Electrochemical Determination of Alkaline Phosphatase as a Potential Marker of Reperfusion Injury

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Currently, there are no well-defined markers for distinguishing ischaemia from reperfusion injury. In this study, the practicality of a diagnostic health sensor was examined via the investigation of voltammetric alkaline phosphatase (ALP) detection. An indium tin oxide (ITO) film on glass was employed in the fabrication of an electrochemical sensor via facile photolithography using a transparent film and an office printer. The enzymatic hydrolysis of the substrate *p*-nitrophenyl phosphate (PNPP) by ALP produces *p*-nitrophenol, which was quantified by square wave voltammetry (SWV) and cyclic voltammetry (CV). Untreated human blood (UHB), human serum (HS), foetal bovine serum (FBS), and many other media provide a platform for ALP detection via this technique, which has a linear range of 5–250 U/L. The standard colorimetric analysis method was performed to further confirm the results.

Keywords: Alkaline phosphatase; Electrochemical sensor; Reperfusion injury; Electrode modification

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