Electrochemical Determination of the Anticancer Drug Capecitabine Based on a Graphene-Gold Nanocomposite- Modified Glassy Carbon Electrode

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This study used a glassy carbon electrode (GCE) modified by gold nanoparticles (AuNPs) and stacked graphene nanofibres (SGNF) to prepare a facile electrochemical sensor for the detection of capecitabine, an anti-cancer drug used in breast cancer treatment. Differential pulse voltammetry (DPV) measurements were performed to investigate the electrochemical reduction of capecitabine using the AuNPs/SGNF-modified GCE. Our proposed sensor showed exceptional electrochemical activity to the capecitabine reduction with a linear range of 0.05 μM to 80.00 μM and a limit of detection (LOD) of 0.017 μM (S/N=3). Due to the distinct analysis behaviour, our proposed sensor shows potential for the practical detection of capecitabine in serum specimens.

Keywords: Capecitabine; Gold nanoparticles; Stacked graphene nanofibres; Electrochemical determination; Breast cancer

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