Séminaire

CONFÉRENCIER INVITÉ

Vendredi 28 novembre 2014 à 11h

Salle des séminaires

Institut de biologie structurale - 71 avenue des Martyrs CS 10090 38044 Grenoble Cedex 9 - T.+33 (0)4 57 42 85 00

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Hydrophobic pollutants reshape membrane domains

Cell membranes are heterogeneous assemblies of lipids and proteins with a complex lateral organization. Such complex organization is essential for biological processes such as signal transduction, membrane fusion, and protein trafficking, as expressed by the raft concept. Hydrophobic molecules are commonly found in the environment as drugs, additives, and as pollutants. They have a high affinity for membranes and they readily dissolve inside the membrane core. However, little is known about the effect of such molecules on membrane lateral organization. I will present predictions on the influence of hydrophobic solutes on phase coexistence in model membranes, based on molecular simulations at the coarse-grained level. We identify two groups of hydrophobic molecules with distinct behavior: aliphatic and aromatic compounds. Aliphatic hydrocarbons distribute at the interface between liquid-ordered and liquid-disordered domains, and promote lipid mixing; on the contrary, aromatic compounds partition into the liquid-disordered phase and stabilize the phase separation by exclusion of cholesterol from the disordered domain. Our results indicate that relatively small concentrations of hydrophobic pollutants can have a broad impact on membrane lateral organization, and suggest possible mechanisms for the biological activity of common hydrophobic compounds.

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