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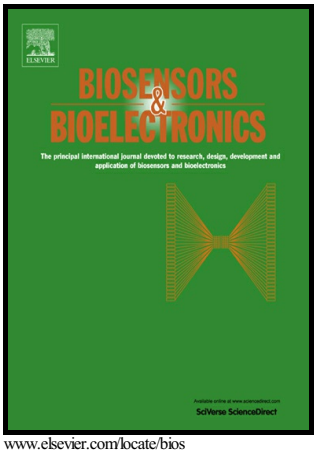

www.elsevier.com/locate/bios

PII: S0956-5663(17)30698-X
DOI: https://doi.org/10.1016/j.bios.2017.10.030
Reference: BIOS10055

To appear in: *Biosensors and Bioelectronic*

Received date: 1 August 2017
Revised date: 28 September 2017
Accepted date: 14 October 2017

Cite this article as: Biyas Posha, Sindhu R Nambiar and N. Sandhyarani, Gold atomic cluster mediated electrochemical aptasensor for the detection of Lipopolysaccharide, *Biosensors and Bioelectronic,* https://doi.org/10.1016/j.bios.2017.10.030

Gold atomic cluster mediated electrochemical aptasensor for the detection of Lipopolysaccharide

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Abstract

We have constructed an aptamer immobilized gold atomic cluster mediated, ultrasensitive electrochemical biosensor (Apt/AuAC/Au) for LPS detection without any additional signal amplification strategy. The aptamer self-assemble onto the gold atomic clusters makes Apt/AuAC/Au an excellent platform for the LPS detection. Differential pulse voltammetry and EIS were used for the quantitative LPS detection. The Apt/AuAC/Au sensor offers an ultrasensitive and selective detection of LPS down to 7.94×10^{-21} M level with a wide dynamic range from 0.01 attomolar to 1picomolar. The sensor exhibited excellent selectivity and stability. The real sample analysis was performed by spiking the diluted insulin sample with various concentration of LPS and obtained recovery within 2% error value. The sensor is found to be more sensitive than most of the literature reports. The simple and easy way of construction of this sensor provides an efficient and promising detection of an even trace amount of LPS.

Key words: Endotoxin, Lipopolysaccharide, Septic shock, Au atomic cluster, Aptasensor

1. Introduction