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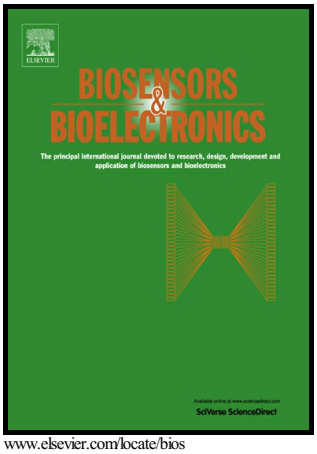

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Abstract

This review discusses recent graphene (GR) electrochemical biosensor for accurate detection of biomolecules, including glucose, hydrogen peroxide, dopamine, ascorbic acid, uric acid, nicotinamide adenine dinucleotide, DNA, metals and immunosensor through effective immobilization of enzymes, including glucose oxidase, horseradish peroxidase, and haemoglobin. GR-based biosensors exhibited remarkable performance with high sensitivities, wide linear detection ranges, low detection limits, and long-term stabilities. Future challenges for the field include miniaturising biosensors and simplifying mass production are discussed.

Keywords
Biosensor; electrochemical; graphene; metals; pesticides, immunosensor

1 Introduction

In recent years great progress has been made in applying graphene (GR) to design novel biosensors. The use of GR offers to biosensing platforms exceptional optical, electronic and magnetic properties. GR can increase the surface of the transducing area of the sensors that in turn bring an increase in catalytic behaviours. A class of graphene-like 2D materials (2DMats) is emerging and has recently attracted the interest of researchers, because of their unique properties, which also allow applications in sensing and biosensing, energy conversion and storage (Szabó, Magyar et al. 2015, Ghosh*, Gupta et al. 2016, Tanmoy and Suvra Prakash 2016, Yingkui Yanga, Cuiping Hana et al. 2016), catalysis (Sun, Hou et al. 2015, Wang, Dong et al. 2015, Zhai, Zhu et al. 2015, Wang, Liu et al. 2016, Chen, Yan et al. 2017, Kong, Du et al. 2017, Wen, Zhao et al. 2017), composites, electronics(Zhang, Liu et al. 2017) and biomedical field (Pittori, Santonicola et al. 2015, Xuqiang Ji, Yuanhong Xu et al. 2016).