Development of Electrochemical Sensor for Homocysteine Determination as a Cerebrovascular Disease Biomarker

Jibo Zhao^{1,*}, Ping Du², Xingyuan Sun¹ and Hongbin Liu¹

¹ Department of Neurology, The Third Affiliated Hospital of Qiqihaer Medical University, No.27 Taishun Rd, Qiqihaer, Helongjiang, P.R. China

² Department of Rehabilitation, The Third Affiliated Hospital of Qiqihaer Medical University, No.27 Taishun Rd, Qiqihaer, Helongjiang, P.R. China

*E-mail: zhaojibo789@163.com

doi; 10.964/2017.09.66

Received: 21 June 2017 / Accepted: 29 July 2017 / Published: 13 August 2017

This work proposed the glassy carbon electrodes (GCE) based on reduced graphene oxide-TiO₂ (RGO-TiO₂) nanocomposite to realize sensitive homocysteine (Hcy) detection. The RGO-TiO₂ exhibits a remarkable electrocatalytic activity to Hcy oxidation at a low potential, as indicated in cyclic voltammetric (CV) results. The RGO-TiO₂-based GCE has also been found highly stable and reproducible. Furthermore, it is strongly resistant to electrode fouling. In addition to these analytical features, it requires low operation potential. Therefore the proposed RGO-TiO₂-based GCE could reliably and sensitively detect Hcy, with a limit of detection (LOD) of 24 nM (S/N=3) and a desirable dynamic linearity (80 μM).

Keywords: Homocysteine; Electrochemical sensor; Graphene; Biomarker; Cerebrovascular disease

[FULL TEXT](#)

© 2017 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).