

PhD research project opportunity



Supercharging Aquaculture – cryopreservation for advanced reproductive nutritional techniques



Contact Supervisor: Doctor Leo Nankervis
(<https://research.jcu.edu.au/portfolio/leo.nankervis/>)

Location: James Cook University, Townsville 4814, QLD Australia.

Other Supervisors: Professor Dean Jerry and others see <https://www.jcu.edu.au/arcsta/teams>

PhD (International/Domestic). Applicants will need to apply for a [JCU competitive Research Scholarship](#) and should be familiar with the [Higher Degree by Research Requirements](#).

Project summary

This PhD opportunity is offered within the ARC Industrial Transformation Research Hub for Supercharging Tropical Aquaculture through Genetic Solution. The Project will involve work with three species (pearl oysters, barramundi, and grouper) with an aim to enhance production control in the field of aquaculture through the implementation of cryopreservation techniques. Cryopreservation offers the potential to facilitate 1:1 crosses at different time intervals and enables the production of larval batches without relying on spawning broodstock. While methods for sperm cryopreservation already exist, cryodamage often occurs, requiring the development of cryoprotection methods. On the other hand, preserving fish eggs and embryos has been less successful due to challenges such as ice crystal formation and chilling injuries. Additionally, fish eggs face complications with low membrane permeability, which may be addressed through techniques such as electroporosity, the precise timing of permeability, or optimizing broodstock nutrition. By addressing these challenges, this project aims to optimize cryopreservation techniques for both sperm and eggs, ultimately improving production control in aquaculture.

While these projects are fully funded, student financial support is not available, thus the successful candidates are expected to apply for a competitive Postgraduate Research Scholarship funding offered through James Cook University. Potential candidates preferably should have at least one peer-reviewed scientific publication and demonstrate a high level of academic achievement. Candidates should also demonstrate an interest in aquaculture systems with knowledge and skills in areas such as microbiology, genetic or genomic approaches, animal nutrition, bioinformatics or artificial intelligence and machine learning applications to biological systems. The positions are open to both Australian and non-Australian citizens. Please send inquiries and expressions of interest (cover letter and CV) sta@jcu.edu.au by 20th August 2023.