

**Polyelectrolyte multilayer Films of modulating Stiffness to Control  
Bacteria and Mammalian Cell Adhesion**

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The development of material surfaces which promote the proliferation of mammalian cells in a controlled way while decreasing the development of biofilms is a recurrent challenge of a major importance, notably in the tissue engineering field. Superficial stiffness of underlying substrate is one of the important parameter which is known to influence mammalian cell behavior. But the influence of this surface property on the behavior of bacterial cells has been less far explored. Polyelectrolyte multilayers (PEMs) of variable stiffness have been prepared through a photocrosslinking process and the adhesion and the growth of bacteria and mammalian cells on these coatings have been studied.

Bacterial assays reveal that stiffer crosslinked films slightly favor the initial adhesion of both gram + (*L. lactis*) and gram - (*E. coli*) strains. However, growth kinetics of gram - bacteria is higher on softer non crosslinked films while gram + bacteria seem to be only slightly affected by the surface stiffness. Myoblast cell behavior has been investigated on photopatterned PEMs that possess lateral variation of superficial stiffness at the micrometer scale. Selective adhesion and growth of cells are mostly observed on stiffer crosslinked regions

Systematic studies investigating the influence of the size and the shape of the surface pattern on the cell response are currently in progress.