

Abstract Submitted  
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**Spatial organization of proteins due to membrane-induced interactions** KAYLA SAPP, LUTZ MAIBAUM, Univ of Washington — We investigate the interaction between lipid bilayers and other cellular components using mathematical modeling and numerical simulations. A biologically relevant example is a collection of actin filaments that suppress membrane shape fluctuations locally. We present a model that takes into account the membrane's elastic behavior, a generic non-specific interaction between proteins, and the coupling between these two systems that we assume to be dominated by geometric effects. This model combines a continuum description of the lipid bilayer with a particle representation of membrane-bound proteins, and employs Brownian Dynamics to study both dynamical and fluctuation effects. We find that the presence of the proteins significantly changes the fluctuations of the membrane, while the bilayer induces an effective interaction between proteins that may lead to the formation of protein clusters even in the absence of protein-protein attractive forces.

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