STRATEGIC PLAN 2022-2026   (POL-001 – V1)

OUR MISSION To transform tropical aquaculture production using the power of genetics

ARC RESEARCH HUB FOR
Supercharging Tropical Aquaculture
THROUGH GENETIC SOLUTIONS

OUR VISION

To conduct innovative research that positions Australian tropical aquaculture companies as world-leaders in the application of genetic solutions that improve long-term productivity and sustainability

OUR PURPOSE

Work collaboratively together to develop the knowledge, processes and tools to conduct world-leading breeding programs and research for tropical aquaculture species.

OUR VALUES

- Collaborative and respectful partnerships
- Scientific integrity
- Open communication
- Commitment to outcomes
- Leadership and stewardship
- Training for the future

STRATEGIES

Breeding for productivity

- ➢ Establish genetic parameters
- ➢ Predict genetic merit
- ➢ AI-assisted phenotype acquisition
- ➢ Optimising breeding program design using genomic prediction
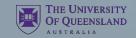- ➢ Genomic resources

Improving aquatic animal health

- ➢ Industrial pathogen testing
- ➢ Point of care diagnostics
- ➢ Advanced reproductive and nutritional techniques

Decode production environments

- ➢ Role of microbiome in production
- ➢ Linking pathogens environment, and host susceptivility
- ➢ AI-assisted predictive analytics

EXPECTED OUTCOMES

Breeding for productivity

- Knowledge of trait genetic parameters for pathogen tolerance, growth and fillet traits, pearl quality, oyster growth and survival, seaweed bromoform concentration (KPI – genetic parameter estimates per species, publications, implementation in breeding program design)
- Estimated breeding values of industry partners broodstock population for commercial traits (KPI EBV's for each species)
- AI and NIR tools to obtain phenotypic records for animal morphological traits, fillet colour, pearl quality and chemical composition traits at industrial-scales (KPI – trained AI and NIR models, IP, publications)
- Evaluated genomic prediction models for determination of genetic merit under different production scenarios (KPI – trained GP models, IP, publications, gEBVs)
- Industry-applicable SNP genomic panels for breeding applications (KPI - # of SNP genomic panels, publications)

Improving aquatic animal health

- Pathogen inoculums and industrial-scale challenge methodologies to deliver genetic basis of phenotypes related for economically important diseases (KPI – # pathogen inoculums, challenge trials conducted, publications)
- Environmental DNA and rapid diagnostics for on-farm detection/quantification of pathogens (KPI – eDNA and on farm detection tests developed, IP, publications)
- Increased understanding of maturation and dietary requirements leading to improved spawning outcomes (KPI – improved maturation diets and processes, IP, publications)

Decode production environments

- Improved understanding of the role and how to manipulate microbiomes to achieve better production outcomes (KPI – publications, IP)
- Better practical knowledge of how dysbiosis occurs in aquaculture species leading to disease (KPI publications)
- AI-assisted tools to prediction likelihood of disease outbreaks based on multiple data input streams (KPI – IP, publications)

TRANSLATION AND INTELLECTUAL PROPERTY

Translation Principles

Researchers and partners will work together in collaborations to develop industry adoptable knowledge, processes and tools that increase the productivity, sustainability and capacity for future growth of partners and academic partners to deliver world-leading research enterprise. Strategies implemented by the ITRH to facilitate translation are:

- Partner-researcher embedment
- Siting research on-farm
- Investing resources dedicated to training targeting translation into industry practice
- Capturing IP and investigating commercialisation options

Intellectual Property Management

Intellectual property and commercialisation will be managed under the three principles agreed to in the Multi-Institutional Agreement.

- Background IP ownership is not affected by the agreement but granted to research parties to extent to deliver the ITRH project.
- Project IP will vest in Admin Organisation but is granted to partners for non-commercial internal business use
- Commercialisation will be agreed in good faith by parties with revenue shares reflecting contributions to IP creation

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Australian Government
Australian Research Council

JCU

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

MainStream AQUACULTURE

agrf
Empowering Australian Genomics

SEA FOREST

The Company ONE

CYGNET BAY
PEARL FARM