Kolkata, India, J.E. KIM, UC-San Diego, La Jolla, CA, M.K. SANYAL, SINP, Kolkata, India, S.K. SINHA, UC-San Diego, La Jolla, CA — Biological membranes are heterogeneous and dynamical organizations of lipids and proteins, which perform functions fundamental to cell survival. Lipid-protein interactions control these functions by influencing folding and stability of integral or peripheral membrane proteins. Further, the incorporation or adsorption of these proteins into the membrane can in turn influence the lipid bilayer properties. In spite of some progress in understanding this process, a detailed structural analysis is lacking. Towards a better understanding of this interaction, we have performed an advanced interface sensitive scattering experiment using synchrotron x-rays. To accurately mimic the biological membranes with their natural thermal fluctuations and in-plane mobility of lipid molecules, polymer cushioned lipid bilayers have been used. This study shows that the adsorption of peripheral membrane protein*spectrin*depends on the lipid headgroups, exhibiting different types of binding to phosphatidylcholine (PC) and phosphatidylethanolamie (PE). Further, the interaction of *outer membrane protein A (OMP-A)*, an integral membrane protein is sensitive to the thermodynamic phase of the lipids. A detailed physical modeling of the lipid-protein interactions is under way.

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