

An Electrochemical DNA Biosensor Based on Oracet Blue as a Label for Detection of Helicobacter pylori

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Abstract : An innovative method of a DNA electrochemical biosensor based on Oracet Blue (OB) as an electroactive label and gold electrode (AuE) for detection of Helicobacter pylori, was offered. A single-stranded DNA probe with a thiol modification was covalently immobilized on the surface of the AuE by forming an Au-S bond. Differential pulse voltammetry (DPV) was used to monitor DNA hybridization by measuring the electrochemical signals of reduction of the OB binding to double-stranded DNA (ds-DNA). Our results showed that OB-based DNA biosensor has a decent potential for detection of single-base mismatch in target DNA. Selectivity of the proposed DNA biosensor was further confirmed in the presence of non-complementary and complementary DNA strands. Under optimum conditions, the electrochemical signal had a linear relationship with the concentration of the target DNA ranging from 0.3 nmol L⁻¹ to 240.0 nmol L⁻¹, and the detection limit was 0.17 nmol L⁻¹, with a promising reproducibility and repeatability.

Keywords : DNA biosensor, oracet blue, Helicobacter pylori, electrode (AuE)

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