University of Wisconsin-Milwaukee

Dept. of Physics
COLLOQUIUM

Interactions of Neuromodulators with Model Lipid Membranes

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Neurotransmitters and neuromodulators typically function by binding to specialized receptors in neuronal membranes. In this work, we study two different neurotransmitters that also function as neuromodulators, namely dopamine (DA) and adenosine triphosphate (ATP). Dopamine is best known as the feel-pleasure hormone while ATP is best known for being the source of energy in the cell. Using a combination of scattering and spectroscopic methods, we show that both DA and ATP have an affinity to lipid membranes lacking specialized receptors. In particular, by x-ray scattering and NMR spectroscopy we show that both DA and ATP interact with lipid headgroups at the membrane-water interface. As a consequence, the membrane surface potential is modified as measured by Dynamic Light Scattering. Our results can contribute to understanding the role of lipid membranes in neuromodulation.

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