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Impact of Helical Polypeptoid Polymer Chain Shape on Block Copolymer Self-Assembly[1] EMILY DAVIDSON, University of California Santa Barbara, ADRIANNE ROSALES, University of Colorado Boulder, ANASTASIA PATTERSON, University of California Santa Barbara, RONALD ZUCKERMANN, Lawrence Berkeley National Laboratory, RACHEL SEGALMAN, University of California Santa Barbara — Polypeptoid chain shape is tunable across a range of degrees of helicity via the introduction and sequence of bulky, chiral side chains; as the polypeptoid chain's degree of helicity is increased, the chain stiffness increases. This work shows that these effects are translated to bulk self-assembly where increases in chain stiffness for chemically identical materials on the monomer level drives increases in the diblock domain spacing. By selectively placing the helical part of the peptoid adjacent to or far from the block junction, we show that the stabilized peptoid helix distant from the block junction results in a significantly greater degree of overall domain stretching. Furthermore, a diblock with a helical polypeptoid block displays a higher order-disorder transition relative to the diblock with the chemically analogous but disordered block.

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