

## Assessment of Specific Binding Proteins Suitable for the Detection of Paralytic Shellfish Poisons Using Optical Biosensor Technology

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Paralytic shellfish poisoning (PSP) toxin monitoring in shellfish is currently performed using the internationally accredited AOAC mouse bioassay. Due to ethical and performance-related issues associated with this bioassay, the European Commission has recently published directives extending procedures that may be used for official PSP control. The feasibility of using a surface Plasmon resonance optical biosensor to detect PSP toxins in shellfish tissue below regulatory levels was examined.

Three different PSP toxin protein binders were investigated: a sodium channel receptor (SCR) preparation derived from rat brains, a monoclonal antibody (GT13-A) raised to gonyautoxin 2/3, and a rabbit polyclonal antibody (R895) raised to saxitoxin (STX). Inhibition assay formats were used throughout. Immobilization of STX to the biosensor chip surface was achieved via aminocoupling.

Specific binding and inhibition of binding to this surface was achieved using all proteins tested. For STX calibration curves, 0-1000 ng/mL, IC<sub>50</sub> values for each binder were as follows: SCR 8.11 ng/mL; GT13-A 5.77 ng/mL; and R895 1.56 ng/mL. Each binder demonstrated a different cross-reactivity profile against a range of STX analogues. R895 delivered a profile that was most likely to detect the widest range of PSP toxins at or below the internationally adopted regulatory limits.