Stable protein immobilization onto desired space for the fabrication of biosensor

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Protein patterning is crucial for the development of protein chip and biosensors. The most important point of this technique is how to bind both protein and surface. A lot of studies were reported about this. However theses conventional methods have problems that strong binding by covalent bonding cause deformation of three dimensional structures of protein and by electrostatic force have a weak binding force for effective patterning. In this study, we have introduced the development of protein micro-patterning on polyelectrolyte multilayer thin films by consecutive layer-by-layer adsorption of polyelectrolyte via self-assembly technique. Protein was immobilized on polyelectrolyte modifed surface by electrostatic interaction. As a model system, the printing of the fluorescein isothiocyanate labeled bovine serum albumin (FITC-BSA: 1 g/ml) was performed. The protein patterning fabricated on PEM provide higher signal intensity than patterning by conventional method.This novel method is well suited for immobilizing many types of biological molecules so that a wide variety of micro patterning formats can be developed.