

PhD research project opportunity



Supercharging Aquaculture – advanced genetic methods for enhanced health and growth



Contact Supervisor: Prof Kyall Zenger (<https://research.jcu.edu.au/portfolio/kyall.zenger/>)

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

Other Supervisors: Professor Dean Jerry, Professor Ron White, Dr Leo Nankervis 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

These PhD projects (four available) are part of The ARC Industrial Transformation Research Hub for Supercharging Tropical Aquaculture through Genetic Solutions which will involve work with four species (pearl oysters, barramundi, seaweed, and grouper) with the aim to apply various genetic and technological approaches to boost productivity of farming, improve breeding outcomes and lower risks associated with disease with key industry partners. The projects will deliver outcomes that include selection of genetic lines for fast growth, product quality and pathogen tolerance, improve hatchery breeding processes, improve biosecurity and lower threat of disease, plus delivering on farm solutions to better understand how the farm environment interacts with the culture species to boost productivity outcomes.

PhD Project 1 & 2 - These PhD projects will specifically investigate the genetic makeup of barramundi and/or pearl oyster aquaculture species with a specific focus on estimating animal performance and optimisation of on-farm breeding program designs. This PhD project is suited to those with a background (or strong determination to advance) in *quantitative genetics and breeding program designs*.

PhD Project 3 - This PhD project will specifically investigate the establishment and validation of Near Infra-Red (NIR) methodology for rapid chemical composition analyses as a non-invasive semi-automated farm product quality evaluation tool on fish flesh and pearl quality traits. This PhD project is suited to those with a background (or strong determination to advance) in *NIR spectroscopy and AI/machine learning*.

PhD Project 4 - This PhD project will specifically investigate the link between animal genetic makeup, diet, gut microbiome and performance under different environmental conditions for grouper and barramundi. This PhD project is suited to those with a background (or strong determination to advance) in *animal nutrition, genetics and host / environment interactions*.

Enquiries to: aquaculture@jcu.edu.au