Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Characterizing detergent mediated reconstitution of viral protein M2 in large unilamellar vesicles[1] MARIEL FREYRE, CARL GROSSMAN, CATHERINE CROUCH, KATHLEEN HOWARD, Swarthmore College — Influenza M2 is a model membrane protein whose function is to induce curvature and vesicle formation in the process of viral infection. To study embedded M2 in synthetic phospholipid vesicles (large unilamellar vesicles or LUVs), a concentration of detergent and buffer is optimized to balance protein solubility, proteolipid concentration, and LUV stability. Adding detergent also causes the LUVs to partially disassemble and form micelles, which warrants detergent removal to restore LUV integrity. We explore methods of measuring the coexistence of detergent micelles and LUVs to track the different phases of the system as detergent is removed. A combination of Fluorescence Correlation Spectroscopy, Dynamic Light Scattering, and chemical analysis are used to measure the properties of this system. With detergent/LUV number densities as high as 5 we find coexistence of micelles and LUVs at 50% to 60%. As the detergent is removed, the micelle concentration drops to lower than 30% while detergent levels drop to nearly zero. These results may indicate a polydispersed LUV size distribution after detergent mediated reconstitution.

[1]Supported by HHMI and Swarthmore College

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Date submitted: 14 Nov 2014 Electronic form version 1.4