# Exploring the Cross-Reactivity of a Monoclonal Antibody against Tetrodotoxin Analogues

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The implementation of immunoassays in the monitoring of toxins is essential for food safety management and public health protection, being an outstanding bioanalytical tool for its specific, sensitive, rapid and user-friendly intrinsic characteristics. However, their applicability could be questioned considering that the detection principle is based on structural recognition and no toxicological information can be obtained from the analysis. The toxic potential of a sample is product of all the different analogues present, which sometimes have notorious structural differences. For that reason, is important to know which analogues the immunosystem can detect, being the most useful the one able to detect the most toxic ones. With this aim, we evaluated the cross-reactivity of an anti-tetrodotoxin (TTX) monoclonal antibody against different TTX analogues using a competitive magnetic bead-based immunoassay. All TTX analogues have been detected with the immunoassay, but different affinities were observed. 5-deoxyTTX and 11-norTTX-6(S)-ol showed high cross-reactivity while 5,11-dideoxyTTX, 6,11-dideoxyTTX and 5,6,11-trideoxyTTX showed much lower cross-reactivity with the antibody. Considering the toxicity of each TTX analogue, we conclude that the anti-TTX antibody is able to detect the most toxic TTX analogues with high affinity. Therefore, the proposed magnetic bead-based immunoassay is very promising as a bioanalytical tool for TTX risk assessment.