

Marine Toxins Produced by Marine Dinoflagellates

Takeshi Yasumoto

(Japan Food Research Laboratories, and CREATE in Okinawa, JST)

Marine dinoflagellates produce toxins that enter the food chain and thereby cause food poisoning when toxin-containing fish or shellfish are eaten. The majority of the toxins are lipophilic compounds characteristically having multiple cyclic-ether rings, often aligned in a ladder shape, in the molecules or very long carbon chain backbones bearing many hydroxyl groups. From planktivorous mollusks, we isolated and determined the structures of the dinophysistoxins, pectenotoxins, yessotoxins, and azaspiracids. Benthic dinoflagellate produce ciguatoxins, maitotoxin, and palytoxin analogs named oscitreocins that accumulate in fish. As the red-tide toxins, prymnesins and gymnocins were isolated. We unambiguously determined the biogenetic origins of all toxins. Along with the NMR spectroscopy, the charge remote fragmentation FAB MS/MS played an important role in structural studies. Stereochemical assignments were facilitated by the use of chiral reagents for NMR or fluorescent HPLC.