Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Coil-globule Transitions in Model Bioinspired Polymers HANNAH MURNEN, ADRIANNE ROSALES, University of California Berkeley, RONALD ZUCKERMANN, The Molecular Foundry, Lawrence Berkeley National Laboratory, RACHEL SEGALMAN, University of California Berkeley — The monomer sequence of a polypeptide chain has a profound effect on the coil to globule transition of the protein. Both theoretical and experimental efforts to probe the effect of monomer sequence have included the use of chemical modifications post chain collapse in a homopolymer/solvent system followed by further analysis of the chain to understand the resulting sequence. Polypeptoids, or N-substituted glycines, are a far more precise sequence specific model system that can be used to test the effect of monomer sequence on the coil to globule transition. In this study, we synthesized 50mer sequences of a blocky protein-like copolymer using 40 monomers of N-(methyl)glycine and 10 of N-(carboxyethyl)glycine). As predicted in theoretical simulations, the protein like copolymer forms a smaller globule than the periodic control sequence. In addition, decreasing the relative hydrophobicity of the two comonomers results in a looser globule size at room temperature. Future work will focus on using polypeptoids to further probe this transition and to gain insight into the fundamental forces at play in polypeptide folding.

Hannah Murnen
University of California Berkeley

Date submitted: 16 Nov 2010 Electronic form version 1.4