

## A Conductive Porous Structured Chitosan-grafted Polyaniline Cryogel for use as a Sialic Acid Biosensor

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| <b>Abstract</b>     | <p>A porous conductive supporting material base on chitosan grafted polyaniline (CPANI) cryogel was developed for the fabrication of a sialic acid biosensor. Two enzymes, N-acetylneuraminic acid aldolase (NAL) and pyruvate oxidase (PYO), were employed together with an electrochemical detector. The electron transfer was further enhanced by using multiwalled carbon nanotubes (MWCNTs) and mediated by ferrocene (Fc) entrapped in the cryogel pores wall. A sialic acid derived electroactive product was detected amperometrically in a flow injection system. The fabricated sialic acid biosensor provided excellent analytical performances with a wide linear range of 0.025 to 15.0 mM and a limit of detection of 18 Under the low applied potential of 0.20 V versus a Ag/AgCl, common electroactive interfering compounds such as ascorbic acid, uric acid and pyruvic acid were not detected and they have no effect on the analysis of sialic acid. The fabricated sialic acid biosensor also demonstrated a high stability after up to 100 injections. The reliability of the biosensor to detect sialic acid in blood plasma was in good agreement (<math>P &gt; 0.05</math>) with a standard periodic-resorcinol spectrophotometric method. This easy to prepare conductive and bio-compatible porous structure should be a prospective supporting material for biosensor development. (C) 2014 Elsevier Ltd. All rights reserved.</p> |
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