An electrochemical sensor based on a graphene/AuNP nanocomposite for the determination of prolyl hydroxylase

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doi: 10.20964/2018.05.17

Received: 24 November 2017 / Accepted: 16 January 2018 / Published: 10 April 2018

Prolyl hydroxylase (PHD1) is a vital indicator of a patient's health level evaluation after liver metastases. The present study reports the fabrication of a state-of-the-art and highly conductive graphene-gold nanoparticle-modified glassy carbon electrode (GCE-graphene-AuNPs) for application in PHD1 analysis. Fabrication of the composite was achieved by the successive electrodeposition of Au NPs and graphene onto the GCE surface. It was found that the oxidization was a diffusion-controlled, irreversible process over a pH range of 3.0 to 10. Over a paclitaxel concentration range of 0.01 to 2 mM, a linear relationship was found between the concentration and the anodic peak current. Additionally, the limit of detection (LOD) was calculated as 0.004 mM.

Keywords: Electrochemical determination; Prolyl hydroxylase; Graphene; Au nanoparticle; Liver injury

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