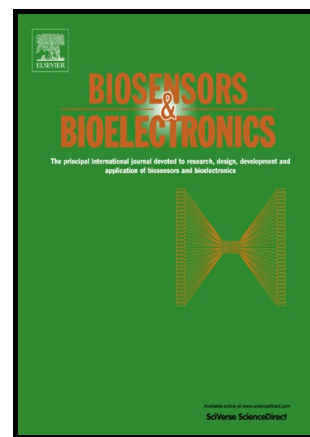


## Author's Accepted Manuscript

Horseradish peroxidase-labelled silver/reduced graphene oxide thin film-modified screen-printed electrode for detection of carcinoembryonic antigen

S.X. Lee, H.N. Lim, I. Ibrahim, A. Jamil, A. Pandikumar, N.M. Huang



PII: S0956-5663(15)30685-0  
DOI: <http://dx.doi.org/10.1016/j.bios.2015.12.030>  
Reference: BIOS8260

To appear in: *Biosensors and Bioelectronic*

Received date: 2 October 2015  
Revised date: 29 November 2015  
Accepted date: 14 December 2015

Cite this article as: S.X. Lee, H.N. Lim, I. Ibrahim, A. Jamil, A. Pandikumar and N.M. Huang, Horseradish peroxidase-labelled silver/reduced graphene oxide thin film-modified screen-printed electrode for detection of carcinoembryonic antigen *Biosensors and Bioelectronic*, <http://dx.doi.org/10.1016/j.bios.2015.12.030>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain

**Horseradish peroxidase-labelled silver/reduced graphene oxide thin film-modified screen-printed electrode for detection of carcinoembryonic antigen**

S.X. Lee<sup>a</sup>, H.N. Lim<sup>\*ab</sup>, I. Ibrahim<sup>a</sup>, A. Jamil<sup>a</sup>, A. Pandikumar<sup>c</sup>, N.M. Huang<sup>c</sup>

<sup>a</sup>Department of Chemistry, Faculty of Science, Universiti Putra Malaysia, 43400, Serdang, Selangor Darul Ehsan, Malaysia

<sup>b</sup>Functional Device Laboratory, Institute of Advanced Technology, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

<sup>c</sup>Low Dimensional Materials Research Centre (LDMRC), Physics Department, Faculty of Science, University of Malaya, 50603 Kuala Lumpur, Malaysia

\*Author to whom correspondence should be addressed; E-Mail: janetlimhn@gmail.com;

Tel.: +6016 330 1609; Fax : +603 8943 5380.

**Abstract:** In this study, a disposable and simple electrochemical immunosensor was fabricated for the detection of carcinoembryonic antigen. In this method, silver nanoparticles (AgNPs) were mixed with reduced graphene oxide (rGO) to modify the surface of screen-printed carbon electrode (SPE). Initially, AgNPs-rGO modified-SPEs were fabricated by using simple electrochemical deposition method. Then the carcinoembryonic antigen (CEA) was immobilized between the primary antibody and horseradish peroxidase (HRP)-conjugated secondary antibody onto AgNPs-rGO modified-SPEs to fabricate a sandwich-type electrochemical immunosensor. The proposed method could detect the CEA with a linear range of 0.05–0.50  $\mu\text{g mL}^{-1}$  and a detection limit down to 0.035  $\mu\text{g mL}^{-1}$  as compared to its non-sandwich counterpart, which yielded a linear range of 0.05–0.40  $\mu\text{g mL}^{-1}$ , with a detection limit of 0.042  $\mu\text{g mL}^{-1}$ . The immunosensor showed good performance in the

Download English Version:

<https://daneshyari.com/en/article/5031738>

Download Persian Version:

<https://daneshyari.com/article/5031738>

[Daneshyari.com](https://daneshyari.com)