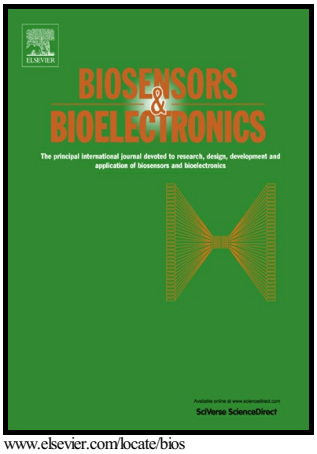

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Excellent storage stability and sensitive detection of neurotoxin quinolinic acid

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Abstract

Quinolinic acid (QA) is a metabolite of tryptophan degradation obtained through kynurenine pathway, produced naturally in the mammalian brain as well as in the human cerebrospinal fluid. The presence of QA ~10-40 μM is a clear indicator of many neurological disorders as well as deficiency of vitamin B_6 in human being. In the present work; rapid, sensitive and cost-effective bio-electrodes were prepared to detect the trace amount of endogenous neurotoxin (QA). Cyclic voltammetry (CV) and differential pulse voltammetry (DPV) studies were carried out to measure the electrochemical response of the fabricated bio-electrodes as a function of QA concentrations. These devices were found to exhibit desirable sensitivity of ~7.86 mA μM^{-1} cm^{-2} in wide concentration range (6.5 μM-65 mM). The lower detection limit of this device is as low as 6.5 μM and it has excellent storage stability of ~30 days. The capability of the proposed electrochemical bio-sensor was also checked to detect QA in the real samples (human serum). These results reveal that the use of this electrochemical bio-sensor may provide a potential platform for the detection of QA in the real samples for the prior detection of many diseases.