عنوان مقاله:

Immunoassay for Human Chorionic Gonadotropin Based on Glassy Carbon Electrode Modified with an Epitaxial Nanocomposite

محل انتشار:

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خلاصه مقاله:

A highly sensitive electrochemicalimmunosensor was developed to detect hCG based on immobilization ofhCG-antibody (anti-hCG) onto robust nanocomposite containing Gr, Chit,۱-methyl-۳-octyl imidazolium tetra fluoro borate ionic liquid (IL)(Gr-IL-Chit). AuNPs were used to immobilize hCG antibody on the modifiedelectrode. The amine groups of the antibody are covalently attached toAuNPs/Gr-IL-Chit nanocomposite. CV, EIS and SEM were employed to characterizethe assembly process and the performance of the immunosensor. DPV and EISstudies demonstrated that the formation of antibody-antigen complexes decreasedpeak current and increased Rct of [Fe(CN)۶]۳−/۴−redox pair at the AuNPs/Gr-IL-Chit/GCE. The optimization of the pH ofsupporting electrolyte and the incubation time were studied in details. Becauseof the synergistic effect of IL, Chit and Gr and the unique properties ofAuNPs, the obtained immunosensor exhibited a wide linear response to hCG in tworanges from ۰.۰۰۵-۱.۴۸۴ and ۱.۴۸۴-۴۱۱.۲۸ (mIU ml-۱). A relativelylow detection limit of ۰.۰۰۱۶ mIU ml-۱ (S/N = ۳) was calculated fromDPV. Satisfactory results were obtained for determination of hCG in human serumsamples.

کلمات کلیدی:

Electrochemical immunosensor, Human chorionic gonadotropin, Nanocomposite, Impedance spectroscopy