Detection of Insulin-Like Growth Factor 1 Based on an Electrochemical Impedance Spectroscopy Sensor

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This work presents the fabrication of a novel label-free electrochemical sensor towards the determination of insulin-like growth factor 1 (IGF-1) by immobilizing IGF-1 monoclonal antibodies using multiwalled carbon nanotubes (MWCNTs) and an ionic liquid (IL). It was found that the increased impedance values were linearly related with the logarithm of the IGF-1 concentrations (0.4 - 15 ng/mL). Furthermore, based on a signal-to-noise ratio of 3, the limit of detection (LOD) was calculated to be 22 pg/mL. The results showed that our developed sensor is highly stable, sensitive, and simple to use, showing potential for the early diagnosis of polycystic ovary syndrome.

Keywords: Insulin-like growth factor 1; Polycystic ovary syndrome; Multi-walled carbon nanotube; Electrochemical sensor; Ionic liquid

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