Characterization of Jellyfish Toxins and Their Toxicological Effects on Fish and Insects

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This interdisciplinary project aims to isolate, characterize and test the toxicity potential of jellyfish toxins on fish physiology. During the summer we have optimized the jellyfish nematocyst and toxin isolation protocol. The protocol has been modified from that described in Weston et al. (2013). The modifications consist of increasing the amount of tissue used and removing the non-essential lyophilization step (see new protocol below). We have also collected tentacles for venom extraction from three different species of jellyfish. Two species are native to the coastal Gulf of Mexico and one species is native to the west coast of the USA: *Aurelia* sp. 9, *Chrysaora chesapeakei* and *Chrysaora fuscescens*.

- Collect and transfer jellyfish to plastic bucket containing sea water and transport to lab.
- Once in the lab, remove tentacles and store samples at -80oC until needed.
- Thaw tentacles on ice and gently homogenize using a pestle and mortar in cold SuFi solution (300 mM sucrose containing 50% percoll (Sigma# P1644-100ML) v/v as per Weber et al. (1987)).
- Keep the homogenate at 4oC for 30 minutes and pass it through a stainless steel strainer containing 2 mm sieve.
- Centrifuge the filtrate at 3000 g/10 minutes (at 4oC).
- Remove s/n, the pellet should contain intact nematocysts.
- Reconstitute the pellet in 200 µL of 50 mM of triethylammonium bicarbonate (TEAB) buffer (Sigma# T7408-100ML).
- Disrupt the reconstituted material in a sonic water bath for 15 min.
- Then centrifuge the tubes at 10,000 g for 5 min at 4oC.
- Decant the s/n and reconstitute the residue with 50 uL of TEAB buffer.

References

Weston, A. J., Chung, R., Dunlap, W. C., Morandini, A. C., Marques, A. C., Moura-da-Silva, A. M., ... & Long, P. F. (2013). Proteomic characterisation of toxins isolated from nematocysts of the South Atlantic jellyfish Olindias sambaquiensis. *Toxicon*, *71*, 11-17.