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The impact of specific drug molecules on lipid bilayers

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We have investigated the impact of the drugs benzocaine and propranolol on a lipid bilayer formed by L-alpha-phosphatidylcholine. The methods used were neutron reflectivity, grazing incidence small angle neutron scattering, small and ultra small angle neutron scattering. On the one hand, we observed a membrane stiffening and a stalk formation for benzocaine. On the other hand, disordered bilayers (lamellar powders) and highly curved structures were found in the presence of propranolol. In this way we hope to explain diseases when high doses of drugs are applied to humans, and what mechanisms could underlie in general when drugs are applied at normal doses.

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