An Ultrahighly Sensitive Electrochemical Biosensor for Cytochrome c with Surface Molecular Imprinting Based on Hybrid Nanomaterials

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A novel ultrahighly sensitive 3D structural electrochemical imprinted biomacromolecular sensor for Cyt c was fabricated based on hybrid polyaniline nanotube/carboxylated multi-walled carbon nanotubes (PANTs-MWCNTs) composites by surface molecular imprinting method on the surface of glassy carbon electrode (GCE). The hybrid nanomaterials can enhance imprinting efficiency. The fabrication and electrochemical behavior of the prepared imprinted biosensor were studied by electrochemical techniques, scanning electron microscopy (SEM) and Fourier transform infrared spectra (FTIR). Under the optimal conditions, the detection of Cyt c with the imprinted sensor exhibited a wide linear range from 1.0×10^{-14} to 1.0×10^{-6} mg/mL with lower detection limit of 7.62×10^{-16} mg/mL. The developed procedure has been successfully used in assay of Cyt c in real samples.

Keywords: Cytochrome c; Electrochemical imprinted biosensor; Nanomaterials; Self-assembly.

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