

Study of Random Polyelectrolyte Thin Films for Biomimetic Surfaces

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Polymers with relatively low ionic content (less than 30 mole %) have been shown to achieve charge concentrations comparable to those in the extra-cellular matrix. The interaction between the cells and the charged surface can be strongly influenced by the presence of ions in a buffer solution due to the charge screening effects, and the hydrated surface due to the presence of diffused surface morphology. Here we report on image ellipsometry (IE) and microscopic study where we explore the polyelectrolyte surface, in this case sulfonated polystyrene (PSSx) and polystyrene acrylic acid (PSAAx), with varying surface charge densities ($x < 30\%$). The structures and adsorption/desorption behavior of fibroblast cells are found to be quite difference as a function of charge and incubation. We have also shown that it is possible to form a fibrillar network of fibronectin on a polyelectrolyte polymer film whose dimensions are similar to those reported on the extra cellular matrix. This work was supported by the Korean Research Foundation (KRF-2002-0420D00046).