

Cell Adhesion and Growth on Nanostructured Surface

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To make the rationale design of interface between cell and artificial surface, many studies have been controlled influencing cue which can typically be divided into two central categories: chemical cues based on modification surface chemical properties containing attractive/repulsive molecules, and physical cues that may include applied tension/stress, electrical polarization, magnetic field, and topography. Recently, researches have been focused on physical cue, especially topography. The surface topography may influence cellular responses for example, cell adhesion, cell morphology and gene expression. However, there were few systematic studies about these nanotopographical effects on neuronal developments in a feature size-dependent manner. Herein, we report a nanoscale-resolved study of nanotopographical effects on cellular adhesion and growth. In this study, we use substrates with packed glass beads by rubbing method for generating highly periodic nanotopographies with various sizes. We found that acceleration of neuritogenesis appeared only on the beads larger than 200 nm in diameter, and observed that filopodial thickness was comparable with this scale. This study is expected to be essential to elucidate the nanotopographical effect on cellular adhesion and growth.

Keywords: Cell Adhesion, Cell Growth, Nanostructured Surface, Nanotopographical Effect