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Structure and Self-Assembly of Thermoreversible Triblock Copolymer Micelles and Gels VIVEK PRABHU, NIST, 100 Bureau Drive, Gaithersburg, Maryland, SHRINIVAS VENKATARAMAN, YI YAN YANG, Institute of Bioengineering and Nanotechnology, 31 Biopolis Way, The Nanos Singapore, JIM HEDRICK, IBM Almaden Research Center, San Jose, California — The polymer physics of hierarchical, self-assembled block copolymer solutions remains an active area of research for both advanced materials and biomaterial applications. Of current interest is the development of aliphatic polycarbonates for biomedical applications [1]. For instance, cholesterol-functionalized aliphatic polycarbonate diblock copolymers of polyethylene glycol formed disk and stacked disk-like self-assembled morphologies that are nano-carriers for hydrophobic molecules [2]. The hydrophobic nature of the cholesterol block provides a versatile platform to form complex morphologies in solution. The presentation will describe the phase diagram, structure and dynamics of the micelles and gels formed by well-defined triblock copolymers prepared with cholesterol and fluorene hydrophobic end-groups. The hierarchical structure of these thermoreversible gels as a function of hydrophobic end-group molecular weight was studied by small-angle neutron scattering and static and dynamic light scattering covering nm-to-micron length scales and microsecond-to-second time scales. [1] F. Suriano, O. Coulembier, J.L. Hedrick, P. Dubois, Polym. Chem. 2, 528 (2011). [2] S. Venkataraman, A.L. Lee, H.T. Maune, J.L. Hedrick, V.M. Prabhu, and Y.Y. Yang, Macromolecules 46, 4839 (2013).

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