

Abstract Submitted  
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**Effects of cholesterol and unsaturated DOPC lipid on chain packing of saturated gel-phase DPPC bilayers**<sup>1</sup> JOHN NAGLE, THALIA MILLS, Carnegie Mellon University, JUYANG HUANG, Texas Tech University, GERALD FEIGENSON, Cornell University — Wide angle x-ray scattering (WAXS) from oriented lipid multilayers was used to study the effect of adding cholesterol (Chol) or DOPC to gel-phase DPPC bilayers. Small quantities ( $X < 0.10$  mole fraction) of both molecules disrupt the tight packing of tilted chains of pure gel-phase DPPC, forming a more disordered, untilted phase. The addition of larger quantities of DOPC causes the sample to phase-separate into a gel phase, characterized by a narrow WAXS peak, and liquid disordered phase, characterized by wide, diffuse WAXS scattering. In contrast, two WAXS peaks indicative of two coexisting phases were not observed in Chol/DPPC mixtures ( $X_{Chol} = 0.07$  to  $0.40$ ). Instead, Chol caused a gradual increase in the width of the WAXS peak, consistent with a gradual change from a more gel-like to a more liquid-like state rather than passing through a region of two phase coexistence. Our WAXS data include a huge amount of information. A new method of analysis suggests that WAXS data may provide definitive results relating to the disagreements between previously published phase diagrams for Chol/DPPC.

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