

Advanced electrochemical glucose biosensor development from self-assembled single-walled carbon nanotubes with peptides

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Here in, we developed electrochemical glucose biosensor based on the self assembled single walled carbon nanotubes (SWNTs) with peptide. Glucose oxidase(GOx) were readily immobilized with peptide on SWNTs through covalent interactions between carboxylic acid group on peptide and amine group on GOx using sulfo-NHS(N-hydroxysulfosuccinimide). This strong immobilization strategy was suitable for the promotion of enzyme activity. As prepared GOx/peptide-SWNTs electrodes were used as biosensing platforms for detecting glucose, showing high sensitivity, low detection limit, and fast response time. Furthermore, in comparison of non-covalent method for immobilization of enzymes, the modified electrode showed better performance than that of non-covalent bond-based electrode, such as higher electron transfer rate, better peak to peak potential separation, and lower charge transfer resistance. The electrochemical behaviors were analyzed by cyclic voltammetric and amperometric measurements. The immobilization methods and fabrication of biosensing platforms suggested here to provide a significant impact on the development of electrochemical devices.