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Growth of Nanostructured Bilayers and Vesicles by Self-assembly of ABC Mikto-arm Star Terpolymers ZHIBO LI, MARC HILLMYER[1], TIMOTHY LODGE[2], University of Minnesota, Chemistry Department, MULTICOMPARTMENT MICELLE TEAM — A new class of nanostructured vesicles and bilayers were observed from aqueous self-assembly of ABC mikto-arm star terpolymers with three mutually immiscible blocks. The micellar structures depend on the relative length of each block and can be tuned to form three classical types of micelles, i.e., sphere, cylinder, and vesicles, however with nanostructured multiple core compartments. The nanostructured vesicles grow by a three-stage process: (i) segmented wormlike micelles first self-assemble upon dissolution of terpolymers in water; (ii) then nanostructured bilayer sheets with apparently hexagonal ordered internal structures grow by consumption of already existing segmented worms, and subsequently (iii) large bilayer sheets curve and close off to form vesicles. The micellar structures at various stages were imaged by cryogenic transmission microscopy.

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