



NEWSLETTER

Volume 28 Issue No.4 September 2017

TURTLES, DEER & ARMADILLO

Images from IJP:PAW
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Meet the new President

4 new Council members

10 pages of images
from Leura

6 pages of state news
and more...



The **2016 ASP Annual Report** is now available for download on the Society's website.

<http://parasite.org.au/publications/annual-reports/>





NEWSLETTER

Volume 28 Issue No.4 September 2017

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Dear Members,

First of all, I would like to thank David Emery (President), Colin Stack (Secretary) and Peter Rolfe (Treasurer) for all their hard work for the ASP and for their support during the transition of the Executive. I would also like to thank outgoing and current ASP Council members and welcome new additions. The current Council members include: Charlotte Oskam (Executive Secretary), Amanda Ash (Treasurer), Giel van Dooren (ACT), Shokoofeh Shamsi (NSW), Michelle Boyle (NT), Gillian Fisher (QLD), Danny Wilson (SA), Crystal Cooper (WA), Matthew Dixon (VIC), Barbara Nowak (TAS), Alex Maier (CIP convenor) Tina Skinner-Adams (Incorporations Secretary), Mal Jones (BMM Convenor); ASP Network Convenor (Nick Smith), Newsletter Editor (Lisa Jones); IJP Editor (Brian Cooke); IJP-DDR Editors Kevin Saliba and Andrew Kotze) and IJP-PAWS Editors (Andy Thompson and Lydden Polley), our inaugural Co-Editor-in-Chief, Lydden Polley stepped down at the end of June and we thank Lydden for the support he has given to IJP-PAW during this time, Maureen Engler continues in the position of Secretariat.

Brian Cooke continues as Editor-in-Chief for IJP and Maria Meuleman continues to do an outstanding job in her role as the IJP Editorial Assistant. On behalf of ASP and the field of Parasitology, I would like to thank Brian and Maria, and the Deputy Editors Alex Loukas and Jan Šlapeta, and the IJP Editorial Board members, for all their hard work, which is greatly appreciated. IJP remains a leading specialist journal that publishes research articles devoted to our discipline. The current impact factor of the journal is 3.730.

The IJP sister journals; International Journal for Parasitology: Drugs and Drug Resistance (IJP-DDR), with Andrew Kotze and Kevin Saliba as editors, and IJP-Parasites and



Wildlife (IJP-PAW), with Andy Thompson and Lydden Polley as editors, continue to go from strength to strength with an impact factor of 4.809 for IJP-DDR and a CiteScore of 3.03 for IJP-PAW. On behalf of ASP, I sincerely thank all Editors, Deputy Editors, Assistant Editors and Editorial Board members for their major contributions.

I would also like to thank Alex Maier (Course Convenor) and the Concepts in Parasitology (CIP) committee, lecturing staff and students for making the CIP course, such an outstanding success. The 2017 course will take place between Sunday 26th November and Saturday 9th December 2017 at the ANU's Kioloa Campus, on the NSW south coast.

The ASP conference was held in Leura in the Blue Mountain in Sydney from 26th-29th of June, 2017. The scenery was stunning and the high calibre international and national speakers ensured that the conference was a big hit. A huge thank you to Lisa and Nick and the organising committee for one of the "best ASP conferences ever", as several people have commented to me. In addition to great science, the catering was outstanding.

We are also grateful to numerous sponsors for their support. The 2018 conference will

From the President's desk continued

take place in Melbourne, 24-27 September at the Novotel Hotel, St.Kilda. The website will be launched soon and I look forward to seeing you there.

The 2016 Annual Report has been published. To find out what our wonderful society has achieved in 2016, download your copy from the ASP website at:

www.parasite.org.au/publications/annual-reports/

I look forward very much to serving the society and am keen to hear any thoughts or views from the current membership on how the committee could serve your needs better and how we as a society can foster our discipline both nationally and internationally.

Please send me an email with your comments and suggestions president@parasite.org.au

Best regards,

Una Ryan

www.parasite.org.au
www.facebook.com/ASParasitology
www.twitter.com/AS_Para

Meet the President, Professor Una Ryan

At the last ASP AGM, Thursday 29 June 2017, held in Leura, Blue Mountains at the Annual Conference for the Australian Society for Parasitology, the new ASP Executive was sworn in. In this interview we will hear from Una Ryan - ASP President and Professor at Murdoch University.

Una, tell us a bit about yourself and about your background?

"I grew up on a dairy farm in rural Ireland. My father, who had recovered from Tuberculosis as a child, died suddenly when I was young. The farm was converted to a cattle farm run by my mother who was a teacher, a strong feminist and wonderful role model for her children."

The death of her father stirred up a passionate interest in infectious disease and Una went on to study zoology with honours in molecular typing of salmon species using mitochondrial DNA at University College Dublin, receiving her BSc in 1988.

How did you end up in Australia?

"I feel like I was born in the wrong

country because when I was growing up I remember always wanting to escape the cold Irish climate. I had a long-standing fascination with Australia and this drove my move there in 1989. I landed in Perth, Western Australia and, after working briefly at Curtin University, I went on to study parasitology. I received my PhD from Murdoch University in 1996 under the supervision of Professor Andy Thompson. I continued to work with Andy as a post-doctoral researcher in epidemiology investigating cryptosporidium in Indigenous communities."

Una is now Professor in Biochemistry and runs the Vector & Water-borne Pathogens Research Group (the CrypTick Laboratory) with Prof. Peter Irwin and Dr. Charlotte Oskam and teaches biochemistry at the School of Veterinary & Life Sciences at Murdoch University, in Perth, Western Australia.

Una, tell us about your parasitology research.

"Our group's research area is the molecular epidemiology of infectious agents, particularly the use of genotyping tools for studying transmission dynamics and the application of Next Generation Sequencing for studying the microbiome of ticks and environmental samples.

We work on the molecular epidemiology

of enteric protozoan parasites such as *Cryptosporidium* and *Giardia*, blood borne protozoans such as *Babesia*, *Theileria* and *Trypanosomes* as well as potential bacterial pathogens in ticks.

"*Cryptosporidium* is a major cause of severe diarrhea in children in developing countries. We were the first group to identify that human cryptosporidiosis was primarily caused by two morphologically identical but clinically and genetically different species of *Cryptosporidium*. Over the years our research has expanded to include *Giardia*, piroplasms and bacteria."

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

"Due to its resistance to levels of chlorine in drinking water, *Cryptosporidium* is the major public health concern of water utilities worldwide. Following my discovery that there were two main species of *Cryptosporidium* that caused disease in humans and that one was zoonotic (*C. parvum*), I named the human species '*Cryptosporidium hominis*'. I developed a rapid molecular test to detect and differentiate between *C. parvum* and *C. hominis* and filed a worldwide patent. I have received grants from the Australian Research Council as well as other organizations to evaluate the public health impact of *Cryptosporidium* contamination of drinking water catchments using this

Meet the President continued

novel diagnostic as well as a range of other molecular typing tool. Since then I have described over 20 new protozoan and bacterial species. In 2001, I was awarded the Minister's Prizes Prize for Life Scientist of the Year and in 2014 was awarded the the Bancroft-Mackerras Medal from the ASP."

How do you see your research developing in the future?

"One focus of our current research (in collaboration with Peter Irwin, Charlotte Oskam and Andrea Paparini at Murdoch University) is to determine if the novel bacterial species we have identified in Australian ticks are also found in humans following a tick bite, and if they are responsible for Lyme-like Disease symptoms. This is essential information for effective treatment."

What keeps you motivated as a parasitologist?

"I still love the science. I find my research fascinating, the parasites are clever, and there is so much more to still find out. With the Lyme-like Disease research I feel like we might be able to make a difference to patients' lives and this keeps me motivated."

What aspects of your role as ASP President are you looking forward to the most?

"I am really looking forward to working with our ASP Early Career Researchers and Students. The ASP is a fantastic society with a strong focus on offering support to the next generation of parasitologists. I am looking forward to finding out more about our members. I thank those ASP members who work so hard for the Society, the Editors and the volunteers. It will be a privilege to serve the Society as President and I look forward to our Annual Conference in 2018 in Melbourne!"

Four of our new Council members

Matthew Dixon (State Rep, Victoria)

Matthew undertook his undergraduate degree majoring in parasitology at the University of Queensland graduating with honours in 2002. He completed his PhD at the Queensland Institute of Medical Research, University of Queensland, in 2008, within the malaria biology lab under the supervision of A/Prof Katharine Trenholme and A/Prof Donald Gardiner. He moved to Prof Tilley's laboratory at La Trobe University and worked as a post doctoral fellow. In 2010 he was awarded a NHMRC Fellowship. In 2011 he moved with Prof Tilley to the Department of Biochemistry and Molecular Biology at the Bio21 Institute, the University of Melbourne. He has authored 40 publication in high ranking journals such as Nature communications, PNAS and BMC Biology and has written several invited reviews for Trends in

Parasitology and the prestigious Nature Reviews Microbiology.

Matthew's research focuses on understanding the remodeling and cell biology processes driving the unique architectural changes undertaken by the human malaria parasite *Plasmodium falciparum*. These changes are central to the parasite's ability to survive within the red blood cells and circulation of the human host. In particular he is interested in the processes mediating cerebral and placental malaria and the mechanisms of sexual differentiation and transmission. Understanding these processes will help guide much needed new approaches aimed at disease eradication. To undertake this work he combines cellular and molecular biology techniques with high end electron



and optical microscopy technologies to visualise the malaria parasites biology.

Christina Spry (State Rep, ACT)

I obtained my PhD from The Australian National University for my work with A/Prof Kevin Saliba investigating and targeting the metabolism of vitamin B5 by the human malaria parasite. Following my PhD, for which I was awarded the Society's JFA Sprent Prize, I worked as a postdoc with A/Prof Saliba and Prof Kieran Kirk studying the nutritional requirements of the human malaria parasite and seeking out new mechanisms by which to inhibit parasite growth.

In 2011, I was awarded an NHMRC overseas-based Early Career Fellowship, which took me to the University of Cambridge, UK, to work with Prof Chris Abell. In Cambridge, I learnt about fragment-based approaches to drug discovery, which I applied to identify

new inhibitors of vitamin B5 metabolism in bacteria including *Mycobacterium tuberculosis*. In late 2015, I returned to the Research School of Biology at The Australian National University, where I'm now based in the Saliba lab, continuing my NHMRC Early Career Fellowship.

I have a strong interest in antimicrobial drug discovery and, among other things, am currently working on identifying, and understanding the mechanisms of action of, new molecules with the potential to help combat malaria. I have remained interested in the pathway by which malaria parasites metabolise vitamin B5 – a nutrient required for parasite survival – and additionally continue to study this pathway through a combination of whole-cell and protein work.



New Council members continued

Charlotte Oskam (Executive Secretary)

Dr Charlotte Oskam is an early career academic and a team leader in the Vector & Waterborne Pathogen Research Group at Murdoch University co-directed by Professor Una Ryan and Professor Peter Irwin. She completed her PhD in 2013, which incorporated an interdisciplinary approach to investigate extinction processes through ancient DNA and stable isotopic profiling. Since joining the VWBPR group in 2013, her research now focuses on Australian ticks and characterising their microbial communities to inform the current debate about tick borne disease in Australia. She was the recipient of the 2015 Vice Chancellor's Excellence in Research Award for Early Career Development and Achievement in Science at Murdoch University.



Michelle Boyle (State Rep, NT)

DI completed my PhD with Professor James Beeson in 2012 with a focus on developing methods to study *Plasmodium falciparum* malaria parasite invasion of red blood cells. These studies included investigating mechanisms and inhibitors of invasion with a focus on progress towards vaccine and drug development. Following my PhD, I completed a two-year post-doctoral position at University of California, San Francisco under the mentorship of Associate Professor Maggie Feeney. I focus on cellular immune responses in naturally exposed populations, and my work identified a number of age- and malaria exposure-dependent changes to T cells that contribute to naturally acquired immunity.

I am currently based at the Menzies

School of Health Research in Darwin where I hold a Honorary Fellow position, and am a Senior Research Officer at the Burnet Institute. I am working on collaborative projects between the two institutes to identify mechanisms contributing to the acquisition of immunity against multiple malaria species in the South East Asia region.



Can you name these Fellows of the Society?

The Fellows in this edition of the newsletter will be familiar to most members of the Society as they are the five to be honoured most recently.

We are continuing to add more detail to our "Fellows of the Society" pages. As they grow over the coming months, these pages should form a fascinating biographical archive of some of the leading Australian Parasitologists of the last fifty years.

If you have any suggestions for the improvement of these pages, please write to Lisa Jones at lisa.jones1@jcu.edu.au



To put names to faces and to read a brief biography of each Fellow, visit parasite.org.au/the-society/fellows-of-the-society/

The answers can also be found at the bottom of page 50 of this newsletter

Lisa Jones awarded a Fellowship of the Australian Society for Parasitology

Lisa Jones has worked for the Australian Society for Parasitology since 2005 and is currently its Executive Officer. She was awarded a Fellowship of the Society by Professor David Emery, President of the ASP, at the 2017 Annual Scientific Meeting in Leura, NSW.

In her Fellowship citation written by Professors Una Ryan and Mal Jones, Lisa was praised for her outstanding communication skills. Lisa's "background in science and genuine passion for science communication has made her an invaluable asset to parasitology in Australia."

Since joining the Society in 2005, Lisa has played a key managerial role as coordinator of the ARC/NHMRC Research Network for Parasitology and more recently as the ASP's Executive Officer. Her contributions have encompassed financial management and strategy and policy development. She organises the Society's annual conference each year and has been a driving force behind some major outreach initiatives

including Parasites in Focus and The Hidden Zoo, an exhibition of high-resolution parasite images, which has been displayed across Australia. She was also instrumental in the Inspiring Australia/ ASP funded art-science project *Gula Guri mayin* (which means "Heal the body") and which explores themes of parasites and health in Indigenous Australian communities. The art work has been featured at the 2015 National Science Week and numerous conferences throughout Australia.

"Lisa has been, without question, one of the most loyal and hard-working servants of the Australian Society for Parasitology in all its history. She has inspired scientists across Australia to engage with the public

in ways they never imagined possible."

Lisa described receiving her Fellowship Award from the ASP as the highlight of her career, "What an honour and privilege to receive this prestigious Fellowship award from the ASP, I am very grateful and humbled. Thank you!"

The full citation can be found on the ASP's website at:

<http://parasite.org.au/the-society/fellows-of-the-society/lisa-jones-fasp-2017/>

Below: Lisa Jones and colleagues celebrating her Fellowship at Leura



University of Melbourne honours Robin Gasser

The University of Melbourne has awarded Robin Gasser the title of Redmond Barry Distinguished Professor.

Professor Robin Gasser, a past President of the Society, has been awarded the title of Redmond Barry Distinguished Professor for his outstanding contribution to research at the University of Melbourne.

Robin's research into the biology of socioeconomically important parasites is aimed at improving the health and wellbeing of both animals and humans. He and his team have been using genetic, genomic and bioinformatic approaches to understand parasite biology and molecular

biology, parasitic diseases and host-parasite interactions and to develop improved diagnostics and disease interventions.

Robin is also Director of Research at the Melbourne Veterinary School, a Fellow of the Australian Society for Microbiology and a Fellow of the Australian Society for Parasitology.

The Redmond Barry Distinguished Professor title, established in honour of Sir Redmond Barry's contribution as founder of the University, recognises professors who demonstrate outstanding leadership in the University and wider community, coupled with pre-eminence in their research, teaching and creative activity. Nominations are considered by the University's

Distinguished Academic Awards Committee and approved by the Vice-Chancellor.

Redmond Barry Distinguished Professors are a highly select group of the University's leading international level researchers and Robin joins Professor Frank Dunshea as only the second holder of this award within the Faculty of Veterinary and Agricultural Sciences.

John Fazakerley, Dean of the Faculty, writes: "Robin, congratulations for this well-deserved recognition of your ongoing contributions to the University and to veterinary medicine, parasitology and genomics around the world."



Awards

JFA Sprent Prize winner, Julie Burel



Left: Julie Burel (La Jolla Institute for Allergy and Immunology, formerly a PhD student at QIMR Berghofer) received the JFA Sprent Prize. The Sprent prize is presented to a member of the Society who in the opinion of a selection committee appointed by the Council has written an outstanding thesis in Parasitology for which the PhD degree was awarded during the previous three years. We will feature an interview with Julie in the next newsletter.

Below left: Adelaide Dennis (ANU) for best five-minute presentation by a student

Below centre: Melanie Ridgway (ANU) for best fifteen minute oral presentation by a student

Below right: Samantha Emery (WEHI) for best oral presentation by an Early Career Researcher

Conference presentation awards



INTERNATIONAL GRADUATE SCHOOL

Crossing Boundaries

Molecular interactions in malaria

Malaria continues to be one of the most important infectious diseases. Interactions between molecules of the parasites and the host are essential for the survival and propagation of the parasite as well as for the aetiology of the disease. However, to fully appreciate malaria as a disease there are additional boundaries to be crossed: boundaries between laboratory-based projects and field work, between different disciplines, between academia, industry and the public sector. Our International Graduate School will provide you with exciting opportunities to transverse some of these barriers.

Key features of the Graduate School:

- > Conducting research at two world-class institutions
- > Exposure to non-academic environment
- > Comprehensive training program
- > Dual PhD degree

Areas of research include:

- > Nutrient uptake & metabolism
- > Parasite genetics and adaptations
- > Immune responses
- > Host genetics and responses

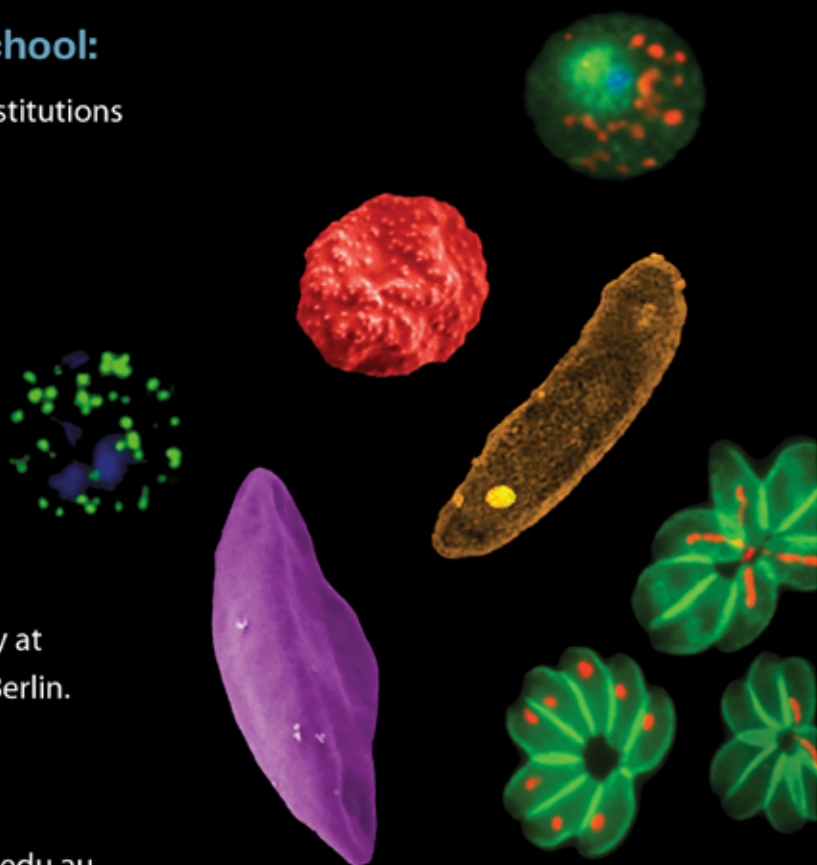
Guidance for each project will be provided by at least one supervisor in Canberra and one in Berlin.

Ready to cross boundaries?

For more information email: alex.maier@anu.edu.au

Deadline for the 2018 intake: 15. October 2017

www.allianceberlincanberra.org



Lizard Social Behaviour, Conservation and Host Parasite Ecology: 300 papers and Mike Bull

Friday 6th October 2017
South 1 Lecture Theatre
Flinders University

A symposium to
recognise the
research and
mentorship of
Professor Mike Bull

Plenary talks by Andy
Sih (UC Davis), Geoff
While (U Tas), Corey
Bradshaw (Flinders U)
and Steph Godfrey (U
Otago). Plus student
and researcher talks

An informal BBQ
dinner will follow
(RSVP required)



RSVP by the 29th September 2017 at:
<https://tinyurl.com/mike-bull-dinner-rsvp>

News from the ASP Network for Parasitology

Welcome

Review of the 2017 Conference

We had a great time at the 2017 ASP Conference in the Blue Mountains, June 26-29, many thanks to all who helped to make that happen including the Conference Organising Committee, the Student Volunteers, the speakers and chairs, the sponsors and, you, the conference delegates. The Welcome Reception at The Carrington Hotel in Katoomba was very grand and a great highlight a "most excellent and fancy welcome reception ever" (comment from delegate). The outgoing President, Professor David Emery gave a wonderful presentation with some good advice for young researchers starting out in parasitology. Well done to our newest ASP Fellow, Lisa Jones! (My heartfelt thanks to the ASP for this amazing honour – Lisa)

Our national and international speakers were excellent and covered a wide variety of parasitological research including Industry Perspectives, Toxoplasmosis, Malaria Control, Diagnostics, Companion Animals, Aquaculture, Drugs and Drug Resistance, Wildlife Parasitology, Livestock Parasitology, and Parasitology Education.

Survey results

We have analysed the survey results from the conference, thanks to everyone who responded. We had 76 respondents, with equal numbers of each gender and equal numbers of ASP students and regular delegates. Overall the comments and survey responses were overwhelmingly positive. As always, where possible, we will take on board suggestions for improvements and address some comments about how to make sure the conference is inclusive for everyone. We will have a new policy in place for the 2018 conference which should address issues about the responsible and

appropriate behaviour of delegates during the meeting. We will also adopt the policy on gender equality that was used for the ASP Annual Conference in 2016 at ICTMM2016. These policies will be on the conference website and we will direct delegates to them when they register for the conference. Some comments for improvements were directed at the venue, others within the program and others pointing out the remote location was an issue for transport; our 2018 ASP Conference venue will be able to address those issues and the committee will take on board your suggestions for programming.

When asked what did you like and what would you like to see in the future delegates gave the following comments:

What did you like about the 2017 Conference?

- Great to bring in industry delegates this year! Gave the conference a different spin!
- The industry focus in this conference I thought was great.
- There were good opportunities to talk with people informally, always the way to encourage collaborations
- Excellent quality of presentations, great networking opportunities and fantastic food. Talent night was a big success.
- Really good industry focus. The dinner on the first night was an excellent idea. One of the best ASP conferences I have attended.
- I think the not-capital-city was a great setting. While it was a smaller conference than usual, it had a very friendly and collegial feel to it. Other non-capital cities should be considered for future conferences.
- Varied presentation topics. Exceptional invited speakers in most cases. Emphasis on industry collaboration.
- The collegiality in ASP
- I enjoyed the breadth of topics at this year's meeting.

Suggestions for future conferences?

- 5min presentations were good during the day, but too long in the evening
- One single venue or the other in closer walking distance would make logistics a bit easier.
- Posters are better option and provide sufficient time to absorb the information.
- More free time and perhaps a little more time for discussions on certain 'hot' topics either in sessions or some other setting
- Involvement of people on executive boards such as the livestock boards or wildlife conservation boards
- Making "rules" for 5 minute presentations similar to the 3 minute thesis presentations
- Presentations about patent rights and the role of IP protection and about relationships between academia and industry - how to foster them.

Early Career Researcher Events

A great success of the 2017 ASP Conference were the two Early Career Researcher Events. The first evening, Tuesday 27th June, was hosted by Ron Kaminsky gave students a chance to work in teams to make a "sales pitch" for their science product. The second evening ECR event on Wednesday June 28 was supported by Virbac with the theme "Careers with Industry" and gave students an insight into how industry and researchers might work together and how to follow a career in industry. Workshop participants made the following comments about their experiences:

- Opportunity to meet other ECR/ students and create new networks
- The networking opportunities were great and I found the talks about industry really interesting.
- Very useful and dynamic
- I thought that the way the workshops got us thinking about research and what we want to do in the future was really useful. The networking side

was also really useful to see what people at the same stage as me are doing and where I fit into the bigger picture.

- Interactive, funny, engaging presenter, very enjoyable.
- Getting to talk to industry reps in a informal format.
- The talks about industry opened up some new doors for me and I met lots of people.
- They began to open my eyes to what is possible in the future.
- Very relevant for planning a career path
- Supporting Young talents and gaining fresh ideas
- I was inspired by the quality and attitudes of the students and early career researchers who participated in the events

As part of the strategic planning review meeting the ASP Education Committee organised a workshop to "Create interactive and engaging learning resources for Parasitology Education" at the 2017 ASP Conference. This workshop enabled a small group of ASP lecturers to gain an overview of the tools that they can use to create ASP Parasitology Education modules on various topics to be delivered by ASP members. This workshop

was an introduction to BEST Network and its tools, including the Slice image bank and the Adaptive eLearning Platform (AeLP), an authoring platform licenced from Smart Sparrow. Delegates enjoyed attending this workshop and requested "another BEST Network workshop, or any training/ resources for creative biomed education" in the future. See the ASP Education Committee Report in this newsletter to see all of the exciting developments that are happening within the ASP.

Sarah Preston, Federation University, chaired our first ASP Outreach Forum on Thursday 29th June at the conference. This informal discussion was open to all parasitologists interested in science based outreach programs. Participants shared their ideas, demonstrations and stories amongst the group and the feedback was very positive. "I attended a wonderful lunch time meeting on outreach. There is a lot going on among various members of the society. How about a session on those activities to better publicise what is going on and perhaps involve even more people?" (comment from attendee). See the ASP Outreach Forum report in this newsletter to see how you can get involved and come to the 2018 ASP Conference with your Outreach ideas to share!

Once again we would like to acknowledge the generous support of our 2017 ASP conference sponsors, thanks to Elsevier Parasitology, the International Journal for Parasitology (IJP), Virbac, Bayer, Boehringer Ingelheim and Novatec.

2018 ASP Annual Conference

We are very pleased to announce that the 2018 ASP Annual Conference will take place Monday 24th – Thursday 27th September at the Novotel Hotel, St Kilda, Melbourne, Victoria. We hope that you will join us at this lovely venue for another wonderful collegial meeting. The Welcome Reception will take place at Encore, right on St Kilda beach on Monday 24th September and the Conference Dinner at

Luna Park, on Thursday 27th September and both venues are walking distance from the Novotel in St Kilda. This venue has excellent transport links with the airport bus and Melbourne tram stopping regularly at the front of the hotel. The conference website will open soon with registration and abstract submission opening early in 2018.

Network Researcher Exchange and Travel Awards

Applications for the next Network Researcher Exchange and Travel Awards round close on 29 September 2017 check the ASP website for guidelines and the application form. www.parasite.org.au/awards/jd-smythpostgraduate-travel-awards/

Funding news

Congratulations to Barbara Nowak and colleagues for their ARC Linkage grant

Dr Andrew Bridle, Dr Matthew Longshaw and Professor Barbara Nowak at the University of Tasmania BENCHMARK ANIMAL HEALTH GROUP LIMITED were recently awarded an ARC Linkage Grant for \$300,000 for "Development of an amoebic gill disease vaccine to protect Atlantic salmon. This project aims to identify candidate vaccine antigens and produce an experimental vaccine against amoebic gill disease (AGD) that will benefit the Tasmanian and international Atlantic salmon aquaculture industries. AGD is the most significant health problem affecting Atlantic salmon aquaculture in Tasmania. In the last decade, AGD has become a legitimate health threat to the multibillion dollar global Atlantic salmon industry. A solution is needed before AGD fully establishes itself in the largest Atlantic salmon producing nations. The expected outcome of this project is the development of a commercial vaccine that should significantly benefit the Australian and international aquaculture industries."

**Cheers,
Nick and Lisa**

Closing dates for ASP awards

ASP Fellowships
9 January 2018

**ASP Researcher Exchange, Travel
and Training Awards & JD Smyth**
29 September 2017

**Bancroft-Mackerras Medal for
Excellence**
30 September 2017

More information
www.parasite.org.au

ASP Network Researcher Exchange, Training and Travel Award Report

Javier Sotillo Gallego of James Cook University in Cairns won an ASP Network Researcher Exchange, Training and Travel Award for a Researcher Exchange with Dr. Giovina Ruberti at the Istituto di Biologia Cellulare e Neurobiologia Consiglio Nazionale delle Ricerche, Rome, Italy to learn techniques to transfer adult schistosomes from one host into a recipient in February 2017.

Javier, tell us about the outcomes of your Researcher Exchange?

My stay in Rome was very successful. I learnt a technique that was developed

by Prof Donato Cioli in the late 1970's and that only two laboratories in the world can apply (one lab in USA and the IBCN from Rome). The technique consists in obtaining 5 week-old *Schistosoma mansoni* adult worms from a donor mouse and inject them back in the mesenteric veins of a recipient mouse. This surgical technique opens great possibilities for the analysis of adult worm survival after drug treatment. Another useful possibility is to knock down worm genes using RNAi and analyse the importance of those genes in parasite survival by putting the worms back into a recipient mouse using this technique. Our laboratory at James Cook University will apply this technique routinely in the future.

Dr Ruberti has a multidisciplinary group, and the postdocs have different expertise in fields like biochemistry, microscopy and parasitology. I will also start collaborating

with Dr Roberto Gimelli, who is an expert in confocal microscopy and immunohistochemistry. He has access to a state-of-the-art confocal microscopy and we will start collaborating trying to localise worm proteins using the confocal microscope.

During my stay, I presented my work in a seminar organised by the host institution. Around 50 people attended the seminar, and different researchers were interested in our work on extracellular vesicles from worms.

Bwlow: images supplied by Javier Sotillo Gallego



Carbohydrates and a better malaria vaccine

Researchers at WEHI have shown for the first time that carbohydrates on the surface of malaria parasites play a critical role in malaria's ability to infect mosquito and human hosts.

The discovery also suggests steps that may improve the only malaria vaccine approved to protect people against *Plasmodium falciparum* malaria.

The research, published in Nature Communications, was led by Associate Professor Justin Boddey, Dr Ethan Goddard-Borger, Mr Sash Lopaticki and Ms Annie Yang at the Walter and Eliza Hall Institute, with support from Professor Norman Kneteman at the University of Alberta, Canada.

Associate Professor Boddey said the team had shown that the malaria parasite 'tags' its proteins with carbohydrates in order to stabilise and transport them, and that this process was crucial to completing the parasite's lifecycle. "Malaria parasites have a complex lifecycle that involves constant shapeshifting to evade detection and infect humans and subsequently mosquitoes," he said.

"We found that the parasite's ability to 'tag' key proteins with carbohydrates is important for two stages of the malaria lifecycle. It is critical for the earliest stages of human infection, when the parasite migrates through the body and invades in the liver, and later when it is transmitted back to the mosquito from an infected human, enabling the parasite to be spread between people.

"Interfering with the parasite's ability to attach these carbohydrates to its proteins hinders liver infection and transmission to the mosquito, and weakens the parasite to the point that it cannot survive in the host," Associate Professor Boddey said.

The first malaria vaccine approved for



human use – RTS,S/AS01 – was approved by European regulators in July 2015 but has not been as successful as hoped, with marginal efficacy that wanes over time.

Dr Goddard-Borger said the research had attracted a lot of interest because of the implications it has for improving malaria vaccine design. "The protein used in the RTS,S vaccine mimics one of the proteins we've been studying on the surface of the malaria parasite that is readily recognised by the immune system.

"It was hoped that the vaccine would generate a good antibody response that protected against the parasite, however it has unfortunately not been as effective at evoking protective immunity as hoped. With this study, we've shown that the parasite protein is tagged with carbohydrates, making it slightly different to the vaccine, so the antibodies produced may not be optimal for recognising target parasites," Dr Goddard-Borger said.

Dr Goddard-Borger said there were many documented cases where attaching carbohydrates to a protein improved its efficacy as a vaccine.

"It may be that a version of RTS,S with

Associate Professor Justin Boddey (left) and Dr Ethan Goddard-Borger have shown that malaria parasites have carbohydrate 'tags' that are crucial for parasite survival. Credit: Walter and Eliza Hall Institute

added carbohydrates will perform better than the current vaccine," he said. "Now that we know how important these carbohydrates are to the parasite, we can be confident that the malaria parasite cannot 'escape' vaccination pressure by doing away with its carbohydrates."

Associate Professor Boddey said the Institute's insectary, opened in 2012, was critical to the discovery.

"Carbohydrates have long been considered unimportant to malaria parasites. This discovery reveals that carbohydrates are very important, and in two completely different lifecycle stages. This is exciting because to ultimately eradicate malaria we need combined approaches that attack different stages of the parasite at once," Associate Professor Boddey said.

Story and images courtesy WEHI

A trip to South East Asia

NICHOLA CALVANI, A PHD CANDIDATE AT THE UNIVERSITY OF SYDNEY REPORTS ON AN RECENT TRIP TO CAMBODIA AND LAOS.

Since attending the conference in Leura I have been lucky to spend two weeks in Cambodia and Laos determining diagnostic capabilities for potential future field trials on *Fasciola* prevalence and control.

I've found that establishing lab access and organising field work is much like deciding on prices with a tuk tuk driver. Start high, be turned down three times, and then come to a compromise.

While I'm still working on dates and sample sizes for my field trials, I was able to get a scope of the labs in Phnom Penh. What I found was quite interesting, but ultimately not surprising. The labs have all the equipment that you would find in a developed country, in fact in some instances they have even more equipment than what I would normally have access to back in Sydney! For example, one of the labs I was allowed to visit had three qPCR machines, two conventional PCR thermocyclers, two plate readers and sequencing capabilities. All donated by foreign governments or NGOs.

However, despite this capacity, there were no reagents, intermittent electricity limiting cold storage capabilities... and no staff!

I think this demonstrates an important component of foreign aid that many of you may be familiar with. That is, as soon as funding stops, so does the work. So I guess the ultimate question is: how do we ensure sustainable extension and capacity in developing countries?

I'm still working on a solution to that one, and would certainly welcome any suggestions. But in the meantime I'll be busy bargaining to get continued access to the labs and establish sites for field trials.

Wish me luck!

Images supplied by Nichola Calvani



Kate Hutson and *Anoplodiscus hutsonae*

A recently discovered species of *Anoplodiscus* is to be given a patronym that acknowledges the work of Kate Hutson.

The recently discovered *Anoplodiscus hutsonae* has been given its official name in honour of Dr Kate Hutson from James Cook University's Centre for Sustainable Tropical Fisheries and Aquaculture, where she is a senior lecturer in the Marine Parasitology Laboratory.

Dr Hutson is an international expert in fish parasitology, and the naming of the new species recognises her contribution to that field.

The recently discovered fish parasite was described by Dr Hutson's PhD student David Vaughan and co-author Kevin Christison. Mr Vaughan said it was a no-brainer to name it after Dr Hutson.

"This patronym was given out of deepest gratitude and respect for Dr Hutson. Without her, I would not have been afforded this opportunity to pursue my PhD. Immortalising her name in science is a fitting act of gratitude."

The species was initially discovered near Lizard and Heron islands in Queensland.

Mr Vaughan said it is an important addition to the known biodiversity of Australia, as it is only the second *Anoplodiscus* species formally described from Australia, and one of six recognised species world-wide.

The paper describing the new parasite will appear shortly in the international journal, *Systematic Parasitology*.

Its naming comes at an especially auspicious moment for Dr Hutson as she prepares to go on maternity leave.



Right: Kate Hutson in Leura

Education

The ASP' has a new Education Committee

In the Council's February meeting an Education Committee was established in response to increased concern regarding diminishing resources for teaching parasitology across Australian schools.

The main aim of the education committee is to support and bring together people, experts and educators to develop resources for teaching parasitology in undergraduate and postgraduate courses. Current members include Una Ryan (Murdoch University), Shokoofeh Shamsi (Charles Sturt University), Jan Slapeta (University of Sydney), Abdul Jabbar (University of Melbourne), Danny Wilson (University of Adelaide), Barbara Nowak (University of Tasmania) and Ryan O'Hanly (University of Adelaide).

Parasitology lecturers from Australian Veterinary Schools have initiated a

working party in which Smart Sparrow is used as the platform (see Smart Sparrow workshop's report). This is not limited to Veterinary Parasitology alone, we are looking for parasitologists from other disciplines to form a working group on, for example, medical parasitology and wildlife parasitology. If you are such a passionate and dedicated person and happy to donate your precious time to this cause, please get in touch with us.

Another initiative of the Education Committee was to hold a Symposium on Parasitology Education was held in this year's ASP Annual Meeting in Leura. The aim was to discuss how modern technology can be used to effectively teach both theoretical and practical aspects of Veterinary Parasitology. Invited Speakers and presentations included:

- "How can contemporary, digitally enabled higher education pedagogies help to address the specific challenges in teaching veterinary parasitology?"

Presented by Prof Barney Dalgarno and Associate professor Shokoofeh Shamsi from Charles Sturt University

- "Veterinary Parasitology teaching in Australia: challenges and opportunities" Presented by Associate Professor Abdul-Jabbar from University of Melbourne
- "Teaching Veterinary Parasitology with big pharma under clear objectives: example using a flea tutorial at the University of Sydney" Presented by Associate Prof Jan Slapeta from University of Sydney

We aim to have a dedicated session on Parasitology Education in upcoming ASP Annual Meetings. Please contact us with your feedback or to suggest suitable presenters for that session.

sshamsi@csu.edu.au

ASP Undergraduate Prize

Murdoch University

The ASP supported two undergraduate prizes at Murdoch University Award Ceremony, which was held on May 9th. The ASP prize for Parasitology in Veterinary Science (2nd year) was awarded to **Christopher Tan** and the ASP prize for Parasitology in Biomedical Science was awarded to **Kathryn Kent**. Both students (pictured on the right, receiving their awards from **Crystal Cooper**) were extremely pleased with their awards and have provided letters of thanks to the society.



Education continued

Teaching Parasitology: developing shared modules Jan Slapeta & Shokoofeh Shamsi report.



During the 2017 Annual Conference at Leura, ASP members joined a workshop on the cloud teaching solution, SmartSparrow/BEST (www.smartsparrow.com, www.best.edu.au). The workshop was an opportunity to get some hands-on experience with a platform for developing and sharing modules. Participants learned a few tricks and created a simple quiz.

We hope that this is the tangible start of

developing modules that could be the foundation of an ASP library of teaching materials for deployment by ASP members. Thank you to those that signed up to take an active role and put their name on the sign-up sheets with tentative project titles. We look forward to seeing and hearing about it at ASP Conference next year in 2018.

We have gathered 5 projects with several contributors willing to contribute. They are listed here with those that signed up. The list is not final you can team up / invite more colleagues and even come up with new topics. If you are working on something, please let us know & keep us in the loop on your progress. We would love to see you presenting your work next year at ASP Conference.

Projects currently under development

Horse parasitology module: Jan Slapeta, Anne Beasley and Shokoofeh Shamsi

The Australian tick ID: Una Ryan, Peter Irvine, Charlotte Oskam and Kim Loh

Blood parasites: Rina Wong and Una Ryan

Sheep parasites: Abdul Jabbar and Anne Beasley

Parasitology terminology: Shokoofeh Shamsi

If you are totally new to SmartSparrow/BEST, don't despair. Below are a few help

videos that can be used as an introduction or refresher.

Creating a multiple choice question with feedback

<https://www.youtube.com/watch?v=z3FM1-QPIW>

This video covers the creation of a multiple-choice question in the Smart Sparrow Adaptive eLearning Platform including assigning a correct option with feedback as well as giving feedback for incorrect choices.

Creating an image-based question (drag and drop style)

<https://youtu.be/JgDnvPx1Qw>

In this video, you will learn how to select an image from the BEST Network image bank (Slice), and turn it into an interactive Virtual Microscopy Adaptive Tutorial (VMAT) using the Annotate wizard in the Smart Sparrow platform, which is available to all the members of the BEST Network.

How to use the Slice Image Bank

https://youtu.be/GOsoqK5_B9w

This tutorial demonstrates how students can use Slice, the BEST Network's biomedical image repository. The tutorial shows how to search for biomedical images, create private or group annotations, and share layers with others.

BEST on YouTube

<https://www.youtube.com/channel/UC57aCOlTrUGG--SKX8EylAQ>

BEST Blog to read about what's happening in the community:

<https://www.best.edu.au/news-events/>

The Smart Sparrow Support team are also available on: support@smartsparrow.com. They can help with troubleshooting or you can get in touch to develop something through their Learning Design Studio.

\$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.

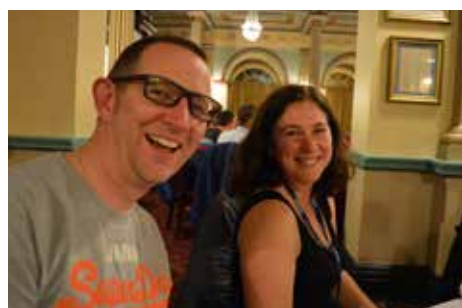
Requests for 2017 prizes must be made by the eligible University to the ASP Treasurer by the 30th September 2017. Please complete the online application form:

www.parasite.org.au/awards/asp-undergraduate-prizes/

Images from Leura

The 2017 ASP Annual Conference took place in the Blue Mountains of New South Wales

Welcome reception in the Grand Dining Room of the Carrington Hotel, Katoomba



*Images from Leura continued***The Blue Mountains - a lovely setting**

Images from Leura continued

Annual General Meeting, ASP Council and conference volunteers



*Images from Leura continued***Early Career Researcher events**

Images from Leura continued

Conference dinner and *Parasitology's Got Talent*



*Images from Leura continued***Conference dinner and *Parasitology's Got Talent***

Images from Leura continued

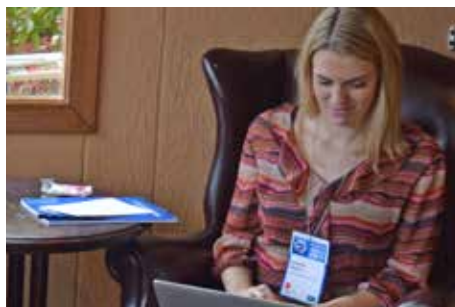
Faces from around the conference



*Images from Leura continued***Conference speakers**

Images from Leura continued

Faces from around the conference



Images from Leura continued

Faces from around the conference



Remembering Ian Whittington

MIKE WESTLEY FROM BIRMINGHAM IN THE UK RECENTLY CONTACTED THE ASP TO SHARE THIS PICTURE AND MEMORY OF THE LATE IAN WHITTIGTON

Ian and I began and were in the same class at Moseley Grammar School between 1972 and 1979, and I remember him well during this time. I remember his humour and witt (no pun intended). I recall how very studious and clever he was even then. Our paths separated in 1979 as he went to Uni and I instead began work.

I am sure that his family are so very proud of his accomplishments. I just wanted to

say he is remembered by me with fondness and friendship.

If you are able to contact his family, I would be very grateful. Attached is a happy photo on a hot summer's day at the school's Sports Day in 1979, with Ian and other classmates.



IJP

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Instagram: ijpara

47.08 (July 2017)

Did biogeographical processes shape the monogenean community of butterflyfishes in the tropical Indo-west Pacific region?

M. Reverter, T.H. Cribb, S.C. Cutmore, R.A. Bray, V. Parravicini, P. Sasal

47.09 (August 2017)

A novel *ex vivo* immunoproteomic approach characterising *Fasciola hepatica* tegumental antigens identified using immune antibody from resistant sheep

Timothy C. Cameron, Ira Cooke, Pierre Faou, Hayley Toet, David Piedrafita, Neil Young, Vignesh Rathinasamy, Travis

Beddoe, Glenn Anderson, Robert Dempster, Terry W. Spithill

Gene-enriched draft genome of the cattle tick *Rhipicephalus microplus*: assembly by the hybrid Pacific Biosciences/Illumina approach enabled analysis of the highly repetitive genome

Roberto A. Barrero, Felix D. Guerrero, Michael Black, John McCooke, Brett Chapman, Faye Schilkey, Adalberto A. Pérez de León, Robert J. Miller, Sara Bruns, Jason Dobry, Galina Mikhaylenko, Keith Stormo, Callum Bell, Quanzhou Tao, Robert Bogden, Paula M. Moolhuijzen, Adam Hunter, Matthew I. Bellgard

47.10/11 (September 2017)

Review Article

IgG opsonization of merozoites: multiple immune mechanisms for malaria vaccine development

Danika L Hill, Louis Schofield, Danny W Wilson

Succinctus

The merozoite-specific protein, TgGRA11B, identified as a component of the

Toxoplasma gondii parasitophorous vacuole in a tachyzoite expression model

Chandra Ramakrishnan, Robert A. Walker, Ramon M. Eichenberger, Adrian B. Hehl, Nicholas C. Smith

Original Research Articles

Next Generation Sequencing uncovers within-host differences in the genetic diversity of *Cryptosporidium* gp60 subtypes

Alireza Zahedi, Alexander William Gofton, Fuchun Jian, Andrea Paparinia, Charlotte Oskam, Andrew Ball, Ian Robertson, Una Ryan

Minimally invasive microbiopsies: a novel sampling method for identifying asymptomatic, potentially infectious carriers of *Leishmania donovani*

Oscar David Kirstein, Ibrahim Abbasi, Ben Zion Horwitz, Laura Skrip, Asrat Hailu, Charles Jaffe, Lynlee, L. Li, Tarl W. Prow, Alon Warburg

Comparative analyses of whole genome sequences of *Leishmania infantum* isolates from humans and dogs in northeastern Brazil

DG Teixeira, GRG Monteiro, DRA Martins, MZ Fernandes, V Macedo-Silva, M Ansaldi, PRP Nascimento, MA Kurtzf, JA Streit, MFFM Ximenes, RD Pearson, A Miles, JM Blackwell, ME Wilson, A Kitchen, JE Donelson, JPMS Lima, SMB Jeronimo



Left: IJP covers for July, August and September 2017 editions



IJPP INTERNATIONAL
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Drugs and Drug Resistance

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**Editors In Chief: Andrew
Kotze & Kevin Saliba**

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can promote the journal and
all of the wonderful research
published through *IJP-DDR*

Featured articles from ASP members in International Journal for Parasitology: Drugs and Drug Resistance, Volume 7, Issue 2, August 2017

Karen Kemirembe, Mynthia Cabrera,
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Issue 2, August 2017, Pages 131-137,
ISSN 2211-3207, [https://doi.org/10.1016/j.
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Jaques Reifman, Anders Wallqvist, [Using
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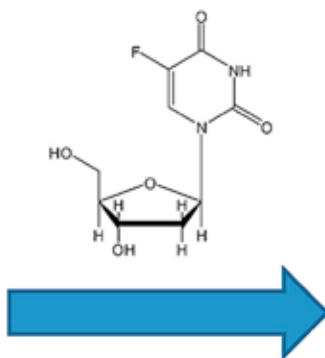
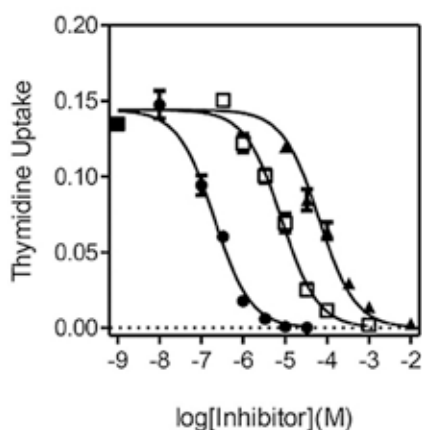
Serena Camerini, Alessio Bocedi, Serena
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Ana Rita Gomes, Matt Ravenhall, Ernest
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IJP:DDR continued

Weisi Wang, Qiang Li, Yufen Wei, Jian Xue, Xiao Sun, Yang Yu, Zhuo Chen, Shizhu Li, Liping Duan, [Novel carbazole aminoalcohols as inhibitors of \$\delta\$ -hematin formation: Antiplasmodial and antischistosomal activities](#), International Journal for Parasitology: Drugs and Drug Resistance, Volume 7, Issue 2, August 2017, Pages 191-199, ISSN 2211-3207, <https://doi.org/10.1016/j.ijpddr.2017.03.007>.

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Neil H. Bagnall, Angela Ruffell, Ali Raza, Timothy P. Elliott, Jane Lamb, Peter W. Hunt, Andrew C. Kotze, [Mutations in the *Hco-mptl-1* gene in a field-derived monepantel-resistant isolate of *Haemonchus contortus*](#), International Journal for Parasitology: Drugs and Drug Resistance, Volume 7, Issue 2, August 2017, Pages 236-240, ISSN 2211-3207, <https://doi.org/10.1016/j.ijpddr.2017.05.001>.

Daniel Gold, Mohammed Alian, Avraham Domb, Yara Karawani, Maysa Jbarien, Jacques Chollet, Richard K. Haynes, Ho Ning Wong, Viola Buchholz, Andreas Greiner, Jacob Golenser, [Elimination of *Schistosoma mansoni* in infected mice by slow release of artemisone](#), International Journal for Parasitology: Drugs and Drug Resistance, Volume 7,

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James H. McKerrow, Christopher A. Lipinski, [The rule of five should not impede anti-parasitic drug development](#), International Journal for Parasitology: Drugs and Drug Resistance, Volume 7, Issue 2, August 2017, Pages 248-249, ISSN 2211-3207, <https://doi.org/10.1016/j.ijpddr.2017.05.003>.

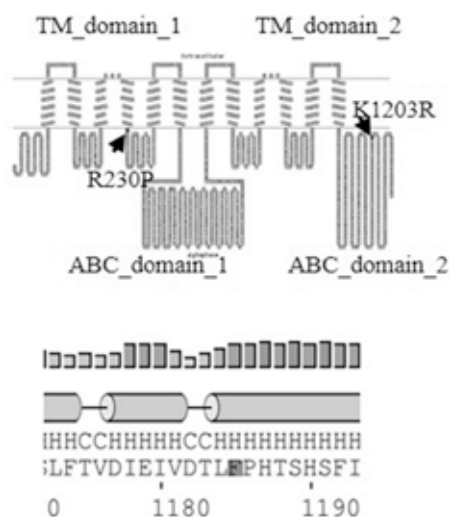
Jessica A. Jesus, Thais N. Fragoso, Eduardo S. Yamamoto, Marcia D. Laurenti, Marcelo S. Silva, Aurea F. Ferreira, João Henrique G. Lago, Gabriela Santos-Gomes, Luiz Felipe D. Passero, [Corrigendum to "Therapeutic effect of ursolic acid in experimental visceral leishmaniasis" \[Int. J. Parasitol. Drugs Drug Resist. 7 \(2017\) 1–11\]](#), International Journal for Parasitology: Drugs and Drug Resistance, Volume 7, Issue 2, August 2017, Page 250, ISSN 2211-3207, <https://doi.org/10.1016/j.ijpddr.2017.04.001>.

The images relate to the following papers:

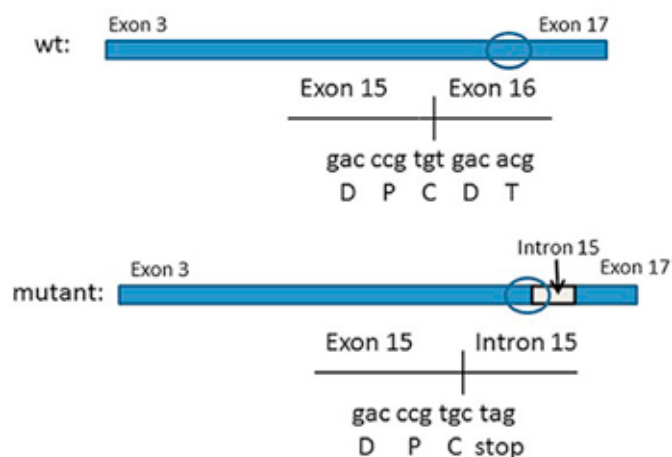
Previous page: Alzahrani et al

Below left: Mani et al

Below right: Bagnal et al



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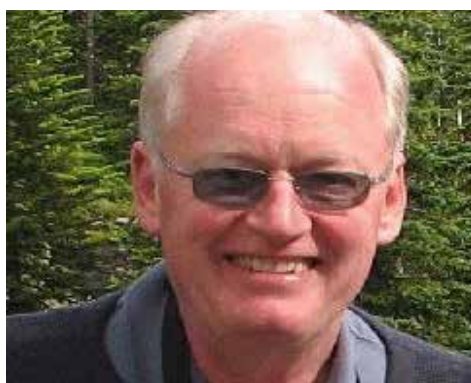
IJPPAW has a Facebook page, please check it out and like us and some of our articles so we can promote the journal and all of the wonderful research published through *IJPPAW*

Our inaugural Co-Editor-in-Chief, Lydden Polley (**pictured right**) stepped down at the end of June. The International Journal for Parasitology: Parasites and Wildlife was launched in 2012 and over the last five years we have shared the Editorship role. I would like to express my gratitude for the support Lydden has given to me and the journal during this time.

The journal's development and profile have benefitted greatly from Lydden's wealth of expertise in the field of wildlife parasitology, his international reputation, and the extensive links he has with scientists and researchers throughout the world.

The breadth and quality of the topics that are published in the journal, and the fact that our papers are representative of current international research, attest to Lydden's standing in the field.

Thankfully, Lydden's association with the journal will continue as he has generously



agreed to join the Editorial Board as an Associate Editor.

IJPPAW are delighted to announce their new Co-Editor-in-Chief, Susan Kutz, Professor in the Department of Ecosystem and Public Health at the Faculty of Veterinary Medicine, University of Calgary, Canada. The Kutz Research Group focus on understanding the impacts of environmental perturbations (e.g., climate change and habitat disturbance) on animal health. See more about Susan's research on the University of Calgary website <http://people.ucalgary.ca/~kutzrg/> and <http://www.ucalgary.ca/caribou/>

Susan will officially take up the role in April next year.

The journal has just published a special issue on 'Invasions' with a forward by Robert Poulin. Hard copies will be printed and available at the International Congress on Parasites of Wildlife being held in Kruger National Park later this month. A number of ASP members are going to the meeting but if any other members would like a copy of the special issue they can let me know.

All the best

Andrew Thompson,
IJPPAW Editor
a.thompson@murdoch.edu.au

Articles published in International Journal for Parasitology: Parasites and Wildlife, Volume 6, Issue 2, August 2017

André A. Dhondt, Keila V. Dhondt, Sophie Nazeri, [Apparent effect of chronic *Plasmodium* infections on disease severity caused by experimental infections with *Mycoplasma gallisepticum* in house finches](#), International Journal for Parasitology: Parasites and Wildlife, Volume 6, Issue 2, August 2017, Pages 49-53, ISSN 2213-2244, <https://doi.org/10.1016/j.ijppaw.2017.03.003>.

Francisco Brusa, Martin M. Montes, Paula Marcotegui, Sergio R. Martorelli, [Two new species of *Syndesmis* \(Platyhelminthes, Rhabdocoela, Umagillidae\) from the sea urchin *Pseudechinus magellanicus* \(Echinodermata, Echinoidea\) in the Southwestern Atlantic Ocean](#), International Journal for Parasitology: Parasites and Wildlife, Volume 6, Issue 2, August 2017, Pages 54-58, ISSN 2213-2244, <https://doi.org/10.1016/j.ijppaw.2017.03.002>.

Gideon A. Erkeniswick, Mrinalini Watsa, Alfonso S. Gozalo, Nicole Dmytryk, Patricia

The images on the pages that follow relate to the following papers:

Image of freshwater turtle by Carol Mascarenhas (Mascarenhas et.al.)

Image of White-tailed deer by David Hewitt (Goolsby et.al.)

Image of armadillo by Madeleine Paff (Dalton et.al.)

IJP:PAW continued

G. Parker, [Temporal and demographic blood parasite dynamics in two free-ranging neotropical primates](#), International Journal for Parasitology: Parasites and Wildlife, Volume 6, Issue 2, August 2017, Pages 59-68, ISSN 2213-2244, <https://doi.org/10.1016/j.ijppaw.2017.03.004>.

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ASP Outreach Funding

ASP members are encouraged to apply for ASP funding to support 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. The funds can be used to support a wide range of activities - from seminars and 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.

Parasites: Friends Without Benefits (Part 4)

We continue the transcript of Peter O'Donoghue 2013 parasitology outreach event, Science in the Pub, a social interactive occasion where (POD points out) many liberties were taken with content and language in the pursuit of entertainment,

In part 1 to 3, we described eight core concepts of parasitology:

1. Parasites are friends without benefits!
2. The pathology of parasitism is cumulative.
3. Parasites exhibit tissue tropism.
4. Parasites undergo cyclic transmission between hosts!
5. Parasites discriminate!
6. Differential diagnosis is difficult!
7. Parasites are hard to control
8. Parasite biodiversity is vast

In this penultimate episode, POD's talk takes a taxonomic turn.

9

Rogue's gallery

PROTOZOA

Four groups are recognized on basis of their motility (or lack of)

- cells that creep and crawl (amoebae sliding over substrates, such as gut lining) - many free-living species, good guys in water and soil as they eat bacteria and algae; some parasites
- cells with propellers (flagellates

swimming in body fluids, gut content, blood) - many free-living in water, some symbiotes (esp. in termites), some parasitic in gut and blood

- cells with numerous oars (ciliates swimming in fluids) - many free-living species, many mutualists/symbiotes, esp. in herbivores
- cells that just sit there (spore-forming sporozoa) all parasites, must invade host cells to form spores

Protozoan life-cycles essentially involve an endogenous feeding stages (a trophozoite) in the host, and a resistant stage formed as a transmission strategy (a cyst or oocyst passed into the external environment or a spore formed in another host).

Amoeba [trophozoites crawling over substrates using false-feet (= pseudopodia) – motility involves transient microtubular organization and protoplasmic streaming - essential the same as the motion observed with human macrophages (an example of conservation in Nature)]

- *Entamoeba* causing amoebic dysentery, extraintestinal lesions, abscesses in soft tissues, such as liver/brain, anchovy sauce pus (never let the sun set on undrained pus!)
- *Acanthamoeba* causing keratitis, contact lenses (soft/hard) washed in contaminated water

Flagellates [trophozoites swimming in body fluids, using elongate flagella (with 2+9 microtubule cores) - flagellar motion involves dynein-walking mechanism producing undulating motion (hence flagella sometimes called undulopodia), quite different from the helical/spiral flagellar motion of bacteria]

- *Trichomonas* causing vaginitis/infertility, direct venereal transmission, chronic inflammation linked to cervical cancer, infections in cattle transmitted by AI (cryopreservation allows

flagellated sperm, and flagellated protozoa, to survive (controlled by culling – kill the bulls)

- *Giardia* causing watery diarrhoea (Delhi belly, Bali belly, porcelain polka, the trots, the squirts), amazing looking parasites, bilateral symmetry, eyes looking back at you, sucker for attachment, failure-to-thrive syndrome, treatment with metronidazole (nasty side-effects with alcohol)
- Trypanosomes causing sleeping sickness/Chagas disease/kala azar, trypomastigotes swimming in vertebrate blood and/or amastigotes forming cysts in vertebrate tissues, promastigotes/epimastigotes formed in vectors (tsetse flies for sleeping sickness caused by *Trypanosoma brucei*; reduviid bugs for Chagas disease caused by *Trypanosoma cruzi*; sand-flies for kala azar caused by *Leishmania* spp.)

Ciliates [trophozoites swim in body fluids using numerous undulipodia, similar in ultrastructure to flagella but having complex interconnections to facilitate synchronous movement]

- *Balantidium* causing bloody diarrhoea, also pig-pen breath associated with vented aromatic ester

Sporozoa [spore-formers, invade host cells, multiply and form more spores for transmission by faecal-oral, vector-borne or predator-prey routes]

- *Eimeria/Isospora* causing coccidiosis (diarrhoea), enteric coccidia, monoxenous, fast life cycles, faecal-oral transmission of oocysts
- *Toxoplasma* causing toxoplasmosis (space-occupying lesions), tissue-cyst-forming coccidia, heteroxenous, slow life cycles, predator-prey transmission, definitive hosts are cats, intermediate hosts are any other vertebrate, infections during pregnancy can

Parasites: Friends Without Benefits continued

cause abortion, still-birth, congenital abnormalities, females infected before pregnancy transfer their immunity to their offspring, so ladies, get infected (eat raw meat or cat poo before family planning).

- *Plasmodium* causing malaria in humans, one of the Great Fevers plaguing human history, haemosporidian, parasites replicate in liver then cycle through ring stages, trophozoites, schizonts and merozoites in red blood cells (causing haemolytic anaemia and ischaemia), typically forming toxic haemozoin pigment (parasite poop comprised of metabolized haemoglobin), transmitted by mosquitoes (females requiring blood meal)
- *Babesia* causing babesiosis (tick fever) in animals, piroplasm parasites replicate in red blood cells (causing haemolytic anaemia and jaundice), transmitted by ticks, including one-host ticks in which transovarian transmission occurs)
- *Enterocytozoon* causing diarrhoea in immunocompromised patients, microsporidian parasites now shown to be a fungus, other species common in fish and shellfish, how did they get to humans?
- *Henneguya* causing lesions in fish, myxozoan parasites now shown to be cnidaria (similar to jellyfish), occasionally detected as pseudo-parasites in humans, including sperm-like spores in faeces and accusations of sexual abuse

HELMINTHS

Three main groups of worms (really original names, based on shape)

- nematodes (called roundworms because they are round in cross-section)

- cestodes (called tapeworms because they are flattened like tape)
- trematodes (called flatworms or flukes because they are flattened like leaves)

Helminth life-cycles essentially involve three stages, eggs which hatch to release larvae which moult several times into adults. Life-cycles are completed by faecal-oral transmission of eggs or larvae, vector-borne transmission of larvae, or predator-prey transmission of encysted larvae.

Nemathelminthes (nematodes) are often referred to as tubes under pressure, they are pseudocoelomate and their fluid-filled body cavities act as hydrostatic skeletons, they have prominent longitudinal muscles which produce a sideways thrashing motion

- pinworms (*Enterobius*), stuff of legends (oldwives tales) females come out anus at night-time and glue eggs around anus, produce very itchy bottom and irritability
- whipworms (*Trichuris*), eggs passed in faeces, ingested with contaminated food/water, adult worms live half buried in rectal wall, trick host into thinking there are some faeces to void (called tenesmus), over-straining may cause rectal prolapse
- roundworms (*Ascaris*), eggs passed in faeces, ingested with contaminated food/water, larvae in gut then undergo curious pulmonary migration, penetrate gut, carried to lungs in blood, break into alveoli, coughed up, swallowed, back in gut (WHERE THEY STARTED)!!! tangles of worms in gut cause obstructions, watch what you do with nightsoil!
- hookworms (*Ancylostoma*), adults feed on blood, bite gut mucosa, eggs passed in faeces but hatch externally, release larvae which then invade host through skin (transdermal migration) causing subcutaneous larval migrans, resolves spontaneously by larvae undergo pulmonary migration to end

up in gut to suck blood – best control programs involved building toilets, and getting children to wear shoes

- filarial worms (*Onchocerca*, *Wuchereria*), transmitted by vectors (flies and mosquitoes) which pick larval microfilariae in blood/tissues, adult worms live in nodules – females are huge - control may involve nodulectomy (surgical removal of females) - new drug (rutin) used to help drain lymphatics (so treatment for organ enlargement = rutin)

Platyhelminthes are acoelomate flatworms, they do not have body cavities and have flattened bodies so that nutrients can reach all tissues. They include the cestodes (elongate tapeworms) and the trematodes (leaf-like flukes). They have longitudinal, transverse and circular muscles and exhibit exquisite 3-D writhing motion.

Cyclophyllidean cestodes utilize terrestrial animals as definitive and intermediate hosts, and the adult worms have a prominent anterior scolex (often with suckers and sometimes armed with hooks)

- *Taenia* tapeworms cause cysticercosis in domestic animals. The adult worms actually live in humans but the larval stages (metacestodes) become encysted in the tissues of cattle and pigs.
- *Echinococcus* causes hydatid disease in humans. The adult worms actually live in dogs but the larval stages form large hydatid cysts in many other vertebrates, including humans.

Pseudophyllidean cestodes use terrestrial animals as definitive hosts and aquatic animals as intermediate hosts, and the adult worms have prominent anterior bothria (grooved suckers).

- *Diphyllobothrium* are human tapeworms but the larval stages occur in freshwater fish (one unusual outbreak linked to Jewish grandmothers in New York City who

Parasites: Friends Without Benefits continued

make gefilte fish delicacies)

Digenean trematodes have heteroxenous life-cycles involving hermaphroditic adults in vertebrates and asexual amplification in aquatic snails. Adult flukes may be found in the gut, liver or blood.

- *Fasciolopsis/Clonorchis* are intestinal flukes in humans who have consumed encysted metacercariae on aquatic plants or in small fish/crustacea (crabs)
- *Fasciola* are liver flukes commonly found in herbivores grazing on pastures containing encysted metacercariae. Liver disease in dairy cattle mimics the fibrotic cirrhosis found in alcoholics
- *Schistosoma* are unusual blood flukes in that the adults are not hermaphroditic but the male worms clasp a female in a special love groove (gynecophoreal canal) for their lifetime. Females lay eggs into the bloodstream and they must dissolve their way out of the host (aka ALIEN) causing a lot of pathology

ARTHROPODS

have articulated limbs and belong to three main groups:

- insects (six-legged biters)
- arachnids (eight-legged biters)
- crustacea (armoured swimmers)

All arthropods have an exoskeleton, which poses a problem for the growing animal. This is solved by the process of periodic ecdysis (moulting). Arthropod life-cycles involve eggs which hatch to release larvae which then either grow through nymph stages to adults or undergo pupation to change into adults (termed incomplete and complete metamorphosis). Parasitic representatives are ectoparasitic and may cause local/focal problems (pain,

annoyance, irritation, itching, altered behaviour, trauma, dermatitis, ulceration, inflammation, allergy, hypersensitivity), systemic effects (blood-loss, anaemia, toxicoses, poisoning, paralysis), predispose to secondary infections or even act as vectors for other infectious micro-organisms.

Insects are one of the most abundant assemblages on Earth, and there are many parasitic groups, both of plants and animals.

- mosquitoes are voracious blood feeders (swarms causing anaemia), annoying pests (cause erratic behaviours), and female *Anopheles* transmit malaria when they inject anticoagulant saliva (also containing *Plasmodium* sporozoites) into humans during feeding
- flies come in many types (tsetse flies, black flies, sand flies, bot flies, etc.). Sometimes the adult fly is the parasite (sucking fluids or biting tissues using scissor action mandibles), and sometimes the larval stages are parasitic (burrowing into tissues causing myiasis (flystrike)).
- fleas are renowned for their prodigious jumping abilities using unique resilin pads held under compression. Larval stages are caterpillar-like, feeding on adult flea scat, before undergoing pupation in dens/burrows
- lice on humans may infest the head, body or pubis. Adult head lice like girls with long clean hair and drug resistance has spawned a growing alternative medicine market.
- bugs also infest human dwellings and beds. Assassin (reduviid) bugs transmit Chagas disease when they defaecate near bite sites (stercorarian transmission)

Arachnids comprise many free-living and parasitic groups, the latter being voracious feeders when infesting vertebrate hosts.

- mites are microscopic in size and often burrow into host orifices or epidermal tissues. The scabies mite *Sarcoptes* causes nasty lesions in the skin, particularly in geriatric communities.
- ticks are macroscopic in size and females may engorge on host blood. They are said to be 1, 2 or 3-host ticks depending on whether their larval, nymphal and adult stages feed on 1, 2 or 3 different hosts. The paralysis tick *Ixodes holocyclus* may cause ascending fatal paralysis in dogs or Bell's palsy (craniofacial nerve paralysis) in young children.

Crustaceans have a crust or shell and exhibit many other unique characters to distinguish them from other arthropods. Many occur as free-living aquatic species while other are parasitic on aquatic hosts.

- copepods in freshwater bodies may harbor *Dracunculus* (guinea worm) larvae, but this parasite has almost been eradicated worldwide by filtering drinking water. There are few alternatives as chemotherapy may kill the metre long worms in human limbs causing anaphylaxis, and surgery cannot follow their torturous paths (folk remedy involves slowly winding them out of the skin using a twig)
- various copepods attach themselves to fish, including the anchor worm *Lernaea* embedded in skin
- an unusual parasite is the isopod *Cymothoa* which invades snapper and then replaces its tongue
- another is the rhizocephalan *Sacculina* which infects crabs and causes parasitic castration. What is it with parasites and gonads?

The final episode of POD's talk will appear in the next newsletter.

State News

New South Wales

Congratulations to the following students who were awarded ASP Undergraduate prizes: **Andrew James Crosland** from The University of Sydney and **Luke Emerson** from The University of New England.

University of Sydney

Laboratory of Veterinary Parasitology @ McMaster Building

The world is very tech savvy. But are those born before 1984 doomed and lost in a computer driven world? Some say yes, because the youngsters born after 1984 are digital natives. Last week, in a commentary in Nature, I learned that that it is not true, the old and the young use technology in the same way. And the quote from the commentary to remember is "Children say they prefer IT in their lessons and courses?"

Do schools listen when kids say they prefer chips for lunch every day?" You can read the full commentary on <https://tinyurl.com/yd4k3dcu>

The University of Sydney's veterinary science is now in a newly formed school – Sydney School of Veterinary Science.

Shannon Donahoe (pictured below with **Jan Šlapeta**) has just been informed by the University that she has satisfied the requirements for the PhD! Fantastic news and well deserved! She has already started her work with our Veterinary Pathology Diagnostic Services. Shannon's thesis is titled "Comparative pathogenesis of neosporosis and toxoplasmosis in Australian marsupials". Shannon's final chapter is now published in Infection and Immunity:

Donahoe et al. (2017). Differential Gamma Interferon- and Tumor Necrosis Factor Alpha-Driven Cytokine Response Distinguishes Acute Infection of a Metatherian Host with *Toxoplasma gondii* and *Neospora caninum* INFECTION AND IMMUNITY vol. 85 no. 6, e00173-17

<http://iai.asm.org/content/85/6/e00173-17.abstract>

Jan Šlapeta spent April and May in Italy on an invited trip to the vet school at the University of Bari (Universita Degli Studi di Bari Aldo Moro) (see images on next page). Importantly, it enabled him to compare parasitology curricula, research components and evaluation/graduation of the DVM students. Jan had a superb time working alongside the team of Prof. **Domenico Otranto**. While in Italy, he visited Travis Veterinary School; Università degli Studi di Padova and could not miss the original post-mortem Anatomy Theatre (Fig 3). What a place to visit!

Upon his return, Jan took his kids out and could not resist teaching them that parasites are all around us and the importance of why our dogs have to be on tick preventatives ;-)

(See images on next page).

Karen Smith an Animal Veterinary BioScience Honours student has finished her work on Saudi Arabian dogs and tick borne disease molecular diagnostics. Karen's project is now being followed up by our new PhD student **Shona Chandra**.

Two new Animal Veterinary BioScience Honours students working on ticks and the tick microbiome aim to show the degree that DNA preparation biases the outcome, **Jess Panetta** and **Jessica Panuccio**.

Nichola Calvani, PhD candidate, has been cracking the eggs of *Fasciola*, while making a video that has reached >18,000 views on our research group's Facebook page. Her work centres around beef and buffalo production, hence *Fasciola*, in South East Asia. She has recently visited Laos and Cambodia and sent us her latest news. (A report of this visit can be found earlier in this newsletter)

Now to our other PhDs, **Andrea Lawrence** is finalising her world flea study and **Clarencia Lie** has now grasped the husbandry of cane toads, to get on top of *Entamoeba* spp. residing in them.



State News continued



Images from Jan Slapeta

3 images above left: Jan in Italy with the Bari parasitology group

Directly above: "This is where the first bodies were opened under the veil of secrecy! Università degli Studi di Padova Anatomy Theatre (BTW: It was illegal to take pictures....)"

Left: Jan's children flagging for *Ixodes holocyclus* in their local neighbourhood. They were amazed how many they found.

Previous page: Jan Slapeta with Shannon Donahoe

Charles Sturt University Tasmania

Welcoming Shafaet Hossen

Md. Shafaet Hossen has started his PhD program at the School of Animal and Veterinary Sciences of Charles Sturt University in May 2017. His project is on molecular characterisation of parasites of commercially important fish in Australia, under the supervision of **Shokoofeh Shamsi** and **Panos Loukopoulos**. Shafaet has arrived from Bangladesh where he was an assistant professor in the Department of Fisheries Biology and Genetics of Bangladesh Agricultural University.

Three Minute Thesis Winner

PhD student and ASP member **Cara Wilson**, Graham Centre, Charles Sturt University, recently competed in the Charles Sturt University Three Minute Thesis (3MT) final along with 7 other finalists. The aim of the competition is to summarise a PhD thesis into an engaging three-minute presentation. Cara's presentation "War on waste: It's not just plastic bags" was the winning presentation. She spoke about the wastage caused by hydatid disease (*Echinococcus granulosus*) in the beef industry and how her research will help the industry reduce the waste and increase profit. Cara will now represent Charles Sturt University at the Asia-Pacific 3MT competition held in Brisbane in September.

Pictured on this page, left to right:

Shafaet Hossen, Cara Wilson



University of Tasmania

PhD students

University of Tasmania PhD students **Mai Dang**, **Jessica Johnson-Mackinnon** and **Jimena Balli Garza** presented their research at ASP conference in Blue Mountains.

PhD student **Tina Oldham** returned from her research in Norway and is now running her Amoebic Gill Disease experiment.

Barbara Nowak's travels

In April **Barbara Nowak** attended Gill Health Initiative meeting in Bergen Norway where she presented an update on University of Tasmania research on Amoebic Gill Disease and another talk on epitheliocystis. This meeting was attended by researchers and aquaculture industry and focused on gill conditions in Atlantic salmon, some of them are of parasitic origin.

Barbara visited her collaborators at Aarhus University in Roskilde Denmark to discuss results from Mai Dang's PhD on sculpin from Greenland. The results are very exciting – including some interesting parasites. Barbara gave a seminar at Aarhus University on How to measure fish health, which included assessment of parasite loads.

During her current study leave she spent some time in CEFAS Weymouth UK where



she talked about Microbiome research in aquaculture. She met with salmon industry in Scotland to discuss salmon gill issues, including those caused by parasites. Barbara also visited a cleanerfish farm in Portland, which grows lumpfish for use on Atlantic salmon farms in Scotland. Barbara is currently enjoying summer weather at St Johns New Foundland Canada where she is collaborating on salmon research with Prof Matt Rise from Memorial University New Foundland

ACT

Australian National University

Crossing Boundaries: PhD Scholarships

Earlier this year, parasitologists from the Australian National University and various institutes in Berlin, Germany, were awarded a multi-year international training grant for PhD students. The training grant, called "Crossing Boundaries: Molecular Interactions in Malaria", provides PhD scholarships to students keen to work in an innovative, interdisciplinary environment at the cutting edge of malaria research.

Students will undertake research in both Canberra and Berlin, and graduate with a dual PhD from the ANU and Humboldt University. Students will take part in a customised training program that includes yearly retreats, seminars given by leaders in the field, and the opportunity to participate in voluntary internships in industry. Upon completion of their PhD, students will have acquired a broad range of skills and experiences that will make them employable in an increasingly competitive global marketplace.

The Berlin research groups have recently recruited 11 students, who will spend at least one year of their PhD at the ANU. ANU is now recruiting for 8 PhD positions, with applications closing soon.

State News continued

See these links for details on applying:

www.allianceberlincanberra.org

<http://science.anu.edu.au/study/phd-mphil/anuhumboldt-university-graduate-school>

and contact Alex Maier (alex.maier@anu.edu.au) for further details..

Queensland

James Cook University

Paper

PhD student **Giana Bastos Gomes** published the article "Evidence of multiple species of Chilodonella (Protozoa, Ciliophora) infecting Australian farmed freshwater fishes' in March of this year. <https://www.ncbi.nlm.nih.gov/pubmed/28291600>

Central Queensland University

Lee Barnett visits JCU

Lee Barnett of Central Queensland University enjoyed the wonderful hospitality of **Kate Hutson** and **David Vaughan** during a visit to Kate's lab at James Cook University in late May.

While there, Lee and David collected some local snails to check for cercariae (which yielded 7 infections). Lee thoroughly enjoyed the opportunity to talk to other ASP members for a change now that she is sole ASP person at CQU, following the departure of Richard Bradbury to the CDC in the US.

Lee and Kate worked out that between them, they had covered every ASP meeting since about 2003.

Griffith University

News from the Tropical Parasitology Laboratory

PhD student **MJ Chua** from the Tropical Parasitology Laboratory at GRIDD was awarded the people's choice poster award (\$100) at the QLD ASMR Post Graduate Student conference in May. MJ's poster described the preclinical testing of a novel antiplasmodial compound (AR-42) in a murine model of malaria.

The Tropical Parasitology Laboratory also welcomes German student **Hannah Wissing**. Hannah has recently graduated from high school and is spending her gap year in Australia to gain insight into different medical research projects. Currently Hannah is gaining experience in malaria drug discovery approaches under the supervision of Professor Kathy Andrews.

News from the Discovery Biology Laboratory

Professor **Vicky Avery** was awarded the VC's Remarkable Research Achievement Award in 2017 for an Individual Mid-career or Senior Researcher who has demonstrated an outstanding record of achievement in research. Professor Avery was also an ASP invited participant at Science Meets Parliament in Canberra, March 21-22nd.

Sandra Duffy from the Discovery Biology Laboratory at GRIDD was awarded a Griffith University Postgraduate Scholarship to undertake her PhD project in Malaria starting in October.

Professor Avery & Sandra Duffy were also awarded Griffith University's Nature Incentive Scheme and \$2500, for the contribution made to the following Nature article in 2016; Diversity-oriented synthesis yields novel multistage antimalarial inhibitors.

University of Queensland

Undergraduate Prize

Congratulations to Australian Society for Parasitology Undergraduate Prize winner for 2016 **Kate van Haeringen** from the University of Queensland.

Kate says, "Thank you so much for your kind donation, it was a lovely way to conclude the subject. I thoroughly enjoyed PARA3002, so it was very easy to put the effort in as I didn't mind studying such interesting material - that being said, it was very rewarding to see my hard work pay off. The scholarship has really encouraged me to continue my studies and interest in parasitology, I'm currently a medical student (also at UQ) and am considering specialising in infectious diseases."

Tabor Group, Centre for Animal Science,

Ala (Lew) Tabor's lab has been all about ticks and tick borne diseases and also bovine venereal diseases - with the last year associated with proof of concept trials for provisional patents for both the new cattle tick vaccine and new paralysis tick vaccine for dogs. Cattle tick challenge trials are undertaken at the Queensland Animal Science Precinct at UQ's Gatton campus which is well set up for cattle tick trials with individual moated pens to allow tick infestations for challenge and also tick collections for in vitro monitoring of tick fecundity. The staff there have cattle tick trials down to a fine art our trials started in 2009. Assisting with trial work have been **Cathy Minchin**, **Bing Zhang**, **Beth Fowler** and **David Mayer** (Qld Dept of Agriculture & Fisheries) for which I am very appreciative. Looking forward to the next phase of this work and moving on with further research and commercialisation.

Manuel Rodriguez Valle finished up on the paralysis tick project last year and is now situated at the University of Melbourne with **Robyn Gasser's** group. As Manuel is an

State News continued

inventor on the above patents, we are in still close contact while also supervising **Thomas Karbanowicz** PhD research (proteomics of ticks- cattle tick and paralysis tick; and yeast display of salivary proteins of paralysis ticks). Together with Drs **Peter James** and **Conny Turni** (QAAFI, EcoScience Precinct, Dutton park campus), Prof **Ben Hayes** (Geneticist, QAAFI, St. Lucia) and Dr **Constantin Constantinoiu** (James Cook University) we have embarked on a new project looking at genetics and biomarkers for cattle tick resistance, as well as buffalo fly and BF lesion resistance.

For this project we are interviewing a new Post-Doctoral scientist soon and recruiting new PhD students (please contact me if you are interested: a.lewtabor@uq.edu.au).

The lab welcomed **Héloïse Duval** – a 2nd year Veterinary student as an intern for 6 weeks (July-August 2017) from the National Veterinary School of Toulouse, France – in her short time she examined the serum proteome and analysed genetic SNPs from a small group of tick resistant and susceptible cattle.

Through a collaboration with UQ's Centre for Clinical Research (Prof **Murray Mitchell** & Dr **Hassendrini Peiris**), we have also been looking at cattle exosomes associated with tick resistance. Thus while vaccine work is 'ticking over' (pun intended), the research focus has moved to the bovine host.

Finally, Australia hosted for the first time the International Tick and Tick-borne Pathogen conference (TTP9) which is held every 3

years around the globe. Partnering with the Australian Rickettsial Reference Laboratory this TTP was held in conjunction with the 1st Asia-Pacific Rickettsia Conference (APRC1) – see <http://www.ttp9-aprc1.com/> on the 27th August-1st September 2017 in Cairns. I personally thank ASP for sponsorship support for this event and the many ASP members who are attending. Plenaries include (local favourites and internationals): Prof **Peter Irwin**, Prof **Steve Barker**, Prof **Uli Munderloh**, Prof **Pat Nuttall**, Prof **Cate Hill**, Prof **Pierre-Edouard Fournier**, and Prof **Carlos Suarez**. Biographies can be found on the above web-site. I also thank ASP for a great conference in Leura, privileged to be able to speak, and apologising for the singing in advance !!!!

PS. I must also note that QAAFI is again promoting 'TropAg' (website: <http://tropagconference.org/>) which will be held on 20-22nd November at the Brisbane Convention & Exhibition Centre. Registrations will be closing soon!

for her 2 minute presentation titled "Pesky pests and their parasite guests". FameLab is a live science communication competition that aims to discover early career scientists who can inspire people with their research. Congratulations to Narelle!

Perth Science March

In April a group of conservation biologists, anatomists, marine biologists, and molecular biologists from Murdoch University took part in the Perth Science March in Perth city to speak about the importance of and continued funding into scientific research. **Narelle Dybing** was there to represent parasitology. They heard from inspirational speakers such as Professor **Lyn Beazley** and Professor **Carmen Lawrence**. The message that resonated with Narelle the most was that we need to be able to communicate our research effectively to not only fellow researchers but also to the public, which then helps to emphasize the importance of science funding and research in Australia.

Parasites: Life Undercover

The Perth Royal Show (23rd September – 30th September 2017) is hosting "Parasites – Life undercover" from the Museum für Naturkunde Berlin, which was at the

Western Australia

Murdoch University

International FameLab

Narelle Dybing from Murdoch University competed in the WA semi-finals of the International FameLab competition in April

Below left: Narelle Dybing competing at International FameLab

Below Right: Perth Science March



State News continued

Brisbane Museum last year. ASP outreach will be working with Murdoch University, the Department of Agriculture and Food, and the Royal Agricultural Society of Western Australia who will have a number of stalls at the show to generate interest in careers in parasitology for future students and to promote parasite understanding in the community.

Anyone free to help man stalls and talk to people about parasites for the event please contact crystal.cooper@research.uwa.edu.au

Victoria

Walter and Eliza Hall Institute

Awards

A/Prof **Wai-Hong Tham** has been named as a HHMI-Wellcome Trust International Research Fellow to pursue her research on molecular mechanisms of *P. vivax* invasion.

Charlie Jennison was awarded the JD Smyth travel award in 2016 and in May this year went to the Lab of Prof. Dennis Kyle in Mae Sot, Thailand where, he learnt their high throughput liver stage drug screening assay for *P. vivax*. A second part of this research exchange is currently underway in the laboratory of Prof. Tsuboi at Ehime University, where he aims to generate much needed liver stage reagents for the malaria community, using the wheat germ cell free protein expression methods developed at Ehime University and also assist with CRISPR transfections. A full report will follow.

PhD completion

Alex Kennedy has completed his PhD studies under the supervision of **Wai-Hong Tham**

and co-supervisor **Alan Cowman**. His PhD thesis was entitled "Complement evasion mechanisms of the deadly human pathogen *Plasmodium falciparum*".

During his PhD, he discovered two new host-pathogen interactions between merozoite surface proteins and human complement regulators, which established a new field of research on how malaria parasites hijack human immune proteins to facilitate infection.

University of Melbourne

Awards

Natalie Spillman, Bio21 and Department of Biochemistry and Molecular Biology was awarded an Oral presentation prize at the BioMalPar XIII: Biology and Pathology of the Malaria Parasite conference in Heidelberg, Germany, in May for her talk titled "Understanding artemisinin action in *Plasmodium falciparum*."

Natalie was also awarded the ASBMB Eppendorf Edman Award.

Welcome Tatyana Almeida Tavella

Prof **Leann Tilley**'s laboratory welcomes **Tatyana Almeida Tavella** a visiting PhD Student from the University of Campinas (UNICAMP), Brazil. Tatyana is from the laboratory of Prof Fabio Costa and she is working with Matt Dixon and Leann to look at novel compounds against malaria parasites. She will spend 6 months in Australia.

Publications

Charnaud, SC; Dixon, MWA; Nie, CQ; Chappell, L; Sanders, PR; Nebl, T; Hanssen, E; Berriman, M; Chan, J; Blanch, A; Beeson, JG; Rayner, JC; Przyborski, JM; Tilley, LT; Crabb, BS and Gilson, PR. The exported chaperone Hsp70-x supports virulence functions for *Plasmodium falciparum* blood stage parasites.

PLOS One. 2017. Jul 21;12(7):e0181656.

Batinovic, S; McHugh, E; Chisholm, S.A; Matthews, K; Liu, B; Dumont, L; Charnaud, S.C; Parkyn Schneider, M; Gilson, P.R; de Koning-Ward, T.F; Dixon, W.W.A*; Tilley, L*. An Exported Protein-Interacting Complex involved in the trafficking of virulence determinants in *Plasmodium*-infected erythrocytes. NATURE COMMUNICATIONS. 2017. Jul 10;8:16044

Farid, R*; Dixon, MWA*; Tilley, L; James McCarthy, J. Gametocytogenesis is initiated at very low parasite densities in malaria infections and is refractory to piperazine. JOURNAL OF INFECTIOUS DISEASES. 2017 Apr. 1;215(7):1167-1174.

Preston, S., P. K. Korhonen, L. Mouchiroud, M. Cornaglia, S. L. McGee, N. D. Young, R. A. Davis, S. Crawford, C. Nowell, B. R. E. Ansell, G. M. Fisher, K. T. Andrews, B. C. H. Chang, M. A. M. Gijss, P. W. Sternberg, J. Auwerx, J. Baell, A. Hofmann, A. Jabbar and R. B. Gasser (2017). "Deguelin exerts potent nematocidal activity via the mitochondrial respiratory chain." FASEB J. In press.

Preston, S., Y. Jiao, J. B. Baell, J. Keiser, S. Crawford, A. V. Koehler, T. Wang, M. M. Simpson, R. M. Kaplan, K. J. Cowley, K. J. Simpson, A. Hofmann, A. Jabbar and R. B. Gasser (2017). "Screening of the 'Open Scaffolds' collection from Compounds Australia identifies a new chemical entity with anthelmintic activities against different developmental stages of the barber's pole worm and other parasitic nematodes." Int J Parasitol Drugs Drug Resist 7(3): 286-294.

Jiao Y, Preston S, Song H, Jabbar A, Liu Y, Baell J, Hofmann A, Hutchinson D, Wang T, Koehler AV, et al. Assessing the anthelmintic activity of pyrazole-5-carboxamide derivatives against *Haemonchus contortus*. Parasit Vectors. 2017 May 31; 10(1):272. Epub 2017 May 31.

Jobs

WESTERN SYDNEY UNIVERSITY



Two Postdoctoral Research Fellow positions, School of Science and Health

**Full-Time, Fixed-Term until 31 January
2020 (Ref 1527/17)**

Western Sydney University is a major urban university spread over six campuses in Greater Western Sydney, a region of great opportunity, diversity, challenge and growth. The University has a strong connection to Greater Western Sydney, working with its communities and businesses to contribute to the region's growth. The University is culturally diverse, with 2,500 staff and 40,000 students drawn from Australia and around the world.

The School of Science and Health is currently seeking two (2) forward thinking, dynamic, and innovative scholars to take on Postdoctoral Research Fellow with research backgrounds in parasitology and/or immunology and/or cell and molecular biology. The positions are funded by a National Health and Research Council Project Grant awarded to Professor Nick Smith, Deputy Dean of Science and Health at Western Sydney University. These positions will be responsible for conducting research investigating the cell biology, molecular biology and immunobiology of infection with the parasite, *Toxoplasma gondii*, with the goal being to develop a vaccine to prevent transmission of this parasite from cats to humans and other animals.

Successful applicants will analyse data and prepare reports and scientific papers for publication as well as assist in co-supervision of research students and assistants. In the first 12 months of the project, the appointees will be based in the collaborating laboratory of Dr Giel van

Dooren, in the Research School of Biology at the Australian National University in Canberra. The opportunity to travel to conduct research in the laboratories and facilities of international collaborators – Professors Peter Deplazes and Adrian Hehl – at the University of Zurich, Switzerland, will also be part of the roles throughout the project.

Remuneration Package: Academic Level A \$85,330 to \$103,092 per annum (comprising Salary \$76,984 to \$93,008 p.a., 9.5% Superannuation and Leave Loading)

Position Enquiries: Professor Nick Smith, Deputy Dean, School of Science and Health on +61 2 9685 9904 or nick.smith@westernsydney.edu.au

Closing Date: 8 October 2017

How to Apply: Please go to https://www.westernsydney.edu.au/employment/home/current_vacancies and follow the online instructions



Professor/Associate Professor/Assistant Professor (Veterinary Parasitology) at City University of Hong Kong

**Department of Infectious Diseases and
Public Health, College of Veterinary
Medicine and Life Sciences**

The new College of Veterinary Medicine and Life Sciences at City University of Hong Kong in collaboration with Cornell University's College of Veterinary Medicine is assembling an outstanding group of international academics to

undertake teaching and research within the Department of Infectious Diseases and Public Health.

Duties: curriculum development; teaching and managing undergraduate and postgraduate courses; development of new research directions and maintenance of robust research programmes; and contribution to administrative work and other duties to facilitate the development of the Department and the College as a whole. Ability and willingness to help support veterinary diagnostic services and to work with clinicians would be an advantage.

Further information: further information is available from <http://www.cityu.edu.hk>, or from the Human Resources Office, City University of Hong Kong, Tat Chee Avenue, Kowloon Tong, Hong Kong [Email : hrojob@cityu.edu.hk/Fax : (852) 2788 1154

or (852) 3442 0311].

How to apply: please submit an online application at <http://jobs.cityu.edu.hk>, and include a current curriculum vitae, a cover letter, and research and teaching statements based on the position. Nominations can be sent directly to the Human Resources Office.

Applications and nominations received will receive full consideration until the positions are filled. Only shortlisted applicants will be contacted; and those shortlisted for the post of Assistant Professor will be requested to arrange for at least 3 reference reports sent directly by the referees to the Department, specifying the position applied for. The University's privacy policy is available on the homepage.

Jobs continued



Two new job opportunities in cellular and molecular parasitology at Monash University

Opportunity 1: understanding the role of exported kinases in the pathogenesis of human malaria

A new opportunity exists in cellular and molecular parasitology in the Cooke Laboratory in the Biomedicine Discovery Institute (Department of Microbiology) for an experienced Research Assistant or Research Fellow to be involved in exciting work to elucidate the cellular and molecular mechanisms by which malaria proteins cause disease in humans. You will be involved in a multi-disciplinary project to elucidate the function of a sub-set of newly identified kinases in malaria parasites which we believe play a central role in red blood cell invasion and modification.

The successful candidate will have experience and a strong track record in

microbiology, molecular and cell biology, parasitology or a related area.

Previous experience specifically in molecular parasitology (ideally working with malaria parasites) is essential.

This role is a full-time position however flexible working arrangements may be negotiated.

Opportunity 2: development of an effective vaccine to protect against cattle tick fever.

As a result of recent and exciting developments within the Biomedicine Discovery Institute at Monash University, a new opportunity exists in cellular and molecular parasitology in the Cooke Laboratory in the Department of Microbiology for an experienced Research Assistant and/or Research Fellow to be involved in a new and exciting project to characterise a newly identified sub-set of proteins in *Babesia* parasites and determine their role in the pathogenesis of bovine babesiosis. Working closely with international partners both in the USA and Africa, our ultimate goal of this project is to develop and roll out a new and effective vaccine to protect cattle against bovine babesiosis (cattle Tick Fever).

Specifically, you will be involved in a multi-disciplinary project to determine the role and importance of a newly identified set of proteins (discovered in the Cooke Lab) in infection and pathogenesis and assess their potential as vaccine candidates both in vitro and in vivo. The project may involve some national and international travel to perform experiments in collaborating laboratories.

The successful candidate will have experience and a strong track record in microbiology, molecular and cell biology, parasitology or a related area.

Previous experience specifically in molecular parasitology (ideally working with apicomplexan parasites) is essential.

This role is a full-time position however flexible working arrangements may be negotiated. May involve some national and international travel.

Applications

For both positions, please send expressions of interest to:

Professor Brian M. Cooke,
brian.cooke@monash.edu
 +61 3 9902 9146



Community Outreach Specialist (University of Pennsylvania)

The Eukaryotic Pathogen Database resource (EuPathDB.org) is a large, multi-institution project that develops scientific data-mining

websites used by researchers worldwide to study selected microbial pathogens, including those responsible for malaria and enteric disease. With support from the Bill & Melinda Gates Foundation, we are expanding this effort.

The Community Outreach Specialist will join a growing team responsible for communicating with diverse audiences, including not only laboratory research scientists & epidemiologists, but also clinicians, field biologists, and policy-makers. The successful applicant will work collaboratively as part of a 30+ member team including biologists, annotators,

data-loaders, ontologists, user-interface specialists, software developers, outreach staff, and others to present our global user base with intuitive and informative web interfaces for accessing and interrogating large-scale datasets.

For more information about this position, please refer to:

<http://jobs.hr.upenn.edu/postings/30593>

Events

Fish Histopathology Workshop 2017

The University of Tasmania
22-24 November, 2017

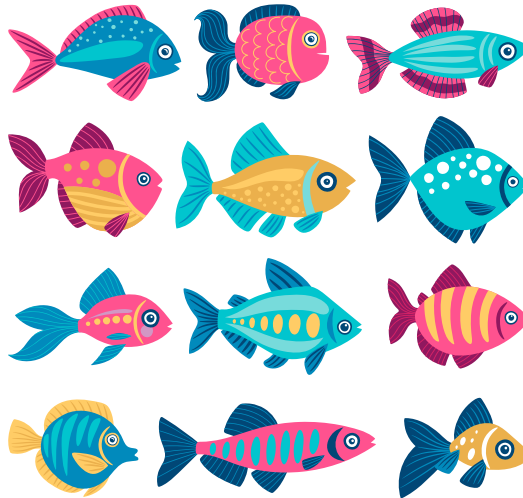
Offered by the University of Tasmania, Institute of Marine and Antarctic Studies at Launceston.

Laboratory style (limit 12) - conference microscopes and teaching software

This workshop covers histology and histopathology of all fish organs. Interpretation of histology, including artefacts will be included. Quantification of pathological changes and image analysis will be discussed. Participants are encouraged to bring their own material for discussion. A range of educational materials for

further study will be presented.

The course is taught by Dr Judy Handlinger, Dr Graeme Knowles, Dr Brian Jones and Professor Barbara Nowak. Small (4 participants) groups ensure teaching addresses the level of individual experience.



The course caters for everyone: from beginners to advanced.

Fee: \$990 (GST inclusive)

A one day Introduction to Fish Histology will be arranged on Tuesday 21 November if any participants were interested (additional cost \$330 including GST).

The registration fee covers lunches, morning and afternoon teas but NOT accommodation or transport, which is a responsibility of the participants. We will be happy to provide some suggestions.

For further information and to register please contact Barbara Nowak

B.Nowak@utas.edu.au

Image from Adobe Stock

Fellows of the Society: names to the faces

Here are the names of the five ASP Fellows shown on page 8



Rob Adlard
FASP 2014



Tom Cribb
FASP 2014



Geoff McFadden
FASP 2014



Ian Whittington
FASP 2015



Lisa Jones
FASP 2017

To read a brief biography of each Fellow, visit
parasite.org.au/the-society/fellows-of-the-society/

22nd ANNUAL WOODS HOLE IMMUNOPARASITOLOGY MEETING

Organized by Tracey Lamb (U of Utah) and De'Broski R. Herbert (UPenn)

15th-18th April 2018



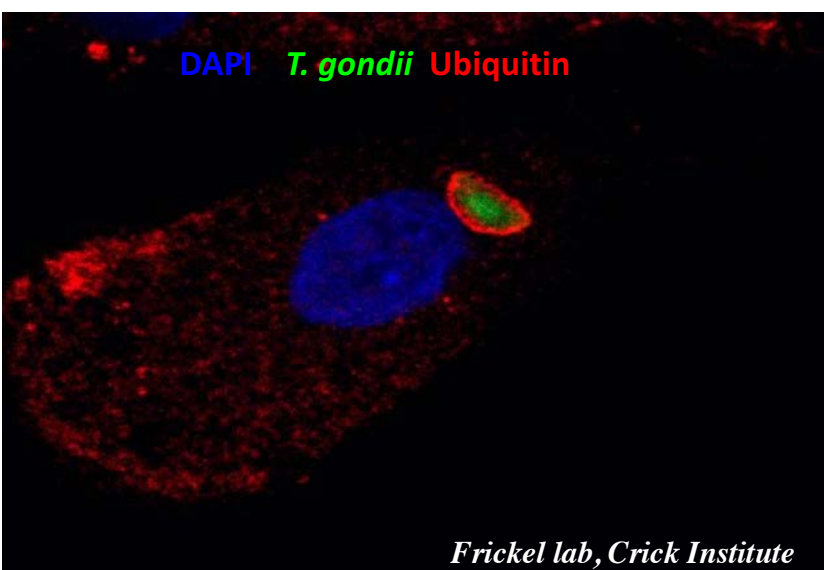
**Parasite
Immunology**

PLENARY SPEAKERS
Avery August, Cornell
Nicole Baumgarth, UC Davis
Laurent Renia, A* Institute Singapore

Information on registration, abstract submission and preliminary program

https://MBL-web.ungerboeck.com/wri/wri_p1_display.aspx?oc=10&cc=WHIP-HOME16

(Abstract submission deadline February 15th; Registration deadline March 15th 2018)



Council of the Australian Society for Parasitology Inc.

Executive



President

Una Ryan

Murdoch University

E: president@parasite.org.au



Vice President

David Emery

The University of Sydney

T: (02) 9351 3102

E: david.emery@sydney.edu.au



Treasurer

Amanda Ash

Murdoch University

E: treasurer@parasite.org.au



Executive Secretary

Charlotte Oskam

Murdoch University

E: secretary@parasite.org.au

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ACT

Chrstina Spry

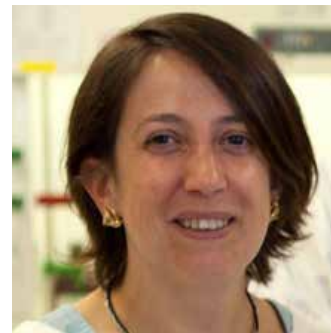
Research School of Biology,
Australian National University,
Canberra, ACT 0200
E: christina.spry@anu.edu.au



NSW

Shokoofeh Shamsi

Charles Sturt University
Wagga Wagga, NSW 2678
T: +61 2 6933 4887
E: sshamsi@csu.edu.au



NT

Michelle Boyle

Menzies School of Health Research
Global and Tropical Health Division
PO Box 41096
Casuarina, NT 0811
E: mboyle@burnet.edu.au



QLD

Gillian Fisher

Eskitis Institute for Drug Discovery,
Griffith University,
T: +61 7 3735 4415
E: g.fisher@griffith.edu.au



SA

Danny Wilson

University of Adelaide.
T: +61 8 8313 8259
E: danny.wilson@adelaide.edu.au



TAS

Barbara Nowak

University of Tasmania
AMC, NCMCRS
Locked Bag 1370
Launceston, Tasmania 7250
E: B.Nowak@utas.edu.au



VIC

Matthew Dixon

University of Melbourne
E: matthew.dixon@unimelb.edu.au



WA

Crystal Cooper

University of Western Australia,
crystal.coper@research.uwa.edu.au

ASP Council continued

Other Members of Council



IJP Editor

Brian Cooke

Monash University,
E: editor@IJP.org.au
T: +61 3 9902 9146



IJP:DDR Editor

Kevin Saliba

Australian National University
kevin.saliba@anu.edu.au
(02) 61257549



IJP:DDR Editor

Andrew Kotze

CSIRO Animal, Food and Health
Sciences
andrew.kotze@csiro.au



IJP:PAW Editor

Andrew Thompson

Murdoch University
Murdoch WA
T: (08) 9360 2466
E: a.thompson@murdoch.edu.au



Bancroft-Mackerras Medal Convenor

Malcolm Jones

University of Queensland
E: m.jones@uq.edu.au



Incorporation Secretary

Tina Skinner-Adams

Eskitis Institute for Drug Discovery,
Griffith University,
E: t.skinner-adams@griffith.edu.au



ASP Network Convenor

Nick Smith

E: nick.smith@parasite.org.au



ASP Executive Officer

Lisa Jones

ASP Network for Parasitology,
James Cook University,
Cairns Campus QLD 4878
T: (07) 4232 1311
E: lisa.jones1@jcu.edu.au



Archivist

Haylee Weaver

Australian Biological Resources
Study
T: (02) 2 6250 9434
E: Haylee.Weaver@environment.gov.au