

Flexible electrochemical biosensor composed of Au-MoS<sub>2</sub>-Au multilayer for HIV-1 detection

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HIV-1 gp120 is one of the surface protein located on HIV envelope which is widely researched to detect HIV-1. Also, recently, introduction of flexibility to the bioelectronic devices such as biosensor and transistor has been researched due to the saving space of device, application to various environment. From these points of view, in this study, the electrochemical biosensor composed of gold (Au) and molybdenum disulfide (MoS<sub>2</sub>) is developed to detect gp120. Furthermore, by using Polyethylene terephthalate (PET) as the substrate, flexibility is granted to this biosensor. To fabricate this flexible electrochemical biosensor, Au is sputter coated on substrate and MoS<sub>2</sub> is spin coated on Au. And then, Au is sputter coated once again to prepare the multilayer (Au-MoS<sub>2</sub>-Au) on PET substrate. The gp120 antibody is immobilized on the surface of Au-MoS<sub>2</sub>-Au through specific binding with cysteamine immobilized on the Au-MoS<sub>2</sub>-Au for gp120 protein detection. This fabricated can be used to develop the flexible bioelectronics device with high electrochemical signal for portable device platform.