

Aspirin Inhibits the Formation of Rafts in Fluid Lipid Membranes

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Low doses of Aspirin have become a common treatment for patients with high levels of cholesterol. Cholesterol is a stiff molecule which incorporates into the lipid membrane and orders lipid tails, and plays a leading role in the formation of laterally ordered structures (so called lipid rafts), and also produces crystalline cholesterol plaques at high concentrations [1,2]. From X-ray and neutron diffraction imaging, I present first direct experiment evidence for a non-specific interaction between aspirin and cholesterol in lipid membranes. Using in in-vitro experiments in synthetic lipid membranes, we find that aspirin incorporates into the lipid membrane, increases fluidity, and eliminates membrane domains caused by cholesterol [3-5]. The results present a molecular model and a mode of action for aspirin therapies in patients with high levels of cholesterol. We also find evidence for this effect in oriented red blood cell ghost membranes.

[1] D. Lingwood and K. Simmons. *Science* **327** (2010)

[2] M.A. Barrett, et al. *Soft Matter*. **9** (2013)

[3] M.A. Barrett, et al. *PLOS ONE*. **7**, (2012)

[4] R.J. Alsop, et al. *Soft Matter*. **10** (2014)

[5] R.J. Alsop, et al. *BBA-Biomembranes*. **1848** (2015)