

Cell chip composed of nanopatterned array based on spectroelectrochemical technique

최정우*

서강대학교 화공생명공학과

(jwchoi@sogang.ac.kr*)

A cell chip was reported as a valuable tool for evaluating effects of various kinds of chemicals, drugs or nanomaterials on target cells with high accuracy. In this study, nanoscale film was developed on an artificial electrode surface to establish a cell-friendly environment which was effective for enhancing cell spreading, adhesion and proliferations. The film was further developed to three dimensional peptide nanopillar arrays which were more efficient than two dimensional peptide film in regard to various kinds of cellular functions. The electrochemical signals achieved from cells showed linear correlations with the cell viability which can be used as indicator for the toxicity assessment. Surface-enhanced Raman spectroscopy (SERS) was further applied as powerful tool to identify different cell lines, to discriminate alive- or dead- cells and to investigate toxicity of anticancer drugs. The combination of SERS and electrochemical technique was found to be excellent to study the alterations of intracellular composition of cells, as well as to investigate the internal redox properties of single cell. Proposed cell chip based on spectroelectrochemical technique can be used as an in vitro analysis tool in various kinds of biotechnology fields.