

Cell Adhesion Control Using Nanostructure Fabricated on Polymer Surface

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We studied the adhesion control of cells cultured on nanometer-scale patterned poly (dimethylsiloxane) (PDMS) structures with various shapes. Although cell cultures on microstructures and nanostructures with random shapes have been studied so far, cell cultivation on well-defined nanopatterned PDMS has not been reported. PDMS was molded into stripes and pillars with nanometer- or micrometer-scale widths using a patterned glass template. Human stomach cancer cells (Kato-III) were cultured on the nanopatterned PDMS sheets. The cells adhered to the nanometer-scale stripe and became elongated as structures. They extended along the direction of the nanostructures. When the surface was thickly coated with a protein (*e.g.*, extracellular matrix (ECM) gel), cell extension was not observed. Cultured cells selectively recognized the direction of the nanostructure. The findings in this work could lead to future developments in whole-cell-based biosensors.

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