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Robustness of Pluronic Block Copolymer Nanostructure to Structural Changes in Dispersed Nanoparticles THERESA A. LAFOLLETTE, LYNN M. WALKER, Carnegie Mellon University — Thermoreversible block copolymers [(PEO)n-(PPO)m-(PEO)n; trade name Pluronic] self assemble into ordered micelle gels. Nanoparticles (3-10nm) are templated in the interstitial spaces of Pluronic micelle gels to form nanocomposite systems. Globular hydrophilic proteins have served as model monodisperse nanoparticles in this work. We have shown that these proteins are templated in the interstitial sites of the cubic packed micelle gels at room temperature. By raising the temperature, the proteins are denatured to study the robustness of the micelle gel to structural changes due to the unfolded protein. Nanoscale structure is determined from small angle neutron scattering (SANS). It was expected that any change in the nanoparticle size would cause a change in the packing of the Pluronic micelle gel. However in SANS experiments, the FCC and BCC Pluronic templates show no nanoscale structural differences between a room temperature sample and a sample that has been heated to denature the protein and then cooled back to room temperature. There is a change in the template at longer length scales as evidenced by a low q upturn in the scattered intensity. The robustness of the micelle gel at different length scales will be discussed.

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