

## **Ciguatoxins and methods of detection**

Voltage gated sodium channels (VGSC) are the cellular target of ciguatoxins, which cause a food poisoning disease known as ciguatera. Nowadays is a human global disease caused by the consumption of contaminated fish that have accumulated ciguatoxins (CTXs). The algae producers of CTXs were initially found in warmer water but nowadays have spread to European waters. The *in vitro* methods of detection for ciguatoxins, implemented about 30 years ago, are based in a tumoral mice cell line (Neuro 2A). Since CTXs cause the opening of voltage-dependent sodium channels at hyperpolarizing membrane potentials, producing cell membrane depolarization at rest by mainly increasing sodium influx, the Neuro 2A assay must be reconsidered for the detection of ciguatoxins because this cell line has a low expression of VGSCs. In this work, comparing the effect of CTXs in mice and human neuroblastoma cells and in non-tumoral cells expressing the  $\alpha 6$  subunit of sodium channels we conclude that the change in membrane potential is the reliable method to assess the effects of ciguatera toxins by using *in vitro* techniques employing cells with sodium channels. Therefore the *in vitro* methods for detection of ciguatoxins must be re-evaluated since it has been demonstrated that the current methodology did not reflects the real CTXs toxicity. Other methods based on membrane depolarization may be more suitable to assess ciguatoxin cell exposure