43c Spicying-up Simulations of Phospholipid Bilayers

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Anyone that has eaten spicy food has experienced the adverse effects of capsaicin, that is the warming thermosensation caused by excitation of sensory neurons. Capsaicin belongs to a class of biomolecules that are known to cause noxious effects when they interact with peripheral nociceptor neurons. Capsaicin effectively mimics a thermal stimulus by lowering the thermal threshold of neuron excitation. Capsaicin is known to be lipophilic, and is therefore assumed to interact with membrane receptors within the hydrophobic region of the neuron membrane. The activation of the membrane receptors is a complex mechanism involving the cell membrane and the receptors. Two conflicting theories exist that explain the activation process, one suggesting that capsaicin binding sites are intercellular, and the other that capsaicin permeates the cell membrane. To shed some light into the specific molecular interactions of capsaicin with sensory neurons, we describe here our initial molecular simulations studies for capsaicin in different chemical environments and the implications in the activation of the membrane receptors.