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Protein Diffusion at the Interface of Responsive Polymer Thin Films SHENGQIN WANG, YINGXI ELAINE ZHU, Dept. of Chemical and Biomolecular Engineering, Univ. of Notre Dame, IN — Protein adhesion at polymer interfaces has been much explored, yet the interfacial friction is not. We employ fluorescence correlation spectroscopy (FCS) and single-molecule imaging to examine the translational dynamic processes of protein at the responsive polymer interfaces, whose surface hydrophobicity and interfacial viscoelasticity are tunable experimentally. We focus on the dynamics of human serum albumin (HSA) and lubrin, a nutritious protein in synovial fluids, at the interface of responsive poly (N-isopropylacrylamide) (PNIPAM) brush layers. The effects of PNIPAM brush thickness, grafting density, and surface hydrophobicity on protein interfacial diffusivity are investigated. We observe the coupling of the local protein dynamics at the protein-PNIPAM interfaces with the interfacial viscoelasicity of PNIPAM brush thin films.

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