

NEWSLETTER

Volume 26 No. 2 June 2015

ABORATORY



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Dear Members,

Welcome to the June Edition of the ASP Newsletter. How time flies!

This newsletter features 2015 Conference news, including the Marine Parasitology & Aquaculture Tribute to Ian Whittington, featuring Andy Shinn (Fish Vet Group Asia, Thailand) as the Symposium speaker, Invited ASP lecturers, welcome to the new UP editor, ASP Concepts in Parasitology 2015 course, Brian Cooke at Science Meets Parliament, the wrap-up/final report of our ASP-Inspiring Australia grant, grant news, and ASP state news.

The 2015 ASP/NZSP meeting is almost here. This meeting will be held between 29 June and 2 July in Auckland. There have been 126 abstracts submitted, 196 registrations to date, and 64 ASP Student Conference Travel Awards. The final program is now available online (https:// www.conftool.net/parasitology2015/ sessions.php) and includes a numerous talks of interest by key expert international and national speakers on protozoan and metazoan parasites of veterinary, wildlife, marine medical significance. The ASP has awarded Invited Lectureship Travel Grants to Eric Hoberg and Ray Kaplan. Other highly respected international and national speakers invited speakers include Jetsumon Prachumsri, Ivo Mueller, Adele Lehane, David Piedrafita, Louise Jackson, Valery Combes, Andy Shinn, Stephanie Godfrey, Paul Giacomin and Shelley Walton.

On behalf of the Society, I want to thank Lisa Jones (Conference Coordinator) and Nick Smith (ASP Netwok Covenor) for organizing this conference; as well as Victoria Chapman, Ian Scott and Tania Waghorn of the local Organising Committee (NZSP) . Many thanks for your major efforts. I also acknowledge the generous support of Elsevier Parasitology,



the International Journal for Parasitology, IJP:DDR, IJP:PAW, Virbac, Bayer Animal Health, Zoetis, New Zealand Veterinary Pathology Ltd, Elanco, Gribbles Veterinary, Merial, PGG Wrightson and New England BioLabs Inc, who are supporting this conference.



The organization of the International Congress of Tropical Medicine and Malaria 2016, to be held in Brisbane in September 2016, is well underway and an enormous amount of effort has gone into fund raising, coordination, attracting sponsors and speakers, etc.. This Congress will be co-hosted by the ASP and the Australasian Society of Infectious Diseases and planning and fundraising are "full steam ahead". Sincere thanks to Mal Jones, Denise Doolan, Kathy Andrews and many others for their efforts.

In other news, in the past months, major efforts have gone into consolidating the ASP Parasitology Course (Concepts in Parasitology), with sub-committees shaped

From the President's desk continued

for course content and management. Alex Maier is the Course Convenor and is on ASP Council as a non-voting member. The Course Content sub-committee consists of Una Ryan, Stuart Ralph, and Rob Adlard. The Management sub-committee still consists of Denise Doolan, Aaron Jex, Nick Smith, Lisa Jones and Robin Gasser. After the great success of the course in 2014, planning is underway for the second course in November 2015. Course and budget reviews have been conducted and presented to ASP Council.

It has been very pleasing to learn of the many and varied State Outreach events that were planned and undertaken by ASP members and representatives in different states. There has been enormous creativity and enthusiasm associated with these events, and all members are encouraged to take advantage of these funds for your benefit.



Professor Alex Loukas concluded his appointment as Editor-in-Chief of the International Journal for Parasitology (IJP) at the end of March 2015. Over the last 6 years, under Professor Loukas' direction, the journal has consolidated its position as the most highly cited journal dedicated to publishing

primary research and reviews in Parasitology. On behalf of ASP, I take this opportunity to sincerely thank Alex for all of his very hard work and major commitment to IJP, and also the Deputy Editors and particularly Maria Meuleman, who has provided outstanding support over many years as the Editorial Assistant of IJP, and who will continue in her key role. This is an exciting time for the journal, and we look forward to IJP maintaining its high international profile and success under Brian's expert leadership. Professor Alex Loukas (James Cook University) and Dr Jan Slapeta (The University of Sydney) will support Brian as Deputy Editors of the journal.



I am very pleased to welcome Professor Brian M. Cooke of Monash University, Melbourne, Australia, commenced as the new Editor-in-Chief of IJP. Brian obtained his B.Sc. (Hons) in 1989 from Bristol, UK, and then his PhD in Clinical Haematology from the University of Birmingham

Medical School, UK, in 1992 under the guidance of Professors John Stuart and Gerard Nash. After clinical studies conducted in The Gambia, West Africa, under the guidance of Professsor Brian Greenwood, he migrated to Australia to conduct postdoctoral work at The Walter and Eliza Hall Institute of Medical Research in Melbourne. Subsequently, he was recruited to the Department of Microbiology at Monash University, where he has worked ever since. Presently, Brian is Professor of Microbiology and leads a group focused on understanding the mechanisms of the pathogenesis of human and animal diseases caused by protozoan parasites of red blood cells, supported by mainly by NHMRC, ARC, NIH and the Wellcome Trust. Brian has had substantial roles on the editorial boards of some international journals and was a Deputy Editor of IJP from 2011 to March 2015. We look very much forward to Brian's leadership as Editor-in-Chief in the next phase of growth and development of our journal.

I also thank Brian Cooke for representing ASP at the Science Meets Parliament at the end of March 2013, Brian represented ASP and IJP at. This annual, invitation only event brings around 200 members of Science and Technology Australia to Canberra to improve communication between science, policymakers, parliamentarians and the media. Brian engaged with policy advisers, journalists, analysts and politicians on how to effectively engage with the media, politicians and the policymaking process. Among the highlights, there was face to face meetings with parliamentarians at Parliament House, a nationally televised Keynote Address to the National Press Club by Chief Scientist for Australia, Professor Ian Chubb AC, and a Gala Dinner at Parliament House (MC'd by science broadcaster and comedian Adam Spencer) with guests including The Hon Ian Macfarlane MP, Minister for Industry and Science, The Hon Bill Shorten MP, Leader of the Opposition, Catherine Livingstone AO, President, Business Council of Australia and numerous scientific leaders and members of Parliament, Brian promoted the numerous and disparate activities of the ASP, both nationally and internationally, and highlight the critical role of the discipline of Parasitology, and of basic and applied research in Australia. Brian said that the goal was to impress on Government the need for clearer research priorities and policies and for increased funding to prevent an inevitable loss of some of the finest next generation leading Australian scientists to positions overseas if we do not invest more in science and health and medical research. Brian indicated that a particular highlight of the meeting was the release by Professor Chubb of the results of a new and elegant study, conducted with the Australian Academy of Science and The Centre for International Economics, that guantifies, for the first time, the contribution of advanced physical and mathematical sciences to Australia's GDP [http://www.chiefscientist. gov.au/wp-content/uploads/Importance-of-Science-to-the-Economy.pdf].

The Editors of IJP:DDR (Andrew Kotze and Kevin Saliba) and IJP:PAW (Andy Thompson and Lydden Polley) are providing strong leadership to these IJP Sister Journals and they are going from strength to strength. IJP:DDR already has its first impact factor, an astonishing >2.5, which is a testament to the great work that has gone into the journal. Both

From the President's desk continued

journals are highly visible internationally on the ASP website and are attracting major attention. We congratulate the Editors for their outstanding leadership and efforts.

In this, my last President's Report, I would like to thank the Executive, Drs David Piedrafita (Executive Secretary), Dr Aaron Jex (Treasurer), Prof. David Emery (Vice President) and Maureen Engler (Secretary) as well as all the Members of Council and the various Committees, for their invaluable and continued. I also want to thank all members for their feedback, enthusiasm, dedication and support during my tenure as President. I particularly wish to thank all ASP Members for constructive feedback, support, enthusiasm and dedication. It has been a pleasure serving the Society and I look forward to future interactions and events. I wish all of you every success into the future. David Emery will assume the Presidency at the AGM in Auckland.

Look forward to seeing you in Auckland.

Wishing you the very best.

Robin Gasser

2015 Science Meets Parliament

At the end of March, Brian represented the ASP, IJP and Monash University at the 15th annual Science meets Parliament. This annual, invitation only event brings around 200 members of Science and Technology Australia to Canberra to improve communication between science, policymakers, parliamentarians and the media.

During two exhausting, yet highly enjoyable and rewarding days, Brian engaged in professional development workshops with policy advisers, journalists, analysts and politicians on how to more effectively engage with the media, politicians and the policymaking process. Among the highlights, there was face-to-face meetings with parliamentarians at Parliament House, a nationally televised Keynote Address to the National Press Club by Chief Scientist for Australia, Professor Ian Chubb AC, and a Gala Dinner at Parliament House (MC'd by science broadcaster and comedian Adam Spencer) with guests including The Hon Ian Macfarlane MP, Minister for Industry and Science, The Hon Bill Shorten MP, Leader of the Opposition, Catherine Livingstone AO, President, Business Council of Australia and numerous scientific leaders and members of Parliament.

Brian was proud to promote the numerous and disparate activities of the ASP, both nationally and internationally, and highlight the critical role of the discipline of parasitology, and of basic and applied research, in a healthy, wealthy, safe, secure, smart and sustainable Australia of the future.

Brian said that what was clear on everyone's minds was to impress on Government the need for clearer research



Clockwise from top: Brian Cooke at Science Meets Parliament 2015 with Anna Burke MP, Federal Member for Chisholm and former Speaker of the Australian House of Representatives; Professor Ian Chubb, AC, Chief Scientist for Australia; Professor Warwick Anderson AM in his last few days as CEO of NHMRC (no wonder he looks happy!); (middle centre) The Hon Ian Macfarlane, MP. Minister for Industry and Science; (bottom right) The Hon. Malakai Tabar, MP, Minister for Higher Education, Research and Technology; National Parliament of Papua New Guinea (centre) and Prof. Teatulohi Matainaho Professor and head of the pharmacology department at the School of Medicine and Health Sciences, University of Papua New Guinea and Chairman and CEO of the PNG Science and Technology Secretariat (right); (bottom right) Adam Spencer (mathematician, radio and TV presenter, comedian, and media personality - both quite 'sleek geeks' in their own right) and (middle left) The Hon Bill Shorten MP, Leader of the Opposition.

Visiting International ASP Lecturer Dr. Eric Hoberg

Professor Eric Hoberg is one of the 2015 ASP Invited Lecturers and will visit Murdoch University and the University of Melbourne in early July, following the NZSP & ASP Conference in Auckland.

Following the 2015 Joint Conference of the Australian and New Zealand Societies for Parasitology in Auckland, Dr. Hoberg will initially spend time with Professor Andrew Thompson and colleagues in Perth between 3 and 9 July, to meet with interested local scientists and to present a lecture- "Climate Cascades and Dynamic Perturbation: Implications for Host-Parasite Diversity in Space and Time." Subsequently, from 9-15 July, Dr. Hoberg will visit with Professor Ian Beveridge, Dr. Anson Koehler, and Professor Robin Gasser and colleagues at the University of Melbourne, presenting a final lecture in the series- "Parasite Faunal Assembly in a Crucible of Changing Climate." Lectures will draw on current field investigations by Dr. Hoberg and an extended research collaboration linking colleagues in the United States, Canada, Finland to explore the implications of accelerating climate change for the structure and assembly of the biosphere.

Extending over the past 40 years, Eric Hoberg may best be described as a field biologist and biogeographer who explores nuanced questions about the history of the biosphere in a continuum across evolutionary and ecological time. Complex-host parasite systems are the threads that bind an intricate tapestry describing and revealing myriad patterns and interactions what we observe in our world, providing a pathway to understand a history of dynamic change. Born in San Francisco on the western edge of the North American craton, he was educated at the University of Alaska in biology (1971-1975) where a passion for high latitudes was soon evident. Graduate studies were to follow at the University of Saskatchewan, Canada (1979) and the University of Washington (1984). A career trajectory has taken him to Oregon State University (1985-1989) the Atlantic Veterinary College, University of Prince Edward Island (1989-90) and to his

current position as a senior Research Zoologist and Chief Curator of the US National Parasite Collection with the United States Department of Agriculture (from 1990).

Research directions have been diverse and Dr. Hoberg has led and contributed to innovative and pioneering studies in biodiversity, phylogenetic reconstruction, coevolution and historical biogeography among host-parasite assemblages in terrestrial and marine systems. His fundamental discoveries in biodiversity have served as foundations for understanding parasites and pathogens and processes involved in invasion and faunal assembly in space and time. Dr. Hoberg has been one of few scientists to have contributed significantly to the phylogenetic architecture of two disparate phyla of parasites, achieving major advances in our knowledge of tapeworm and nematode evolution. General models for biogeographic history and speciation are emerging from the multi-national Beringian Coevolution Project, and the related Research Group for Arctic Parasitology with Dr. Hoberg serving as the conceptual driver for an array of global biodiversity studies of parasites and hosts in northern ecosystems. Dr. Hoberg articulated the hypothesis for the equivalency of processes, across varying temporal and spatial scales, for host and geographic colonization emphasizing the role of episodic events, and ecological perturbation driven by global climate change as determinants for geographic colonization, parasite diversification and the structure of mosaic faunas. These have been comprehensive, transboundary approaches for exploring interrelationships of parasitic helminths, hostparasite biology, and distribution within the broader context of faunal diversity and global change at the interface of managed and natural ecosystems.

Land-sea systems have been a long-term focus. During the 1970's through the 1980's marine research was marked by extraordinary voyages on research ships, great woodenhulled boats, and sleek dories following multitudes of seabirds across the tumultuous Bering Sea, North Pacific basin and Sea of Okhotsk, and into the Southern Ocean to



Antarctica. Later, on the open expanses of the tundra from Nunavut to Siberia he has watched the passage of great herds of caribou and isolated bands of muskoxen, as studies delved into biodiversity and responses of complex systems to global change.

Dr. Hoberg is for the most part now engaged in invasion biology (in the broadest sense linking evolutionary and ecology time), faunal assembly, emergent disease, and areas related to biodiversity assessment and the use of archival collections in documenting and understanding the biosphere. Current research is centered to a considerable extent on the high latitudes of the Holarctic region, and is addressing the implications of episodic climate change and ecological perturbation over the past 3 million years as a driver of faunal structure and patterns of diversity. Integrated studies are the baselines for parasite biodiversity and foundations for understanding and anticipating the impact of ecological perturbations including climate change which influence the emergence of diseases of consequence for animal and human health.

With science has been satisfaction, however, there is nothing finer than a perfect drift of a miniscule black francis, and a first surging leap of a heavy salmon from blackened depths of a hidden Icelandic river fading to shadows with the sunrays at day's end near midnight.

2015 Conference 29 June - 2 July, Auckland



The 2015 Joint Conference for the New Zealand and Australian Societies of Parasitology will take place at Crowne Plaza Auckland, New Zealand from 5pm Monday June 29 – Thursday July 2, 2015, inclusive. It will celebrate the best Australian and New Zealand parasitology research; the Conference program includes an outstanding mix of quality international, New Zealand and Australian scientists and with the following confirmed themes and invited speakers:

Elsevier Parasitology Lectures

- IJP Lecture **Professor Robert Poulin** (University of Otago, N.Z.)
- IJP Drugs and Drug Resistance Lecture & 2014 ASP Invited Lecturer – Professor Ray Kaplan (The University of Georgia, U.S.A.)
- IJP Parasites and Wildlife Lecture & 2014 ASP Invited Lecturer – Dr Eric Hoberg (United States Department of Agriculture, U.S.A.)

Plenary and Symposia themes and confirmed speakers

- Immunity, Inflammation and Immunopathology - Dr Paul
 Giacomin (James Cook University, Australia), Dr Valery Combes (University of Technology, Sydney),
 Professor Shelley Walton, (University of the Sunshine Coast)
- Diagnostics and Control Dr Jetsumon Prachumsri (Mahidol University, Thailand
- Population Genetics **Professor** Ivo Mueller (Walter and Eliza Hall Institute, Australia)
- Veterinary Parasitology Dr David Heath (AgResearch New Zealand), Dr David Leathwick (AgResearch New Zealand), Dr Louise Jackson (Biosecurity Queensland)

- Protozoan Biology Dr Adele Lehane (Australian National University)
- Helminth Biology Associate
 Professor David Piedrafita (Federation University, Australia)
- Marine Parasitology & Aquaculture: A Tribute to Associate Professor Ian Whittington - **Dr Andy Shinn** (Fish Vet Group Asia, Thailand)
- Ecology of Parasitism Dr Stephanie Godfrey (Murdoch University, Australia), Dr Laryssa Howe (Institute of Veterinary, Animal and Biomedical Sciences, Massey University, New Zealand)

The NZSP & The ASP and the NZSP acknowledge the generous support of **Elsevier Parasitology**, the International Journal for Parasitology, IJP: DDR, IJP:PAW, Virbac, Bayer Animal Health, Zoetis, New Zealand Veterinary **Pathology Ltd**, Elanco, Gribbles Veterinary, Merial, PGG Wrightson and New England BioLabs Inc.,who are supporting this conference.

Check the conference website for more details www.parasite.org.au/2015conference/

We look forward to seeing you in Auckland in June and July!





ASP Outreach: Kate Hutson, Alejandro Trujillo González and Giana Gomes

James Cook University ASP members introduced the public to fish parasites as part of 2014 National Science Week.

As part of Queensland's state outreach, the Marine Parasitology Laboratory at James Cook University set up an interactive display at the Science and Technology Expo, Townsville, as part of National Science Week. At the event Kate gave a 10 min presentation to high school students on careers in science. Masters student Alejandro and PhD student Giana managed our interactive stand which included small aquaria with live fish and cleaning organisms on display to reflect our current research on the use of biological controls in aquaculture. The public especially enjoyed looking at an assortment of fish parasites under the microscope and checking water quality parameters of our tanks.

The Science and Technology Expo attracted high school students from across the Townsville district. This expo gave young students a rare opportunity to learn and be inspired by exciting research work in aquatic parasitology. Although some students found the parasites a little creepy, others delighted in first hand contact with parasitologists and parasites. The Australian Society for Parasitology supported our stand through funding design (Bud Design Studio, www. buddesignstudio.com.au) and printing of a pull up banner (pictured) and canvas prints which have already been used in other outreach activities, including the JCU open day. It is anticipated that these resources will be used at least once a year, specifically for science week.

Giana, Alejandro and Kate are pictured top right and Alejandro pictured right.



2015 Science Meets Parliament continued

priorities and policies and for increased funding to prevent an inevitable loss of some of the finest next generation leading Australian scientists to positions overseas if we do not invest more in science and health and medical research.

One particular highlight of the meeting was the release by Professor Chubb of the results of a new and elegant study, conducted with the Australian Academy of Science and The Centre for International Economics, that quantifies, for the first time, the contribution of advanced physical and mathematical sciences to Australia's GDP [1]. The study estimates this to be approximately \$145 billion a year - equivalent to about 11% of GDP. When all of the indirect flow-on effects of these sciences are considered, this figure doubles to \$292 billion per year - 22% of Australia's economic activity. Furthermore, for the sake of better accuracy, this study deliberately focussed only on the physical and mathematical sciences. Although undoubtedly more difficult to estimate with such accuracy, it will be interesting to see if, in the near future, the group can put a figure on the worth of health and biomedical research in Australia.

Brian's attendance at Science meets Parliament was funded by the Australian Society for Parasitology.

[1] http://www.chiefscientist.gov.au/wp-content/uploads/Importance-of-Science-to-the-Economy.pdf

ASP Outreach: parasitologists from the Research School of Biology at the Australian National University

ACT ASP members deliver "Parasite Detectives" outreach for National Youth Science forum, Canberra in January 2015

Meng is an intrepid traveller with a love of languages who recently returned from backpacking through South East Asia. She spent much of her time in a local village near the Thai-Cambodian border, honing her mastery of the Northern Khmer dialect. Since her return to Australia, Meng has experienced increasingly severe cycles of headaches, fevers and chills. In a race against time, 42 National Youth Science Forum students donned their labcoats, focused their microscopes and honed their pipetting skills in an attempt to diagnose and cure Meng of her ills.

This summer, as for the past 30 summers, some of Australia's brightest and most enthusiastic high school science students converged on Canberra to participate in the National Youth Science Forum (NYSF). Supported in large part by Rotary International, NYSF students from every corner of Australia spend two weeks in and around Canberra, visiting universities, research institutes and government departments to learn more about research science and the myriad career paths on offer to them.

This year, parasitologists from the Research School of Biology at the Australian National University devised a 'Parasite Detective' prac for the NYSF. NYSF students were asked to become infectious disease experts for the day. Patients (who, conveniently enough, doubled as demonstrators for the prac) had come to the NYSF students with some unusual symptoms that indicated they were suffering from a mysterious parasitic infection. The students' brief was to use modern approaches to diagnose their patients, and, through consultation with the medical literature, suggest an appropriate treatment.

Using DNA samples from their patients, students performed diagnostic polymerase chain reactions to determine the identity of the parasite. They also examined microscope slides with blood smears and tissue samples to look for the presence of parasites in their patients. When they had established the likely cause of their patient's illness, the students examined the medical literature to determine an appropriate course of treatment.

In addition to their crucial role in diagnosing their patients/ demonstrators, the NYSF students got to chat with research scientists at various stages of their career, learning what it's like to investigate the fascinating world of parasite biology. They also got a tour of a modern research lab to learn about the sort of equipment that scientists use to investigate parasites.

So how did the students go in diagnosing Meng? They soon learned that she was infected with Plasmodium falciparum, the



most devastating species of malaria-causing parasites. Without rapid treatment, Meng's future looked grim. After consulting the medical literature, students realised that the region of Cambodia where Meng acquired her infection is rife with parasites that are resistant to many of the common medications used to treat malaria. Meng was prescribed with a course of artemisinin combination therapy, one of the very few antimalarial treatments still effective. Of course, prevention is better than cure. Upon examining Meng's case history, students realised that she had not been sleeping in bed nets, nor had she take prophylactic anti-malarial medication, both of which would likely have avoided the predicament she found herself in. After a stern talking to, the NYSF students left Meng to her recovery and continued on their paths of scientific discovery in the nation's capital.

The 'Parasite Detectives' pracs were conducted by Meng Zhang, Edwin Tjhin, Esther Rajendran and Giel van Dooren (Research School of Biology, ANU), with wonderful assistance from Peta Moisis and her team at the ANU Biology Teaching and Learning Centre. Melanie Rug and Kathryn Parker also contributed to the design of the prac.

ASP Outreach: Parasitology for kids at University of Tasmania's 2014 Open Day

A children's parasitology event August 2014 organised by student member Catarina Norte dos Santos was held during the University of Tasmania's Open day (Aug 2014).

The event targeted children with an age range from 5 to 10 years old who were visiting the UTAS/AMC open day with family members. For this event we had a large fish poster showing various parasites. To encourage active participation we also had foam sheets, pre-cut in the body shape of the parasites presented in the poster. Children had the opportunity to choose the body shape (parasite), and with craft materials including glitter pens, pom poms, pipe cleaners etc to then decorate it. Once completed the parasites were tied with a string to an UTAS/AMC balloon filled with Helium, so the parasites would stand, and children could take them home. In addition to making parasites, there was a colouring competition, with fish cartoons for painting, and little parasites to put them in the right areas of the fish. The ASP event was very successful with many children joining in the activities. Also some parents participated with their children to make their own parasites, or to help the younger ones. Additionally, some teenagers joined to do the parasites. Although actual head counts of people attending the ASP stand were not recorded it was estimated that approximately 70 parasites were created during the event. Throughout the activities we provided more information, and suggested people visit the other UTAS Aquatic Animal Health booth which had various fixed parasites on display. The ASP sponsored funds for this event were used to purchase chocolates for the kids that participate either in the craft activities or in the colouring competition. Mini parasites (from Giant Microbes) that were purchased last year were given away as prizes for the colouring competition. This event was advertised by UTAS and AMC centrally as part of the Open Day. This involved everything from TV campaigns, bill board and road signage, newspaper adverts, radio commercials, posters distributed Tasmania wide. Additionally we also send direct invitations to schools. This event was highly successful, and significantly benefited the ASP. Firstly, many children and adults experienced

their first exposure to fish parasites. Many of the parents attending the event expressed surprise that fish could have parasites. The interactive participation of creating/decorating their own parasites will hopefully foster further discussions at home about parasitology. Interactive activities make children interested, and bringing the parasites home will make them not forget what they learn, and they will share the knowledge with the adults (parents). This event provided a positive experience for children particularly in regards to learning about common fish parasites. In the future, they may want to know more, and study them. The ASP was very well represented in the AMC open day, we had good feedback from the visitors and from the AMC staff, which was very pleasant.







Photos: top right Student member Catarina Norte dos Santos promoting the ASP and outreach at the UTAS/AMC open day

Middle: Over 70 fun foam parasites were created by the kids during the event. The event also featured a colouring competition.

Bottom: As well as creative activities for kids the event featured ASP conference posters and parasite viewing for adults.

ASP Researcher news: Dr Clare Anstead and Professor Robin Gasser

Researchers have decoded the Australian sheep blowfly genome, adding ammunition to the battle against one of the nation's most insidious pests.

Around 2000 genes not seen before in any other organism were discovered. These genes can now be investigated as potential drug and vaccine targets.

This blowfly is responsible for about \$280 million in losses to Australia's sheep industry each year from flystrike.

All 14,544 genes of the blowfly (*Lucilia cuprina*) were identified by the international research team, led by the University of Melbourne, in partnership with the Baylor College of Medicine Human Genome Sequencing Center, and funded by the United States National Human Genome Research Institute and Australian Wool Innovation.

The research, published today in Nature Communications, provides insights into the fly's molecular biology, how it interacts with the sheep's biology and, importantly, shows its potential to develop insecticide resistance.

Blowfly maggots live on the skin of sheep and invade open wounds, where they feed on tissue and cause severe skin disease, known as myiasis or flystrike. It is an aggressive and notoriously difficult pest to control.

Lead researcher on the project, Dr Clare Anstead, of the University of Melbourne Faculty of Veterinary and Agricultural Sciences, said the genome map has 'limitless potential' for fighting the blowfly at home and abroad.

"Lucilia is an extremely nasty parasite. The sheep is literally eaten alive. The Lucilia species are responsible for more than 90 per cent of flystrike in Australia and New Zealand," Dr Anstead said.

"This fly is especially good at evolving to resist insecticides. It's exciting that we have now identified more than 2000 genes that have never been seen in any other animal or plant. Some of these 'orphan' genes hold the key to the parasitic relationship between the blowfly



Clare Anstead: Photo credit University of Melbourne

and the sheep. They could be targeted to develop a completely new method of control."

University of Melbourne Professor Robin Gasser, who oversaw the research, added: "If you want to develop effective interventions against this fly, you need to know it inside out and understand its biology, starting by identifying all the genes. And, we have done that."

Insecticides can be effective, however, the blowflies rapidly evolve to develop resistance to these chemicals.

To decode the genome, researchers used a combination of supercomputing and bioinformatic techniques to handle huge reams of data. They aim to use a powerful new technology called CRISPR to investigate switching off a number of genes, including the gene responsible for the blowfly's extraordinary sense of smell.

Lucilia cuprina is one of 30 insect species to have genome sequences generated at the Baylor College of Medicine Human Genome Sequencing Centre as part of a pilot project for the genome analysis of some 5000 arthropod species of medical,



Clare Anstead and Robin Gasser

scientific, economic and agricultural importance.

Story: Jane Gardner, University of Melbourne

Publication

Clare A. Anstead, Pasi K. Korhonen, Neil D. Young, Ross S. Hall, Aaron R. Jex, Shwetha C. Murali, Daniel S.T. Hughes, Siu F. Lee, Trent Perry, Andreas J. Stroehlein, Brendan R.E. Ansell, Bert Breugelmans, Andreas Hofmann, Jiaxin Qu, Shannon Dugan, Sandra L. Lee, Hsu Chao, Huyen Dinh, Yi Han, Harsha V. Doddapaneni, Kim C. Worley, Donna M. Muzny, Panagiotis Ioannidis, Robert M. Waterhouse, Evgeny M. Zdobnov, Peter J. James, Neil H. Bagnall, Andrew C. Kotze, Richard A. Gibbs, Stephen Richards, Philip Batterham & Robin B. Gasser. Lucilia cuprina genome unlocks parasitic fly biology to underpin future interventions. Nature Communications 6. Article number: 7344 doi:10.1038/ncomms8344

http://rdcu.be/df5Z

News from the ASP Network for Parasitology

Welcome

In this newsletter we feature photos from our ASP-Inspiring Australia "Parasites, People, Art" collaborative Art-Science project with Indigenous artist and performer Bernard Lee Singleton and artist Tai Inoue (Nature Sounds - Filming and Photography). The Art-Science piece was launched at the Cairns Childrens Festival, 10th May 2015 at the Tanks Arts Centre in Cairns and then the art installation stayed for the rest of the month. Over 3000 visitors enjoyed and participated in our ASP-Inspiring Australia exhibition throughout May and we hope that other venues across Australia will host the art piece over the next few years. Email Lisa if you have ideas for other venues for the artpiece and/or Parasites in Focus exhibition.

Annual Conference

The 2015 Annual Conference will be a joint meeting held with the NZSP at the Crowne Plaza, Auckland, New Zealand from 5pm June 29th - July 2nd. We hope to see you all in June for, what promises to be, another wonderful event. See conference information on page 5 of this newsletter. www.parasite.org.au/2015conference/

Closing dates for ASP awards and ASP Fellowships

ASP Network Researcher Exchange, Travel and Training Award and JD Smyth Award

Friday 26 September 2015

ASP Fellowships 9 January 2015

More information <u>www.parasite.org.au</u>

ASP Network Researcher Exchange, Travel and Training Award and JD Smyth Award

Congratulations to recent JD Smyth Travel Award and ASP Network Travel Award winners.

JD Smyth Travel Award winners

Melanie Williams, PhD Candidate, Walter and Eliza Hall Institute for Researcher Exchange to the laboratory of Professor Michael Geeves at the University of Kent in UK to learn biochemical and biophysical techniques for the purpose of investigating the mechanism of force production by the MyoA glideosome of apicomplexan parasites.and EMBO Practical Course: The Application of Transient Kinetic Methods to Biological Macromolecules May 11th – 27th June 2015.

ASP Network Travel Award winners

- Sabrina Chin, PhD Candidate, Australian National University, for Wageningen University Laboratory of Nematology training courses 16th March – 10th April, Basic course in Nematology and Molecular Identification of Nematodes.
- Alejandro Trujillo, MPhil Candidate, Centre for Sustainable Tropical Fisheries and Aquaculture & School of Marine and Tropical Biology, James Cook University for a Researcher Exchange to the Institute of aquaculture "Torre de la Sal" for Morphological and molecular identification methods of protozoan and metazoan parasites of imported ornamental fish.



An Australian Government Initiative

- Stephanie Tan, PhD Student, Walter and Eliza Hall Institute, Research exchange to Mahidol University and CRESIB 12th June – 1st August 2015.
- Jessica Johnson-Mackinnon, PhD student, The University of Tasmania, for a researcher exchange to University of Victoria in Canada working with Dr. Ben Koop and Dalhousie University, to work with Professor John Archibold and for a Bioinformatics Course at Black Forest University, Germany 14th September – 12th October 2015.
- Natalia Guimaraes Sampaio, PhD Student, WEHI for a Researcher exchange to the University of Nottingham and Laboratory of Prof. Luke O'Neill in Dublin Sept 5th -15th, 2015.
- Adelaide Dennis, PhD candidate, Kirk laboratory, ANU for a Researcher Exchange with the Eskitis Institute for Drug Discovery, Griffith University, Brisbane.
- John Holleran, Discovery Biology, Eskitis Institute, Griffith University, Researcher exchange to Australia National University, Canberra.
- Erick Tjhin, PhD student, Australian National University for a training course MBL's Biology of Parasitism Summer Course.
- **Taher Uddin**, PhD student, University of Melbourne, to attend The Biology of Parasitism (BoP) summer course at the Marine Biological Laboratory, Woods Hole, MA.





Network Mentorship Scheme

Early career researchers are encouraged to apply to the Network Convenor (nicholas.smith@jcu. edu.au), in strict confidence, for funding to participate in the Network Mentorship Scheme. The scheme allows young investigators to be paired with experienced, successful researchers to discuss, plan, prioritise and set targets for their career. Typically, the early career researcher will fly to the institute of a senior parasitologist and spend a day there. Arrangements for professional development and progress to be reviewed by the pair annually can also be arranged. Importantly, mentors need not be from an individual's home institution but can be drawn from across the Network. The scheme has proved very valuable for several young researchers and their mentors already.

To apply, simply write to Nick Smith (nicholas. smith@jcu.edu.au) with a brief outline of your research interests and aspirations. You can also indicate a preferred mentor or ask Nick for advice on whom amongst the Network participants may be most suitable.

Nick Smith Convenor, ASP Network for Parasitology

Lisa Jones Communications Coordinator



Photo of the participants in the training course. From left: Casper van Schaik, Luuk Reijmers, Maarten Smits, Sabrina Chin, Joost Riksen, Lissy de Rooi, Kevin Walgering and Chris Bisperink.

ASP Network Researcher Exchange, Training and Travel Award: Sabrina Chin

Report by PhD student Sabrina Chin, The Australian National University

I would like to thank the Australian Society for Parasitology for their generous contribution in my research to attend two training courses in the Laboratory of Nematology at Wageningen University, Netherlands from the 16th March to the 10th April 2015. The aim of this visit was to learn essential nematology skills in handling and identifying plant- parasitic nematodes and to network with Dutch nematologists. Throughout my visit, I am grateful to have met several staffs from the Laboratory of Nematology from Wageningen University, Joost Riksen, Sven van den Elsen, Casper van Schaik, Assoc. Prof. Hans Helder and Assistant Prof.Geert Smant, and Prof. Gerrit Karssen from the Netherlands Food and Consumer Product Safety Authority, and other students who have made the trip even more enjoyable.

My PhD work revolves around the plant- parasitic nematode, Meloidogyne javanica. I study the role of the plant secondary metabolite, flavonoids in the interaction between M. javanica and the plant model, Medicago truncatula. Meloidogyne spp. is the most economically significant plantparasitic nematode because they cause extensive productivity loss (5-50%) by resulting in nutritional deficiency in its host and its ability to infect the roots of more than 200 plant species. Flavonoids may be a key mediator in the plant-nematode interaction because they are involved in modulating the plant development and in defense response. Hence, these nematodes may "kill two birds with one stone" by down-regulating flavonoids that act as defense compounds and to up-regulate and/or down-regulate specific flavonoids that control plant development pathway to induce their feeding sites in the plant root. In the long run, the elucidation of the role of flavonoids in this interaction could lead to the development of new control method. Therefore, an extension of my project is to test flavonoids on other plant-parasitic nematodes. Although I am trained to work with M. javanica, I lack the skills and experience to work with other plantparasitic nematodes.

Assoc. Prof. Hans Helder and two lab technicians, Joost and Sven over sighted the training courses. The first training course, basic handling in nematology has taught me important nematology skills such as the extraction of nematodes from plant material and soil, the analysis of the extracts, nematode staining and fixing. In addition, I received an intensive training to identify the free-living stages of 14 plant- parasitic nematode genera of economic importance, based on their morphology

Sabrina Chin continued

using a dissecting microscope. These 14 nematode genera are Pratylenchus, Paratylenchus, Tylenchorhynchus, Rotylenchus, Helicotylenchus, Heterodera larvae, Meloidogyne larvae, Hemicycliophora, Criconematidae, Tylenchus, Aphelenchus, Trichodorus, Ditylenchus and Heteroderidae males. The second course, which is in the molecular identification of nematodes using PCR- based techniques. For this course. I extracted nematode DNA from fieldisolated nematodes as templates and used nematode-specific primers in guantitative RT-PCR. This provided a high-throughput and resolution method to distinguish nematodes on the family level and to determine their relative quantity in a large sample of mixed population. This work was largely based on the research of Dr. Helder's group in nematode phylogenetic analysis using small subunit of ribosomal DNA sequences. This course also demonstrated how to clone nematode DNA fragments into a cloning vector for further amplification in bacteria, as a longterm storage solution to obtain the DNA of rare nematodes.

During my time in Wageningen, I had the opportunity to meet Assistant Prof. Geert Smant who works on nematode secretion in Meloidogyne spp and other nematodes. We discussed about our own researches and aspects of nematode parasitism. He also kindly allowed me to visit his lab, whereby his technician, Casper van Shaik, demonstrated their Meloidogyne culturing and handling techniques. Through this, I learnt new tricks that I intend to apply on my own Meloidogyne techniques. In addition, I also met Prof. Gerrit Karssen who is a nematode taxonomist who specializes in nematode identification for biosecurity purposes. He kindly provided me a tour of the laboratory and the facilities in the Wageningen campus of the Netherlands Food and Consumer Product Safety Authority. He also showed the institute's comprehensive nematode collection from Netherlands, Belgium and different parts of the world, thereby highlighted the importance of accurate

nematode identification for biosecurity works.

The support from ASP is a strong encouragement and affirmation to continue my work in plant-parasitic nematodes, especially since Australia lacks research in plant-parasitic nematodes.

I plan to raise the profile and garner interests in plant-parasitic nematodes through teaching. I will be teaching in the lab of a parasitology course at ANU in a few months time. With the skills I've learnt from Wageningen University, I will isolate some free-living nematodes from the soil for students to observe the diversity of nematodes.

I am also interested in establishing a rapport with Prof. Gerrit Karssen by

sending some nematode samples to him and in networking with local nematologists by meeting them in Toowoomba later this year.

In conclusion, I've learnt a lot about plant- parasitic nematodes, from their evolution to how evolution is very useful in phylogenetics, and comprehensive practical skills to isolate and accurately identify them at both morphological and molecular levels, the creative use of modern laboratory techniques to conduct research and above all, the importance of research in plant- parasitic nematodes. I plan to utilize these skills in isolating and identifying plant-parasitic nematodes when I expand my project to include more plant-parasitic nematodes.

ASP Outreach Funding

ASP members are encouraged to apply for ASP funding to suport outreach in their state. Up to \$500 per event is available with a total per state or territory of \$2000 per calendar year. Initiatives should foster outreach by members and advance the field of parasitology. ASP President Robin Gasser would like to emphasise that the funds can be used to support a wide range of activities - from seminars, symposia to "beer and nibbles" networking sessions of State members or any other parasitology-related event.

Submit your proposal to your ASP State/Territory Representative for consideration.



ASP Network Researcher Exchange, Training and Travel Award: Stephanie Hing

Stephanie Hing, PhD student at Murdoch University, won an ASP Travel Award for her Researcher Exchange to Charles Sturt University in 2014 and talks to Lisa Jones about her trip.

Stephanie, tell us about your research.

When you get stressed do you find you get sick more easily? Now imagine you're an endangered species facing numerous stressful threats. If you're stressed out, what will that mean for your health and the future of your species? My PhD research focuses on stress, immunity and infection in the context of wildlife conservation, specifically efforts to save a unique critically endangered Australian marsupial the woylie (Bettongia penicillata). While stress has been associated with parasite infection dynamics in man and domestic species, these links have rarely been explored in wildlife. It is important to characterise how stress may influence infection dynamics in wildlife populations as this may have flow on effects for conservation, animal and public health.

How did the Researcher Exchange help your research?

A key part of my research is to investigate how patterns in woylie 'stress hormones' relate to parasite infection patterns. I owe a great deal of thanks to ASP for the Researcher Exchange grant which enabled me to travel over east to work with my external co-supervisor, Dr Edward Narayan an expert in wildlife endocrinology based at Charles Sturt University. During this Researcher



Image: Stephanie Hing during her Researcher Exchange

Exchange I received essential training in every step of the process from hormone metabolite extraction to running the endocrine assays. Important milestones were reached and skills acquired that will aid in our efforts to understand the role of stress in parasite infection.

What has been the highlight of your science career so far?

Working with wildlife takes me to some incredible far flung places and crazy situations with amazing animals. Vivid memories range from assisting a choking elk to collecting semen from a saltwater crocodile but the highlight so far is parasitological. For my Masters, I conducted the first parasitological survey of wild Bornean elephants and coming face to face with them was a life changing experience.

Where to from here?

After all the blood, sweat and tears, almost two years of fieldwork and painstaking sample preparation, I am very excited about analysing all the samples and results! What a nerd! I hope to continue to progress through my research and aim to complete in 2016. Then I'd love to be able to build upon my PhD and continue to do my small part to aid wildlife conservation.

This project is also generously supported by Murdoch University School of Veterinary and Life Sciences, Australian Academy of Science Margaret Middleton Foundation, Foundation for National Parks and Wildlife and Holsworth Research Endowment. Photos from the Inspiring Australia - ASP grant "Parasites, People and Art" collaborative project









Photos from the Inspiring Australia - ASP grant "Cairns Childrens Festival" at the Tanks Arts Centre, May 2015



OzEMalaR

News about Australia/Europe Malaria Research Cooperation

Now in our final year of operation we hope to see many new applications from Australian malaria researchers for OzEMalaR Researcher Exchanges to eligible laboratories in 2015.

Like our facebook page, **www.facebook. com/ozemalar** and follow us on twitter **twitter.com/OzEMalaR**

If you are running events, programs, public outreach please email details to Lisa.Jones1@jcu.edu.au for additional promotion through the ASP membership.

The 5th Molecular Approaches to Malaria Conference, February 21-25, 2016 in Lorne, Australia aims to

highlight the latest molecular advances in our understanding of:

- host cell invasion
- virulence mechanisms
- immunity and pathogenesis
- drug resistance
- drug and vaccine discovery
- population biology
- transmission
- epidemiology
- host-parasite interactions (including vector)
- all human malaria parasite species

Visit the MAM2016 website www.mamconferences.org for more details and to register your interest and don't forget to 'like' our facebook page www.facebook.com/MAMconference and follow us on twitter twitter.com/MAMLorne OzEMalaR funding runs until the end of 2015 and we want to make the most of such a fantastic opportunity. All OzEMalaR Travel Award funds granted to successful applicants must be invoiced for by the end of 2015.

The deadlines for 2015 OzEMalaR Travel Awards are:

Friday 10 July 2015 Friday 11 September 2015 Friday 30 October 2015

Visit our website www.ozemalar.org to find out how you can apply for OzEMalaR Travel Awards to support early career malaria researchers (PhD and postdocs) from Australia to work and be trained in top European laboratories within EviMalaR (=BioMalPar) for malaria research. To check which laboratories are eligible as hosts visit www.evimalar. org.uk Download funding guidelines from the OzEMalaR website and start planning your researcher exchanges to utilise this great opportunity. If you are not currently but would like to be part of the OzEMalaR Network please contact Lisa with your details. And please email Lisa with any news, jobs or events you have for the website or with your comments and suggestions.

Geoff McFadden Convenor, OzEMalaR OzEMalaR Travel Award Scheme

Congratulations to our latest OzEMalaR Travel Award winners:

- Dr Michael Duffy, Laboratory Head, Peter Doherty Institute, University of Melbourne for a Researcher Exchange to Till Voss' laboratory, Swiss Tropical & Public Health Institute Swiss TPH, Department of Medical Parasitology and Infection
- Charles Jennison, PhD Student, WEHI, Boddey Laboratory for a Researcher Exchange to London School of Hygiene and Tropical Medicine insectary and the Laboratory of Prof. Maria Mota, Instituto de Medicina Molecular, Lisbon Portugal.
- Janavi Suresh Rambhatla, PhD Student, University of Melbourne, Department of Medicine (RMH) in Professor Stephen Rogerson's Laboratory for a Researcher Exchange to Professor Lars Hviid, Professor Thor Theander, & Dr Thomas Lavstsen at Department of International Health, Immunology and Microbiology, Centre for Medical Parasitology, University of Copenhagen, Denmark.







Fellowship Award for Professor Leann Tilley

23 June 2015

Minister for Education and Training, the Hon. Christopher Pyne MP, announced Professor Leann Tilley as the recipient of the 2015 Georgina Sweet Australian Laureate Fellowship. Leann will conduct research on the malaria parasite to deliver new biotechnology and biomedical outcomes that may combat disease in livestock and humans.

Leann's project title is "Bio-metrology and modelling of a complex system: the malaria parasite". This fellowship project aims to develop a cross-disciplinary program to measure, model and manipulate a complex cellular system - sexual differentiation of the human malaria parasite. Combining life and physical sciences with powerful imaging techniques, the project seeks to develop quantitative biochemical, biophysical and modelling techniques to probe a complex system in a way previously not possible. It expects to integrate and correlate thousands of measurements of the dynamic processes inside cells and use these datasets to generate rigorous and sophisticated mathematical models that can predict drivers of commitment for transformation of the parasite to a sexual phase in preparation for transmission to mosquitoes. This holistic approach hopes to deliver new biotechnology and biomedical outcomes, including new ways to combat disease in livestock and humans.

Since 2011 the ARC has also awarded two special female Laureate Fellowships. The new Australian Laureate Fellowships are funded through the Australian Research Council (ARC) and recipients of these awards undertake an ambassadorial role to promote women in research, in addition to their research programme.





2015 MiM conference

Registrations are open for the 2015 Malaria in Melbourne conference, 1st & 2nd October, at Monash University, Caulfield campus on Dandenong Road. See the website for further information.

www.malariainmelbourne.org.au

Top image: Professor Leann Tilley, recipient of the 2015 Georgina Sweet Australian Laureate Fellowship

Bottom image: Different views of the sexual blood stage of *Plasmodium falciparum*. 3D Structured Illumination Microscopy reveals the nucleus (blue) and a membrane complex (green) that wraps around the extending gametocyte. Leann Tilley and team (University of Melbourne)

News about Australia/Europe Malaria Research Cooperation

Fellowship Award for Professor Geoff McFadden



Congratulations to Professor Geoff McFadden who was elected to Fellowship in the American Academy of Microbiology in January 2015. Geoff is one of 79 individuals elected this year. Fellows of the Academy are elected annually through a highly selective, peerreview process, based on their records of scientific achievement and original contributions that have advanced the microbial sciences. There are over 2,400 Fellows representing all subspecialties of microbiology, including basic and applied research, teaching, public health, industry, and government service.

\$11.6M funding to progress malaria vaccine development

Two teams from the Walter and Eliza Hall Institute's malaria research program received grants to support the translation of fundamental malaria discoveries to develop potential malaria vaccines.

Professor Alan Cowman and Professor Ivo Mueller were awarded one of 11 NHMRC Program Grants, together with Professor Brendan Crabb and Professor James Beeson from the Burnet Institute and Professor Stephen Rogerson from The University of Melbourne. The team, led by Professor Cowman, received \$10.9 million over five years to progress the development of treatments for malaria based on discoveries made at these institutions.

Professor Cowman said malaria was one of the world's most significant health problems. "Plasmodium falciparum causes 250 million clinical cases of malaria and more than 800,000 deaths per year," he said.

"Our team has more than 30 years experience and 100 scientists who are unravelling the secrets of malaria, including its basic biology, how it causes disease, where it spreads and how it thwarts our control efforts," Professor Cowman said.

"This grant will be used to enable significant fundamental malaria discoveries made by the team to be translated into potential new vaccines and antimalarial drugs for the most severe form of malaria that can be progressed to clinical trials."

Professor Cowman said the program would have a larger focus on the malaria strain Plasmodium vivax. "Plasmodium vivax is often overlooked and left in the shadow of the enormous problem caused by Plasmodium falciparum," he said.

"However it is a significant cause of disease in Asia and the Pacific, with up to 2.5 billion people at risk, as well as the most common cause of chronic malaria infections in the region.

"Our strong links with medical research organisations in Papua New Guinea will help the development of better diagnostic tests that will pinpoint transmission 'hotspots' in the Asia-Pacific in the quest to eradicate malaria in the region." Professor Louis Schofield is leading a team that was awarded a NHMRC Development Grant of more than \$750,000 to progress a vaccine that could potentially be effective against all species, stages and strains of the malaria parasite.

"Malaria eradication is the ultimate goal for any malaria vaccine approach," Professor Schofield said. "However the complexity of the parasite's biology and lifecycle make it extremely difficult for a single vaccine to be effective against all strains and development stages of the parasite.

"Excitingly, we have found a part of the malaria parasite that is conserved across all species and has been able to kill all the main stages of malaria in models. This funding will help us progress our vaccine to the point of human clinical trials, hopefully within three years."

In addition to the malaria funding grants, two new postgraduate students received more than \$200,000 in total over three years in scholarships to support their work at the institute.

Story source: Liz Williams, WEHI http://www.wehi.edu.au/news/116m-funding-progress-malariavaccine-development

Congratulations to the team behind the "Help us beat malaria" crowdfunding campaign launched by Walter + Eliza Hall Institute of Medical Research and Christopher Weir which was successfully funded on 06 March 2015 http://www.pozible.com/project/190553#



You are invited to attend the

XIX International Congress for Tropical Medicine and Malaria

Brisbane Convention & Exhibition Centre Sunday 18 - Thursday 22 September 2016

Visit the Congress website for more information and join our mailing list to receive email updates on the Congress.

www.tropicalmedicine2016.com

Important dates to mark in your diary

Call for abstracts open

16 November 2015

Registration opens

15 February 2016

Call for abstracts close

1 April 2016

Early bird registration deadline

17 June 2016



IJP

INTERNATIONAL JOURNAL FOR PARASITOLOGY

The ASP extends thanks to Professor Alex Loukas for his contributions to the International Journal for Parasitology, and welcome to Professor Brian Cooke as new Editor-in-Chief.

Professor Alex Loukas concluded his appointment as Editorin-Chief of the International Journal for Parasitology (IJP) at the end of March 2015. Over the last 6 years, under Professor Loukas' direction, the journal has consolidated its position as the most highly cited journal dedicated to publishing primary research and reviews in Parasitology. On behalf of the Australian Society for Parasitology (ASP), I take this opportunity to sincerely thank Alex for all of his extremely hard work and major commitment to IJP, and also the Deputy Editors.

ASP is pleased to announce that Professor Brian M. Cooke of Monash University, Melbourne, Australia, commenced as new Editor-in-Chief of IJP from April 2015. Brian obtained his B.Sc. (Hons) in 1989 from Bristol, UK, and then his PhD in Clinical Haematology from the University of Birmingham Medical School, UK, in 1992 under the guidance of Professors John Stuart and Gerard Nash. After clinicallybased studies on malaria conducted in The Gambia, West Africa, under the guidance of Professor Brian Greenwood, he migrated to Australia to conduct postdoctoral work at The Walter and Eliza Hall Institute of Medical Research in Melbourne. Subsequently, he was recruited to the Department of Microbiology at Monash University, where he has worked ever since. Presently, Brian is a Professor in Microbiology and leads a group focused on understanding the mechanisms of the pathogenesis of human and animal diseases caused by protozoan parasites of red blood cells, supported by mainly by NHMRC, ARC, NIH and The Wellcome Trust. Brian has played substantial roles on the editorial boards of some high-ranking international journals including Deputy Editor of the IJP from 2011 to March 2015. We look very much forward to Brian's leadership as Editor-in-Chief in the next phase of growth and development of our journal.

Maria Meuleman, who has provided outstanding support for many years as the Editorial Assistant of IJP, will continue in her role. This is an exciting time for the journal, and we look forward to the IJP maintaining its high international profile and success under Brian's expert leadership. Professor Alex Loukas (James Cook University) and Dr Jan Slapeta (The University of Sydney) will support Brian as Deputy Editors of the journal.

45:01 (January)

The affinity of magnetic microspheres for *Schistosoma* eggs Renata R. F. Candido, Vivian Favero, Mary Duke, Stephan Karl, Lucía Gutiérrez, Robert C. Woodward, Carlos Graeff-Teixeira, Malcolm K. Jones, Timothy G. St. Pierre

45:02/03 (February double issue)

Succinctus

High numbers of circulating pigmented polymorphonuclear neutrophils 1 as a prognostic marker for decreased birth weight during malaria in pregnancy

Caroline Lin Lin Chua, Leanne J. Robinson, Francesca Baiwog, Danielle I. Stanisic, John A. Hamilton, Graham V. Brown, Stephen J. Rogerson, Philippe Boeuf

Echinococcus equinus and *Echinococcus granulosus* sensu stricto from the United Kingdom: genetic diversity and haplotypic variation

Belgees Boufana, Wai San Lett, Samia Lahmar, Imad Buishi, Anthony J. Bodell, Antonio Varcasia, Adriano Casulli, Nicholas J Beeching, Fiona Campbell, Monica Terlizzo, Donald P. McManus, Philip S. Craig

45:05 (April)

Editorial, New Editor-in-Chief of the *International Journal for Parasitology* Robin B Gasser

Improving the gene structure annotation of the apicomplexan parasite *Neospora caninum* fulfils a vital requirement towards an in silico-derived vaccine **Stephen J. Goodswen, Joel L. N. Barratt, Paul J. Kennedy, John T. Ellis**

Low cost whole-organism screening of compounds for anthelmintic activity

Sarah Preston, Abdul Jabbar, Cameron Nowell, Anja Joachim, Baerbel Ruttkowski, Jonathan Baell, Tony Cardno, Pasi K. Korhonen, David Piedrafita, Brendan R.E. Ansell, Aaron R. Jex, Andreas Hofmann, Robin B. Gasser

INTERNATIONAL JOURNAL FOR PARASITOLOGY

45:06 (May)

Invited Review* New developments in Cryptosporidium research Una Ryan, Nawal Hijjawi *Australian Society for Parasitology 2014 Bancroft-Mackerras Medal Oration.

Hemoglobin, a new major allergen of Anisakis simplex Juan González-Fernández, Alvaro Daschner, Natalie E. Nieuwenhuizen, Andreas L. Lopata, Consolación De Frutos, Ana Valls, Carmen Cuéllar

Elucidating the life cycle of Marteilia sydneyi, the aetiological agent of QX disease in the Sydney rock oyster (Saccostrea glomerata) Robert D. Adlard, Matthew J. Nolan

45:07 (June)

Multiplex real-time PCR monitoring of intestinal helminths in humans reveals widespread polyparasitism in Northern Samar, the Philippines

Catherine A. Gordon, Donald P. McManus, Luz P. Acosta, Remigio M. Olveda, Gail M. Williams, Allen G. Ross, Darren J. Gray, Geoffrey N. Gobert



http://www.journals.elsevier.com/internationaljournal-for-parasitology-drugs-and-drug-resistance/

Recent papers from Australian and New Zealand authors:

Available online 20 June 2015

Profiling the anti-protozoal activity of anti-cancer HDAC inhibitors against *Plasmodium* and *Trypanosoma* parasites Jessica A. Engela, Amy J. Jonesa, Vicky M. Averya, Subathdrage D.M. Sumanadasaa, Susanna S. Nga, David P. Fairlieb, Tina Skinner-Adamsa, Katherine T. Andrews

5:01 April 2015

Evidence for reversion towards anthelmintic susceptibility in Teladorsagia circumcincta in response to resistance management programmes

Dave M. Leathwick, Siva Ganesh, Tania S. Waghorn



http://www.journals.elsevier. com/international-journal-forparasitology-parasites-and-wildlife/

Recent papers from Australian and New Zealand authors:

4:01 April 2015

The role of wildlife in the transmission of parasitic zoonoses in peri-urban and urban areas

Ute Mackenstedt, David Jenkins, **Thomas Romig**

4:02 August 2015

Identification of novel Theileria

genotypes from Grant's gazelle Janis Hooge, Laryssa Howe, Vanessa O. Ezenwa

A review of neosporosis and pathologic findings of Neospora caninum infection in wildlife Shannon L. Donahoe, Scott A. Lindsay, Mark Krockenberger, David Phalen, Jan Šlapeta

A retrospective study of Babesia *macropus* associated with morbidity and mortality in eastern grey kangaroos (Macropus giganteus) and agile wallabies (Macropus agilis) Shannon L. Donahoea, Christopher S. Peacock, Ace Y.L. Choo, Roger

W. Cook, Peter O'Donoghue, Sandra Crameri, Larry Vogelnest, Anita N. Gordon, Jenni L. Scott, **Karrie Rose**

Diversity of Cryptosporidium in brush-tailed rock-wallabies (Petrogale penicillata) managed within a species recovery programme Elke T. Vermeulen, Deborah L. Ashworth, Mark D.B. Eldridgea, Michelle L. Power

Species of Angiostrongylus (Nematoda: Metastrongyloidea) in wildlife: A review David M. Spratt

Events





3rd International Workshop on Symbiotic Copepoda

10-16 July, 2016 • Heron Island Research Station, Queensland, Australia



Every three years, researchers and students from around the world meet to exchange ideas and learn taxonomic techniques on symbiotic copepods from leading experts.

This 5-day workshop will include:

- Lectures
- Discussions
- Oral & poster presentations
 - Dissection and identification techniques
- Lab tutorials
- Illustration techniques
- Identification of personal material
 - One day dedicated to symbiotic isopods

If interested, please contact Dr Kate Hutson (kate.hutson@jcu.edu.au; +61 7 478 16216).



Organizing committee: Dr Kate Hutson, James Cook University, Australia Dr Julianne Kalman Passarelli, Cabrillo Marine Aquarium, USA Dr Danny Tang, Orange County Sanitation District, USA

Jobs

www.parasite.org.au/jobs/



Postdoctoral positions

available to investigate innate immunity and virulence of intracellular pathogens using the parasite *Toxoplasma gondii*. This important human pathogen enjoys excellent experimental tools for genetic, molecular, and cellular analyses, making it an attractive model. Project 1 combines small molecule screening, molecular genetics, and functional assays to define the role of autophagy in innate immunity. Project 2 combines forward genetic mapping, molecular genetics, and murine models to define the molecular basis for pathogenesis. Prior experience with in vitro biochemical assays, cellular immunology, molecular genetics, or computational analysis of large genomic datasets is advantageous. However, no prior experience with parasites is necessary.

English language (speaking and writing), analytical, computational, and interpersonal skills are considered essential. Washington University offers a highly diverse intellectual community with outstanding training opportunities for postdoctoral fellows. Salary and benefits along with educational and training opportunities are summarized at the Office of Post Graduate Affairs (http://dbbs.wustl.edu/PostDocs/Pages/PostDocs.aspx).

Submit a current C.V. and names of three references to: Dr. David Sibley, Professor, <u>(sibley@wustl.edu</u>), Dept. Molecular Microbiology, Washington University Sch. Med., St. Louis, MO 63110.

Jobs

www.parasite.org.au/jobs/

Postdoctoral research associate position available in the Marine Genomics Project in Korea

The Marine Genome 100+ Korea project, a newly initiated, large-scale marine genomics project, aims to determine whole genome sequences and transcriptomes of > 100 selected marine species. The research team is seeking for a highly motivated and enthusiastic person (postdoc or senior research associate, depending on one's research career or achievement) who is able to work as one of our research team member.

The candidate will be primarily involved in analysis of NGS (Next Generation Sequencing) data particularly from marine invertebrates using phylogenomics and comparative genomics approaches. The ideal candidate should have finished — a PhD in bioinformatics, with experience in the analysis of Next Generation Sequencing data.

The candidate will be responsible for:

- Managing NGS data and analyses
- Proactively identifying and incorporating new algorithms and technology to automate the analysis of marine genomes and to extend the features of existing analysis pipeline
- Participating in a team of scientists to offer bioinformatics, genomics, transcriptomics and other omics solutions
- Training research staffs on the use of relevant bioinformatics software and tools

The successful candidate is required to possess the following:

- Ph.D. or equivalent in Computational Biology, Bioinformatics,
- Genomics, Marine Biology or related field and experiences in two or more of
- the following areas: comparative genomics, transcriptome sequencing analysis, phylogenetic analysis, and/or genome wide association studies;
- Experience with bioinformatics analyses, including programming in any scripting language (e.g. PERL or Python) and ability to handle a large data set efficiently using scripts, particularly in the analysis of NGS data;
- Experienced skill for commercial and open-source bioinformatics tools and various public genomic databases;
- Genome assembly of de novo genomes;
- Knowledge of statistical software tools and packages (e.g. R);
- Evidence of excellence in research and high productivity.

Location: Seoul in South Korea

Salary & benefits: commensurate with experience

Applicants should send a short research statement (including past, present, and future goals), CV, and the names and email addresses of at least 3 potential references as a single pdf file to Prof. Joong-Ki Park Project PI: E-mail: jkpark@ewha.ac.kr

\$400 Undergraduate Prizes

The Australian Society for Parasitology is pleased to announce that it will be offering undergraduate student prizes of \$400 each to Australian Universities identified as offering a suitable course in parasitology, for presentation to the best undergraduate student in parasitology (highest passing mark/grade). The course(s) must be taught by a financial member of the ASP (of more than one year standing), and must comprise at least 30% parasitology. **Requests for 2015 prizes must be made by the eligible University to the ASP Treasurer or Secretary by the 30th September 2015.** Requests for prizes must include the following for each eligible course:

- 1. Course name/code/degree year
- 2. Number of Students enrolled in 2015
- 3. Number of hours dedicated to parasitology (and total number of hours for the course)
- 4. Name of financial ASP member (of at least 1 year standing) teaching course



Concepts in Parasitology

2015 Course

Dates: Sunday 29th November -Saturday 12th December 2015

Apply online http://parasite.org.au/ education/concepts-in-parasitology/ Deadline for applications is Saturday 1st August 2015.



Course Convenor: Associate Professor Alex Maier (ANU) Email alex.maier@anu.edu.au Phone 02-6125 0832

What is the course about?

The following themes will be explored through lectures, tutorials and practicals during the course:

Evolution of Parasites Molecular and Cellular Mechanisms Drug Discovery Parasites and the Immune System Immuno-diagnostics of Parasitic Infections Bioinformatics of parasite genomes Epidemiology Veterinary and Wildlife Parasitology Vector borne Diseases



Our expert faculty will include:

- Rob Adlard (Queensland Museum)
- Vicky Avery (Griffith University) Ian Beveridge (The University of Melbourne)
- Denise Doolan (QIMR Berghofer Institute of Medical Research)
- Giel van Dooren (The Australian National University)
- Aaron Jex (The University of Melbourne)
- Malcolm Jones (The University of Queensland)
- David Jenkins (Charles Sturt University)
- Nigel Beebe (University of Queensland)
- Tom Cribb (University of Queensland)



- Alan Lymbery (Murdoch University)
- Alex Maier (The Australian National University)
- Geoff McFadden (The University of Melbourne)
- Peter O'Donoghue (The University of Queensland)
- Michelle Power (Macquarie University)
- Stuart Ralph (The University of Melbourne)
- Melanie Rug (The Australian National University)
- Una Ryan (Murdoch University)
- Kevin Saliba (The Australian National University)

and many more ...

Website: www.parasite.org.au/education/concepts-in-parasitology/

State News New South Wales

Charles Sturt University

In February, Shokoofeh Shamsi had a trip to Pakistan as part of ACIAR project to investigate potential future research on important parasites of dairy (an ACIAR initiated project). There are a number of research students in Parasitology department commencing in 2015: After completing an Honours degree with high distinction, Thomas Williams received a Graham Centre PhD scholarship and commenced his PhD on parasites of dairy cattle and buffalos in Pakistan, an ACIAR supported project with Shokoofeh Shamsi, David Jenkins and David McGill. We also welcome Sara Baker and Kate McSpadden to the Honours program in Parasitology supervised by Shokoofeh and Dave. They are working on prevalence and abundance of Linguatula in livestock and canines, respectively.

Anita Poupa started an Add-On Honours project with Shokoofeh and Jean-Lou Justine from Museum National d'Histoire Naturelle, France on morphologically describing and genetically characterising nematodes of marine fish and cetacea from New Caledonia Brenton Kilby received an honours scholarship from Graham centre and started his Honours in Animal Science working on Optimising diagnostic techniques featured in the isolation, identification and risk evaluation of common production internal and external parasites. Brenton is supervised by Shokoofeh and Matthew McLellan from Narrandera DPI. Jaydip Suthar an international student from India commenced his Masters degree with shokoofeh on zoonotic parasites of common seafood in Australia.

Tara Cassidy is working with **Rob Woodgate and Shokoofeh** on evaluating common diagnostic techniques for Fasciola hepatica, focusing on FEC sedimentations and

coproantigen ELISA. Tara along with her supervisors and colleagues has developed a sedimentation technique and plans to validate it using spiked faecal samples of known egg concentrations. She also aims to compare individual ELISAs with pooled ELISAs to determine if using pooled ELISAs would be a reliable diagnostic test to monitor Fasciola hepatica infection. This work will be predominantly done and focused in sheep. Sarah Fotheringham commenced her Honours with Dave Jenkins, Victoria Brooks, Rob Woodgate and Allan Gunn on Study to Determine the Financial Impact of Hydatid Disease in Beef Cattle on Mainland Australia. Other members of the group with continuing projects are Alexandra Swan and Alice Banyan.

Shokoofeh hosted visiting Professor Manjunatha Kini from Singapore National University at CSU in March.

University of Western Sydney

The Autumn semester has well and truly kicked off at UWS with the **Stack lab** welcoming a number of new students. **Priya Kumar** has started her honours research project on examining the phosphoproteome of *Tritrichomonas foetus*, while **Farnaz Eqhanian** has just commenced her masters project on investigating the role pH plays as a barrier to host expansion in *Tritrichomonas foetus*. PhD candidate **Leah Cronin (Stroud)** has enetered the final year of her PhD and will be submitting her thesis at the end of the year.

The University of Technology, Sydney

In sad news for UTS **Michael Wallach's** former PhD student **Sonja Frolich** is moving from UTS to start her new role as a Research Scientist working for Roger Redel and the Genome Integrity team at the Children's Medical Research Institute to develop new automated 3D and 4D imaging technologies. The group focuses on how telomeres (proteins at the end of chromosomes) regulate genome integrity in normal and cancer cells so I am very excited to be working on some very cool biology. It is sad to see **Sonja** leave parasitology but we wish her well in her new endeavors.

Elizabeth Macarthur Agricultural Institute

The group led by Dr. Cheryl Jenkins at Elizabeth Macarthur Agricultural Institute includes post-doctoral fellow, Dr. Daniel Bogema, PhD student Sherin Alex and Technical Officer Melinda Micallef. The research team has been focused on recent outbreaks of the Theileria orientalis Ikeda genotype in Australian cattle and has developed a multiplex TagMan gPCR diagnostic, which can detect and quantify T. orientalis and identify if clinically-associated genotypes are present. This work published in the March issue of the Journal of Clinical Microbiology (doi: 10.1128/JCM.03387-14) also describes diagnostic thresholds for disease to assist veterinarians in diagnosing clinical theileriosis.

The research team have also had an article accepted in *Infection, Genetics and Evolution,* which describes the identification of two phylogenetic sub-groups of the *T. orientalis* Chitose genotype. One subgroup in particular is associated with the lkeda genotype in a high proportion of clinical cases. The temporal dynamics of *T. orientalis* genotypes in infected cattle were also explored viaqPCR analysis, with different genotypes of the parasite switching over time. This phenomenon is believed to be driven by host immune factors.

Western Australia

Department of Agriculture and Food Western Australia, Albany

The DAFWA parasitology group has managed to remain intact despite some severe staff cuts across the agency, something all too prevalent in state agriculture agencies these days.

The big news - the release of "Barbervax", the Barbers Pole worm vaccine for commercial use in October last year, foreshadowed at the Perth WAAVP conference in 2013. As a worldfirst (first sheep or gut nematode vaccine; first commercial helminth vaccine since the 1950s), it's a real feather in the cap for the Moredun Research Institute crew who laboured on it for 20 years (David Smith, George Newlands and numerous others). The role of the Albany group is the parasitology underlying the sheep system to produce Haemonchus for antigen extraction, no small task as production ramps up. We appreciate the new laboratories and equipment, and have even got used to our collaborators' Scottish ways (whisky, haggis, tolerance of bagpipes ...).

That's not all we do – a large MLA-funded investigation of the effects of worms on prime lambs, and what we can do about it, is running on 14 farms across the SW of WA, with Albany veterinary officer Danny Roberts at the helm. This year we'll test our best-bet control recommendations, developed after 80,000 km of travelling to the trial farms!

On the communication front, it's great to see that ParaBoss is in full swing – a national sheep parasite control coordination program, based in University of New England (Lewis Kahn as Executive Officer), and with representation from all states (www.paraboss. com.au). **Brown Besier** presented on this at the Australian Sheep Veterinarians conference in Hobart in February, and will also head to Brisbane for the AVA meeting in May (Barbervax as the topic), to talk about the prime lamb project at the WAAVP conference in Liverpool in August.

Murdoch University

Vector- and Water-borne Pathogens Group | CrypTick Laboratory (Prof. Una Ryan)

Dr. Fuchun Jian from the College of Veterinary Medicine, Henan Agricultural University in China is currently working with **Prof. Una Ryan's** group on a 12 month Visiting Fellow exchange program. She is working on *Cryptosporidium* epidemiology.

Telleasha Greay and Kim Loh have commenced their PhD's with the Vector and Waterborne Pathogens Group at Murdoch University under the supervision of **Prof.** Peter Irwin, Dr. Charlotte Oskam and Prof. Ryan. Telleasha will be working mostly on companion animal ticks as part of the ARC Linkage project entitled "Troublesome ticks: a new molecular toolkit to investigate zoonotic tick-borne pathogens in Australia". Kim will be working on wildlife ticks.

Parasitology Group



Murdoch crew taking a break and going 'on safari' at the International Congress on Parasites in Wildlife in Kruger National Park!

A number of people from Murdoch (Andrew Thompson, Alan Lymbery, Mikayla McCreddon, Amy Northover and **Stephanie Hing**) attended the International Congress on Parasites in Wildlife in Kruger National Park in September 2014. It was excellent conference, both scientifically and with the amazing wildlife on display in the park. We really appreciated the work of the Parasitological Society of Southern Africa, particularly Nico Smith and Banie Penzhorn, in organising the conference.



Dale Seaton (Executive Publisher Biology and Parasitology), centre, Lynn Sherrer, former Editor of Trends in Parasitology and now Associate Editor for Life Sciences at Elsevier, and Paul-Andre Genest, inaugural Managing Editor for JJP-PAW at the IECID conference in Spain.

Prof. Andy Thompson was an invited speaker at the inaugural international conference on the Impact of Environmental Changes on Infectious Diseases (IECID) in Sitges, Spain. It was an excellent multidisciplinary conference and Dale Seaton and other colleagues from Elsevier are to be congratulated on its inception and organisation. The programme has been enthusiastically received by delegates who want to see the conference held on a regular basis every 2-3 years. Andy was also a keynote speaker, along with Robin Gasser, at the 12th International Conference on the Molecular Epidemiology and Evolutionary Genetics of Infectious Diseases in Bangkok last December.

Stephanie Hing (PhD candidate) has embarked on her first trip with her precious woylie faecal samples to analyse them for stress hormones, thanks to an Australian Society for Parasitology Researcher Exchange award. **Stephanie** will be spending a

month at Charles Sturt University with Dr Edward Narayan to learn faecal metabolite glucocorticoid analysis techniques, so she can understand the relationships between stressors and parasite infection dynamics in the woylie, and whether stress has played a part in their recent population declines. We look forward to seeing what Steph comes back with! (See story on Stephanie's exchange on Page 15 of the newsletter).

Prof. Hamish McCallum (Griffith University) visited our research group earlier this year for discussions on our ARC Linkage project which is looking at the potential role of parasitic disease in translocations, and in particular the impact of trypanosome infections on the decline of woylies. The team agreed that results are consistent with an epidemic and with Hamish's input are developing models to support/test this hypothesis.

Congratulations to **Adriana Botero and Craig Thompson** who were both awarded their PhD's earlier this year. Adriana has taken a postdoctoral position with the Parasitology group at Murdoch, and Craig is doing an Applied Masters in Epidemiology (Public Health) at the Australian National University.

A number of new students have started this year. Le Ma is starting a PhD with Alan Lymbery on the ecological factors influencing the distribution of the freshwater mussel, *Westralunio carteri*, Daniel Squire has commenced a PhD on genetic and phenotypic variation in *Trichomonas*, supervised by Andrew Thompson and Alan Lymbery, and Jacqui Morgan is undertaking an Honours project on *Cryptosporidium spp*. in fishes, with Una Ryan, Susan Kueh and Alan Lymbery as supervisors.

Queensland

James Cook University

QTHA/AITHM

Loukas Laboratory

In a deal that is a first for an innovative research university, **Alex Loukas** and his team have partnered with Janssen Pharmaceuticals to develop a first-in-class therapeutic for the treatment of Ulcerative Colitis and Asthma. What do these two seemingly dissimilar diseases have in common? The answer is inflammation, with Prof Lucas harnessing the anti-inflammatory properties of proteins secreted by hookworms to develop treatments, and potentially cures for these immune-related maladies. One such protein, Ac-AIP-2, appears act via regulatory T-cells, which opens the possibility that it could treat a range of different diseases.

The partnership with Janssen sees the pharmaceutical company funding a one-year preclinical development program to answer some vital questions about the suitability of Ac-AIP-2 as a drug. In return, Janssen receive an exclusive option to negotiate a world-wide licence at the end of the program.

This year sees the recruitment of a few new additions to the lab. Stephanie Ryan joins the team from Rick Maziels lab in Edinburgh to pursue a PhD to identify more immunoregulatory proteins from hookworms that could be used to treat inflammatory diseases by employing a high-throughput, cell-free system to make her molecules. The Cairns-Edinburgh superhighway is kept open with the recruitment of Linda Jones (also from Edinburgh), who will be working with Severine Navarro to answer some of those Ac-AIP-2 guestions. Honours student Geraldine Buitrago is working with Darren Pickering to identify AIP-2 homologues from other helminths and medical student Charlotte Durand is studying mucosal inflammation and Celiac disease with Paul Giacomin.

The lab farewells **Leon Tribolet**, who has submitted his thesis on characterisation of the hookworm vaccine antigen Na-ASP-2. **Leon**, who was co-supervised by **Alex Loukas, Mark Pearson and Paul Giacomin**, published 4 papers throughout his thesis and is now going to look for a postdoc opportunity down south. Good luck Leon!

Marine Parasitology Laboratory

Members of the Marine Parasitology Laboratory are enjoying a productive semester which has included grant success, travel and published manuscripts. Kate Hutson and Terry Miller have commenced a new research project on parasites of ornamental fishes funded by the Fisheries Research and Development Corporation in collaboration with the University of Sydney. This project will examine imported fish species for protozoan and metazoan parasites and identify them using a combined morphological and molecular diagnostic approach. Also working on the project are PhD student Alejandro Trujillo-González and Masters of Applied Science student, Josh Allas. Kate, Alejandro and Josh had a productive first sampling trip to the Quarantine Approved Premise (QAP) at the University of Sydney, while Terry Miller stayed back in Cairns to help with newborn Carter! Congratulations Terry!

PhD student Giana Gomes recently returned from her Researcher Exchange through an ASP Network Researcher Exchange, Training and Travel Award at the Microbial Diversity Laboratory at UMass-Amherst (Program in Organism and Evolutionary Biology) led by Professor Laura A. Katz. Giana was thrilled to learn new techniques for cultivating ciliate parasites of fishes and now has a healthy culture established in the laboratory. Alexander Brazenor has finalised molecular work with Terry in the Cairns laboratory where he has sequenced three gene regions from more than 50 Neobenedenia isolates from Australia and around the world. This research, in collaboration with Terry Bertozzi and Ian Whittington (dec.) (South Australian Museum), aims to identify the Neobenedenia species associated with outbreaks on farmed fishes in Australia.

We also welcome **Soranot Chotnipat** back into the lab. **Soranot** just couldn't get enough of parasites in his Masters of Applied Science and has returned for his Masters of Philosophy to examine ectoparasitic treatments in aquaculture.



Giana Gomes working in the field at a freshwater Barramundi (Lates calcarifer) pond farm in far north Queensland. **Giana** plans to validate the use of environmental DNA as a monitoring tool for identification and quantification of parasitic ciliates in fish farms.







Marine Parasitology Lab members in Sydney for lab work and little bit of culture: **Alejandro, Kate and Josh** at the pop art exhibition, Josh dissecting a banggai cardinal fish (top) and **Alejandro** preparing organ smears at the QAP (bottom).

Griffith University

Eskitis Institute

Dr Dulangi Sumanadasa's PhD was conferred on the 5th March 2015 for her thesis entitled "Investigation of novel antimalarial agents and novel target identification approaches". Dulangi carried out her PhD project in the Griffith University Tropical Parasitology laboratory headed by Associate Professor Kathy Andrews and was co-supervised by Dr Tina Skinner-Adams, Professor Denise Doolan, and Associate Professor Rohan Davis. Dulangi published five papers during her PhD and is currently working for for Progen Pharmaceuticals Limited in Queensland. Rachael McGeorge graduated her PhD last July and Alice Butterworth has submitted her PhD and is currently responding to examiners' comments. The Tropical Parasitology lab also welcomes Gillian Fisher, who recently submitted her PhD thesis in the same lab, as a new postdoc working on malaria prophylactic drug discovery.

University of Queensland

School of Chemistry and Molecular Biosciences

Peter O'Donoghue (POD) and Linda Ly have just returned from the ASP Concepts in Parasitology camp held at the ANU Kioloa campus in NSW. Fantastic venue, great facilities, and good food. We ran four lectures and four practicals on Diagnostic Parasitology in one day of the course and had some great fun with numerous parasites and some weird results. The whole occasion was thoroughly enjoyable for 2 main reasons: the students were brilliant (focussed, interested, enthusiastic, smart) and the fellow teaching staff were likewise. We hope that the course continues to run year after year, as we think it is a brilliant way to engage and enthuse people into the broader realm of parasitology, rather than the narrow parochial technological streams available in universities and research organizations. Well done ASP and well done organizers (esp. **Alex Maier)**!!!!

POD has also been frantically working on the protistan entries in the Australian Faunal Directory (AFD) published on the internet by the Australian Biological Resources Study. Not only is it a taxonomic treatise on all species recorded in Australia, but it also gives details on their geographic distribution and zoogeography (habitat/host records, tissue tropism, etc) and lists all previously published papers. The database is a work in progress and provides a solid foundation to any student/scholar undertaking a literature review on specific taxa. Special thanks is given to Alice Wells whose energy, enthusiasm and professionalism has enabled this incredible resource. The ASP needs to advertise the existence of the AFD as all other parasite assemblages are also covered.

Queensland Alliance for Agriculture & Food Innovation

Jess Morgan completed a successful gnathiid collecting trip to Lizard Island in 2014 thanks to a Sea World Research and Rescue Foundation grant. In collaboration with Lexa Grutter at UQ, Buz Wilson at the US National Museum of Natural History, Di Barton at NT-DPI, , UQ MSc coursework student Azin Delavari we have been working on finding genetic markers to match the larval and adult stages of several different species of these blood sucking parasites.



Previous page images Adult male (top) and female (bottom) *Gnathia falcipenis* collected from Lizard Island.

Manuel Rodriguez Valle and Ala Lew-

Tabor are busy with staff and students on the paralysis tick project (ARC Linkage) and MLA funded cattle tick vaccine challenge trials. Chian Teng Ong completed her Biotechnology Honours associated with paralysis tick transcriptome analyses; Beibei Chen is continuing with her Masters developing ELISAs and growing novel monoclonal antibodies, Tom Karbanowicz and Tao Xu (and while also working on his PhD thesis review) have been working as casuals expressing toxins in yeast. Greta **Busch** is writing as much as she can currently. We welcome Muhammad Usman Badar to the group as a summer scholar and Masters student for 2015. Congratulations to Chian who won the Zoetis Animal Health Research Award for her Poster at the Animal Science Olympics (19th September 2014). She used the prize money to attend VETSCI2014 in Singapore last November and won the Best Student Paper at that conference ! Congratulations also to **Tom Karbanowicz** who won the Elanco ECR Innovation prize for Animal Science for his poster on the 19th September (he has yet to attend a conference with his prize money) and also congrats to Greta Busch who won the Best Centre for Animal Science RHD poster at the QAAFI Annual Research Meeting late November. Well done to all students ! NOTE: Australia is hosting the 9th International Tick and Tick-borne Pathogen conference in Cairns in 2017!!!!!! As mentioned previously anyone interested in being involved with TTP9 - please contact Ala.



Previous image: Chian Teng Ong (UQ) – Supervised by Dr Rodriguez Valle and co-supervised by A/Prof Ala Lew-Tabor



ARC Linkage (paralysis tick) project Annual project meeting 4th December 2014

Front: Muhammad Usman Badar, Beibei Chen Standing (from left): Kevin Broady (UTS), Manuel Rodriguez Valle (UQ), Kim Agnew (Elanco), Greta Busch, Tom Karbanowicz, Bronwyn Venus (UQ), Aleta Knowles (Elanco), Tao Xu, Ala Lew-Tabor and Diane Vankan (UQ). (missing from photograph Chian Teng Ong and Prof Rick Atwell)

Central Queensland University

Lee Barnett has just come back from being one of 16 students in the inaugural Concepts in Parasitology course run by ASP. This was a great way to get across a broad range of parasitology, taught by well-known experts from ASP. Having 8 days at the ANU Kioloa coastal campus was also a pretty sweet gig and the food there was excellent (priorities are so important). The course was a great networking opportunity as well, as students were from a broad cross-section of the society, with post-docs, current postgraduate students, prospective postgraduate students and industry/departmental Parasitologists, and there were lots of opportunities to interact with the experts (mainly over food) who so generously gave their time. Much fun was had by all, and the concepts covered varied widely, from trawling for ticks in the bush and then identifying them, to checking out new

high fangled technologies in the ANU labs (the benchtop SEM on display was also pretty cute). **Lee** expected to enjoy the experience of learning more about parasitology (and she did), but she also found new friends as well!

Richard Bradbury is plugging along at CQU with his Parasitology research. He has presented a number of posters and talks at conferences lately, including the 9th National Workshop on Strongyloidiasis in Sydney and at the Royal Society's Commonwealth Science Conference in India (for which he was lucky enough to be selected as one the Australian ECR delegates by the Australian Academy of Sciences). He has recently published a perspectives piece on malaria diagnosis and treatment in MJA and has a few papers on surveys in Africa and the Solomon Islands in preparation. Richard and Rick Speare recently came across several people with spurious passage of *Melioidogyne* spp. eggs in the Solomon Islands, a phenomenon not described for many years and which they are submitting a short report for publication on this finding. He has an Honours student working on Central Queensland tick borne diseases and a Summer scholarship student looking at potentially zoonotic parasites in Central Queensland domestic dogs. More surveys and other fun with parasites are planned for later in the year!

QIMR Berghofer Medical Research Institute

At the 2014 QIMR Berghofer Awards, presented on 2 December, the Ralph Doherty QIMR Berghofer Prize for Outstanding Achievement and Leadership in Medical Research was awarded to **Don McManus**, Senior Scientist from the Molecular Parasitology Group. The Long Service Award was also presented to **Don McManus** for over 25 years support to the Institute.

ACT

The Australian National The University of University

Research School of Biology

In January 2015 the Malaria Host Genetics group (Brendan McMorran, Gaetan Burgio and their colleagues) moved from Macquaire University to the John Curtin School at ANU. Everyone is enjoying the friendly collaborative environment at ANU, and they're beginning to adjust to the quieter Canberra lifestyle. But we will wait and see how long the smiles last once winter hits!



January also saw ANU play host to the National Youth Science Forum, a two week science 'summer camp' for high school students from all around Australia. This year, ANU parasitologists designed a 'Parasite Detectives' prac, wherein the NYSF students became infectious diseases experts for a day and had to diagnose a 'mock' parasitic infection that had been acquired by their prac demonstrators. (See Outreach story on page 9 of this newsletter) The pracs ran over three sessions, and were run by Meng Zhang (Maier group), Esther Rajendran (Kirk group), Edwin Tjhin (van Dooren group) and Giel van Dooren, with significant input from Melanie Rug and Kathryn Parker (van Dooren lab).

Finally, congratulations to **Doctor Patrick** Lelliot (Burgio/Foote/McMorran groups), who recently recieved his PhD from Macquarie University. His thesis also recieved The Vice Chancellor's Commendation. Well done Pat!

Victoria

Melbourne

Faculty of Veterinary Science

Gasser lab

Dr Clare Anstead received a two-year National Science and Engineering Research Council (NSERC) postdoctoral fellowship from the Canadian Government.

Prof Gasser's group published a paper "Lucilia cuprina genome unlocks parasitic fly biology to underpin future interventions" in Nature communication. (see story on page 11 of this newsletter)

Lightowlers Lab

Charles Gauci, Meritxell Donadeu and

Marshall Lightowlers spent two separate weeks in Wagga Wagga over March and April with David Jenkins undertaking necropsies on sheep. Two experiments were involved, with a total of 90 animals. Each animal required meticulous examination of the liver and lungs for hydatid cysts including number of cysts, cyst size, viability and fertility. One of the experiments tested the hypothesis that regular use of albendazole for the treatment of GI nematode infections would reduce the number, size and fertility of hydatid cysts. They discovered that rather than adversely affecting the growth and maturation of hydatid cysts, sheep receiving a double dose of albendazole every 2 months for two years following an experimental infection with Echinococcus granulosus eggs had more cysts, larger cysts and more fertile cysts!



Meritxell Donadeu and Charles Gauci slicing sheep liver and lung tissue to count hydatid cysts.



Fertile hydatid cysts in the lung of a sheep experimentally infected with Echinococcus granulosus eggs 2 years previously.

Traub Lab

Associate Professor Rebecca Traub was invited to present her work on Rickettsia felis at the World Forum for Companion Animal Vector-borne Disease symposium sponsored by Bayer in Barcelona, March 23-27.

Mr Dinh Nguyen has returned to Vietnam to commence fieldwork relating to his PhD project on pork-borne parasitic zoonoses in ethnic minority communities of Central Vietnam

Bio21 Molecular Science and **Biotechnology Institute**

Prof Leann Tilley's group published a landmark paper in PLOS Biology in March 2015.

Dogovski C, Xie SC, Burgio G, Bridgford J, Mok S, et al. (2015) Targeting the Cell Stress Response of Plasmodium falciparum to Overcome Artemisinin Resistance. PLoS

Biol 13(4): e1002132. doi:10.1371/journal. pbio.1002132

Below is an extract from a blog by **Lauren** Richardson:

"Containing and eliminating resistant parasites before they spread is critically important, and in a new research article published in PLOS Biology by Con Dogovski, Stanley C. Xie, Nectarios Klonis, and **Leann Tilley** at the University of Melbourne, working with colleagues from Thailand, Singapore and the USA, have identified two ways to overcome artemisinin resistance. They also develop a model, which can be used in clinical settings to predict whether a parasite has become resistant to artemisinins, providing a powerful tool to improve detection and treatment of malaria."

Fellowship Awards

Congratulations to Professor Geoff

McFadden, University of Melbourne, School of Botany who was elected as a Fellow of the America Academy of Microbiology.

Congratulations to Professor Leann Tilley who is the recipient of the 2015 Georgina Sweet Australian Laureate Fellowship.

Tasmania

The University of Tasmania

Welcome to our new student Tasmanian ASP members Jessica Johnson-Mackinnon and Jimena Balli Garza. Both students have started PhD projects with Barbara Nowak at the University of Tasmania. In January this year Jimena went to RMIT University to the School of Applied Sciences. Jimena worked under Dr Nathan Bott's direction in the Department of Biotechnology and Environmental Biology. Using different PCR primers, amplifying different gene regions, they identified one species of Scuticociliates that was found in Southern Bluefin Tuna. This Scuticociliate along with *Uronema nigricans* has been previously linked with to Swimmer Syndrome in different fish species, but hasn't been reported in Tuna. Further work will be continued using the partial sequences obtained.

Congratulations to Dr Victoria Valdenegro who graduated in December last year from the University of Tasmania. Victoria has accepted a postdoc position at the Technical University of Denmark, in the Section for Aquaculture, DTU Aqua. The research centre is located in Hirsthals, at the top of the Jutland peninsula in northern Denmark. She is primarily working within the project "ExiPro" funded by Innovation Fund Denmark. ExiPro is a collaboration project between BioMar, University of Copenhagen, University of Aarhus and DTU Agua, and its main focus of is to resolve the effects of fish feed extrusion on the nutritional quality of dietary proteins within the feed, and how this affect physiological responses in the fish. Since December, the two last manuscripts of Victoria's thesis have been accepted for publication in the Fish and Shellfish Immunology journal. The first manuscript was accepted in December 2014. Entitled "Effects of single and repeated infections with N. perurans on antibody levels and immune gene expression in Atlantic salmon", this work investigated how AGD affects the association between systemic and mucosal antibody responses and Ig transcription in the gills of fish infected only once and sequentially with the parasite. The second manuscript, which was accepted for [publication in mid-March and is entitled: Vaccination with recombinant protein (r22C03), a putative attachment factor of Neoparamoeba perurans, against AGD in Atlantic salmon (Salmo salar) and implications of a co-infection with Yersinia ruckeri", presents the results of a large scale immunisation and challenge experiment using a putative vaccine candidate against N. perurans.



Dr Victoria Valdenegro who graduated in December last year from the University of Tasmania with her supervisors **Barbara Nowak and Phil Crosbie**.

Congratulations also to Honours student **Napatsorn Torchareon (Mean)** who also graduated last year. Our final congratulations go to **Laura Gonzales** (PhD) who has just completed her PhD entitled "Ectoparasites and associated pathogens affected farmed salmon during marine grow out in Chile and Australia". **Laura** will graduate from the University of Tasmania in August. We wish all of our graduates the best of luck for the future.



New Graduate Napatsorn Torchareon with Melanie Leef



Dr Laura Gonzales working the lab – hard work really does pay off.

Congratulations also to ASP student member Ylenia Pennacchi was recently awarded funding from the Fisheries Society of British Isles Travel Grant and to the University of Tasmania Conference and Research Travel Scheme to attend and present her research at the upcoming 13th International Society of Developmental and Comparative Immunology (ISDCI) Congress in Murcia, Spain. The ISDCI congress is a leading conference in the immunology field and takes place every three years. Ylenia said "I am really looking forward to attend this conference and in particular I am very enthusiastic about discussing my research with the keynote speaker Dr Scapigliati who accepted my request to visit his laboratory at the Department of Innovation of Biological Systems, Food and Forestry at Tuscia University in Italy. It really looks like a promising end for my PhD studies".

Last but not least our final congratulations to **Stephanie Mahnken**, the winner of the 2014 ASP sponsored Best Undergraduate Prize for unit JFA304 (Aquatic Animal Health) at the University of Tasmania. We wish **Stephanie** the best with all of her future endeavours.



Catarina Norte dos Santos presenting her research at the University of Waikato, New Zealand.

Last year both **Barbara Nowak and Melanie** Leef attended the International Congress of Parasitology (ICOPA) conference in Mexico City. Whilst there **Barbara and Melanie** took the opportunity to meet with their new PhD student and ASP member **Jimena Balli Garza** who gave both her new supervisors the most amazing tour of the city and its surrounds. This year **Barbara** has also been invited to Gill Health Initiative meeting which is being held in April in Galway Ireland to present our current work on amoebic gill disease.



Stephanie Mahnken, winner of the 2014 ASP sponsored Best Undergraduate Prize in Parasitology.

Catarina dos Santos was recently awarded an ASP Network Researcher Exchange, Training and Travel Award to visit Dr. Steve Bird, at the University of Waikato in New Zealand. She is very grateful for the opportunity to learn molecular methods. She will analyze relevant immune genes to gain further insight into the role of the interbranchial lymphoid tissue during amoebic gill disease in Atlantic salmon.



Barbara Nowak (left), Melanie Leef (right) and new ASP student member Jimena Balli Garza (centre) in front of the Teotihuacan temple of the sun.

Outreach: Parasitology for kids

A children's parasitology event August 2014 organised by student member **Catarina Norte dos Santos** was held during the University of Tasmania's Open day (Aug 2014) and this story appears on page 10 of this newsletter.

Parasitology Poster Lunch

The annual Fish Histopathology workshop at the University of Tasmania conducted Professor Nowak offered a unique opportunity for outreach and to showcase our ASP student parasitology research to an audience of veterinarians, pathologists, university lecturers, researchers, students and government agency workers. This outreach event, hosted by Melanie Leef and Barbara Nowak, consisted of a lunchtime poster session which utilized research posters from the 2012 and 2013 ASP conferences. In total 12 posters were displayed for the workshop participants to look at during their ASP sponsored lunch break. Our current students Lukas Neumann, Paul Li, Thomas Hill and Jessica Johnson-Mackinnon were also invited to attend the lunch to discuss their research with the participants. To encourage discussions and active participation the workshop participants were asked to vote for the best poster. The winner of this poster session was ASP member Melissa Martin. Melissa was awarded with a \$30 Co-op bookshop voucher as a prize. The parasitology poster lunch session was attended by 12 workshop participants, 4 tutors, the ASP state representative, the workshop organiser as well as the ASP students. ASP funds were used to sponsor the lunch and purchase the poster prize. The event was advertised to participants on the first day of the workshop and also on the day of the poster session using flyers. This event has created a greater awareness of fish parasitology and offered another great opportunity for ASP student members to showcase their research.



Council of the Australian Society for Parasitology Inc.

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