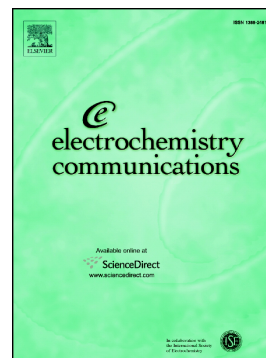


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Mucin 4 detection with a label-free electrochemical immunosensor

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Abstract

Mucin 4 (MUC4) is a useful biomarker for endometriosis and cancers of the pancreas, esophagus and breast. The very first electrochemical immunosensor for the detection of MUC4 is reported, using carbon-based screen-printed electrodes modified by reaction with the diazonium salt of *p*-aminophenylacetic acid. Electrochemical impedance spectroscopy and cyclic voltammetry were used to characterize and optimize the electrografting process. The *in situ* surface modification through diazotation with phenylacetic groups enables the chemical binding of the specific antibody, followed by its affinity reaction with MUC4. The immunosensor was optimized with respect to several parameters and is very promising for clinical applications, having a limit of detection of 0.33 $\mu\text{g mL}^{-1}$ and a linear domain between 1 and 15 $\mu\text{g mL}^{-1}$ obtained by electrochemical impedance spectroscopy measurements.

Keywords: Mucin 4; electrochemical immunosensor; label-free detection; cancer diagnostic

1. Introduction

Mucins are large O-glycoproteins which can be either secreted or membrane-bound, and have been implicated in relation to cancer cell behavior and in the cell signaling pathways associated

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