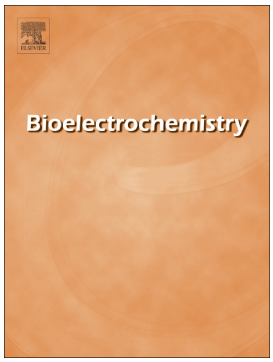

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Electrochemical Antioxidant Screening Based on a Chitosan Hydrogel

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Abstract: A chitosan based hydrogel has been fabricated using silver ions as crosslinking agent. The silver redox behavior in the hydrogel is suppressed due to complexation. However, hydrogen peroxide induced hydroxyl radicals could attract the glucoside bonds and consequently restore the silver redox behavior. This depolymerization also could be suppressed in the presence of antioxidants due to their scavenging property. Therefore, we used this hydroxyl radical induced chitosan depolymerization as an indicator for antioxidant capacity evaluation. Due to the low-cost, portable and without need for electrode modification, we believe the proposed hydrogel sensing platform shows great potential in antioxidants screening application.

Keywords: Antioxidant; Hydrogel; Hydroxyl radical; Depolymerization; Electrochemical sensing

1. Introduction

Human beings have evolved a sophisticated inner system to protect cells and organs against the free radical generated *in vivo*. However, an imbalance between the antioxidant protection system and free radicals could result in oxidative stress, which has been shown to be associated with various chronic disease such as rheumatoid arthritis, neurological degeneration, and even cancer [1]. The study of antioxidants