Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Interaction Forces and Mechanics of Cellular Membranes using Novel Atomic Force Microscopy Probes BENJAMIN ALMQUIST, NICHOLAS MELOSH, Dept. of Materials Science, Stanford University — In order to probe the nature of nanostructure-membrane interfaces, we have developed an AFM probe platform that can quantitatively measure the interaction forces between specifically functionalized layers and the cell membrane. This platform consists of a cantilever with a post-style tip that ends in a hetero-metallic layer. This metallic layer can be selectively functionalized with various molecules of interest. Once functionalized, the layer is inserted into the hydrophobic region of the cell membrane. By varying the molecular species and examining the associated penetration and extraction forces, we will be able to correlate the molecule-membrane interaction forces to the molecular structure. This, in turn, will allow us to determine the role of molecular size, hydrophobicity, and disorder. In addition, the effects of functional layer thickness and post geometry will be examined.

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Date submitted: 20 Nov 2006 Electronic form version 1.4