Fabrication of Immunosensor Based on Au-silica Nanocomposite for Neuron-specific Enolase Detection

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Neuron-specific enolase (NSE), a type of neuroendocrine molecule, is a putative serum marker for small-cell lung carcinoma. This work addressed the fabrication of a signal-enhanced, label-free, electrochemical immunosensor based on Au nanoparticle/mesoporous silica nanoparticles (Au-MSNs) for NSE determination. Because of the large number of active sites provided by the Au-SiO₂ sensor, the modified immunosensor has a significantly enhanced sensitivity. Furthermore, during quantitative NSE detection, the sensor has a desirable linear relationship with the concentration (0.1-2000 ng/mL) and a detection limit of 0.05 ng/mL.

Keywords: Label-free immunosensor; Neuron-specific enolase (NSE); Signal-enhanced; Electrochemical immunosensors; Silica

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