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## **Association at the membrane: Do “lipophobic effects” mediate membrane protein assembly?**

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Membrane protein association plays an important role in several cellular processes, such as cellular signalling and adhesion. Although considered to be protein-mediated, membrane components are being recognized as critical in mediating association. Here, we will discuss the effect of the lipid bilayer, in particular lipid chain order, on membrane protein organization. The dimerisation profile of simple transmembrane helices has been calculated using biased and unbiased coarse-grain molecular dynamics simulations. The contribution of the membrane and protein have been decoupled, and the contribution of the “lipophobic effect” has been investigated. To analyze the origin of this effect, we have estimated the repulsive component of the solvation free energy of the protein residues. Our work highlights the role of the bilayer in modulating the energetics as well as the structural characteristics of membrane protein dimers.