Fabrication of Self-Assembled Protein G Monolayer and its Application to Immunosensor

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One of the most important points in the design of immunosensor and protein chip is the proper choice of immobilization method for protein ligand molecules to retain the activity. In this study, self-assembled protein G is introduced as a binding protein in order to immobilize various kinds of protein ligand, antibodies. Protein G, a cell wall protein found in most strains of *Streptococcus spp.* has specific interaction with the Fc portion of IgG.[1] In order to immobilize protein G molecule, the mixture of 11-mercaptoundecanoic acid (11-MUA) and hexanethiol was self-assembled on gold substrate by chemical binding. The carboxylic group of 11-MUA was activated with 1-ethyl-3-(3-dimethylaminopropyl)carbodiimide hydrochloride(EDAC) to bind protein G with 11-MUA. The surface morphology of protein G on self-assembled 11-MUA were analyzed by AFM. On the self-assembled Protein G monolayer, IgG was immobilized, which was detected by SPR.[2] The steric hindrance by antigen size in the binding characteristics between antibody and antigen could be controlled with molar ratio variation between 11-MUA and hexanethiol. The effect of steric hindrance by antigen size was investigated with AFM and SPR.

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References

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