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Effect of Sequence Blockiness on the Morphologies of Surface-grafted Elastin-like Polypeptides JULIE ALBERT, KORNKANOK SINTAVANON, ROBIN MAYS, North Carolina State University, SARAH MACEWAN, ASHUTOSH CHILKOTI, Duke University, JAN GENZER, North Carolina State University — The inter- and intra- molecular interactions among monomeric units of copolymers and polypeptides depend strongly on monomer sequence distribution and dictate the phase behavior of these species both in solution and on surfaces. To study the relationship between sequence and phase behavior, we have designed a series of elastin-like polypeptides (ELPs) with controlled monomer sequences that mimic copolymers with various co-monomer sequence distributions and attached them covalently to silicon substrates from buffer solutions at temperatures below and above the bulk ELPs' lower critical solution temperatures (LCSTs). The dependence of ELP grafting density on solution temperature was examined by ellipsometry and the resultant surface morphologies were examined in air and under water with atomic force microscopy. Depositions performed above the LCST resulted in higher grafting densities and greater surface roughness of ELPs relative to depositions carried out below the LCST. In addition, we are using gradient substrates to examine the effect of ELP grafting density on temperature responsiveness.

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