Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

A Microchannel Device for the Alignment of Self-Assembled Filamentous Protein Systems LINDA S. HIRST, E. PARKER, Z. ABU SAMAH, Y. LI, N.C. MACDONALD, C. R. SAFINYA, Materials and Physics Depts, Biomolecular Science and Engineering Program, UCSB, R. PYNN, Los Alamos National Laboratory, NM — We report a technique for the alignment of filamentous self-assembled protein systems, such as F-actin bundles and microtubules, in a surface modified titanium or silicon micro-fluidic device. Such Protein systems are delicate and typically difficult to align as they must be formed under carefully controlled solution conditions. Narrow channels allow the protein system to assemble in-situ in a confined geometry, producing an aligned sample. The device surfaces are modified via self-assembled monolayers to resist protein adsorption. Biomolecular self-assembly can be investigated in a controlled fashion under different molecular concentration gradients and conditions along the channel. This technique produces highly aligned samples for structural studies carried out via x-ray scattering and is also useful for mechanical studies of different filamentous assemblies. Use of a micro-fabricated device for protein studies is perfect for microscopy and also will allow for the incorporation of MEMS features into the device.

Roger Pynn
Los Alamos National Laboratory, NM

Date submitted: 30 Nov 2004 Electronic form version 1.4