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**Self-assembly of crystalline bioinspired block copolymers** ADRIANNE M. ROSALES, HANNAH K. MURNEN, Department of Chemical Engineering, University of California, Berkeley, RONALD N. ZUCKERMANN, Materials Science Division, Lawrence Berkeley National Laboratory, RACHEL A. SEGALMAN, Department of Chemical Engineering, University of California, Berkeley — Polypeptoids are sequence-specific bioinspired polymers based on N-substituted glycines which hold promise for investigating the effects of monomer sequence on polymer physics. Sequence control allows for a degree of tunability in the physical and thermal properties not available in classical polymer systems. Melting transitions of crystalline peptoid homopolymers can be tuned via the introduction of defects (as a side chain substitution), with the resulting melting point depending on defect type, amount, and distribution. The sequence specificity of the polypeptoids enables complete control over the position of the defect, and it is demonstrated that both the melting transitions and heats of melting depend on the location of the defects for several peptoid homopolymers with exactly two defects each. In addition to thermal properties, chain conformation can be controlled by introducing monomers with chiral side chains in a three fold periodic fashion. Bioinspired rod-coil block copolymers were synthesized using this sequence motif as a handle on the rigidity of the rod-like block, which make these systems an ideal platform for studying the effects of conformational asymmetry on self-assembly.

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