

486a Intact Transfer of Layered Bionanocomposite Arrays

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Microarrays containing multiple, nanostructured layers of biological materials would enable high-throughput screening of drug candidates, investigation of protein-mediated cell adhesion, and fabrication of novel biosensors. In this presentation, we will present an approach that allows high-quality microarrays of layered, bionanocomposite films to be deposited on a wide variety of substrates. The approach uses layer-by-layer self-assembly to preestablish a multilayered structure on an elastomeric stamp, and then uses microcontact printing to transfer the 3-D structure intact to the target surface. This approach extends the method previously used for intact transfer polyelectrolyte multilayer patterns to include amphiphilic biomolecules, such as proteins. The approach overcomes a problem encountered when using microcontact printing to establish a pattern on the target surface and then building sequential layers on the pattern via layer-by-layer self-assembly. Amphiphilic molecules tend to adsorb both to the patterned features as well as the underlying substrate, resulting in low-quality patterns. By circumventing this problem, this research significantly extends the range of surfaces and layering constituents that can be used to fabricate 3D, patterned, bionanocomposite structures