

Abstract Submitted  
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**Length Dependent Force Characteristics of Coiled-Coils** SARA SADEGHI, ELDON EMBERLY, Simon Fraser University — Coiled-coil domains play an important role in mediating protein-protein interactions in biology. Each helix in a coiled-coil has a hydrophobic strip that winds around it, and it is the packing of these hydrophobic residues that leads to the superhelical structure. A recent continuum model [1] showed that the correspondence between the chirality of the pack to that of the underlying hydrophobic strip comes about because of the internal deformation energy associated with each helix in forming the superhelix. Here we use a coarse-grained atomistic model for coiled coils to examine the dependency of super-helical formation on the deformation energy. We then explore the force-extension properties of these model coiled-coils as a function helix length, and find surprising length dependence, with certain periodic lengths being stable to much higher pulling forces.

[1] S. Neukirch, A. Goriely and A.C. Hausrath, PRL, 100, 038105 (2008).

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