

Abstract Submitted
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Measuring the change in hydration of a polypeptide-based block polymer vesicle as a function of pH¹ IAN SMITH, Department of Chemistry, University of Florida, Gainesville FL 32611-7200, ALBAN CHARLIER, Parisian Institute of Molecular Chemistry, Universit Pierre et Marie Curie Paris 6, 4 Place Jussieu, 75252 Paris cedex 5, ALEXANDER SHISHLOV, DANIEL SAVIN, Department of Chemistry, University of Florida, Gainesville FL 32611-7200 — Amphiphilic AB₂ star polymers undergo directed self-assembly into vesicles in aqueous solution. The overall structure of the assembly is responsive to a change in solution pH by incorporating an ionizable polypeptide as the A-block and two lipid-like tails for the B-blocks. Herein, we present some recent results in the solution characterization of polyglutamate-octadecanethiol₂ (PE-DDT₂) star polymers using static and dynamic light scattering, as well as transmission electron microscopy. An increase in pH will induce a transition in secondary structure of the PE block from an α -helix to an extended coil, thereby perturbing the morphological structure and resulting in an expansion of the vesicle. The magnitude of this response is much larger than what is expected based on the conformational transition of the peptide. The mechanism of this process can be probed by measuring the change in hydration at the surface of the hydrophobic bilayer. Towards this end, we utilize 2,4,6-trichloro-1,3,5-triazine (TCT) as a modular linker to install spin labels into the assembly as a mechanism to directly interrogate local hydrophobicity using electron paramagnetic resonance (EPR).

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