

Abstract Submitted  
for the MAR06 Meeting of  
The American Physical Society

**Structure of Cholesterol Helical Ribbons, Self-Assembling Biological Springs.**<sup>1</sup> B. KHAYKOVICH, C. HOSSAIN, A. LOMAKIN, J. MCMANUS, D. E. MONCTON, G. B. BENEDEK, Department of Physics and Materials Processing Center, Massachusetts Institute of Technology, Cambridge, MA — Helical ribbons with characteristic pitch angles form spontaneously in a variety of quaternary surfactant-lipid-sterol-water solutions. These helical ribbons form in a variety of axial lengths, widths and radii. Surprisingly, however, they all have pitch angles of either 11 or 54°. Our X-ray diffraction studies of individual ribbons confirm that the remarkable stability of each of the two pitch angles is related to a crystalline nature of the ribbons. The small size (of 100 x 10 x 0.1  $\mu\text{m}^3$ ) and the significant curvature of the ribbons produce weak and broad Bragg peaks. Therefore, novel methods are used to analyze these data. The structure of these ribbons is similar to that of cholesterol monohydrate. Interestingly, there is an evidence for a superlattice structure, resembling that found in thick films of cholesterol grown at the air-water interface.

<sup>1</sup>This work is supported by the Department of Energy, Division of Materials Sciences and Engineering, Office of Basic Energy Sciences under Award No. DE-FG02-04ER46149.

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Date submitted: 30 Nov 2005

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