

Abstract Submitted  
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**Aspirin Increases the Solubility of Cholesterol in Lipid Membranes** RICHARD ALSOP, MATTHEW BARRETT, SONBO ZHENG, HANNAH DIES, McMaster University, MAIKEL RHEINSTADTER, McMaster University and the Canadian Neutron Beam Centre — Aspirin (ASA) is often prescribed for patients with high levels of cholesterol for the secondary prevention of myocardial events, a regimen known as the Low-Dose Aspirin Therapy. We have recently shown that Aspirin partitions in lipid bilayers [1]. However, a direct interplay between ASA and cholesterol has not been investigated. Cholesterol is known to insert itself into the membrane in a dispersed state at moderate concentrations (under  $\sim 37.5\%$ ) [2] and decrease fluidity of membranes. We prepared model lipid membranes containing varying amounts of both ASA and cholesterol molecules. The structure of the bilayers as a function of ASA and cholesterol concentration was determined using high-resolution X-ray diffraction. At cholesterol levels of more than 40mol%, immiscible cholesterol plaques formed. Adding ASA to the membranes was found to dissolve the cholesterol plaques, leading to a fluid lipid bilayer structure [3]. We present first direct evidence for an interaction between ASA and cholesterol on the level of the cell membrane. [1] MA Barrett, S Zheng, G Roshankar, **RJ Alsop** *et al.* PLoS ONE 7, e34357, 2012 [2] MA Barrett, S Zheng, LA Toppozini, **RJ Alsop** *et al.* Soft Matter 9, 9342-9351, 2013 [3] **RJ Alsop** *et al.*, submitted

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