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Effect of anesthetics on bending elasticity of lipid membranes ZHENG YI, Indiana University, NAGAO MICHIHIRO, NIST/Indiana University, DOBRIN BOSSEV, Indiana University — Change in physical and chemical properties of bio-membranes is of great interest for understanding the mechanism of anesthetic action on membranes. Hypothetically the anesthetic alters the lipid membrane structure (promoting pore formation across membranes or at least switching transmembrane channels) and therefore the biophysical properties of the membrane. We have used neutron spin echo (NSE) spectroscopy to study the effect of anesthetic molecule, lidocaine, on the bending elasticity (BE) of lipid membranes. BE of lipid bilayers made of (1,2-Dimyristoyl-*sn*-Glycero-3-Phosphocholine) DMPC and 1,2-Dipalmitoyl-*sn*-Glycero-3-Phosphocholine (DPPC) have been measured at different temperatures and different in the fluid (L_α) phase. Using Zilman-Granek theory the BE were obtained from the decay of the NSE intermediate scattering function. We have found that in the presence of lidocaine the BE of DMPC and DPPC bilayers increases. The results were correlated with those from differential scanning calorimetry. Increase in the lidocaine concentration leads to decrease in the liquid/crystalline transition temperature.

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