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Light Scattering Characterization of Elastin-Like Polypeptide Trimer Micelles ILONA TSUPER, DANIEL TERRANO, ADAM MARASCHKY, NOLAN HOLLAND, KIRIL STRELETZKY, Cleveland State University — The elastin-like polypeptides (ELP) nanoparticles are composed of three-armed star polypeptides connected by a negatively charged foldon. Each of the three arms extending from the foldon domain includes 20 repeats of the (GVGVP) amino acid sequence. The ELP polymer chains are soluble at room temperature and become insoluble at the transition temperature (close to 50 C), forming micelles. The size and shape of the micelle are dependent on the temperature and the pH of the solution, and on the concentration of the phosphate buffered saline (PBS). The depolarized dynamic light scattering (DDLS) was employed to study the structure and dynamics of micelles at 62 C. The solution was maintained at an approximate pH level of 7.3 - 7.5, while varying PBS concentration. At low salt concentrations (<15 mM), the micelle radius was about 10nm but not very reproducible on account of unstable pH levels arising from low buffer concentrations. At intermediate salt concentrations (15 – 60 mM), the system formed spherically-shaped micelles, exhibiting a steady growth in the hydrodynamic radius (R_h) from 10 to 21 nm, with increasing PBS concentration. Interestingly, higher salt concentrations (>60 mM) displayed an apparent elongation of the micelles evident by a significant VH signal, along with a surge in the apparent R_h. A model of micelle growth (and potential elongation) with increase in salt concentration is considered.

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