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From the Subprogram Leader

2019 FRDC Cairns Conference

The 5th FRDC Australasian Aquatic Animal Health & Biosecurity Scientific Conference was held in Cairns, 8-12 July 2019. There were 98 registrants including three keynote speakers:

- **Prof Hong Liu**, State Key Laboratory of Aquatic Animal Health, Shenzhen, Guangdong, PR China, Member of the OIE Aquatic Animals Commission
- **A/Prof Timothy Dempster**, Department of Biosciences, The University of Melbourne, Victoria, Australia
- **Prof KC Han-Ching Wang**, Department of Biotechnology & Bioindustry Sciences, National Cheng Kung University, Tainan, Taiwan

In addition to the keynote presentations there were 52 other presentations conference program in sessions covering various aspects of aquatic animal health management, Pacific Oyster mortality syndrome, yellowtail kingfish, mollusc health, white spot syndrome virus, finfish health, various aspects of biosecurity, finfish immunology and vaccines.

Conference Proceedings have been distributed to all conference registrants.

Thank you to all those that supported the conference this year and congratulations to the winners of the student awards.

Feedback from participants at the conference was extremely positive. Thank you for your opinions. While the vast majority were very supportive of the location (Cairns) and venue there were some that thought a change would be good. There were also mixed views concerning the future inclusion of a poster session. Other concerns included the room



2019 FRDC Australasian Aquatic Animal Health & Biosecurity Scientific Conference student award winners

layout and the quality of the projection. A summary of the feedback on the conference is provided at the end of this newsletter.

For further information about the conference, please contact the conference coordinator, Joanne Slater (joanne.slater@csiro.au).

Finally, please note the announcement about the **Aquatic Animal Health Technical Forum** on page 2 of the newsletter.

STC/SAC Meetings

The AAHBS met in July and March. Items for discussion included:

- Review of R&D Expressions of Interest
- Review of R&D full applications
- Review of Aquatic Animal Health Training Scheme applications

Subprogram Website

Our website is located on the FRDC site and can be accessed directly under:

<http://www.frdc.com.au/en/partners/national-priorities-and-subprograms/aquatic-health-and-biosecurity>

There you can view this issue and all previous issues of *Health Highlights* - in addition to finding other information about the FRDC Aquatic Animal Health & Biosecurity Subprogram. For Final Reports see:

<http://www.frdc.com.au/Research/Final-reports>

Please contact FRDC if you have problems with this website.

Announcements

Aquatic Animal Health Technical Forum

8th Aquatic Animal Health Technical Forum and Workshop

Date: 17-19 June 2020

Host: Department of Agriculture & Fisheries, QLD

Venue: Biosecurity Sciences Laboratory, Health and Food Sciences Precinct, Coopers Plains

Background

The AAHTF training workshops play an important part in developing the aquatic animal health network.

Workshops are targeted at new and emerging technical staff working in aquatic animal health, including on-farm industry staff.

The workshops provide participants with the opportunity to exchange information with other attendees who have expertise and experience in aquatic animal health.

Participants have the opportunity to present work and participate in discussions about relevant cases/research/technologies in a less formal atmosphere than at a larger scientific conference.

Currently, in Australia there are only a relatively small (but growing) number of experienced aquatic animal health specialists with well-developed skills and knowledge. With aquaculture expanding in Australia, transferring these vital skills and knowledge to a new generation will be of benefit to the aquatic animal health sector and aquatic animal industries in Australia.

Further Information: contact Nette Williams

Email: lynette.williams@csiro.au

Aquatic Animal Health Technical Forum is supported from funding by the FRDC on behalf of the Australian Government

Newsletter submissions

The Aquatic Animal Health & Biosecurity Subprogram welcomes contributions to *Health Highlights* on all aquatic animal health & biosecurity R&D news and events – both within and outside the FRDC. We aim to assist with the widespread exchange of information by including any of the following in each annual edition: project updates,

milestone reports, final reports, research papers, project communication and extension outputs, info sheets, and letters to the editor. Announcements of conferences, workshops, meetings, job vacancies etc. are also welcome.

Mailing list

Health Highlights is distributed biannually to stakeholders via email as well as being posted on the FRDC website at:

<http://www.frdc.com.au/en/partners/national-priorities-and-subprograms/aquatic-health-and-biosecurity>

To change contact details or to ensure inclusion on the *Health Highlights* mailing list, please contact Joanne:

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Completed Project Summaries

Project No. 2016/011: Aquatic Animal Health Subprogram: Disinfection measures to support biosecurity for ISKNV at aquaculture facilities (PI: Joy Becker)

Objectives

Identify effective disinfection measures to support biosecurity for ISKNV at aquaculture facilities

Summary

Megalocytiviruses are a group of closely related viruses that cause mass mortalities in both marine and freshwater aquaculture. They are of global importance as some (viz. red sea bream iridovirus) are listed by the World Animal Health Organization (OIE). They are difficult to control as they infect over 125 fish species and individuals can be carriers for life with sporadic disease events resulting in considerable losses at farms. This project was developed by the University of Sydney following consultation with Australian Government Department of Agriculture, relevant state agencies dealing with aquatic biosecurity and from advice received from native fish and ornamental fish aquaculture producers. Research has shown that

imported ornamental fish are a pathway for *Megalocytivirus* to enter Australia. There was a critical need to develop practical and efficacious disinfection protocols for recirculating aquaculture systems. We used ISKNV freshly amplified *in vivo* at low passage to evaluate eight disinfection procedures using a bioassay with Murray cod (*Maccullochella peelii*) as a sensitive test for infectious virus. The six disinfection protocols that produced negative bioassays and were considered effective are described. Further, it was demonstrated that ISKNV remained infectious in aquarium water (void of fish) at 25°C for at least 48 hours. Recommendations have been made to revise operational and disease strategy manuals as part of AQUAVETPLAN and an awareness program for increased reporting of mortality events at ornamental fish aquatic facilities for emergency disease response. The research findings will be used by biosecurity regulators and farm managers for disinfection efficacy data specific for ISKNV. These virus specific data enable interpretation of disinfection guidelines for the prevention and control of disease caused by ISKNV.

Keywords

biosecurity, disinfection, emergency disease response, exotic pathogen, *Megalocytivirus*, *Infectious spleen kidney and necrosis virus*, ISKNV, red bream iridovirus, RSIV, ornamental fish, Blue gourami, *Trichopodus trichopterus*, Dwarf gourami, *Trichogaster lalius*, Murray cod, *Maccullochella peelii*, barramundi, *Lates calcarifer*

Progress Summaries for Active Projects

Project No. 2014/002: Aquatic Animal Health Subprogram: Development of stable positive control material and development of internal controls for molecular tests for detection of important endemic and exotic pathogens (PI: Nick Moody)

Objectives

1. Produce quantified synthetic RNA positive control material for conventional and real-time RT-PCR assays, available on request.
2. Produce quantified plasmid DNA positive control material for conventional and real-time RT-PCR assays, available on request.
3. Optimised universal internal control based on plant viral RNA and DNA and/or species-specific genes for use in molecular assays developed and implemented.
4. Technology transferred and adopted by participating laboratories.

Progress: Draft final report is in preparation.

Project No. 2016/404: Aquatic Animal Health and Biosecurity Subprogram: Strategic planning, project management and adoption (PI: Mark Crane)

This project commenced 1 July 2016 and will continue until 31 August 2020.

Objectives

1. Manage a portfolio of R&D projects that are directly concerned with aquatic animal health & biosecurity and are not managed by other FRDC subprograms, FRABs or IPAs
2. In consultation with key stakeholders (industry, government and aquatic animal health providers) develop strategic directions for R&D
3. Facilitate the dissemination of outputs (information and results) from R&D projects to key stakeholders

Project No. 2015/001: Aquatic Animal Health and Biosecurity Subprogram: Bonamiasis in farmed Native Oysters (*Ostrea angasi*) (PI: Tracey Bradley)

Objectives

1. Obtain nucleic acid sequence and compare with other, described *Bonamia* sp. and determine their taxonomic relationship and ensure that available diagnostic tools are suitable.
2. Improve understanding of Bonamiasis infestations in Native Oysters including the determination, under controlled conditions, of the stressors that induce clinical disease in sub-clinically infected oysters.
3. Develop a biosecurity plan and farm management practices to manage the risk of infestation and the mitigation of clinical infection with *Bonamia* sp.

Progress: Final report is in review.

Project No. 2015/003: Aquatic Animal Health and Biosecurity Subprogram: Development of standard methods for the production of marine molluscan cell cultures (PI: Andrew Read)

Objectives

1. Describe standard methods for the development and storage of marine molluscan cell cultures.
2. Production and characterisation of molluscan cell cultures.
3. Examination of resultant cell cultures for the ability to sustain growth of endemic molluscan viruses and protozoa.
4. Examination of resultant cell cultures for the ability to sustain growth of exotic molluscan viruses and protozoa.

Progress: Final report is due.

Project No. 2017/117: Aquatic Animal Health and Biosecurity Subprogram: Identification of differentially expressed innate immune genes in the New Zealand paua (*Haliotis iris*) and the Australian hybrid abalone (*H. laevigata* X *H. rubra*) upon immersion challenge with the abalone herpesvirus-1 (HaHV) (PI: Serge Corbeil)

Objectives

1. Define the time-line of an anti-viral response in the paua and Australian hybrid abalone for the first time, utilising real-time PCR, and a set of known anti-viral effector genes.
2. Through mRNA sequencing and genomic analysis, identify early genes expressed in paua and Australian hybrid abalone upon HaHV immersion challenge.
3. Establish an immune signature in the early response of the host to the virus that differs between the paua and Australian hybrid abalone, to determine key immune players in HaHV resistance.

Progress: Draft final report is in review.

Project No. 2018/144: Aquatic Animal Health and Biosecurity Subprogram: Aquatic Animal Technical Forum and Training Workshops (PI: Nette Williams)

Objectives

1. Source workshop venues, in various States and Territories, that have aquatic animal health capability or services and can accommodate the group size.
2. Organise all aspects of conducting the workshops including, advertising through *Health Highlights* subscription and peer referrals, guest presenter, presentation program, field trips and practical sessions, accommodation and catering.
3. Encourage new and emerging science and production staff to attend the AAHTF and to gain experience in making presentations.
4. Continue to up-date the contact list and email distribution list/group for continued information exchange.
5. Reports and financial acquittals prepared according to milestone schedule.

Progress:

The first training workshop scheduled for this project took place at the Department of Primary Industries, Parks, Water and Environment's Aquatic Animal Health Laboratory and Centre of Excellence in Aquatic Animal Health & Vaccines, Launceston, Tasmania, 6-8 March 2019. There were 22 participants from Commonwealth and State laboratories, universities, regulatory agencies and industry (from ACT, NSW, QLD, SA, TAS, VIC, WA and New Zealand).

Milestone Progress Report has been approved.

New Projects

Project No. 2018/147: Aquatic Animal Health and Biosecurity Subprogram: Diagnostic detection of aquatic pathogens using real-time next generation sequencing (PI: David Cummins)

Objectives

1. Evaluate if MinION data meets or exceeds the data obtained using established laboratory-based NGS platforms. Objectives (1) and (2) align with Methods section (1). The first objective of this project is to demonstrate if the MinION can obtain quality genome assemblies of known pathogens, such as WSSV, AHPND, OsHV-1 and HaHV that have been created using existing NGS technology. Moreover, determine if the MinION is capable of producing a diagnostic result more rapidly and with greater confidence than traditional techniques. STOP/GO POINT: If MinION data does not produce reliable genome assemblies, no improvement in genome quality, or is significantly more laborious to set-up/run or analyse than existing NGS technologies, do not proceed with objective 2.
2. Evaluate the performance of the MinION using existing diagnostic extraction techniques and produce robust methods and protocols for sample preparation, sequencing and data analysis. This objective will optimise MinION protocols for sample pre-processing, optimal sequencing conditions, and data post-processing. We will then evaluate the MinION data produced from a range of aquatic organisms against data produced using traditional techniques from the same samples. STOP/GO POINT: If after these optimisations, the MinION cannot detect pathogens as reliably as traditional techniques, do not proceed with objective 3.
3. Compare the applicability of MinION to standard molecular assays for identification of pathogens in diagnostic samples. Objective (3) is aligned with Methods section (2). In this objective, diagnostic samples will be tested using existing diagnostics tools (qPCR, cPCR) and MinION sequencing. Analysis between the methods will be detailed, including time to result, pathogen identity and genomic information. This objective will not only provide an insight into real-time sequencing for diagnostics, but in addition the feasibility of MinION technology for field application in the future.

Progress: First milestone progress report due March 2020.

Summary of Active Projects

Project No.	Project Title	Principal Investigator
2014/002	AAHS: Development of stable positive control material and development of internal controls for molecular tests for detection of important endemic and exotic pathogens (<i>Associated species</i> : multi-species)	Dr Nick Moody CSIRO AAHL Fish Diseases Laboratory Phone: 03 5227 5749 Email: nick.moody@csiro.au
2015/001	AAHS: Bonamiasis in farmed native oysters (<i>Ostrea angasi</i>) (<i>Associated species</i> : <i>Ostrea angasi</i>)	Dr Tracey Bradley Dept Economic Development, Jobs, Transport and Resources - Victoria Phone: 03 9217 4171 Email: tracey.bradley@ecodev.vic.gov.au
2015/003	AAHS: Development of standard methods for the production of marine molluscan cell cultures (<i>Associated species</i> : multi-species)	Dr Andrew Read Elizabeth Macarthur Agriculture Institute Phone: 02 4640 6332 Email: andrew.j.read@dpi.nsw.gov.au
2015/005	AAHS: Determining the susceptibility of Australian <i>Penaeus monodon</i> and <i>P. merguensis</i> to newly identified enzootic (YHV7) and exotic (YHV8 and YHV10) Yellow head virus (YHV) genotypes (<i>Associated species</i> : <i>Penaeus monodon</i> , <i>P. merguensis</i>)	Dr Nick Moody CSIRO AAHL Fish Diseases Laboratory Phone: 03 5227 5749 Email: nick.moody@csiro.au
2016/404	AAHBS: Strategic planning, project management and adoption (<i>Associated species</i> : multi-species)	Dr Mark Crane CSIRO AAHL Fish Diseases Laboratory Phone: 03 5227 5118 Email: mark.crane@csiro.au
2016/009	AAHBS: <i>Perkinsus olseni</i> in abalone - development of fit-for-purpose tools to support its management (<i>Associated species</i> : <i>Haliotis</i> spp.)	Dr Cecile Dang Department of Fisheries – WA Phone: 08 9363 4825 Email: Cecile.Dang@agric.wa.gov.au
2016/013	AAHBS: Comparative pathogenicity of exotic AHPND and the presumptive bacterial hepatopancreatitis detected in farmed <i>Penaeus monodon</i> in Queensland (<i>Associated species</i> : <i>Penaeus monodon</i> and <i>P. merguensis</i>)	Dr Nick Moody CSIRO AAHL Fish Diseases Laboratory Phone: 03 5227 5749 Email: nick.moody@csiro.au
2017/117	AAHBS: Identification of differentially expressed innate immune genes in the New Zealand paua (<i>Haliotis iris</i>) and the Australian hybrid abalone (<i>H. laevigata</i> X <i>H. rubra</i>) upon immersion challenge with the abalone herpesvirus-1 (HaHV) (<i>Associated species</i> : <i>Haliotis</i> spp.)	Dr Serge Corbeil CSIRO AAHL Fish Diseases Laboratory Phone: 03 5227 5254 Email: s.corbeil@csiro.au
2017/190	AAHBS: Assessment of gamma irradiation as a feasible method for treating prawns to inactivate White Spot Syndrome Virus (<i>Associated species</i> : <i>Penaeus</i> spp.)	Dr Stephen Wesche Biosecurity Queensland Phone: 07 3087 8086 Email: stephen.wesche@daf.qld.gov.au
2018/144	AAHBS: Aquatic Animal Technical Forum and Training Workshops (<i>Associated species</i> : multi-species)	Nette Williams CSIRO AAHL Fish Diseases Laboratory Phone: 03 5227 5442 Email: lynette.williams@csiro.au
2018/147	AAHBS: Diagnostic detection of aquatic pathogens using real-time next generation sequencing (<i>Associated species</i> : multi-species)	Dr David Cummins CSIRO AAHL Fish Diseases Laboratory Phone: 03 5227 5777 Email: david.cummins@csiro.au

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**5th FRDC Australasian Conference on Aquatic Animal Health & Biosecurity
Cairns, 10-14 July 2019**

Feedback Summary

ITEM	Excellent	Good	OK	Poor
Location (Cairns) • Other suggestions	27	5	1	1
Venue (Reef Hotel) • Other suggestions	28	5	1	
Dates (in July) • Other suggestions	21	6	4	1
Format • 3x 45 min keynote presentations • Special industry presentations • 20 min presentations • Need for posters? • Need for concurrent sessions? • Approx. 20-min breaks • Approx. 45-min lunch break • Other suggestions	21 2 2 2 1 1	12 1 1 2 1 2		2 1
Conference room layout • Round tables • Two screens • Other suggestions	17	10	2	3
Program session topics • Other suggestions	15	7	3	
Length (4 days) • Free afternoon (Wed) • Dinner on last night • Other suggestions	21	8	1	1
Keynote speakers Suggestions for 2021?	9	5		
Abstract format (1 page)	24	8		
Abstract book (electronic only)	22	9	1	
Registration fee value \$500 (\$150 for students) • Other suggestions	19	13	1	