

New Toxicological Approach for the Detection of Tetrodotoxin and their Analogues in PufferFish

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Tetrodotoxins (TTXs) are one of the most potent marine neurotoxins known, being responsible for many poisoning accidents and some fatalities. Until now, more than 30 TTX analogues have been described but their individual implication in poisoning is not clear. In order to evaluate the individual toxicity of five TTX analogues purified from the liver of a toxic pufferfish (*Lagocephalus sceleratus*) caught in Greek waters, a new single-cell biosensing platform based on patch clamp technology has been used. The recording of electrophysiological sodium currents of cells enabled the determination of the Toxicity Equivalency Factor (TEF) of each one of the tested analogues. Additionally, the single-cell biosensing platform proposed in this work was applied to the analysis of different pufferfish tissues, providing composite toxicological responses. Overall, this new biosensing device proved to be useful for toxicological analysis, being promising for their implementation in research and monitoring programs.

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