Fabrication of an Electrochemical Immunosensor with a Sol-Gel Derived Carbon Composite Electrode

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In order to fabricate an electrochemical immunosensor for the detection of pathogenic microbes such as *E. coli* O157:H7, a bioactive platform with a sol-gel derived carbon composite electrode is being studied. In this study, sol solution is prepared by hydrolyzing tetraethylorthosilane(TEOS) in ethanol and then graphite powder is added into the solution. The solution applied onto the surface of a slide glass is cured to fabricate a carbon composite electrode. Then anti-E.coli and glycerol mixture is applied to induce the physisorption of anti-E.coli antibodies onto the porous surface of a carbon composite electrode. Finally this bioactive platform is tested as an electrochemical immunosensor by applying *E. coli* O157:H7.

Surface morphology of the platform with a carbon composite electrode will be investigated using atomic force microscopy (AFM). Antigen and antibody disturb diffusion of charge and interrupt flow of electric current on the electrode surface. Therefore Antigen-antibody reaction will be conformed by cyclic voltammetry(CV). Difference of CV peak proves immobilization of antibody and result of antigen-antibody reaction, and also proves concentration of antigen according to difference of peak in CV.