Development of a Graphene-Based Aptamer Sensor for Electrochemical Detection of Serum ECP Levels

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The eosinophil cationic protein (ECP) is the biological marker for bronchial eosinophil inflammation, and it can be detected in serological levels to objectively predict the activity and severity of asthma in children. This work reports a facile electrochemical aptasensor without labels for the detection of ECP using a glassy carbon electrode (GCE) modified by Au nanoparticles dotted with a graphene (GNPs/GR) nanocomposite film. The ECP-aptamer interactions were studied using ferricyanide as the electrochemical probe. The terminal GNPs/GR layer displayed an acceptable current for ECP determination. The peak current variation of ferricyanide was linearly related to the ECP concentration (0.01 μ M - 10 μ M), and the limit of detection (LOD) was 4 nM.

Keywords: Eosinophil cationic protein; Aptamer sensor; Graphene; Electrochemical determination; Children asthmatic attack

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