Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Templated biomineralization on self assembled protein fibers S. PALMACCIO, Sachem High School NY, K. SUBBURAMAN, N. PERNODET, Stony Brook Univ Stony Brook NY, S.-Y. KWAK, E. DIMASI, BNL, Upton, NY, S. GE, Stony Brook Univ Stony Brook NY, N.L. YANG, CUNY, Staten Island, NY, M. RAFAILOVICH, Stony Brook Univ Stony Brook NY — We have previously shown that fibrillogenesis of extracellular matrix (ECM) proteins like Fibronectin and Elastin can be induced when adsorbed on charged polymer surfaces. These self assembled fiber networks reach sizes of dimensions similar to natural ECM. Here we present a study of biomineralization on these protein fibers, achieved using $CaCO_3$ through Kitano & Flow cell methods. The mechanical properties were measured usingShear Modulation Force Microscopy (SMFM) as part of early stage mineralization studies. Results indicated increase in modulus with exposure time on fibers, with no increase off the fibers. Control studies with other Ca salts showed no change in fiber modulus, differentiating mineralization from salt adsorption. Late Stage Mineralization studied using ToF SIMS showed preferential Ca adsorption on the fibers. Optical Microscopy also showed preferential crystal formation on fibers. TEM was used to identity the crystal structure and orientation. Effect of proteins on crystal orientation and mineralization of natural ECM from osteoblasts are under study. Supported by USDOE Contract No DE-AC02-98CH10886, NSF-MRSEC & BNL-SBU Seed Grant.

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Date submitted: 03 Dec 2005 Electronic form version 1.4