

Scientific hunch poised to save thousands from toxic fish poisoning

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A neuroscientist at UQ's Queensland Brain Institute has found a way to combat a debilitating illness that affects an estimated 50,000 people a year in tropical regions.

Ciguatera poisoning – which often results in acute nausea, vomiting and painful gastrointestinal episodes – is caused by eating fish that have fed on a micro algae that are toxic to mammals and often associated with large algal blooms known as red tides.

Cases of ciguatera poisoning have been documented for more than 200 years – and were recorded and described by Captain Cook on his second voyage to the Pacific in 1774.

Recently, scientists have discovered that the patented compound brevenal could be used to make an effective treatment for neurotoxic shellfish poisoning (NSP), a condition related to ciguatera poisoning.

Acting initially on a hunch, QBI neuroscientist Associate Professor Fred Meunier hypothesised that brevenal could be adapted to combat ciguatera poisoning.

Simultaneously, and unbeknown to Dr Meunier, Dr Dan Baden at the University of North Carolina Wilmington (USA) was also considering adapting brevenal to fight ciguatera.

The two scientists soon became aware of each other's interest and began



discussing the possibility that the compound active against NSP could have the same therapeutic effect on ciguatera toxins.

Along with Dr Dan Baden, Dr Jordi Molgo (National Center For Scientific Research, France) and Dr Richard Lewis at UQ's Institute for Molecular Bioscience, Dr Meunier pressed on to obtain a small batch of both ciguatera toxin and brevenal to test their hypothesis.

"It now seems that we have found a way of blocking the effect of the ciguatera toxin on sodium channels without affecting their function of propagating the electrical signals in neurons," Dr Meunier said.

One of the main problems with ciguatera is that there are few, if any, effective treatments for the acute impact it has on the health of humans and marine mammals.

"There is one drug available for ciguatera sufferers but a randomised trial conducted by another research group in 2002 found it to be no better than a placebo," Dr Meunier said.

Armed with the knowledge of how the ciguatera toxin affects the body, Dr Meunier and his research collaborators are now looking to develop a drug that will short-circuit the ciguatera toxin's effect in mammals. The process of synthesising and safely delivering the drug for human patients will require extensive trials.

Established in 2003, QBI is dedicated to understanding the molecular basis of brain function and applying this knowledge to the development of new therapeutics to treat brain and mental health disorders.

Citation: "Brevenal inhibits Pacific ciguatoxin-1B-induced neurosecretion from bovine chromaffin cells" – PLoS ONE, 20 October 2008



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