Selective and Reliable Electrochemical Sensor Based on Polythionine/AuNPs Composites for Epinephrine Detection in Serum

Jianyong Huang^{1,*}, Wentan Xu^{2,3}, Yanqing Gong², Shaohuang Weng^{2,*}, Xinhua Lin²

¹ Department of Pharmaceutical, Fujian Medical University Union Hospital, Fuzhou 350001, China.

² Department of Pharmaceutical Analysis, Faculty of Pharmacy, Fujian Medical University, Fuzhou, 350108, China

³ Jinjiang Municipal Hospital, Quanzhou 362200, China.

*E-mail: shweng@fjmu.edu.cn, jyhuangfjmu@126.com

doi: 10.20964/2016.10.56

Received: 19 July 2016/ Accepted: 22 August 2016 / Published: 6 September 2016

This work used a highly selective electrochemical sensor based on polythionine/AuNPs composites (PTh/AuNPs) modified glassy carbon electrode (GCE) to detect epinephrine (EP). An elevated response of the oxidative behavior of EP was obtained on the PTh/AuNPs modified GCE in phosphate buffer saline (pH 6.0), which allowed sensitive sensing of EP using the differential pulse voltammetry (DPV). The electrochemical sensor can selectively measure EP in a wide linear range from 1 to 40 mg/L with a detection limit of 0.3 mg/L (S/N = 3) and a high reproducibility in PBS. The developed electrochemical sensor can be favorably applied to detect EP in a diluted serum. Furthermore, the good linear regression between the EP concentrations and the currents in various diluted serum implied the potential of the proposed method as a promising candidate approach for complex clinical conditions.

Keywords: Epinephrine; Polythionine/AuNPs composites (PTh/AuNPs); Selective detection; Differential pulse voltammetry; Electrochemical sensor

[FULL TEXT](#)

© 2016 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/>).