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Block Copolymer Films for Organizing Charged Biopolymers¹ JUNG HYUN PARK, YUJIE SUN, YALE GOLDMAN, RUSSELL COMPOSTO, University of Pennsylvania — Amphiphilic block copolymers are attractive templates for organizing biopolymers. In aqueous media, selective attachment is achieved by designing a hydrophilic block that is attractive towards biomolecules. Thin films of poly(styrene-b-tert-butyl acrylate) (PS-b-PtBA) (66.2k-32k) are converted to poly(styrene-b-acrylic acid) (PS-b-PAA) by thermal deprotection resulting in PAA spheres embedded in a PS matrix. Upon exposing PS-b-PAA films to buffered solutions at pH 7.4, PAA spheres, initially below the surface, swell and break through the surface to form a hexagonal array with short range order. To create positively charged patches, PS-b-PAA films are exposed to 3-aminopropyltriethoxysilane (APTES) which selectively cross-link the spherical PAA domains. Because these patches favorably attract negatively charged biopolymers such as F-actin, microtubules, and DNA, the PS-b-PAA thin film provides a tunable template for controlling the number and orientation of biopolymers arranged across the surface.

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