Short Communication

Electrochemical Immunoassay Analysis of Apolipoprotein A for Potential Diagnosis of Coronary Artery Disease

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The development of sensitive detection method for human apolipoprotein A (Apo-A) that is an important marker for coronary artery disease is highly demanded. In this study, a uniform composite composed of chemically reduced graphene (GR) and multi-walled carbon nanotubes (MWCT) was prepared via layer-by-layer assembly method. Cyclic voltammetry (CV) and electrochemical impedance spectroscopy (EIS) were employed for investigating the electrochemical performance of GR-MWCT modified electrode. The content of Apo-A could be determined according to the change of reductive current after the electrode was functionalized with HRP-labeled Apo-A antibody. The current response of proposed immunosensor fabricated with GR-MWCT modified electrode was related linearly with the logarithm of human Apo-A concentration within the range of 0.5-1000.0 ng/mL. The detection limit of Apo-A immunosensor was 0.2 ng/mL (S/N=3). In addition, the proposed immunosensor showed excellent specificity for the detection of human Apo-A. In general, the Apo-A immunosensor with remarkable performance demonstrated huge potential use in the clinic diagnosis of coronary artery disease.

Keywords: Coronary artery disease; Apolipoprotein A; Immunoassay; Electrochemistry; Carbon nanomaterials

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