Scientific Achievement
A new concept called “pathway-engineering” is described, where a sequence of processing steps is selected based on the ways a material can naturally order, thereby guiding the assembly towards a desired structure.

Significance and Impact
By taking advantage of a material’s natural ordering, scientists can target previously impossible structures, i.e. tailored functionality.

Research Details
• Molecules are designed to spontaneously order, but they do not always form the ‘optimal’ order.
• To guide the self-assembly, this study demonstrated how a “pathway” can be chosen to form the desired order.
• Through a series of processing steps, a block copolymer was guided into a desired shape.
• CFN Materials Synthesis facilities were used to fabricate the nanostructures. Materials were measured at the CMS beamline, which is operated by partnership between CFN and NSLS-II.


Work was performed at Brookhaven National Laboratory