

## Fabrication of Protein Chip using High-density Hydrogel Microarrays

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This study emphasizes the fabrication of hydrogel microarray for the application of protein chip. Hydrogel microarrays were prepared with various molecular weight of acrylated poly (ethylene glycol)(PEG) via photolithography. For the covalent binding of hydrogel to the substrates, glass or silicon substrates were coated with silanes with methacrylate or benzophenone end group. This surface treatment effectively prevents swelling-induced delamination of hydrogel from the substrate. Proteins were immobilized onto the surface of hydrogel micropattern using bifunctional linker, 5-Azido-2-nitrobenzoyloxy-N-hydroxysuccinimide and immobilized proteins onto the hydrogel surface were visualized using fluorescence-labeled proteins. For the multi-analyte biosensing, different proteins were immobilized in the same array with the aid of microchannels prepared from poly (dimethylsiloxane) (PDMS). Because of non-adhesivity of PEG hydrogels toward protein, hydrogel micropatterns did not allow nonspecific adsorption of other substances. Finally application of protein microarray such as enzyme-substrate or antigen-antibody reaction was assessed using this device.