

عنوان مقاله:

Effects of Surface Viscoelasticity on Cellular Responses of Endothelial Cells

محل انتشار:

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خلاصه مقاله:

Background: One area of nanoscience deals with nanoscopic interactions between nanostructured materials and biological systems. To elucidate the effects of the substrate surface morphology and viscoelasticity on cell proliferation, fractal analysis was performed on endothelial cells cultured on nanocomposite samples based on silicone rubber (SR) and various concentrations of organomodified nanoclay (OC). Methods: The nanoclay/SR ratio was tailored to enhance cell behavior via changes in sample substrate surface roughness and viscoelasticity. Results: Surface roughness of the cured SR filled with negatively-charged nanosilicate layers had a greater effect than elasticity on cell growth. The surface roughness of SR nanocomposite samples increased with increasing the OC content, leading to enhanced cell growth and extracellular matrix (ECM) remodeling. This was consistent with the decrease in SR segmental motions and damping factor as the primary viscoelastic parameters by the nanosilicate layers with increasing clay concentrations. Conclusions: The inclusion of clay nanolayers affected the growth and behavior of endothelial cells on microtextured SR.

کلمات کلیدی:

Cell proliferation, Elastic Modulus, Nanoclay, Roughness, Silicone rubber

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