

Cecilia Pascelli

April 2017

VOLUME 13, ISSUE 1

Congratulations!

We have the pleasure of welcoming our newest 2017 AIMS@JCU PhD scholarship holders into the AIMS@JCU family. We wish them all success in their research endeavours: [Paul O'Brien](#) (supervisors: Drs David Bourne and Nicole Webster), [Mikaela Nordborg](#) (supervisors: Drs Andrew Negri, Michael Oelgemoeller and Oleg Makarynsky), [Marina Santana](#) (supervisors: Drs Frederieke Kroon, Lynne van Herwerden and Cherie Motti) and [Luke Morris](#) (supervisors: Drs Line Bay, David Bourne, Andrew Baird). Look out for their profiles in this and subsequent AIMS@JCU newsletters.

The response to the latest round of AIMS@JCU competitive grants and prizes was overwhelming – in a good way! AIMS@JCU is very pleased to announce that a record number of awards were granted this year, with four Australian Marine Sciences Association memberships being awarded ([Stacy Bierwagen](#), [Vanessa Haller](#), [Jose Montalvo Proano](#) & [Josephine Nielsen](#)); eleven students were awarded Science Communication Awards to support attendance at a conference or institution to complete collaborative research ([Stacy Bierwagen](#), [Leela Chakravarti](#), [Blanche D'Anastasi](#), [Vanessa Haller](#), [Michael Jarrold](#), [Felicity Kuek](#), [Sam Matthews](#), [Cecilia Pascelli](#), [Blake Ramsby](#), [Molly Scott](#) and [Hillary Smith](#)) and seven students were awarded Pilot Research Awards ([Leela Chakravarti](#), [Lachlan George](#), [Felicity Kuek](#), [Natalie Levy](#), [Michaela Miller](#), [Prashant Nair](#) and [Hillary Smith](#)).

CONTENTS

| | |
|--|---|
| Acting Research Director profile | 2 |
| Homeward Bound | 3 |
| Pilot Research Award report | 4 |
| 2017 PhD Scholarship award recipient profile | 5 |
| Deadly Science Getaway program | 6 |
| Where are they now? | 7 |
| Acting Research Director's report | 8 |

Photographs in this publication were submitted by AIMS@JCU members unless otherwise stated

About the AIMS@JCU Newsletter:

This newsletter is produced quarterly and distributed by email to AIMS@JCU members, AIMS and JCU staff.

If you'd like to be added to our mailing list, or have a query regarding this newsletter, please contact:

Editor: Lauren Gregory
Email: aims@jcu.edu.au

Acting Research Director

Dr Cherie Motti



Cherie graduated with a chemistry major from the University of New England in 1991 and moved to Griffith University where she completed a PhD in marine natural products chemistry in 1996. She spent one year as a postdoctoral fellow at the

Queensland Pharmaceutical Research Institute developing a keen interest in marine drug discovery. During this time Cherie and her husband Stephen accepted a unique opportunity in the family surveying business at which point she put away her lab coat and safety glasses and moved to Townsville. After a four year hiatus from science, and a chance meeting with fellow natural products chemists from AIMS, Cherie joined the team on a short term contract ultimately accepting a research position in 2001. Cherie was instrumental in establishing the Biomolecular Analysis Facility (BAF) at AIMS and since 2006 has managed the facility and trained countless students in the art of chemical isolation.

Cherie has authored over 75 peer reviewed publications many of which showcase the scope of research possible using the techniques and instrumentation available in the BAF. Her research uses spectroscopic techniques to investigate the role of chemical signalling in the establishment of symbioses (ie between coral host, zooxanthelle and other microbes), in coral recruitment (ie coral larval settlement cues from crustose coralline algae) and in disease and stress response (ie metabolomic profiling of healthy and compromised marine organisms). More recently she has fostered a number of inter-disciplinary collaborations ranging from detection of photocatalytic degradation products of sunscreens; to identification of compounds responsible for behavioural responses in Crown-of-Thorns Starfish (towards a control technology); to chemical characterisation of microplastics from marine sources.

Cherie is passionate about promoting awareness and understanding of marine chemistry in the general public; as such she often has groups of high school students dancing in the lab! Cherie operates an open door/open lab policy so please drop by the BAF lab at AIMS or the AIMS@JCU office on Wednesdays and say hi.

Contact: c.motti@aims.gov.au

Gerard Ricardo

Homeward Bound

Adriana Humanes

Last year I successfully completed my PhD on the combined effects of water quality and temperature on the early life history stages of the broadcast spawning coral *Acropora tenuis*. As part of my AusAid scholarship, it was mandatory for me to return home for at least two years. Coming back to Venezuela after living in beautiful Townsville was not an easy task, and I never imagined it would be harder than doing my PhD! I was not prepared to see the levels of poverty and hunger, due to the economical and humanitarian crisis that my country is facing since I left 4 years ago.

However, my PhD training has given me tools to see problems from a different perspective and seek for solutions. Seeing the circumstances of my country, I decided to do something about it. This prompted me to apply to the second edition of the Homeward Bound Leadership Training Program. I was selected, being the first Venezuelan to join the international team of 78 researchers and the only representative of the Caribbean Region, an area of great importance for its fishing resources and coral reefs.

This Program uses creative approaches to train professional women who investigate the causes and consequences of climate change. The objective of the Program is to give researchers, with leadership potential, innovative tools with which they can influence the design of policies and actions for a sustainable management of our natural resources. For one year, the Program will provide individual coaching, leadership training and the development of various projects related to the effects of climate change. At the end of this training phase, all participants will meet on a 3-week Antarctic expedition under the guidance of a group of experts in strategic planning and climate change communication.



Participating in this Program is important for me because it will allow me to collaborate with world leaders in environmental conservation on projects focused on reducing the effects of human activities on climate change. The Program covers 60% of the cost of my participation, and I need to raise the remaining funds (US\$ 16,000). Raising funds from within Venezuela is a real challenge for me, since the currency exchange control established in 2003 by the government seriously limits Venezuelans to obtain

Gerard Ricardo

Homeward Bound

Adriana Humanes continued

any kind of foreign currency. However, thanks to resources such as the internet and social media I was able to start a fundraising campaign outside my country. This allows me to speak up on an international stage, creating awareness for the need of supporting initiatives like this one to empower women scientists.

This Program will not only change my life, but most importantly it will change the world.

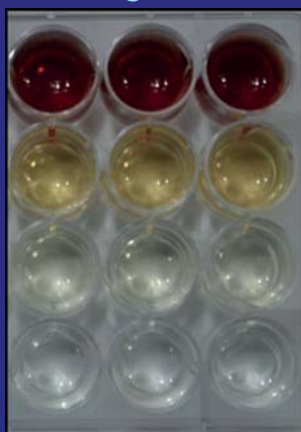
More information about me and my fundraising campaign visit: www.adrianahumanes.com

Pilot Research Award report

Danilo Malara

Recently, Advanced Oxidation Processes (AOPs) using singlet oxygen ($^1\text{O}_2$) to sterilise water have been developed as powerful water treatment methods. My project further investigates AOPs using porphyrins as photosensitisers.

Marine algae are considered to be carriers of pathogens in aquaculture waters. The main aim of my project is to produce gnotobiotic microalgae cultures (microalgae with a controlled cohort of bacteria) using cationic porphyrins (TMPyP). The cationic porphyrin should ideally kill the bacteria and not the microalgae, however, their effect on microalgae has not yet been tested. Dose-response assays are essential to test the sensitivity of the photosynthetic microalgae to porphyrins before the addition of a bacterial culture.



Thanks to AIMS@JCU I was able to conduct a series of complex toxicology experiments using five species of microalgae of high commercial aquaculture value. Results demonstrate that the sensitivity of the microalgae to these porphyrins is species

specific. Therefore, selecting more porphyrin-resistant species increases the likelihood of obtaining gnotobiotic cultures. I have now applied this method to a mixed culture of microalgae and bacteria, and have been able to successfully maintain gnotobiotic cultures.

Contact: danilo.malara@my.jcu.edu.au

Tiffany Sih

2017 PhD Scholarship recipient

Mikaela Nordborg

Mikaela was awarded her Bachelor of Science from the University of Gothenburg, Sweden, in 2011. Her Bachelor thesis focused on the effects of projected temperature increases and ocean acidification on the calcium content of developing eggs and early pelagic larvae of the Norway



lobster, *Nephrops norvegicus*. Mikaela has a background in the scuba diving industry, has worked as a research technician both in Sweden and Australia and assisted during coral spawning related research at AIMS since 2015. She is currently completing her Master of Science thesis on the cumulative effects of petroleum hydrocarbons and ultraviolet radiation on larvae of the reef building corals *Acropora millepora* and *A. tenuis* at AIMS through the University of Gothenburg.

She will commence her PhD in June under Drs. Andrew Negri (AIMS), Michael Oelgemoeller (JCU) and Oleg Makarynsky (AIMS). Her project, Petroleum hydrocarbon ecotoxicology for coral reef risk assessments, focuses on the cumulative effects of petroleum hydrocarbons and other stressors on tropical reef organisms aiming to provide more comprehensive and appropriate information for use in hydrocarbon risk assessments. The project will involve development of experimental systems suitable for exposing reef organisms to hydrocarbons, the production of toxicity thresholds for key reef species and identification of hydrocarbon mixtures or compounds that pose significant risks. For the final part of her PhD she will incorporate the information acquired during the first years of the project into oil spill models. Majority of risk assessments related to petroleum hydrocarbons in use today are based on data from temperate species and ecosystems. Results generated from this research project could be used to evaluate the risks associated with an array of activities and provide decision makers with information that is appropriate for tropical reef ecosystems.

Contact: m.nordborg@aims.gov.au mikaela.nordborg@gmail.com

Danilo Malara

Deadly Science Getaway

Blance D'Anastasi

Congratulations to AIMS@JCU PhD student Blanche D'Anastasi, who recently won the Layne Beachley Aim For The Stars Foundation scholarship for her program, Deadly Science Getaway. For the past three years, her grassroots program has taken Indigenous girls from remote communities in North Queensland to the JCU research station on Orpheus Island to spend time with mentors learning about career pathways, science-based opportunities, art, creativity and gaining science communication skills.



This scholarship will allow Blanche to take Deadly Science to Western Australia, where participants will experience a range of activities including snorkelling on stromatolites, flying quadcopters and sharing cultural and ecological knowledge with local people.

The Deadly Science Getaways project will involve a new collaboration between NACC, Bush Heritage Australia, Scinapse and James Cook University. It will be conducted in the Abrolhos Islands and Guthurraguda, aimed at helping to inspire young women to reconnect with country, while learning more about science.

For more information, visit:

<http://www.abc.net.au/news/2017-03-03/deadly-science-program-heads-to-wa-thanks-to-grant-from-surfer/8318120>
and <http://www.nacc.com.au/deadly-news-deadly-science/>

Contact: blanche.danastas@gmail.com

Kathryn Berry

Where are they now?

Amin Mohammed Esmail



Amin finished his PhD in November 2016 after completing 4.5 years working with Prof David Miller, Prof Bette Willis and Dr David Bourne. Amin has just commenced a postdoctoral position at CSIRO. He is working closely with Dr James Kijas, within the Aquaculture Genetics and Phenomics and Computational and Systems Biology groups in CSIRO Brisbane.

During his PhD at James Cook University, Amin was interested in understanding onset of coral-*Symbiodinium* symbioses at the molecular level. Engineering coral symbioses towards more coral thermotolerance and reef resilience can be of a great benefit to coral reef conservation. Consequently, understanding the process of symbiont infection (uptake) is crucial for better/ effective reef management. Amin's work led to the discovery of the fine-tuned molecular events during *Symbiodinium* infection. The work described candidate genes and pathways in *Acropora digitifera* operating during symbiont infection. The work also found evidence to support that the symbiosome is made by arresting the phagosome maturation (a process that leads to killing invading microbes). This work was recently published in *Molecular Ecology* and was the first step in trying to answer his main question, if *Chromera* (newly-discovered apicomplexan-related alga) is a symbiont or a parasite in corals? Amin compared the response of corals to symbionts and *Chromera*. He found that the response of corals to *Chromera* was fundamentally different to those infected with symbionts but was similar to responses observed by vertebrates to parasites and pathogens. Amin has also generated other transcriptomic data sets from another coral and its compatible symbiont that hopefully will provide more insights into the responses of both host and symbiont during early interaction.

Amin will apply some of the skills developed during his PhD studies to investigate traits in Atlantic salmon that negatively impacts their aquaculture. The project aims to provide mechanistic insights (using transcriptomics and whole genome sequencing) into the triggers for unwanted early sexual maturation in Atlantic salmon. This research has the potential to provide solutions to

Gerard Ricardo

Where are they now? continued

overcome this important production issue and to advance the salmon industry.

Amin thanks AIMS@JCU for his top-up scholarship and travel awards. These gave him the opportunity to present, discuss and more widely promote his research.

Contact: Amin.Esmail@csiro.au

Acting Research Director's Report

This year has started on an unexpected note with our indomitable Research Director Libby taking extended leave due to illness. As such it is with some trepidation but also gusto that I take on the role of AIMS@JCU Research Director – knowing that Lauren and Melissa are the nerve-centre. I've worked closely with Libby for many years at AIMS and it is a privilege to be able to support her during this challenging time. I would like to take this opportunity on behalf of all AIMS@JCU staff and students to wish Libby a speedy and full recovery. Our thoughts are with you.

One of my first (and most pleasant) duties was to represent AIMS@JCU at the JCU graduation ceremony held on the 8th March. It is with great pleasure that I congratulate AIMS@JCU's newest graduates ([Dr Kristen Anderson](#), [Dr Elodie Lédée](#), [Dr Martino Malerba](#), [Dr Amin Mohamed Esmail](#), [Dr Kate Quigley](#), [Dr Melissa Rocker](#)) who were awarded their PhDs and welcome them into the AIMS@JCU alumni. Congratulations also to [Dr Catalina Aguilar Hurtado](#) and [Dr Adriana Humanes](#) who both graduated in absentia in December 2016.

Well done to all of the award winners mentioned on the first page of this newsletter and I look forward to hearing more about your research at the annual AIMS@JCU Seminar Day! My office door is always open (at both AIMS and JCU) so please do not hesitate to drop in, say Hi and share your thoughts (or any issues you may be having)!

Cherie Motti, AIMS@JCU Acting Research Director

Contact: c.motti@aims.gov.au

Kathryn Berry