

1. Developing genetic tools for establishing seafood provenance (Strategic Scholarship)

Establishing seafood provenance is becoming increasingly important for the sustainable development of both fisheries and aquaculture industries. Visual identification of a product to species level, or even much higher taxonomic levels, is frequently impossible, particularly after processing either at sea or on land. It is important for the future development of both fisheries and aquaculture industries to establish that product substitution has not occurred and that products do not contain “filler” species (ie contain more than the single named species). Establishing the geographic or population of origin, and making that information available across the supply chain, is also becoming more important to the consumer and the industry. The current revolution in molecular laboratory and sequencing techniques means that a range of methods for establishing seafood provenance are emerging and these promise more rapid assessment than has been possible previously. This project will take advantage of the latest genetic techniques to develop methods for establishing the provenance of key Australian seafood species.

This project will be supported by a scholarship from Food Agility Cooperative Research Centre; a \$150M, 10 year, innovation hub supporting digital innovation in Australia’s agri-foods sector. The scholarship includes a stipend of \$35,000 p.a. for a maximum of 3 years and the project will be supported by up to \$10,000 p.a. operating funds.

The Scholarship is available to both domestic and international applicants wishing to undertake a PhD or Masters by research degree.

For applicants already holding a higher degree by research scholarship from James Cook University, the scholarship may be converted to a top-up of \$10,000 p.a. with \$5,000 p.a. in additional project operating funds.

Applicants are encouraged to contact the Principal Supervisor, Associate Professor Jan Strugnell (jan.strugnell@jcu.edu.au) to discuss their proposal and will then be required to download an application template from Food Agility CRC via <https://www.foodagility.com/researchers-apply>. Applicants should submit the completed application form to scholarships@foodagility.com by no later than Friday 27th September

Scholarships are awarded on the basis of student merit and will be considered on a first-come-first-served basis for applications received up until the closing date. Only one scholarship is on offer.

2. Combating summer mortality in abalone: can a little bit of stress be beneficial?

Summer mortality is a phenomenon that causes mass dies offs of molluscs during the summer months. Summer mortality affected molluscs include many economically important animals including; oysters, mussels, clams, scallops and abalone. The condition occurs in both natural and aquaculture environments and represents a considerable and increasing threat towards aquaculture and fisheries industries world-wide. Genetic factors play an important role in susceptibility and resilience to summer mortality. Recent work by our group has detected significantly different gene expression signatures in abalone that were found to be resilient to summer mortality than those that were found to be susceptible. Some of these genes were found to have antioxidant and immune-related functions.

Research in other marine species shows that inducing a slight stress response ahead of a more significant stressor (e.g. disease or high temperature) can be somewhat protective. This is yet to be explored in a research setting for abalone, either within or between generations, but could provide a useful tool for combating summer mortality events, thereby providing benefits to the aquaculture industry.

This PhD project will employ manipulative experiments carried out within the Marine and Aquaculture Research Facilities Unit (MARFU) at JCU and employ the latest genomic and bioinformatics techniques in order to investigate whether slight stressor(s) can provide a protective effect against summer mortality in abalone and if so what molecular mechanism is responsible.

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