

عنوان مقاله:

Electrochemical immunosensor for the breast cancer marker CA 15-3 based on the catalytic activity of a CuS/reduced graphene oxide nanocomposite towards the electrooxidation of catechol

محل انتشار:

اولین کنگره بین المللی شیمی و نانو شیمی از پژوهش تا فناوری (سال: 1397)

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خلاصه مقاله:

The authors report on an electrochemical immunosensor for the tumor marker carbohydrate antigen 15-3 (CA15-3). It is based on the use of a composite consisting of reduced graphene oxide (RGO) and copper sulfide (CuS) that was placed on a screen-printed graphite electrode. The electrode shows excellent activity towards the oxidation of catechol acting as an electrochemical probe, best at a working potential of 0.16 V. The electrode was modified with antibody against CA15-3. Once the analyte (CA15-3) binds to the surface of the electrode, the response to catechol is reduced. The assay has a linear response in the 1.0 - 150 U mL⁻¹ CA15-3 concentration range, with a 0.3 U mL⁻¹ lower detection limit and sensitivity of 1.88 'A 'M 1 cm 2. The immunosensor also shows good reproducibility (2.7%), stability (95% of the initial values after storing for four weeks). The method was successfully applied to the determination of CA15-3 in serum samples, and results were found to compare well to those obtained by an ELISA. Conceivably, this nanocomposite based detection scheme has a wider scope and may be applied to numerous other immunoassays.

کلمات کلیدی:

Screen-printed electrode , Copper sulphide , Carbohydrate antigen 15-3 , Tumor biomarkers , Immunosensors , Electrochemistry , Biosensor

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