ELECTROCHEMICAL GLUCOSE BIOSENSORS BASED ON GOLD NANORODS

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Gold nanorods (AuNRs) have attracted great interest in electrochemical biosensing due to their large surface area and excellent conductivity, which improve electron transfer and sensitivity in sensor applications. In this study, AuNRs were synthesised using two different methods to develop electrochemical glucose biosensors. The structural and morphological properties of AuNRs were analysed by scanning electron microscopy (SEM), while their optical properties were evaluated by UV-Vis spectroscopy. Electrochemical characterisation of the AuNR-modified electrodes was performed using cyclic voltammetry to determine the electroactive surface area, and chronoamperometric measurements were performed to evaluate the sensitivity of the sensor to glucose. Selectivity tests were performed to evaluate the response of the sensor in the presence of interfering substances.

The results showed that AuNR-modified electrodes exhibited improved sensitivity and selectivity in glucose detection. A clear correlation was observed between the properties of the synthesised AuNRs and the performance of the biosensor, highlighting the importance of material properties in sensor optimisation. These results contribute to the further development of AuNR-based electrochemical biosensors for accurate and reliable glucose monitoring, with potential applications in medical diagnostics and biotechnology.