

## PÔSTER - BIOSSENSORES / BIOMOLÉCULAS

### OPTIMIZATION OF AN ELECTROCHEMICAL BIOSENSOR FOR SAXITOXIN DETECTION IN WATER

*Renê Santos De Amorim (rsa.ufam@gmail.com)*

*Pablo Cesar Serrano Arambulo (peibol1011@gmail.com)*

*Gisele Elias Nunes (xsele007@yahoo.com.br)*

*Ivan H Bechtold (ivan.bechtold@ufsc.br)*

Saxitoxin is an extremely harmful and naturally produced neurotoxin that is found during water microorganisms/algae bloom season [1]. The Brazilian National Health Surveillance Agency (ANVISA) established a maximum limit of 3.0 µg/L (three micrograms per liter) of this toxin in tap water, showing that even small amounts of this toxin represents serious concern to human Health [2]. Considering the need of constant monitoring of tapwater quality, and looking for cheap, easy-to-use and fast response methods, this work deals with the optimization of an electrochemical biosensor recently developed in our research group using a single-stranded DNA (called aptamer) for specific recognition of saxitoxin in water coupled with electrochemical impedance spectroscopy (EIS) [3], a non-destructive technique used for analysis of interfacial properties. Preliminary studies demonstrated a safe range of working potential (-0.1 and

+0.7 volts when compared with a Ag/AgCl reference electrode), which guarantees the stability of the electrochemical system. Also, that it is possible to obtain a constant baseline value for modified electrodes as long as they are conditioned for a sufficient time in the measurement solutions, allowing aptamers to assume a stable conformation during electrodes building process. Moreover, statistical values of Chi-Square show that the EIS measurements after the time required for equilibration are within ideal conditions for data processing and the tests with different saxitoxin concentrations demonstrated a clear differentiation of signals between the baseline (without toxin) and the signals containing different concentrations.

Acknowledgements: INCT/INEO, Capes, CNPq, FAPESC.

[1] ETHERIDGE, S. M. Paralytic shellfish poisoning: Seafood safety and human health perspectives. *Toxicon*, v. 56, n. 2, p. 108–122, ago. 2010.

[2] BRASIL. MINISTÉRIO DA SAÚDE. Portaria de Consolidação nº 1, de 28 de setembro de 2017 - Consolidação das normas sobre os direitos e deveres dos usuários da saúde, a organização e o funcionamento do Sistema Único de Saúde.

[3] SERRANO, P. C. et al. Electrochemical impedance biosensor for detection of saxitoxin in aqueous solution. *Analytical and Bioanalytical Chemistry*, v. 413, n. 25, p. 6393–6399, out. 2021.