

The pathophysiological mechanism of ciguatera

Ciguatera is a form of ichthyosarcotoxism caused by consumption of many species of tropical and subtropical fishes from the Indo-Pacific Oceans and Caribbean Sea that have become contaminated by ciguatoxins, orally effective polyether sodium channel activator toxins that cause characteristic neurological, gastrointestinal and cardiovascular symptoms in humans. Arguably, ciguatera is the most significant form of fish toxicoses in terms of the number and severity of poisoning episodes. The increased harvesting of tropical marine resources together with an increase in incidence, has meant that fish consumption is associated with an increasing incidence of human intoxication, making ciguatera the most common non-bacterial seafood poisoning and a significant health concern globally.

Although it is known that the ciguatoxins are the most potent sodium channel activators known, the effect on the nine known isoforms of human voltage-gated sodium channels has never been assessed. Using cone snail venom-derived peptides, we determined the molecular basis of ciguatoxin-induced sodium channel dysfunction, which is expected to lead to improved treatment approaches for ciguatera.