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**Hydrogel Stamping of Polyelectrolyte Multilayers for Directed Cell Growth** NICOLE ZACHARIA, Texas A&M University, CHUNGYEON CHO, Texas A&M University, Materials Science and Engineering — The authors have recently introduced the use of hydrogel stamp materials to pattern polyelectrolyte multilayer (PEM) films. It has been demonstrated that using a stamp equilibrated in either low or high pH can cause local swelling in these films, leading to patterns. It has also been shown that stamps soaked in high ionic strength salt solutions are able to locally etch PEM films. This hydrogel stamping technique gives both lateral control of surface properties and depth control over the film's properties. This technique is a promising way to pattern chemical reactions within PEM, phase transformation, and physical properties such as film thickness, Young's modulus, and swelling. By using hydrogels for the stamp material, stamping becomes a process of continuously delivering aqueous reagent of interest to a film, instead of merely a single layer of material, as is the case when using hydrophobic stamp materials such as PDMS. While chemical modification of only the surface may be desirable in some cases, the hydrogel stamping technique is more versatile. By creating local variations in swelling, we are able to pattern mechanical stiffness, and in turn cell adhesion. We demonstrate the creation of gradients in mechanical stiffness which we are able to use to direct cell growth and adhesion on these films.

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