A label-free Electrochemical DNA Biosensor for the Determination of Low Concentrations of Mitoxantrone in Serum Samples

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Herein, a sensitive, accurate and precise DNA biosensor for the quantification of low levels of mitoxantrone in serum samples was presented. This approach is based on the interaction of the drug with double-stranded DNA and subsequent electrochemical transduction. Chitosan as a positive polymer was used for the immobilization of the DNA on the surface of a carbon paste electrode (working electrode). After optimization of different experimental parameters, the proposed biosensor showed a wide concentration linear range of 0.030-3.50 mg L⁻¹ and 3.50-120.0 mg L⁻¹ with a detection limit of 0.0013 mg L⁻¹. It was found that the optimized approach could be applied to the determination of mitoxantrone in serum samples with acceptable recovery values.

Keywords: Mitoxantrone, DNA biosensor, Voltammetry, Chitosan

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