Assembly of a Nanogold-Assisted Aptamer Sensor for Highly Sensitive Detection of Homocysteine

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With more in-depth exploration on stroke risk factors in recent years, an increasing number of studies show that homocysteine (HCY) is a new risk factor of cerebral infarction. In this work, graphene was adopted for the modification of glassy carbon electrodes, and gold nanoparticles were modified onto the graphene surface with a simple and controlled electrodeposition method, followed by aptamer immobilization, to construct the homocysteine electrochemical sensor. Under optimum conditions, the analytical performance of the proposed aptamer sensor showed a positive response to different concentrations of HCY. The peak currents were proportional to HCY concentration. The linear regression equation can be found from 0.05–20.0 μM . The limit of detection can be calculated to be 5 nM based on $S/N=3$.

Keywords: Homocysteine; Aptamer; AuNPs; Graphene; Cerebral infarction

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