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Amphiphilic Peptide-Polymer Conjugates with Side-Conjugation NIKHIL DUBE, University of California, Berkeley, ANDREW PRESLEY, JESSICA SHU, TING XU, Department of Materials Science and Engineering, University of California, Berkeley — As an emerging family of soft matter, peptide-polymer conjugates are highly promising for the design of functional materials. The fundamental understanding of the effect of the interaction between peptides and polymers on the structural and functional properties of these materials is crucial for their development into technologically relevant materials. We have designed a family of amphiphilic materials based on polymer conjugates of coiled-coil helix bundle and characterized their self assembly in surfactant containing aqueous solution. Conjugation of two hydrophobic polymers, PS and PMMA to the exterior of bundle led to unfolding of helix and the extent of structural retention was dependent on polymer hydrophobicity. However, the deleterious effects of hydrophobic polymers on the peptide structures can be eliminated on adding organic solvent to solubilize the hydrophobic polymers. To understand the importance of polymer hydrophobicity, conjugates of the peptide with PNIPAM, which exhibits temperature controlled hydrophobicity, have been studied and the results underscore the significance of the hydrophobic interaction between the polymer and the peptide on the structural retention of peptide. These fundamental studies signify the importance of maintaining the balance between different competitive intermolecular interactions on the peptide structure in these hybrid materials.

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