

Impedimetric aptasensor for the determination of patulin mycotoxin with levan modified electrodes

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Abstract

Mycotoxins are toxic compounds produced by various fungi that grow on a variety of foodstuffs, especially under warm and humid conditions. These toxins can contaminate foodstuffs in the crops or under storage conditions and can pose significant risks to human and animal health if consumed. These mycotoxins can pose a health risk by consuming contaminated cereals, nuts, fruits and spices [1]. Patulin is a mycotoxin produced by fungi belonging to *Penicillium*, *Aspergillus*, and *Byssochlamys* genera. Patulin is most commonly found in apple products such as apples, apple juice and cider, but can also be found in other fruits, vegetables and foods made from them [2]. Patulin causes harmful effects especially on the gastrointestinal system. In addition, animal studies have reported that patulin causes immunosuppression, neurotoxicity and genotoxicity [3]. This mycotoxin is of global concern as it affects food safety, reduces crop yields and has negative economic and health impacts. Therefore, monitoring and controlling mycotoxin levels in foods is very important for the protection of public health. In this study [4], impedimetric aptasensor developed for the determination of patulin. The surface of the pencil graphite electrode was modified with levan and then the patulin-specific aptamer was immobilized on this surface. After the interaction of aptamer and patulin, measurements were performed by electrochemical impedance spectroscopy technique. Various parameters such as aptamer concentration, immobilization time, interaction time were optimized. The selectivity of the developed aptasensor was investigated against fumonisin B1, ochratoxin A and deoxynivalenol. In order to demonstrate the application of the developed aptasensor, patulin determination was carried out in apple juice, limit of determination was calculated and recovery study was performed.

Key words: Patulin, Levan, Aptasensor, Electrochemical impedance spectroscopy, Apple juice

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