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Effect of Secondary Structure on the Persistence Length of a Poly N-substituted Glycine HANNAH K. MURNEN, ADRIANNE M. ROSALES, University of California Berkeley, STEVEN R. KLINE, National Institute of Standards and Technology, RONALD N. ZUCKERMANN, Lawrence Berkeley National Laboratory, RACHEL A. SEGALMAN, University of California Berkeley — A polymer containing helical secondary structure is shown to be nearly as flexible as a chemically analogous polymer containing no structure. Polypeptoids or poly N-substituted glycines are a class of sequence specific polymers in which chain shape can be controlled via monomer choice involving both sterics and chirality. In this study, a polypeptoid containing aromatic chiral sidechains was synthesized. Classical measurements such as circular dichroism and NMR have shown previously that the bulky chiral side chains cause the polypeptoid to adopt a helical conformation. However, small angle neutron scattering demonstrated that in acetonitrile, the persistence length of the helical polypeptoid was approximately 1 nm, only about 15% of the fully extended helical length. This small persistence length indicates that the chain likely adopts several conformations in solution and is not rigidly locked into its helical shape throughout the entire length of the polymer

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