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Temperature and pH Response of PB-P(Lys) Block Copolymer Assemblies DANIEL A. SAVIN, KAY E. GEBHARDT, GOPAL R. VENKATACHALAM, University of Vermont — Amphiphilic block copolymers consisting of poly(butadiene) and poly(L-lysine) (PB-P(Lys)) were synthesized and their solution properties studied using dynamic light scattering and transmission electron microscopy. We exploit secondary structure changes that occur in the P(Lys) chain to observe changes in solution morphology as a function of solution conditions. At high pH, the P(Lys) chain assumes either an α-helical or a β-sheet conformation depending on temperature, while at lower pH the side chains become protonated, resulting in an expanded coil configuration. In these studies, four molecular weights and compositions of PB-P (Lys) were studied. For short P(Lys) blocks, these block polymers assemble into vesicles that swell with decreasing pH. For longer P(Lys) blocks, cylindrical micelles are formed that undergo a morphological shift to spherical micelles with decreasing pH.

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