

# NEWSLETTER

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### Dear Members,

Welcome to the special double issue June/October edition of the ASP Newsletter.

Congratulations to all of you who were awarded ARC, NHMRC and other grants or fellowships.

With the 2014 ASP Annual and Golden Anniversary Conference behind us, we are now looking forward to the Joint Conference with the New Zealand Society for Parasitology (NZSP) in Auckland in July 2015 and the International Congress of Tropical Medicine and Malaria (ICTMM) in Brisbane in September 2016.

The organisation of the joint NZSP/ASP conference is proceeding well the 2015 Annual Conference will be a joint meeting between the Australian Society for Parasitology and the New Zealand Society for Parasitology, held at the Crowne Plaza Hotel, Auckland, New Zealand, Monday (evening) 29th June - Thursday 2nd July. Save the date, conference website will be open soon and registration opening in January 2015. We thank the Executive of NZSP and Nick Smith and Lisa Jones of the ASP Network for all of the work that has gone into organising the next annual conference.



The organisation of ICTMM is proceeding well. Supported by Denise Doolan, Kathy Andrews and others, Malcolm Jones has been heading the Organising Committee on behalf of ASP, together with representatives of the Australasian Society of Infectious Diseases (ASID). The agreement between ASP and ASID is in place, the contract with the conference



organiser (Arixen) has been signed, and information on ICTMM is available on the ASP website. The conference management committee has formulated a budget, including registration fees, which will be on par with the 50th Anniversary conference held in Canberra this year. The committee is selecting keynote speakers and will post announcements as speakers are secured. A key platform of the congress will be investigations into the intersection of animal and human health. The congress will incorporate all of the activities of the ASP memberships in what is hoped to be an interactive meeting spanning multiple disciplines. Input from ASP membership on potential Keynote Speakers and themes is welcome and should be directed to Malcolm. On behalf of ASP, I thank Mal, Denise Doolan and Kathy Andrews and our colleagues from ASID for their outstanding efforts toward this important Congress. <http://tropicalmedicine2016.com/>

The ASP course "Advanced Concepts in Parasitology" will take place at the Australian National University (ANU), Kioloa Coastal Campus, between 23 November and 6 December 2014. As you may know, the objective of this course is to build capacity in Parasitology and



## *From the President's desk continued*

equip early career scientists with the latest concepts and technological advances to foster careers in Parasitology and promote the discipline in Australia. The course will cover key areas of parasite biology, immunology, biochemistry and molecular biology, advances in diagnosis, drugs, vaccines and control interventions, as well as the latest research developments in 'omics' and bioinformatics to meet the challenges of the future in industry and academia. Building on the strength of the Australian community of parasitologists, world-experts from a wide range of disciplines will share their knowledge and insights with 16 course participants. The program will also focus on aspects of career development, offering workshops to help fine-tune participants' professional tools, and presenting a platform for professional networking. Course participants will also take part in workshops to develop skills in communicating science to a public audience.

On behalf of ASP, I would like to thank Alexander Maier and everyone involved in the course for the hard work that has gone into its preparation. In particular, we are grateful to members of the Course Structure/Content sub-committee, Rob Adlard, Mal Jones, Stuart Ralph, Geoff McFadden, Lisa Jones and Giel van Dooren, as well as the Management sub-committee, Denise Doolan, Aaron Jex, Robin Gasser, Brian Cooke, Kieran Kirk, Nick Smith and Lisa Jones, for their inputs throughout the year. Most importantly, we thank all of the lecturers, who have so diligently supported Alex in getting their components of the program organised, and we thank them in advance for delivering what will be a high quality professional course. We look very much forward to the "graduating class" of 2014.

ASP has continually been seeking sponsors for this course, and Denise Doolan, Aaron Jex and Alex Maier have made excellent progress in getting sponsors for different parts of the course. We would like to thank our sponsors **The University of Melbourne, QIMR Berghofer Medical Research Institute, The Australian National University, the Australian**

**Institute of Tropical Health & Medicine at James Cook University and the International Journal for Parasitology** for their generous support. In addition to some funding, a number of companies, including **Thermo Fisher Scientific, Promega, Sigma, Miltenyi Biotec, VWR, Beckman, Bioline, Corning and Geneworks** who have provided in kind support and/or substantial discounts on consumables and equipment. ASP will also be running outreach events linked to this course. The ASP website ([www.parasite.org.au](http://www.parasite.org.au)) will promote the course and feature a sponsorship page.

The International Journal for Parasitology (IJP) spin-off journals, IJP-Drugs and Drug Resistance (IJP-DRR), IJP-Parasites and Wildlife (IJP-PAW) are gaining considerable traction, and submissions from scientists in Australia as well as overseas are encouraged for all three journals. We congratulate Andrew Kotze and Kevin Saliba for securing an impact factor of 2.5 for DRR, which is an outstanding achievement. We also thank Andrew Thompson and Lydden Polley for their continued commitment to PAW. ASP has advertised for the position of Editor-in-Chief of IJP, and an appointment is to be made early in 2015. International Journal for Parasitology (IJP) is performing very well, and we sincerely thank our current Editor, Alex Loukas, his Deputies Brian Cooke and Jan Slapeta, and particularly Assistant Editor Maria Meuleman for their major and continuing contributions to the journal's success around the world. IJP kindly introduced an award for the best student paper published in the journal, which is selected by the IJP Editor-in-Chief and Deputy Editors and awarded at the ASP conference each year.

Members are reminded of "Outreach Funds" available to support State/Territory events, including networking sessions or any other parasitology-related event; up to \$500/event with a total of \$2,000/calendar year per state/territory. Applications for support are coordinated via your state/territory representative.

We congratulate our new ASP Fellows, **Rob**

**Adlard, Tom Cribb and Geoff McFadden**, who were awarded their fellowships at the 2014 ASP AGM. Congratulations to **Una Ryan** who won the The Bancroft-Mackerras Medal for Excellence and **Rina Wong** who won the John Frederick Adrian Sprent Prize. We also congratulate ASP Award winners from the 2014 Annual Conference.

Congratulations to **Ian Beveridge**, who won a 2014 World Federation of Parasitologists Distinguished Achievements Award presented at ICOPA XIII in Mexico. Ian has also officially "retired" from his duties on the editorial board of IJP and his contributions were acknowledged at the 2014 ASP AGM in Canberra.

I also wish to remind ASP members of the Awards Schemes of the Society, which provide funding assistance to ASP members for researcher exchanges, training courses, visiting international lectureships, workshops, grant writing retreats and mentorship support. The first round for 2015 of the ASP Network for Parasitology Travel Award scheme closes on Friday 13th March, there will be two rounds in 2015.

As in previous editions of the Newsletter, I invite for expressions of interest from members with an interest in science policy or related activities to assist Council in raising the profile of Parasitology in Australia. If you or anyone you know have interest in this area, please do not hesitate to contact me. Members of Council have been asked to be proactive in identifying potential interests.

It was another busy year in ASP Executive, and I sincerely thank Aaron Jex (Treasurer) and David Piedrafita (Executive Secretary) for their strong support throughout the year. Without their inputs, the Executive would not run as smoothly as it does. Thanks also go to Maureen Engler for her support of the membership. Thanks also to Council members for their efforts and outreach activities. Welcome to our President-Elect, **David Emery**, Incorporation Secretary, **Tina Skinner-Adams** and new state representatives **Benedikt Ley** (NT), **Giel van Dooren** (ACT), and **Stephanie Godfrey** (WA).

### From the President's desk continued

Importantly, I would like to thank Lisa Jones and Nick Smith for running the ASP Network so efficiently and for organising the extensive outreach activities throughout 2014. We look very much forward to the report at the next Council meeting.

Next week the ASP will launch a new-look website, there may be some disruption to the service and we will advise members when this will take place. The Mid Term Meeting (MTM) of Council will likely be held

in Melbourne in February 2015, so please contact your State/Territory representative if you want any issues to be brought to Council.

With the year rapidly coming to a close, I wish you the very best, and hope that you will find some time to have a good break over the festive season.

Best wishes,

**Robin Gasser**



Clockwise from top right: Robin Gasser with Rob Adlard; Robin with Tom Cribb; Robin with Denise Doolan and Ian Beveridge with Robin Gasser and David Piedrafita

### Sad passing of Mary Cremin FASP

*It is with great sadness that I inform you of the passing of Mary Cremin FASP. Mary was an outstanding contributor to Parasitology in Australia. She became a member of the ASP in 1976. Mary Cremin was Professor John FA Sprent's assistant for more than 40 years, and made major contributions to his research through the meticulous collection and cataloguing of reference works, reprints and all of the literature for research in his Department and provided other expert support, also more broadly to Parasitology in Australia, including her contributions to the book entitled "Parasite Lives: Papers on Parasites, their Hosts and their Associations" (eds. Mary Cremin, Colin Dobson, Douglas E. Moorhouse). At that time, Mary was elected Honorary Editorial Secretary of the International Journal for Parasitology because of her "efficiency and the smooth continuation of editorial needs". She remained a stalwart of the Journal for many, many years. Mary's huge contribution was recognised by ASP when she was elected a Fellow in 1994. Later in life, Mary became John's second wife, Muriel having died in 1998. On behalf of ASP, I send our condolences and deepest thoughts to Mary's family.*  
Robin Gasser, ASP President

### Sad passing of Ian Whittington

*It is with great sadness that I pass on the news that Associate Professor Ian Whittington passed away Sunday 27 October 2014 after a long illness. Ian was 54 years old.*

*Throughout his career, Ian has been an enthusiastic researcher and a champion of studies of the biology of monogenean parasites of fishes. After completing his PhD under the supervision of Dr Graham Kearn at the University of East Anglia, UK, Ian moved to Brisbane in 1987 to take up a University of Queensland Post-Doctoral Fellowship in the Department of Parasitology. He was to remain in Brisbane until 2001, serving in a number of key academic positions including Senior Lecturer in that Department and Director of the Heron Island Research Station.*

*In 2001, Ian moved to Adelaide to take up senior scientific and academic positions at the South Australian Museum and University of Adelaide. Ian was the Head of Biological Sciences at the Museum and the senior science representative on the Executive Team of the Museum.*

*Ian was passionate about monogeneans. He published over 170 articles on the biology and taxonomy of these important external parasites. He made significant contributions to the knowledge of tropical marine parasitology. Ian was an important consultant to the aquaculture industry on the biology and control of these pathogenic organisms, and many of his graduate students now work in senior fisheries and aquaculture positions in government. Ian served on the editorial boards of many journals in parasitology. He chaired the organizing committees of a number of conferences, notably the International Symposium on Monogeneans and a recent ASP conference in Adelaide. Ian passed away at a hospice in Adelaide, surrounded by family and friends. I send our condolences and deepest thoughts to his family. An obituary for Ian will be published in a future ASP newsletter.*

# 2015 Conference

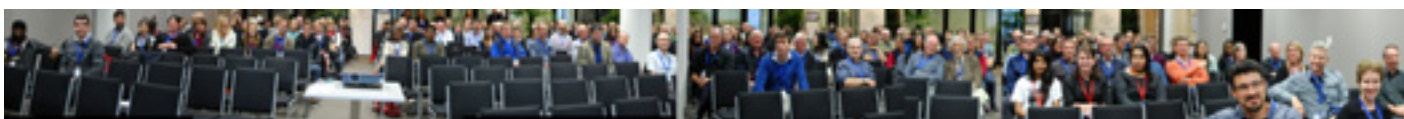


Joint NZSP & ASP Annual Conference  
29 June - 2 July 2015  
Auckland, New Zealand



The 2015 NZSP & ASP Annual Conference, will be a joint meeting between the Australian Society for Parasitology and the New Zealand Society for Parasitology, held at the Crowne Plaza Hotel, Auckland, New Zealand, 29th June - 2nd July. Save the date, conference website will be open soon and registration opening in January 2015.

## ASP 2014 Annual General meeting



We had a full-house at the 2014 ASP AGM in Canberra (picture above by Lisa Jones) and we are hoping for a similar turnout for the next one. The 2015 ASP AGM and induction of new ASP Fellows will take place at the Joint NZ & ASP Annual Conference in Auckland. A gentle reminder that ASP Students in receipt of a 2015 ASP Student Conference Grant are required to attend.

## \$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.

**Please send your 2014 prize request ASAP. Requests for 2015 prizes must be made by the eligible University to the ASP Treasurer or Secretary by the 30th September 2015.** Requests for prizes must include the following for each eligible course:

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



The Chief Scientist launched a STEM strategy in September 2014. STA CEO Catriona Jackson said the plan was critical to make the most of the wealth of scientific expertise and encourage growth, for the benefit of the entire nation." [http://www.chiefscientist.gov.au/wp-content/uploads/FINAL\\_STEMAUSTRALIAFUTURE\\_WEB.pdf](http://www.chiefscientist.gov.au/wp-content/uploads/FINAL_STEMAUSTRALIAFUTURE_WEB.pdf)

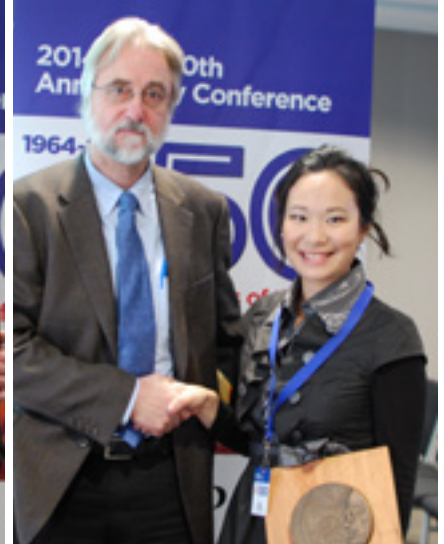


# ASP Prizes

## Congratulations to all of our ASP prize winners at the 2014 ASP 50th Anniversary Conference in Canberra

Congratulations to **Una Ryan**, Murdoch University (pictured top left with Robin Gasser) who won the The Bancroft-Mackerras Medal for Excellence.

Congratulations to **Rina Wong**, University of Western Australia (pictured top right with Robin Gasser) who won the John Frederick Adrian Sprent Prize.



2014 ASP award winners are:

Best Student Poster: **Adriana Botero Gomez**, Murdoch University (2nd row left with Robin Gasser)



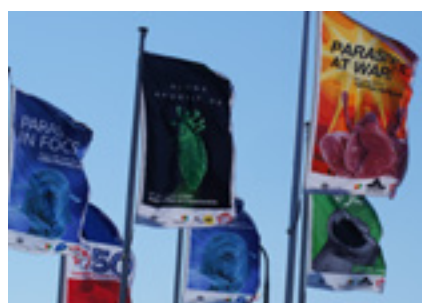
Best Student 2 minute talk: **Alejandro Trujillo Gonzalez**, James Cook University (2nd row right with Robin Gasser)

Best Student 5 minute talk: **Robert Summers**, The Australian National University (3rd row left with Robin Gasser)



Best Student 15 minute talk: **Esther Rajendren**, The Australian National University (3rd row right with Robin Gasser)

Best Early Career Researcher Presentation: **Neil Young**, The University of Melbourne (4th row left with Robin Gasser)



# 2014 ASP Invited International Lecturerships

Professor Boris Striepen,  
GRA Distinguished  
Investigator, University of  
Georgia



Boris Striepen is interested in the cell and molecular biology of protozoan parasites. Most his team's work is focused on members of the phylum Apicomplexa. Organisms in this group cause a number of important diseases including malaria, severe opportunistic infections associated with AIDS, and fetal and early childhood diseases. They use a broad array of modern genomic, genetic, cell biological and biochemical approaches to understand fundamental parasite biology and use this knowledge to identify and develop targets for disease intervention. Currently they are focusing on the function and cell biology of the parasite chloroplast; novel targets for the treatment of cryptosporidiosis & forward genetic analysis in *Toxoplasma gondii*.

*Boris travelled to Melbourne to Malcolm McConville's laboratory, Sydney to visit Sonja Frohlich at UTS, Brisbane to visit Chris Engwerda's laboratory at QIMR Berghofer, and Cairns to visit Nick Smith and Alex Loukas at James Cook University.*

Dr Margaret Mackinnon,  
KEMRI-Wellcome Research  
Programme, Kilifi, Kenya



Margaret Mackinnon is a quantitative geneticist who obtained a PhD at the University of Edinburgh in 1998. She studies the evolutionary pressures that make malaria parasites virulent. Through a series of laboratory-based studies, analysis of field data and theoretical modelling, she and colleagues have established that host immunity is the principal force driving virulence upwards in malaria parasites. This has consequences for the long-term success of malaria control programmes. Her main focus at present is the identification of adaptive genes and their regulatory architecture in the human malaria parasite, *Plasmodium falciparum*, using whole-genome transcriptome analysis of natural populations. She also maintains a working interest in the host genetic basis of resistance to malaria, parasite population genetics and epidemiological modelling. Her lab is based at the KEMRI-Wellcome Research Programme in coastal Kenya with support from the Nuffield Department of Clinical Medicine at the University of Oxford, UK.

*Margaret travelled to visit ASP members at the Research School of Biology at ANU in Canberra, Menzies School of Health Research in Darwin and James Cook University's Australian Institute of Tropical Health Medicine in Cairns.*

A/Professor Mike Ferdig,  
Biological Sciences, University  
of Notre Dame



Mike Ferdig researches the genetics and genomics of *Plasmodium falciparum* using a wide array of tools and methods to gather biological insights into drug resistance and virulence of the parasite. The nearly completed *P. falciparum* genome sequence, along with integrated, analytical tools, offers fresh hope for gene discovery and identification of novel control strategies. Mike's lab is using methods to overlay critical biological processes on whole-genome data to bridge the gap between critical phenotypes, like drug resistance and virulence, and their underlying gene mutations, with the long-range goal of elucidating new avenues of malaria intervention. Mike's group are focused on identifying genes that confer complex *P. falciparum* traits, specifically, susceptibility to antimalarial compounds and parasite proliferation in red blood cells (RBC).

*Mike was hosted by ASP members at the Research School of Biology at ANU in Canberra - Rowena Martin's laboratory, Leann Tilley's group at The University of Melbourne, and at the Army Malaria Institute in Brisbane, with Qin Cheng's group.*



# ASP Outreach: GTAC

**"Parasites in Focus" Student program took place at GTAC on Friday 15th August 2014. Dr Aaron Jex and Brendan Ansell (Veterinary Sciences, University of Melbourne) along with GTAC's Tony Chiovitti and his team delivered the program.**

The program was attended by 106 students of Years 10 & 11 and 11 teachers. The program was co-ordinated by Tony Chiovitti and Rachael Rutkowski of GTAC and comprised the following elements. An opening address by Dr Aaron Jex (Faculty of Veterinary Sciences, University of Melbourne)

Aaron introduced students to the field of parasitology, discussing parasite biology and the global impact of parasites on humans. At the conclusion of the presentation, many students asked Aaron probing questions about parasites, how they are studied, and how the conditions they cause are managed. The students then participated in three rotating 1-hour laboratory workshops where students worked in small groups of ~7 students each mentored by practising scientists. The three workshops were:

- **Hooked on Parasites**

Students used microscopy to explore how endoparasites locate, attach, feed and reproduce in their hosts. Particular case studies included equine bot fly larvae and tape worms, plus chemotaxis experiments with live nematodes.

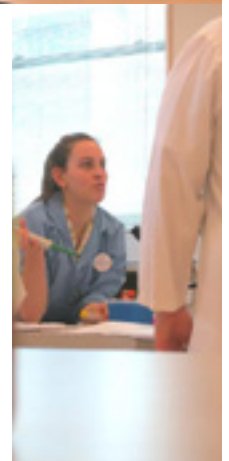
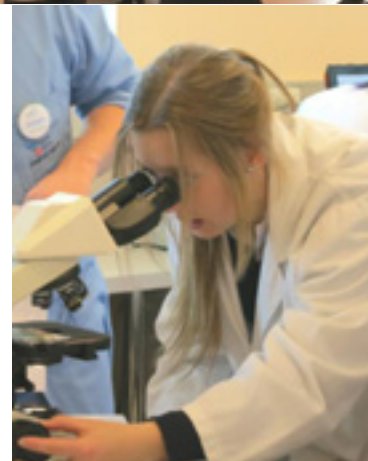
- **A Case of Cross-Border Detection**

An exploration in the application of biotechnology to medical parasitology, students used PCR and gel electrophoresis to diagnose which *Plasmodium* species was infecting a patient recently returned from an adventure holiday.

- **Parasites Getting it Under Control**

Using the NetLogo simulation software, students modelled the impacts of the parasitoid wasp, *Trichogramma carverae* to assess it as a potential biological control for the agricultural pest, the light brown apple moth.

Morning tea and lunch were intended to create a conference-style ambience enabling



students, teachers, and scientists to interact informally. GTAC thanks the Australian Society for Parasitology for its generous grant of \$1,000 to support the program. In addition, GTAC thanks Dr Aaron Jex and Brendan Ansell (Veterinary Sciences, University of Melbourne) for their contribution to the program's delivery and Christine Andersen (Veterinary Sciences, University of Melbourne) for providing resources for the Hooked on Parasites workshop.

*Report prepared for the Australian Society for Parasitology by Tony Chiovitti, GTAC..  
Photos courtesy Tony Chiovitti, GTAC.*

# ASP Outreach: Parasites at EKKA

Parasites featured at the Brisbane EKKA at the showgrounds on the 8th August when ASP members Kathy Andrews and Tina Skinner-Adams from Griffith University Eskitis Institute for Drug Discovery ran a hands on display entitled "How can trees help cure disease?"

The stall was manned by 16 volunteers from the Eskitis Institute, including ASP members Kathy Andrews, Tina Skinner-Adams, Jessica Engel, and Sabine Fletcher. The ~6m long display was visually stunning with Eskitis, ASP, and Street Science (the larger stall organizer) banners, posters and a canvas photo art piece on display. The display targeted children aged 4-12 with the following activities:

- A drug discovery timeline puzzle comprising flasks containing bark, bark extract, assay tubes, pills etc. Visitors were invited to put the flasks in the correct order with a small description card explaining each step. Examples of drugs that were discussed included the antimalarial drug artemisinin.
- A workstation where children were able to make a simple molecule (H<sub>2</sub>O) out of plasticine and straws using simple instructions.
- Two workstations where children were able to perform a "drug" dilution series with a micro pipette and coloured water – this was extremely popular! Children were told that this is the kind of process that is used in the lab when looking for new drugs, including antimalarial agents.
- A microscope displaying a Giemsa-stained thin blood film of *P. falciparum* infected erythrocytes (100x oil immersion). Children were shown pictures of malaria parasites and given a simple description of the disease and health problem malaria causes. This was also very popular.

Over the course of the day we gave away prizes to inspire children:

- 220 ASP-sponsored pens (with highlighter on one end) with a stylized image of a rupturing *Plasmodium* schizont and the simple educational message "*Plasmodium* parasites



cause malaria"

- Hundreds of colouring-in, crossword and find-a-word activity sheets.

Over 3,000 school groups were booked into the EKKA that day, and several hundred directly viewed or actively participated in the Eskitis-ASP display. This was facilitated by Street Science table next to ours being a stamp-station for a competition passbook and the display being at the entrance to a black light science maze. From 10am-1pm in particular there was a constant stream of school groups at the display.

Our display was visited by Mr Jeffrey L Bleich (former US Ambassador and Special Counsel to the President of the US) and Mr Mario Pennisi from Life Sciences Queensland. Kathy Andrews discussed the malaria situation with Mr Bleich, who in his former role had been involved with US decisions around malaria and other health matters.

*Report and images courtesy Kathy Andrews and Tina Skinner-Adams,*

*Griffith University Eskitis Institute for Drug Discovery*

## 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. ASP President Robin Gasser would like to emphasise that the funds can be used to support a wide range of activities - from seminars, symposia to "beer and nibbles" networking sessions of State members or any other parasitology-related event.

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



# ASP Outreach: Burwood Public School

Christie Foster and Victoria Morin-Adeline, PhD candidates from the University of Sydney, recently taught three grade 5 classes at Burwood Public School (NSW) about all parasites great and small.

“Woahhh, they look so different!” – These were the words that echoed throughout the class upon seeing us enter the room.

On the 24th of March we conducted an ASP outreach event at Burwood Public School, NSW, where over the course of the day we ran three classes for a total of approximately 100 eager and inquisitive grade 5 children (aged 9-11 years old). Our self-designed lesson aimed to teach the kids all about parasitology. Starting with the basic concept of the parasitic lifestyle, we then moved on to the different categories of parasites, with a special focus on those relevant to primary school-aged children, such as tapeworm and head lice.

To emphasise the importance of hygiene in preventing transmission, our first fun and interactive activity involved the “GlitterBug” kit – a UV-fluorescent hand lotion which simulates germs. Using this kit, some props and several student volunteers, we showed the classes: A) how thoroughly hands need to be washed; and B) that germs can be transmitted by handshaking, unwashed fruits, and playing with pets.

During each session we passed around laminated colour posters that we printed from the ASP’s “Parasites in Focus” collection, as well as some inflatable ticks and fleas and an anatomical model heart containing heartworms which were all kindly donated by Merial. Jars of “gross” worms and ticks were also on display, and each student took turns looking at fleas under the light microscopes that we brought with us to the school. We had LOTS of questions from genuinely interested kids, both about parasites and ourselves. And it turns out we were certainly NOT what they were expecting when they were told that scientists would be visiting the school; hence their reaction described at the start of this report! Prior to our arrival,



the general consensus was that scientists are “nerdy” and are males with white lab coats, glasses, crazy hair and who mix colourful solutions (see accompanying photo!!). We have now changed their perception of scientists, and through our educational sessions have hopefully inspired some up-and-coming parasitologists of the future! Overall, we had a great day and received lots

of positive feedback from the students and their teachers. We would like to say a big thank you to the ASP for supporting our outreach initiative, and thanks to Mr Mike Taylor from Burwood Public School for his help in planning and coordinating our visit.

*written by Christie Foster and Victoria Morin-Adeline, The University of Sydney*



# ASP Outreach: Science in ACTion

The ACT branch of the ASP, alongside ~20 other science societies participated in 'Science in ACTion', a National Science Week event that was widely advertised throughout the Canberra region, and supported by the ACT government and the ANU.

Melanie Ridgway, Caitlyn Flint, Edwin Tjhin, Erick Tjhin, Johanna Dups, Jonathan Fu, Keith Emerson, Margaret McKinnon, Markus Winterberg, Meng Zhang, Renate Zelger, Sanduni Hapuarachchi, Sashika Richards, Sarah Shafik, Vanessa Howieson, 'Vincent' Yi Aw, and Richard Allen were all part of the ASP and ANU team who participated in 'Science in ACTion', and the 'ANU Science Carnival', 15 & 16 August 2014 at ANU in Canberra.

We used this well publicised and well organised event to highlight the world of parasites, their relevance to humans, and some of the work carried out by ASP members at the ANU, to local high school and university students, and to the general public.

On Friday several hundred high school students from the ACT and ANU students of all complexions and on Saturday we had large numbers of the general public attending.

We ran several activities: The 'What Parasite is that?' game: a fun and challenging exercise where 10 images of parasites were to be matched with 10 images of their hosts. In excess of 300 individuals and families participated in the game over the 2 days, and we estimate that more than double that number strolled past our booth at the Saturday event alone. At one point, we had students standing 6 deep in front of the images completing the quiz, then lining up to have their answers vetted, and receive the high-calorie reward promised for all quiz participants. A duplicate version of the game was also run simultaneously on the Friday between 11am – 2pm, for the ANU's Science Carnival held in the Student Union Court which also attracted a high degree of interest; visitors this area were ACT high



school students and university students. Support for this function was received from the ANU's Science Communication Department, which contributed giveaways, and met some of our printing costs.

Posters, designed by ANU parasitology students and ASP members, explained to the lay person the interesting and unusual lives of a number of human and animal parasites, were displayed at the booth. We set up a large screen to show a variety of entertaining video's exhibiting a range of parasites and their life cycles. Microscopes were set up at the booth enabling visitors to look at slides of different stages of malaria and multi-celled parasites. Badges were made using a variety of parasite images and worn by ASP members who took turns at running the booth. Parasite masks were made by members and students for children who visited the booth.

In addition to chocolate, we had a number of small items to give away,

among them Head Lice combs, more popular than we had expected.

Many of the Science in ACTion events and booths were featured in an article on ABCOnline (<http://www.abc.net.au/news/2014-08-17/science-in-action-draws-crowds-in-canberra/5676414>).

Although confident of having designed an entertaining and interesting display and range of activities, we were pleasantly surprised at the high degree of enthusiasm the ASP booth generated among high school and university students, and in the general public. The organisers of 'Science in ACTion' were impressed with the way that the display, and those who manned the booth, engaged the visitors to the event.

Our many thanks to the many ASP members and students who gave up their experimental time and/or their weekend to contribute to the event's success.

*By Richard Allen and Melanie Ridgway,*

## News from the ASP Network for Parasitology

### Welcome

What a wonderful year 2014 has been to celebrating the 50th Anniversary of the ASP and Australian parasitology research; our ASP-Inspiring Australia "Parasites in Power" and National Science Week events were a highlight this year with public exhibitions, presentations, movies and children's workshops taking place across Canberra in June, July and August, in Cairns in August and October and many other wonderful outreach events run by ASP members that are featured in this issue of the newsletter.

Our wonderful colourful parasite flags adorned the flagpoles leading up to Parliament House in Canberra and brightened up a Canberra winter from June - August 2014.

*Parasites in Focus* was on display at the CSIRO Discovery Centre 9 June – 3 August 2014, and has now moved on to WEHI for use during their public events. To host the exhibition please send Lisa an email (Lisa.Jones1@jcu.edu.au)

At the Australian War Memorial (AWM) in Canberra we ran a two-part public lecture series "Parasites: the war years" in June

and August which was well attended and very well received by the audiences who included many AWM members and staff. Parasites have been affecting soldiers for centuries in times of both war and peace. In "War on Parasites", Sunday 29th June, Professor Alex Loukas from the Australian Society for Parasitology gave an insight on parasitic helminths and Dr Graham Mitchell gave a wonderful introduction to parasites and war.

Nick and Lisa ran a *War Worms* interactive workshop for children aged 5+ at the Australian War Memorial Tuesday 8th July,

Nick Smith gave a parasitological insight into the 1979 cult American science-fiction horror movie *Alien* directed by Ridley Scott, at our "*Aliens amongst us*" event, Tuesday 8th July at the National Film and Sound Archive (NFSA).

"Malaria in wartime" lecture on Sunday 17th August, from 2pm at the Australian War Memorial Lecture Theatre featured Dr Rowena Martin from the Australian Society for Parasitology who gave an excellent insight into malaria in wartime and discussed the latest malaria research and control strategies. Prof Nick Smith gave a wonderful introduction about parasites in wartime.

Richard Allen and his team ran a very successful parasite display at Science in ACTION, 15th – 17th August at ANU in Melville Hall and the Manning Clarke theatres as part of National Science Week.

The final event in our ASP-Inspiring Australia grant funded program was parasites at **PechaKucha night Cairns** - an entertaining evening covering a range of topics – 20 images x 20 seconds – at

the Tanks Arts Centre and two of the presenters were Michael Smout and Lisa Jones from the Australian Society for Parasitology Inc. with their parasite stories.

### Annual Conference

The ASP 50th Anniversary Annual Conference took place 30 June – 3 July 2014 at ANU Commons, Canberra and was a huge success. This truly memorable event celebrated the past, present and future of Australian parasitology. We had record numbers of conference delegates, and a full report with lots of photos will be included in the December newsletter. Once again we are very grateful to our sponsors whose generous support helps to make the ASP Annual Conference an excellent meeting. **ASP 50th Anniversary Annual Conference sponsors: Elsevier Parasitology, the International Journal for Parasitology (IJP), IJP:DDR, IJP:PAW, Meat and Livestock Australia, Virbac Animal Health, Bayer Healthcare, Elanco, Compounds Australia and New England BioLabs Inc.**

The **2015 Annual Conference will be a joint meeting held with the NZSP at the Crowne Plaza Hotel in Auckland, from June 29th - July 2nd.** We hope to see you all in New Zealand in June 2015 for, what promises to be, another wonderful event.

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

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

### Closing dates for ASP awards and ASP Fellowships

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

Friday 13 March 2015  
Friday 26 September 2015

**ASP Fellowships**  
9 January 2015

More information  
[www.parasite.org.au](http://www.parasite.org.au)



An Australian Government Initiative



#### JD Smyth Travel Award winners

- **Amanda Worth**, PhD Candidate, Murdoch University, Researcher Exchange to The Florey Institute of Neuroscience and Mental Health, Melbourne.
- **Andrea Lawrence**, PhD Candidate, The University of Sydney, for a QIIME workshop, Seoul, Korea and a Researcher Exchange to Museum of Natural History, London to visit Theresa Howard, and to attend the III Parasitology Summer Course (IIIParSCo) in Parco Regionale di Gallipoli Cognato, Basilicata.

#### ASP Network Travel Award winners

- **Victoria Morin-Adeline**, PhD Student, The University of Sydney, Researcher Exchange to visit Genomics of Gene Expression Lab of the Bioinformatics Department at the Centro de Investigacion Principe Felipe (CIPF), Dr. Ana Conesa's laboratory.
- **Andrew Teo**, PhD student, The University of Melbourne, Researcher Exchange to European Molecular Biology Laboratory, Heidelberg, Germany and to University of Copenhagen, Copenhagen Denmark.
- **Terry Spithill**, La Trobe, Researcher Exchange to Prof Maule's lab, Queen's University, Belfast, UK, and

Prof Matt Berriman's lab, Sanger Institute, Cambridge, UK.

- **Susann Herrmann**, The University of Melbourne, TEM training at The University of Adelaide.
- **Christie Foster**, PhD candidate, The University of Sydney, Researcher Exchange to Laboratory of Photosynthesis, Institute of Microbiology, Academy of Sciences of the Czech Republic and Institute of Parasitology, Biology Centre, Academy of Sciences of the Czech Republic.
- **Rebecca Stewart**, PhD Candidate, The Walter and Eliza Hall Institute, EMBL Advanced Course in Fluorescent Imaging, Heidelberg Germany.
- **Chris Hosking**, Ph.D Candidate, Monash University, Researcher Exchange to to McManus laboratory, QIMR Berghofer.
- **Giana Bastos Gomes**, PhD candidate, Centre for Sustainable Tropical Fisheries and Aquaculture, School of Marine and Tropical Biology, James Cook University, visit the Microbial Diversity Laboratory at UMass-Amherst, Amherst, MA, USA (Program in Organism and Evolutionary Biology) led by Professor Laura A. Katz to develop new in vitro culture techniques for aquatic protozoan parasites (*Chilodonella* spp.) and use denaturant gradient gel electrophoresis (DGGE) to aid morphological

and genetic identification 15th September 2014- 3th October 2014

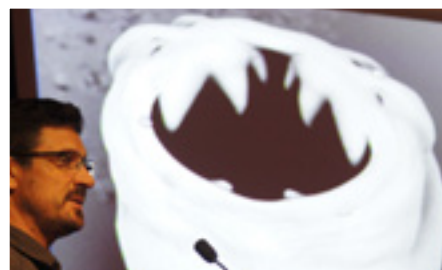
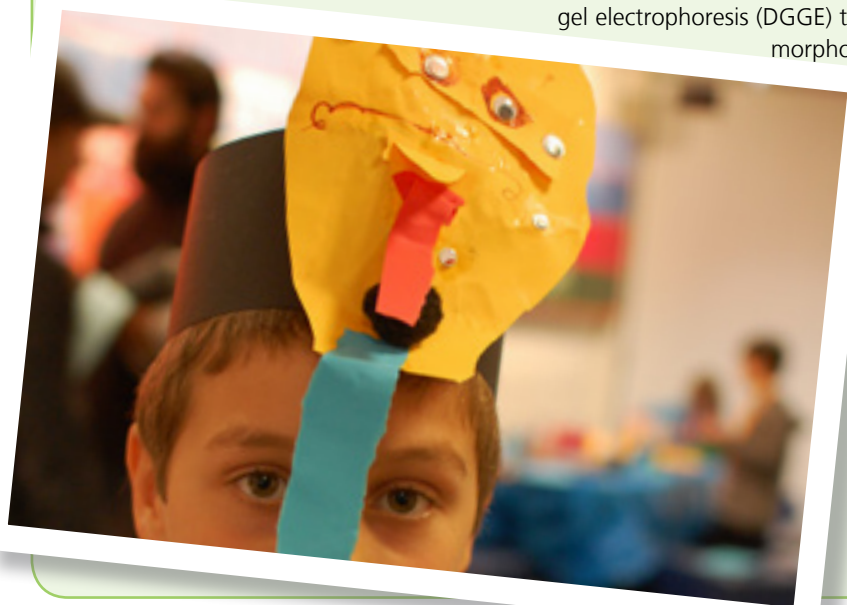
#### Network Mentorship Scheme

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

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

**Nick Smith**  
Convenor, ASP Network for Parasitology

**Lisa Jones**  
Communications Coordinator





## Congratulations to NHMRC & ARC grant recipients

**The following outstanding parasitologist have secured prestigious NHMRC Research Fellowships, worth collectively over \$3 million:**

**Professor James Beeson**, Macfarlane Burnet Institute for Medical Research and Public Health, for Malaria immunity and vaccines;

**Professor Michael Good**, Griffith University, for Translating novel vaccine strategies to early phase clinical trials;

**Professor Terry Speed**, Walter and Elisa Hall Institute of Medical Research, for Statistics and v bioinformatics for medical omics;

**Professor Miles Davenport**, The University of NSW, for Control of chronic infectious diseases.

**Terry Speed** also won the Eureka Prize for Leadership in Science (<http://australianmuseum.net.au/media/2014-Eureka-Leadership>)

**The Magic Glasses Team were finalists in the Infectious Disease Research category** (<http://australianmuseum.net.au/2014-Finalists-Eureka>).

**NHMRC Grants and Fellowships, Awarded in 2014 to Commence in 2015**

**Dr Bridget Barber**, Early Career Fellowship, Comparative pathophysiology and clinical epidemiology of *knowlesi* malaria, Menzies School of Health Research;

**Dr Phurpa Wangchuk**, Early Career Fellowship, Isolation and pre-clinical evaluation of small molecule anti-inflammatory compounds from

hookworms, James Cook University;

**Dr Darren Gray**, Career Development Fellowship, Sustainable Control and Elimination of Neglected Tropical Diseases in the Asia-Pacific, Australian National University;

**Professor Leann Tilley**, Project Grant, Breaking malaria's lethal grip: Targeting the assembly of an adhesive complex on infected red blood cells, University of Melbourne;

**Doctor Geoffrey Gobert**, Project Grant, Targeting Schistosome Calcium Signalling to Improve and Broaden Praziquantel Efficacy, The Council of the Queensland Institute of Medical Research;

**Doctor Nigel Beebe**, Project Grant, Release the sterile males: a new direction for mosquito population control technologies, Commonwealth Scientific and Industrial Research Organisation, CSIRO;

**Associate Professor Tania de Koning-Ward**, Project Grant, Functional dissection of the malaria RhopH complex and its contribution to new permeation pathways, Deakin University;

**Professor Christian Doerig**, Project Grant, Why is the hijacking of a human erythrocyte signalling pathway essential for malaria infection?, Monash University;

**Professor Alexander Loukas**, Project Grant, Secreted exosome-like vesicles from the carcinogenic liver fluke, James Cook University;

**Doctor Sheila Donnelly**, Project Grant, A helminth-derived peptide is a novel prophylactic and therapeutic treatment for autoimmune disease, University of Technology Sydney;

**Professor Miles Davenport**, Project Grant, Dissecting the dynamics of malaria infection, University of New South Wales;

**Doctor Michaela Petter**, Project Grant, Chromatin dynamics during sexual differentiation in the malaria parasite *P. falciparum*, University of Melbourne.

**Congratulations to the one ARC Future Fellow in the parasitological sphere this year:**

**Dr Timothy Dempster**, The University of Melbourne, for research into host behaviour and parasite outbreaks in fish.

# ASP Network Researcher Exchange, Training and Travel Award: Andrea Lawrence

Three countries in three weeks – a whirlwind adventure in parasitology in South Korea and Europe.

Article by Andrea Lawrence,  
The University of Sydney

**It isn't always the case that PhD students get to travel to exotic and exciting places for the betterment of their PhD, particularly in their first year. In September this year, I became one of the lucky ones, the envy of other first year students. This 'luck' was largely in the form of funding received from ASP (JD Smyth Postgraduate Student Travel Award) and further supplemented by The University of Sydney Grants-in-Aid (constituted by the G.H.S and I.R. Lightoller Scholarship and the Bailieu Research Scholarship) and the Australian Biological Resources Study (National Taxonomy Research Grant Program – Student Travel Grant). Without this financial support, this wonderful opportunity would have slipped through my fingers.**

My work is centred on fleas, in particular the common cat flea (*Ctenocephalides felis*), which is the most common ectoparasite found on cats and dogs globally. The ubiquitous nature of these fleas in family households represents a significant disease risk from zoonotic flea-borne pathogens. It is the flea vectors themselves and the dynamics of the pathogens they carry that I am interested in. The opportunity to expand this interest came about in around March in the form of my stumbling across an advertisement on the ASP website for IIIParSCo: the third instalment of a summer parasitology course on vectors and their transmitted pathogens in southern Italy. The course was run by Prof. Dr. Domenico Otranto (University of Bari, Italy) and Dr Filipe Dantas-Torres (Aggeu Magalhães Research Institute,



Andrea as human 'bait' for collecting eyeworm vector *Phortica variegata* - 10/09/2014

Recife-Brazil) – two of the editors of the journal Medical and Veterinary Entomology where, earlier this year I published the paper entitled: 'High phylogenetic diversity of the cat flea (*Ctenocephalides felis*) at two mitochondrial DNA markers'. Consequently, I was very keen to meet the two researchers especially given their reputation as prolific and talented scientists. The main aim of the course was to give us updated information and practical skills on vectors and vector-borne disease in the Mediterranean region. They were to select only 12 applicants globally with preference given to local Italian students. As it turns out, there ended up being 13 attendees representing 9 different nationalities including myself as the only Australian, the only non-veterinarian and the youngest by at least 3 years.

Around the time I applied for IIIParSCo I was also struggling to 'learn bioinformatics'. As a part of my project I aim to validate the flea microbiome as a pathogen detection tool, which will enable analysis of whole microbial community data - instead of single pathogen detection as in regular PCR – allowing the detection

of known and new pathogens. I was just brushing the surface of how to use and understand the command processor Bash when one of my supervisors A/Prof. Jan Šlapeta forwarded me an email for a 1 day bioinformatics workshop in Seoul, Korea. The workshop focussed on a software package called QIIME, used to organise and analyse microbiome data by the people behind the human microbiome project. The workshop was run by the creators of QIIME: Jose C. Clemente (Hess Centre for Science and Medicine, Icahn School of Medicine, NYC), Greg Caporaso (Centre for Microbial Genetics and Genomics, Northern Arizona University), Daniel McDonald (ANU College of Engineering and Computer Science, Canberra) and Antonio Gonzalez and Rob Knight (Knight Lab, University of Colorado, Boulder). I had exactly 4 hours before the deadline for application submission and I was luckily accepted and spent 3 days in Seoul to attend the workshop on the 30th August. The workshop was too brief to be able to work with my own data, however it was an enlightening day for consolidating my existing bioinformatics knowledge and expanding to new concepts and features

## Andrea Lawrence continued

of QIIME. As it was run by the creators, I also became privy to the limitations of the software, which tools I should use for my individual project and the progress of new or improved features. Despite being such a short workshop, the enthusiasm and relatability of the presenters meant that the trip to Seoul was well worth it. I am still currently working with this software in the analysis of my flea microbiome.

Between Seoul and Italy I visited the London School of Hygiene and Tropical Medicine to visit the lab of James Logan, head of the Department for Disease Control and gave a seminar which was very well received. The questions afterwards lead to a discussion regarding the difficulty of flea taxonomy, particularly in the *Ctenocephalides* genus and prompted me to consider morphometrics after it was suggested by a postdoc who used this technique with butterflies during his PhD. I visited the Natural History Museum in London, to view the famous Rothschild Collection of Fleas containing the type specimens used to describe several species. I took with me four specimens representing two native flea species both collected from echidnas in NSW to donate to the museum. During my two day visit to the museum I was able to create an image reference library of the type specimens that I can now refer to when identifying fleas and that will be invaluable to me for the entirety of my PhD and beyond. Working with these type specimens also confirmed and strengthened my own taxonomic knowledge of the *Ctenocephalides* genus, meaning I am now equipped to make confident taxonomic decisions and to challenge existing dogmas in flea taxonomy.

After London, I flew into Bari on the south-east coast of Italy where the first day of my week long Mediterranean parasitology adventure began. The course location was Parco Regionale di Gallipoli Cognato Piccole Dolomite Lucane, Basilicata. This beautiful region contains many of the sites of collection for the parasites and vectors included publications by Domenico and his team.

My main current aim for my PhD is to collect fleas from as many countries as possible to compare global population dynamics of *Ctenocephalides* spp. and relate this to their vector capability using microbiome analysis. I felt what better way to collect fleas from new countries than an international parasitology workshop. As such I emailed all the attendees prior to the trip imploring them to bring fleas from their respective countries. I was happy when on arrival to the course I was greeted by many with "You're Andrea? The flea girl?" and was then handed vials and vials of fleas. I received a large cohort of fleas from Paraguay courtesy of Jorge Miret and we are currently collaborating on a small project together describing the genetic profile of cat fleas throughout Paraguay. I also received fleas from Belgium, Portugal and several parts of Italy and Greece given to me by Domenico and others. Prior to the course I had collected fleas from 20 different countries over the course of 1 ½ years. Arriving home after the trip I had boosted that number to 25 over just three weeks.

The course was based heavily on practical activities with Domenico, Filipe and a number of affiliated veterinarians, parasitologists and molecular biologists imparting their skills in the field. These skills included collecting, identifying, dissecting and preserving endemic vectors such as sandflies, ticks, *Phortica variegata* – a fruitfly that transmits eyeworm – from both the environment and from their respective hosts. The collection of *Phortica variegata* included using us students as human 'bait' for the attraction of the zoophilic flies. We also learnt techniques for isolating and identifying the pathogens these vectors transmit such as *Leishmania* spp., various tick-borne pathogens, *Thelazia callipaeda* (eyeworm), and *metastrongyloides* (lungworms).

We gained experience mist netting migratory birds, tagging and collecting ticks from them, collecting ticks from cattle and deer, collecting *Thelazia* eyeworms from dogs, and skin snip samples from dogs for diagnosis of *Certopithifilaria* and other

filarioid microfilariae and collecting blood, mucosal and bone marrow samples for *Leishmania* spp. isolation.

On top of all this we also got lectures on these topics every day. and one evening we were gifted with a surprise 'meeting' via skype with Emeritus Prof. Chris Arme, editor-in-chief the journal of Parasites and Vectors and we were able pick his brain for an hour with our questions regarding the future of the parasitology field and current challenges.

Attending IIIParSco was an incredible experience for many reasons. Firstly the skills and knowledge I gained from the course gave me an international perspective of vectors and pathogens particularly of a region where vector diversity is rich. Although the course emphasized European vectors and diseases, these same species are also common problems in other regions or are expanding their ranges as a result of climatic changes. Secondly, I have gained samples for my project that will inevitably be incorporated into at least one publication. But the most significant aspect I have taken away is the professional collaborations and long-lasting personal friendships I now have with the talented group of parasitologists who attended and organised the course. I wholeheartedly recommend this course to any young parasitologist who is lucky enough to come across the opportunity to attend. For these experiences, I have ASP to thank along with the University of Sydney and the Australian Biological Resources Study for the provision of essential funding, without which the trip would not have been possible.

Images on page 18 from top:

1. Charlotte Sarre from the Department of Virology, Parasitology and Immunology at Ghent University, Belgium and Andrea Lawrence, photo Courtesy of Charlotte Sarre
2. Basilicata, Italy. Collection of ticks from the environment in Site 1 by dragging
3. Discussing work with postdoc Rodrigo Lomas
4. the Rothschild Collection of Fleas in the British Museum of Natural History. The fleas are stored in the original mahogany, bone and brass cases designed by Charles Rothschild





# Researcher news: Wilson Wong

## New discovery could help turn antibiotic into antimalarial drug.

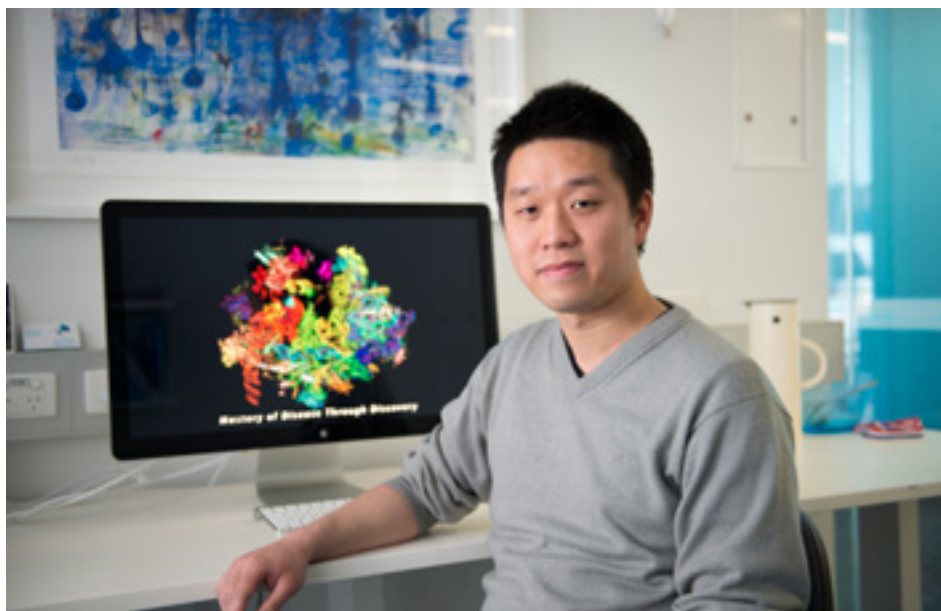
Melbourne researchers are making progress towards new antimalarial drugs, after revealing how an antibiotic called emetine blocks the molecular machinery that produces the proteins required for malaria parasite survival.

Although emetine is effective against malaria it is not used as a preventive drug due to its significant side effects. However, the work of Walter and Eliza Hall Institute researchers Dr Wilson Wong, Dr Jake Baum and colleagues in showing how emetine attaches to and blocks the molecular machinery that makes the proteins required for malaria parasite survival has revealed new approaches for antimalarial drug development. Their study, involving collaborators led by Dr Sjors Scheres from the MRC Laboratory of Molecular Biology in Cambridge, UK and the Bio21 Institute in Melbourne was published in the journal *eLife*.

Malaria infects hundreds of millions of people worldwide every year and causes more than 600,000 deaths. The *Plasmodium malaria* parasite has developed resistance to current antimalarial drugs, making them less effective and new drugs are needed urgently. Dr Wong said the study examined the parasite cell's protein-making machinery, called the ribosome, visualising for the first time the structure of this 'protein complex' in the malaria parasite. "The ribosome is responsible for constructing all proteins inside the cell, based on the DNA 'blueprint'," he said. "Antibiotics such as emetine kill the malaria parasite by binding to its ribosome and preventing the parasite from building the proteins it needs to produce energy, grow, reproduce and evade the immune system." Dr Wong said knowledge of emetine and related antibiotics such as pactamycin could be used as the basis for developing new antimalarial drugs.

Molecular structure of the malaria parasite's ribosome bound to the antibacterial drug emetine (small light blue spheres).  
Molecular structure of the malaria parasite's ribosome bound to the antibacterial drug emetine (small light blue spheres).

Dr Wilson Wong, photograph courtesy WEHI.



"Our structure is an exciting discovery as it gives a clear path forward in developing new drugs to tackle this deadly disease. We have found features of the parasitic ribosome that are not found in the human form. Drug makers could exploit these features in order to specifically target the production of proteins within the malaria parasite," Dr Wong said. "We are now working with our colleagues from the institute's ACRF Chemical Biology division to develop new molecules based on emetine and pactamycin. Knowing exactly how these antibiotics work will enable development of new antimalarial drugs that replicate the active component of these antibiotics while changing the parts that make it toxic to patients," Dr Wong said.

Dr Jake Baum, now at the Imperial College of London, UK, said the study used a new imaging technique called cryo-electron microscopy (cryo-EM) to create the structure of the malaria parasite's ribosome.

"Cryo-EM is an exciting technique that allows us to visualise the structure of protein complexes directly from cellular material, instead of having to crystallise them which is often difficult to do and requires huge amounts of material," Dr Baum said. "Working with our colleagues at the MRC Laboratory of Molecular

Biology in Cambridge, UK, the images of the parasite ribosome revealed how emetine binds to the ribosome, stopping it from reading the 'recipe' for malaria proteins. Now we can use this knowledge to design better forms of emetine that could be used to tackle malaria."

The research was funded by the Australian National Health and Medical Research Council, Australian Research Council, Wellcome Trust (UK), UK Medical Research Council, Australia–Europe Malaria Research Cooperation (OzEMalaR), Human Frontier Science Program and the Victorian Government.

"Cryo-EM structure of the *Plasmodium falciparum* 80S ribosome bound to the anti-protozoan drug emetine", Wilson Wong, Xiao-chen Bai, Alan Brown, Israel S Fernandez, Eric Hanssen, Melanie Condron, Yan Hong Tan, Jake Baum, *eLife* 2014;3:e03080

*Article published with permission from the Walter and Eliza Hall Institute ([http://www.wehi.edu.au/site/latest\\_news/new\\_discovery\\_could\\_help\\_turn\\_antibiotic\\_into\\_antimalarial\\_drug](http://www.wehi.edu.au/site/latest_news/new_discovery_could_help_turn_antibiotic_into_antimalarial_drug))*



## News about Australia/Europe Malaria Research Cooperation

**Great news for OzEMalaR, NHMRC have agreed to extend our funding until the end of 2015, so Australian malaria researchers will be able to continue to apply for funding for Researcher Exchanges to eligible laboratories in 2015.**

**To help boost our profile and promote more Australian malaria researchers through social media and other media please 'like' our facebook page, <https://www.facebook.com/ozemalar> and follow us on twitter <https://twitter.com/OzEMalaR> If you are running events, programs, public outreach please email details to [Lisa.Jones1@jcu.edu.au](mailto:Lisa.Jones1@jcu.edu.au) for additional promotion through the ASP membership.**

**The 5th Molecular Approaches to Malaria Conference, February 21-25, 2016 in Lorne, Australia** aims to highlight the latest molecular advances in our understanding of:

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

Visit the MAM2016 website [www.mamconferences.org](http://www.mamconferences.org) for more details and to register your interest and don't forget to 'like' our facebook page <https://www.facebook.com/MAMconference>

OzEMalaR funding runs until the end of 2015 and we want to make the most of such a fantastic opportunity. All OzEMalaR Travel Award funds granted to successful applicants must be invoiced for by the end of 2015.

**The deadlines for 2015 OzEMalaR Travel Awards are:**

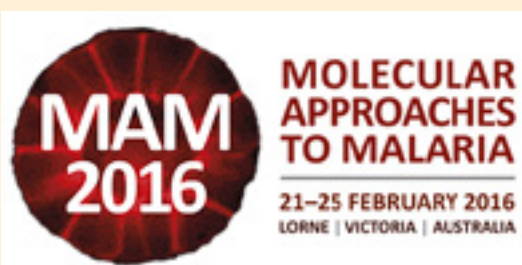
**Friday 5 December 2014**  
**Friday 9 January 2015**  
**Friday 6 March 2015**  
**Friday 8 May 2015**  
**Friday 10 July 2015**  
**Friday 11 September 2015**  
**Friday 30 October 2015**

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

**Geoff McFadden**  
**Convenor, OzEMalaR**  
**OzEMalaR Travel Award Scheme**

**Congratulations to our latest OzEMalaR Travel Award winners:**

- **Kylie Renee James**, QIMR Berghofer Medical Research Institute, to visit Laboratories of Dr Oliver Billker and Dr Sarah Teichmann at the Genome Campus, Hinxton, UK
- **Grennady Wirjanata**, Menzies School of Health Research, to visit Lanzer lab, University of Heidelberg, Germany
- **Dr Johanna Dups**, The John Curtin School of Medical Research, ANU, for collaborative field and laboratory work with Drs Francis Ndungu and Kevin Marsh at The Kenya Medical Research Institute (KEMRI)
- **Dr Philippe Boeuf**, The University of Melbourne, to visit Prof Artur Scherf and Prof Chetan Chitnis at the Pasteur Institute, Paris, France
- **Dr Gaoqian Feng**, The Burnet Institute to visit Centre for Geographic Medicine Research of the Kenya Medical Research Institute in Kilifi, Kenya (Dr Francis Ndungu and Dr Faith Osier)
- **Steven Kho**, Menzies School of Health Research, Darwin to visit Professor Hernando del Portillo, Barcelona Centre for International Health Research (CRESIB), Hospital Clinic - Universitat de Barcelona, Barcelona, Spain & Dr Pierre Buffet, Parasitology and Mycology Unit, and French National Center for Metropolitan Malaria, de l'Hôpital Pitié-Salpêtrière, Paris, France





## OzEMalaR Travel Awards and Reports

- **Dr Sarah Auburn**, Menzies School of Health Research to visit the laboratory of Prof Dominic Kwiatkowski at the Wellcome Trust Centre for Human Genetics, Oxford, UK
- **Dr Teresa Carvalho**, Monash University to visit Menard lab at Pasteur Institute & Gamain's lab at Institut National de Transfusion sanguine, Paris, France
- **Jingyi Tang**, University of Melbourne, for a EMBO practical course of Analysis of High-Throughput sequencing data and Wellcome Trust Chromatin structure and function advanced course Genome Campus, Hinxton, UK
- **Dr Sabine Fletcher**, Eskitis Institute for Drug Discovery, Griffith, to visit Ponzi's lab at Instituto Superiore de Sanita, Rome, Italy
- **Prof Christian Doerig**, Monash University to visit Billker/Rayner groups at Wellcome Trust Sanger Institute Hinxton, UK and collaborators in Bern (Volker Heussler), Pasteur/Paris (Arthur Scherf) and Montpellier (Catherine Braun-Breton)
- **Dr James McCarthy**, QIMR Berghofer MRI to visit visit Dr Simon Draper at University of Oxford

**Dr Wilson Wong, Division of Infection and Immunity, Walter and Eliza Hall Institute of Medical Research won an OzEMalaR travel award to conduct a 5 months research exchange at the laboratories of Dr Julian Rayner at the Sanger Institute, and Dr Sjors Scheres at the MRC Laboratory of Molecular Biology in the UK.** Wilson says he felt very fortunate to have the support of OzEMalaR for this exchange and writes here about his experiences.

The objective of this research exchange was to utilise the latest development in electron cryo-microscopy (cryo-EM) to determine the structure of ribosome from the human malaria parasite, *Plasmodium falciparum* bound to various anti-parasitic drugs. The ribosome is the translation machinery of the cell that synthesise proteins, and the malaria parasite ribosome is a potential candidate as anti-malarial drug target.

During this research exchange, the structure of the *Plasmodium falciparum* cytoplasmic ribosome was characterised at atomic resolution along with the detail interaction with an anti-protozoan drug emetine that has been used for medical treatment against amoebic infection. The structure reveals the mechanism of emetine in blocking an essential step during parasite protein translation, providing a rational for the

potential repurposing of this clinically used compound for treatment against malaria. The data obtained from this research project has become part of a submitted NHMRC project grant. Moreover, this exchange has strengthened the collaboration for future investigation into parasite translation machinery as anti-parasitic drug target. I have gained valuable experience in applying cryo-EM technique to characterise the structure of important parasite macromolecular complexes, a skill that will be useful for future malaria structural cryo-EM research in Australia.

Wilson has also recently published an article based on work from previous OzEMalaR Researcher Exchanges and you can read about this paper in the Researcher news section on page 14.

**Sarah Charnaud, PhD student in the laboratory of Brendan Crabb and Paul Gilson, Burnet Institute, Melbourne, won an OzEMalaR Travel Award for a Research Exchange to Sanger Institute, Hinxton, Cambridge, UK visiting Julian Rayner. Sarah reports here on her exchange.**

Professionally I developed many new skills including working with RNAseq, both producing good directional RNA, how to run it on an Illumina platform, and the subsequent processing and analysis. This



### OzEMalaR Travel Reports

part in particular was a huge learning curve - working with bioinformaticians and programmers to learn working in the command line to analyse the data, how to use the various tools that have been developed at the Sanger for sequence data, how to write scripts and large scale analysis techniques. This work will result in a publication into the role of Hsp70-x in the blood stage of *P.falciparum* and may lead to other questions on transcription in Pf. My collaboration with Matthew Berriman's group will continue and whilst in the UK I also visited the group of Ioannis Vakonakis and we will collaborate on structural interactions of Hsp70-x with accessory proteins - something which has been suggested by both proteomic and RNAseq data.

**Professor Leann Tilley, The University of Melbourne, Dr James McCarthy QIMR Berghofer and Dr Matt Dixon, The University of Melbourne each won an OzEMalaR Travel Award to attend EviMalaR-funded workshop: "Plasmodium falciparum host-parasite interplay in the Human Bone Marrow" and Leann also conducted Research Visits to Dept. of Microbiology and Immunology, Columbia University, New York and Harvard School of**

#### **Public Health, Boston. Leann reports here on their exchanges.**

Transmission of the malaria-causing parasite, *Plasmodium falciparum*, from one human to another via the *Anopheles* mosquito, requires differentiation of asexual bloodstream stages to sexual stage gametocytes. Intervention strategies (drugs and vaccines) that either disrupt gametocytogenesis or target mature gametocyte stages will underpin any attempt to eradicate malaria. Despite this we know very little about core aspects of gametocyte biology. *P. falciparum* gametocytes disappear from the circulation for ~7 days, whilst they reach maturity, but it has not been clear where they sequester. Very recently it has been revealed that the bone marrow is the preferential site for gametocyte maturation<sup>1</sup>, leading to a major rethinking of the parasite lifecycle; however a number of questions remain unanswered. It is not clear how and when immature sexual stage parasites gain access to the bone marrow, whether they develop in precursor or mature erythrocytes, and how the mature forms escape the bone marrow and re-enter the circulation.

In an attempt to answer these questions, a Workshop was organised to bring together a small group of scientists from the malaria gametocyte and the bone marrow fields to share information, expertise and experimental approaches and to identify the scientific and practical questions that need to be answered to fill gaps in our knowledge. The Workshop was supported by Burrows-Welcome, EVIMalaR, and OzEMalaR, as well as the Cochin Institute and Harvard University. It was held at the illustrious Harvard Club of Boston, which was founded in 1908 with the aim of "giving effective expression to the Harvard Spirit". **Prof Leann Tilley, Dr James McCarthy and Dr Matt Dixon**, joined ~30 other participants from the gametocyte, haematology and vascular biology communities, including colleagues from the USA, UK, Switzerland, France, Italy, and the Netherlands. It was a fantastic opportunity to meet within and across disciplines and countries.

Experts in the physical properties of *P. falciparum* gametocytes, including Leann Tilley and Matt Dixon, provided information about gametocyte mechanical properties, mechanisms of shape-shifting, and insights into parasite adhesion mechanisms. Hematology colleagues provided information about the vascular structure of the bone marrow, the composition and organization of the bone marrow stroma and mesenchymal cells, the normal process for erythropoiesis and changes in bone marrow organization in various pathological conditions. A range of techniques and model systems were discussed including the human infection model pioneered by James McCarthy.

Previous page: Sarah Charnaud with collaborators and in the lab at Sanger Institute, UK.

This page: Dr James McCarthy and Dr Matt Dixon joined Prof Leann Tilley for the EviMalaR workshop.



## OzEMalaR Travel Reports

So how do gametocytes get into the bone marrow? While white blood cells readily adhere to and pass between or across the bone marrow endothelium, it is not clear how non-motile, non-adhesive cells such as ring stage gametocytes could cross this barrier. The possibility of entry of motile merozoite was discussed, with subsequent invasion of, and development within, maturing erythrocytes.

How are maturing gametocytes retained within the bone marrow? Previous studies (including those from Matt, Leann and colleagues) have shown that gametocytes are highly undeformable during their maturation phase. In the absence of obvious cytoadherence capability a mechanical sequestration mechanism may trap these maturing cells in the bone marrow space.

How do mature gametocytes re-enter the circulation? Enucleated reticulocytes exit the bone marrow by squeezing between the endothelial cells, driven by hydrodynamic forces. Previous studies (including those from Matt, Leann and colleagues) have shown that late stage gametocytes disassemble their cytoskeleton and regain deformability. This altered deformability may facilitate exit of mature gametocytes, although the mechanism remains unclear.

Vigorous discussions were held and it was agreed that further work is needed to develop better tools to investigate gametocyte-bone marrow interactions, including new reagents to mark circulating ring-stage gametocytes, humanised mice as an in vivo model, tissue-engineered bone marrow systems as an in vitro model, as well as additional access to bone marrow aspirates and autopsy samples from malaria patients.

The meeting was attended by representatives of the funders of malaria elimination efforts, including Ashley Birkett, Director of the PATH Malaria

Vaccine Initiative (MVI), Chris Karp, Head, Vaccines & Host-Pathogen Biology Team, Bill & Melinda Gates Foundation and Omar Vandal, Program Officer for Drug Discovery, Bill & Melinda Gates Foundation and Victoria McGovern, Burroughs Wellcome Fund. It was very useful to get their perspective on the critical issues around gametocyte biology with a view to reducing transmission and eventually eliminating malaria.

Visits to the Harvard School of Public Health and Columbia University provided additional opportunities to meet with colleagues.

The Workshop provided an opportunity for Australian researchers to participate in a multidisciplinary discussion on gametocyte-host interaction in bone marrow. The workshop will produce a review or a white paper assessing the state of the art in this field, outlining the key open questions and proposing suitable experimental systems for future research. The Workshop also provided the opportunity to meet on-one-one with research colleagues including James McCarthy (QIMR Berghofer), Colin Sutherland (LSTMH), Pietro Alano (ISS, Italy), Joseph Smith (Seattle Biomedical Research Institute), and Omar Vandal (Gates Foundation).

Leann's visit to the laboratory of Dr David Fidock, Columbia University, New York

provided an opportunity to discuss joint research opportunities in the area of artemisinin resistance. Her visits to the laboratories of Dr Matt Marti and Dr Sarah Volkman, Harvard School of Public Health, Boston provided an opportunity to discuss joint research opportunities in the area of gametocyte ultrastructure and artemisinin resistance. These discussions are currently being followed up.

**James, Matt and Leann thank OzEMalaR and the Australian Society for Parasitology for their generous support which enabled an Australian contingent to attend the meeting.**

1. Joice, R. et al. *Plasmodium falciparum* transmission stages accumulate in the human bone marrow. *Sci Transl Med* 6, 244re5 (2014).

**Dr. Leonardo Lucantoni, Eskitis Institute for Drug Discovery at Griffith University won an OzEMalaR Travel Award to visit Dr. P. Alano's laboratory at the Istituto Superiore di Sanità (ISS) in Rome, Italy. This is a report from his visit.**

Dr Alano has research expertise on the biology of *Plasmodium falciparum* sexual stages and recently generated an episomal *P. falciparum* parasite line (3D7/pPFL1675-GFP), which expresses GFP at the late gametocyte and gamete stages.

Dr. Leonardo Lucantoni





## News about Australia/Europe Malaria Research Cooperation

### OzEMalaR Travel Reports

This parasite line can be used to develop a phenotypic drug screening assay to test for inhibitors of the female gamete formation, a critical step in malaria transmission.

During my stay at ISS I worked closely with Dr. F. Silvestrini, who has already developed a microscopy-based, small-scale assay on *P. falciparum* 3D7/pPFL1675-GFP female gamete formation. The objectives of my visit were 1) to obtain the necessary training on the culturing of the parasite line (3D7/pPFL1675-GFP) and on the assay format already established at ISS, and 2) to discuss the strategy for the translation of the assay in my home laboratory to be up-scaled to high-throughput screening (HTS) format, including arrangements for the subsequent visit of Dr. Silvestrini to Australia, to collaborate in the HTS translation of the assay.

During my visit I practiced the activation techniques utilized in the host lab for inducing gametogenesis on both the recombinant *P. falciparum* 3D7/pPFL1675-GFP parasite line, and on the reference strain 3D7. *Plasmodium* gamete formation is a process that occurs in the mosquito vector and is triggered by a temperature drop and the presence of a specific, mosquito-derived activator molecule, xanthurenic acid (XA). I learned to manipulate and maintain mature gametocyte cultures

in a thermostatic chamber (Ruskin Bug Box Plus) with strict temperature, humidity, oxygen and carbon dioxide control, which is used in the host lab to avoid spontaneous gamete activation in cultures. Synchronous and asynchronous, 12-14 days old 3D7 gametocyte cultures were generated and coloured prior to activation with combinations of various nuclear, cytoplasmic and membrane stains, including acridine orange, Hoechst, wheat-germ agglutinin/Texas red conjugate and Cell-Tracker. Using the stained cultures, as well as GFP-positive 3D7/pPFL1675-GFP cultures in presence/absence of XA and a specific gametogenesis inhibitor (compound-2), I could practice the operation of the microscope-based High-content imaging station available at ISS (Olympus Screening Microscope). I learnt the basics of the related image analysis software, scan<sup>^</sup>R, in particular the automated image acquisition routine, the segmentation parameter settings and the gating procedures for the selection of cell subpopulations.

During my visit I had a very positive interaction with Dr. Silvestrini, with whom I identified and extensively discussed the critical aspects of the HTS translation of the *P. falciparum* gamete assay. The most important aspects discussed included the need to

source more compound-2 to be used as a positive control in the assay, the strategies to limit spontaneous gamete activation in HTS assay settings (time of addition of compound-2 to the plates, approaches to maintain constant temperature of cultures and plates during preparation of screening plates), and equipment requirements. I had several chances to discuss the project with Dr. Alano, where we discussed the experimental and screening plans, as well as our publication strategy. We agreed that Dr. Silvestrini will apply for EVIMalaR support to come to our laboratory in September, to contribute to the assay development phase and to participate to the execution of compound screening and to the analysis of screening data.

My visit to ISS was an excellent occasion to give a seminar and promote the research activities carried out in my home laboratory. In a subsequent discussion with Dr. Alano about the recent research findings I presented, ideas for a possible new collaboration on a particular aspect of the gametocyte biology and its host erythrocyte were identified. A project draft is now being prepared to identify core preliminary data to be generated, potential key collaborators, and suitable funding agencies.



# IJP

INTERNATIONAL JOURNAL FOR PARASITOLOGY

March 2014  
Double issue

Obituary - Dave Kemp

Current Opinion

The *Schistosoma japonicum* self-cure phenomenon in water buffaloes: potential impact on the control and elimination of schistosomiasis in China. **Li Y-S, McManus DP, Lin D-D, Williams GM, Harn DA, Ross AG, Feng Z, Gray DJ**

Original Research Articles

Microsatellite and mitochondrial markers reveal strong gene flow barriers for *Anopheles farauti* in the Solomon Archipelago: implications for malaria vector control. **Ambrose L, Cooper RD, Russell TL, Burkot TR, Neil F. Lobo, Collins FH, Hii J, Beebe NW**

Analysis of the transcriptome of adult *Dictyocaulus filaria* and comparison with *Dictyocaulus viviparus*, with a focus on molecules involved in host-parasite interactions. **Stefano Mangiola, Neil D. Young, Paul W. Sternberg, Christina Strube, Pasi K. Korhonen, Makedonka Mitreva, Jean-Pierre Scheerlinck, Andreas Hofmann, Aaron R. Jex, Robin B. Gasser**

April 2014  
Special Issue  
12th International Congress on Toxoplasmosis

Original Research Articles

Apicoplast acetyl Co-A carboxylase of the human malaria parasite is not targeted by cyclohexanedione herbicides. **Christopher D. Goodman, Vanessa Mollard, Theola Louie, Georgina A. Holloway, Keith G. Watson, Geoffrey I. McFadden**

Enhancing a search for traditional medicinal plants with anthelmintic action by using wild type and stress reporter *Caenorhabditis elegans* strains as screening tools. **R. Kumarasingha, E.A. Palombo, M. Bhave, T.C. Yeo, D.S.L. Lim, C.L. Tu, J.M. Shaw, P.R. Boag**

A review of global diversity in avian haemosporidians (*Plasmodium* and *Haemoproteus*: Haemosporida): new

insights from molecular data. **Nicholas J. Clark, Sonya M. Clegg, Marcos R. Lima**

An exported kinase (FIKK4.2) that mediates virulence-associated changes in *Plasmodium falciparum*-infected red blood cells. **Lev M. Kats, Kate M. Fernandez, Fiona K. Glenister, Susann Herrmann, Donna W. Buckingham, Ghizal Siddiqui, Laveena Sharma, Rebecca Bamert, Isabelle Lucet, Micheline Guillotte, Odile Mercereau-Puijalon, Brian M. Cooke**

May 2014

Succinctus

Modelling parasite aggregation: disentangling statistical and ecological approaches. **Laith Yakob, Ricardo J. Soares Magalhães, Darren J. Gray, Gabriel Milinovich, Nicola Wardrop, Rebecca Dunning, Jan Barendregt, Franziska Bieri, Gail M Williams, Archie C.A. Clements**

June 2014

Original Research Article

Hc-daf-2 encodes an insulin-like receptor kinase in the barber's pole 2 worm, *Haemonchus contortus*, and restores partial dauer regulation. **Facai Li, James B. Lok, Robin B. Gasser, Pasi K. Korhonen, Mark R. Sandeman, Deshi Shi, Rui Zhou, Xiangrui Li, Yanqin Zhou, Junlong Zhao, Min Hu**

July 2014

Original Research Article

Reversible paralysis of *Schistosoma mansoni* by forchlorfenuron, a phenylurea cytokinin that affects septins. **Ana E. Zeraik, Vitold E. Galkin, Gabriel Rinaldi, Richard C. Garratt, Michael J. Smout, Alex Loukas, Victoria H. Mann, Ana P.U. Araujo, Ricardo DeMarco, Paul J. Brindley**

August 2014

ICOPA XIII Special Issue

Invited Reviews

# IJP

INTERNATIONAL JOURNAL FOR PARASITOLOGY

Parasite biodiversity revisited: frontiers and constraints. **Robert Poulin**

Tick-borne infections of animals and humans: a common ground. **Gad Baneth**

Neglected Tropical Diseases in Central America and Panama: review of their prevalence, populations at risk and impact on regional development. **Peter J. Hotez, Laila Woc-Colburn, Maria Elena Bottazzi**

## Original Research Articles

From ancient to contemporary molecular eco-epidemiology of Chagas disease in the Americas. **Felipe Guhl, Arthur Auderheide, Juan David Ramírez**

*Taenia crassiceps* infection and its excreted/secreted products inhibit STAT1 activation in response to IFN-gamma **Mireya Becerra-Díaz, Luis I. Terrazas**

Ligand heterogeneity of the cysteine protease binding protein family in the parasitic protist *Entamoeba histolytica*. **Konomi Marumo, Kumiko Nakada-Tsukui, Kentaro Tomii, Tomoyoshi Nozaki**

Vaccines to combat river blindness: expression, selection and formulation of vaccines against infection with *Onchocerca volvulus* in a mouse model. **Jessica A. Hess, Bin Zhan, Sandra Bonne-Année, Jessica M. Deckman, Maria Elena Bottazzi, Peter J. Hotez, Thomas R. Klei, Sara Lustigman, David Abraham**

Analysis of putative inhibitors of anthelmintic resistance mechanisms in gastrointestinal nematodes of cattle. **Salha AlGusbi, Jürgen Krücken, Sabrina Ramünke, Georg von Samson-Himmelstjerna, Janina Demeler**

A multi-component integrated approach for the elimination of schistosomiasis in the People's Republic of China: design and baseline results of a 4-year cluster-randomised intervention trial. **Darren J. Gray, Yue-Sheng Li, Gail M. Williamsb Zheng-Yuan Zhao, Donald A. Harn, Sheng-Ming Lid Mao-Yuan Ren, Zeng Feng, Feng-Ying Guo, Jia-Gang Guo, Jie Zhou, Yu-Lan Dong, Yuan Li, Allen G. Ross, Donald P. McManus**

## Succinctus

Small molecule analogues of the immunomodulatory parasitic helminth product ES-62 have anti-allergy properties. **Justyna Rzepecka, Michelle L. Coates, Moninder Saggar, Lamyaa Al-Riyami, Jennifer Coltherd, Hwee Kee Tay, Judith K. Huggan, Lucia Janicova, Abedawn I Khalaf, Ivonne Siebeke, Colin J. Suckling, Margaret M. Harnett, William Harnett**

## September 2014

### Original Research Article

Ovine IgA-reactive proteins from *Teladorsagia circumcincta* infective larvae. **Samantha Ellis, Jacqueline B. Matthews, Darren J. Shaw, Steve Paterson, Hamish E.G. McWilliam, Neil F. Inglis, Alasdair J. Nisbet**



IJP editors 1971 - current





## April 2014

Aminoacyl-tRNA synthetases as drug targets in eukaryotic parasites. **James S. Pham, Karen L. Dawson, Katherine E. Jackson, Erin E. Lim, Charisse Florida A. Pasaje, Kelsey E.C. Turner, Stuart A. Ralph**

Confirmation of *Fasciola hepatica* resistant to triclabendazole in naturally infected Australian beef and dairy cattle. **Yvette M. Brockwell, Timothy P. Elliott, Glenn R. Anderson, Rex Stanton, Terry W. Spithill, Nicholas C. Sangster**

Application of a Poisson distribution quality control measure to the analysis of two human hookworm drug treatment studies in Ghana. **Andrew C. Kotze, Robert J. Dobson, Debbie Humphries, Michael Wilson, Michael Cappello**

## August 2014

Drug-efflux and target-site gene expression patterns in *Haemonchus contortus* larvae able to survive increasing concentrations of levamisole in vitro. **Ranbir S. Sarai, Steven R. Kopp, Glen T. Coleman, Andrew C. Kotze**

Drug repurposing and human parasitic protozoan diseases, **Katherine T. Andrews, Gillian Fisher, Tina S. Skinner-Adams**



The Chief Scientist launched a STEM strategy in September 2014. STA CEO Catriona Jackson said the plan was critical to make the most of the wealth of scientific expertise and encourage growth, for the benefit of the entire nation." [http://www.chiefscientist.gov.au/wp-content/uploads/FINAL\\_STEMAUSTRALIASFUTURE\\_WEB.pdf](http://www.chiefscientist.gov.au/wp-content/uploads/FINAL_STEMAUSTRALIASFUTURE_WEB.pdf)



## April 2014

Pentastomids of wild snakes in the Australian tropics. **Crystal Kelehear, David M. Spratt, Denis O'Meally, Richard Shine**

## August 2014

Beyond the disease: Is *Toxoplasma gondii* infection causing population declines in the eastern quoll (*Dasyurus viverrinus*)? **Bronwyn A. Fancourt, Stewart C. Nicol, Clare E. Hawkins, Menna E. Jones, Chris N. Johnson**

Co-invaders: The effects of alien parasites on native hosts. **Alan J. Lymbery, Mikayla Morine, Hosna Gholipour Kanani, Stephen J. Beatty, David L. Morgan**

Recent advances in our knowledge of Australian anisakid nematodes. **Shokoofeh Shamsi**

Experimental manipulation reveals few subclinical impacts of a parasite community in juvenile kangaroos. **Jemma Cripps, Ian Beveridge, Richard Ploeg, Graeme Coulson**

Global diversity of fish parasitic isopod crustaceans of the family Cymothoidae. **Nico J. Smit, Niel L. Bruce, Kerry A. Hadfield**

Red foxes (*Vulpes vulpes*) and wild dogs (dingoes (*Canis lupus dingo*) and dingo/domestic dog hybrids), as sylvatic hosts for Australian *Taenia hydatigena* and *Taenia ovis*. **David J. Jenkins, Nigel A.R. Urwin, Thomas M. Williams, Kate L. Mitchell, Jan J. Lievaart, Maria Teresa Armua-Fernandez**

Trypanosomes of Australian mammals: A review. **Craig K. Thompson, Stephanie S. Godfrey, R.C. Andrew Thompson**

Parasites as biological tags to assess host population structure: Guidelines, recent genetic advances and comments on a holistic approach. **Sarah R. Catalano, Ian D. Whittington, Stephen C. Donnellan, Bronwyn M. Gillanders**

# ASP news

## Australasian Animal Parasites: inside and out e-textbook link

Professors Ian Beveridge and David Emery have the great pleasure to advise the ASP membership that, we have the link enabling the subscription and download of the new parasite e-textbook "Australasian Animal Parasites; inside and out" for \$33 (\$30 + GST). As the product of many eminent parasitologists from Australia and New Zealand, with generous provision of Institutional images, this text has matured to an infective stage after a long gestation and contorted (indirect) life-cycle with many

paratenic hosts. It is designed to provide a unique and effective teaching and reference resource that not only focuses on the major hosts and parasites (including wildlife, birds and fish) with current control measures, but also addresses the major regional issues of drench resistance, integrated parasite management and exotic pests. The link is:

<http://www.cve.edu.au/animal-parasites-inside-out>

The authors applaud the ongoing and valuable support from the Society over the years of production and acknowledge additional support from MLA and AWI. Part of the subscription costs from the download will return to the ASP to allow for funding of future initiatives in the discipline. We invite your feedback at a special workshop to be arranged in due course.

## New Parasite Imagebank

Dr John Walker compiled a library of images during his career as a medical parasitologist at the University of Sydney and Westmead Hospital. He has kindly made a collection of these images available via the MBI Imagebank  
<http://sydney.edu.au/mbi/imagebank/index.php>

## \$400 ASP 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.

**Please send your 2014 prize request ASAP. Requests for 2015 prizes must be made by the eligible University to the ASP Treasurer or Secretary by the 30th September 2015.** Requests for prizes must include the following for each eligible course:

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

## ASP Fellow Celebrations



Photos from a dinner held in honour of Peter and Jacquie Upcroft becoming Fellows of the ASP. Jacquie (above) and Peter (below).



FACULTY OF  
VETERINARY  
SCIENCE



THE UNIVERSITY OF  
SYDNEY

# PHD OPPORTUNITY

**PROJECT TITLE:** IDENTIFICATION OF EXOTIC BACTERIAL AND VIRAL PATHOGENS IN IMPORTED ORNAMENTAL FISH AND MANAGING THE DISEASE RISKS POSED BY THESE FISH TO THE AUSTRALIAN AQUACULTURE INDUSTRIES..

*The project will provide a comprehensive study into the identification of nationally and internationally significant pathogens carried by ornamental fish imported to Australia.*

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vetscience/research/  
programs/opportunities.  
shtml](http://sydney.edu.au/vetscience/research/programs/opportunities.shtml)

## Project Synopsis:

Nearly 18 million ornamental fish are imported annually under a policy based on an Import Risk Analysis published in 1999. Despite the biosecurity measures in place since 2000, there have been several incidents of exotic pathogens from ornamental fish affecting wild and farmed fish populations. The study will identify species of imported ornamental fish harbouring diseases of quarantine significance and what threat the distribution of these fish pose to the wild or natural and aquaculture fish populations in Australia. The results of this study will provide information to improve current quarantine procedures and policy in the management of the biosecurity risk of imported ornamental fish. The project will start in early 2015.

## Other Information:

The student will be based at the Camden campus of the University of Sydney. The student should have a good quantitative aptitude and willing to learn diverse range of epidemiological and laboratory methods.

The successful candidate must have completed an undergraduate degree in science, agriculture, veterinary science or equivalent, have research experience (Honours or Master's degree), good analytical and communication skills.

The successful applicant must apply for and be awarded a scholarship (stipend):-

- Australian Postgraduate Award (APA) for Australian and New Zealand residents. Full-time award holders receive a stipend of \$25,392 p.a. (2014 rate) which is currently exempt from taxation. Part-time award holders receive a taxable stipend of \$12,696 p.a. (2014 rate). The stipend rate is indexed on the anniversary of the commencement date of the award.
- IPA (International Postgraduate Award). For international students, the student must have a scholarship which covers full tuition fees and a living allowance.

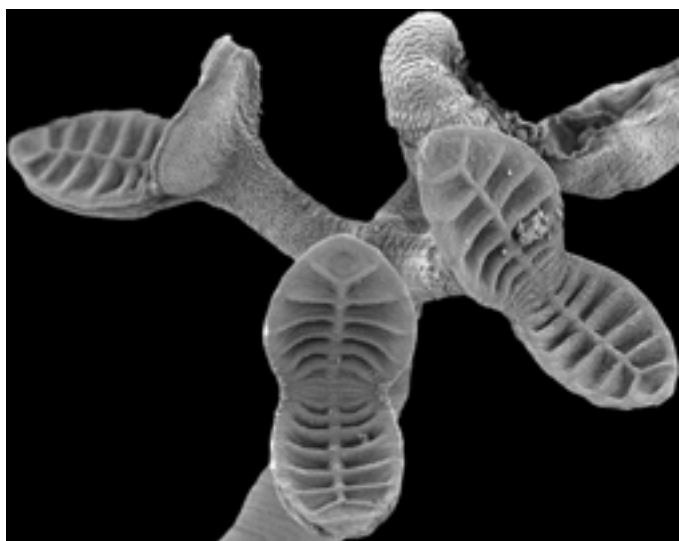


# Publication

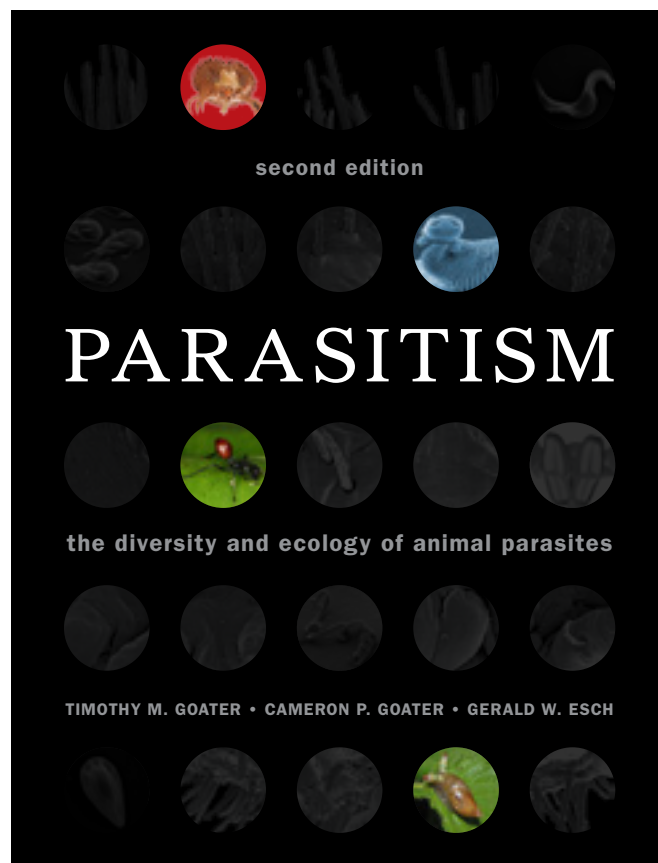
## New edition of the parasitology textbook "Parasitism: the Diversity and Ecology of Animal Parasites"

Two core philosophies underlie the second edition of 'Parasitism', co-authored by Tim Goater, Cam Goater, and Jerry Esch. The first is that complex interactions that occur between parasites and their hosts – from the molecular cross-talk that occurs at the host-parasite interface, to the effects of parasites on host communities – are fundamentally ecological. The second is that a real appreciation for the phenomenon of parasitism requires knowledge of how natural selection has shaped parasite life cycles, life histories, and morphologies to solve particular problems associated with the parasitic lifestyle. Thus, for senior undergraduates that are being introduced to the phenomenon of parasitism in animals, the authors see a need for a single text with dual focus on the biodiversity and ecology/evolution of parasites. This dual, interdisciplinary approach, under one cover, is the hallmark of the text. The 17 chapters, eight of which are new since the first edition, have been thoroughly revised to meet the needs of a new generation of parasitology students, whether their interests lie in ecology, conservation biology, evolution, immunology, medical, wildlife, or veterinary sciences.

**Further information:** [www.cambridge.org/parasitism](http://www.cambridge.org/parasitism)



Author Tim Goater says "Several spectacular scanning electron micrographs are incorporated into this new parasitology textbook. This one (above), from Chapter 6 (Platyhelminthes) shows the elaborate scolex of the rhinebothriidean cestode *Rhinebothrium biochoridum* from the yellow stingray."



"Colour photographs highlight dramatic host-parasite interactions that are showcased throughout the text. This photograph (below) shows females of sea lice, *Lepeophtheirus salmonis* (Copepoda: Caligidae), on the skin of a chinook salmon. The parasite's morphology and life history is described in Chapter 11 (Arthropoda), and its population biology is a focus of Chapter 12 (Parasite population ecology). Potential effects of sea lice on host populations is featured in Chapter 15 (Effects of parasites on their hosts: from individuals to ecosystems)" says author Tim Goater.



# State News

## New South Wales

### University of New England

**Tommy Leung**, parasitologist and social media guru who is co-administrator and writer for the Parasite of the Day blog (<http://dailyparasite.blogspot.com.au/>) writes that Ed Yong (of the Not Exactly Rocket Science blog fame) gave a TED talk about might controlling parasites.

[http://www.ted.com/talks/ed\\_yong\\_suicidal\\_wasps\\_zombie\\_roaches\\_and\\_other\\_tales\\_of\\_parasites](http://www.ted.com/talks/ed_yong_suicidal_wasps_zombie_roaches_and_other_tales_of_parasites)

and he has also recommended

[http://www.ted.com/talks/ed\\_yong\\_suicidal\\_wasps\\_zombie\\_roaches\\_and\\_other\\_tales\\_of\\_parasites/recommendations](http://www.ted.com/talks/ed_yong_suicidal_wasps_zombie_roaches_and_other_tales_of_parasites/recommendations)

### University of Western Sydney

News from UWS Stack lab is that **Leah Cronin** has finally booked her flight to Belfast in August, she will be spending a 3-4 months in John Dalton's laboratory. Leah is very excited about the opportunity to conduct research abroad although I'm not sure she is quite prepared for winter in the North of Ireland. In her absence we have a new masters student, Farnaz Eghanian, starting in the lab in the next month. **Colin Stack** attended the Veterinary Science Student Prize Reception at the University of Sydney on the 23rd of May where he had the pleasure of presenting on behalf of ASP the ASP Prize in AVBS3001 Agents of Disease to **Holly Cope**, the best undergraduate student in parasitology and the ASP Prize in Veterinary Parasitology for the best project in Parasitology 3 which was shared between **Alexandra Ruff, Holly Stone and Ronald Tong**.

### University of Technology Sydney

News for the Parasitology Hub at UTS: we had a meeting in May to discuss potential collaborations and future directions of parasitology in Sydney, new attendees included **Georges Grau** from the University of Sydney and **Michelle Power** from Macquarie University.

### Charles Sturt University

At CSU **Shokoofeh Shamsi** and two of Animal science students, **Tara Cassidy** and **Phoebe Makepeace** attended the ASP Conference in Canberra to present their works on parasites of marine fish in New Caledonia and Australian freshwater fish.

**CSU Fish Parasitology group Shokoofeh Shamsi, Phoebe Makepeace and Tara Cassidy** had a trip to Nelson Bay, facilitated by **Dr Julian Pepperell** to collect parasites from marlin and sharks as part of an ongoing research interest to study life cycle of anisakid nematodes.

**Breony Moloney** and **Zoe Boucher** 4th year Veterinary Science student and Animal Science students, respectively won the ASP Parasitology prize and award. They received the award and \$400 prize each, for the highest achievement and performance in Parasitology in the Dean's award ceremony in CSU Convention Centre.

In the same ceremony **Anna Turner** received award for the completion of her Honours with High Distinction. Anna's Honours was on parasites of introduced freshwater fish in NSW under supervision of **Shokoofeh Shamsi and Skye Wassens**.

**Shokoofeh** received a Life Watch data grant funded by WoRMS to complete the taxonomical data of the anisakid nematodes in World Register for Marine Species.

### University of Sydney

#### Laboratory of Veterinary Parasitology @ McMaster Building Clinical Tropical Medicine Laboratory

**Neil Portman** (post doc) submitted his DECRA!

In June **Christie Foster** (PhD student) travelled to the Czech Republic to spend time working in the Institute of Microbiology (T ebo ) in the laboratory of Prof. Ond ej Prášil. Christie attended the 2nd Chromera Meeting in eské Bud jovice, and presented the outcomes of her PhD project to an audience from the specific field of her study organism, *Chromera velia*.

In July 2014, **Vicky Adeline-Morin** (PhD student) attended the Genetics Society of Australasia conference in Sydney to present her comparative transcriptomics work of the bovine and feline *Trichostrongylus axei* (Figure 1) strains she carried out at the Gene Expression Lab at the Prince Felipe Research Centre in Valencia, Spain late last year.

At the end of March, **Vicky and Christie** organized an ASP-funded outreach activity at Burwood School in Sydney where they ran three parasitology-themed classes for a total of 100 grade 5 kids.

Over the last month, **Shannon Donahoe** (PhD student) has been successfully culturing *Toxoplasma gondii* tachyzoites to understand their effect on fat-tailed dunnarts, a native carnivorous marsupial.

Three new Animal Vet Bioscience Honours students started. **Rowena Chong** to work on fleas. **Kai Mueller** to work on pig trichomonads. **Peter Huaikai Shi** to work on parasites of seals.

**Jan Šlapeta** presented at the Zoonosis conference in Brisbane and attended ICOPA in Mexico City. Together with **Shannon** and pathology colleagues (**Angela Begg, Kristen Todhunter, Mark Krockenberger**) they have successfully applied NGS community profiling

## State News continued

to identify amoeba as a cause of horse placentitis (Figure 2).

Last but not least **David Emery** published the veterinary parasitology e-book.

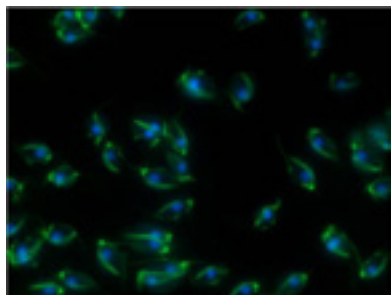


Figure 1. Tubulin labelled in *Trichostrongylus axei* foetus (green; nucleus)

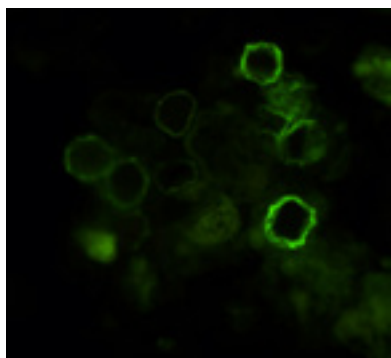


Figure 2. Multiple Calcofluor White labelled *Acanthamoeba* cysts walls (green) in the histological section of a horse placenta under fluorescence microscopy. (API).



NB: PhD students have gone into lab merchandise ;-). These are the lab mugs. Obviously there is never enough coffee.

**Big news is that we now have a Facebook page so please 'like' our page <http://www.facebook.com/UsydVetParasitology>**

## Queensland

### Central Queensland University

**Lee Barnett** and **Richard Bradbury** are happy to see the continued expansion of their Parasitology research platform at Central Queensland University. **Richard** recently received, in collaboration with Dr **Gemma Robertson** and Dr **Rob Norton** of Pathology Queensland, \$28,314 in funding to determine hot spots for parasitic infection in North Queensland by conventional and PCR methods.

Also, in keeping with their love of all things parasitic, Lee and Richard are currently buttering up the local crocodile farm for a project on Croc parasites...

**Richard Bradbury** recently had the honour of being an invited speaker at the 10th Asia Pacific Travel Health Conference, Ho Chi Minh City, Vietnam. The title of his presentation was "Diagnosing the Ill Traveller" plenary, presenting "Parasitic Disease: Stool, Blood and Tissue PCR for the Diagnosis of Parasitic Diseases"

APTHC 2014 had 485 participants from 38 countries, 45% of whom came from outside of the Asia Pacific region, a testament to the growing global interest in travel and travel medicine in this region. The conference themed "Emerging Infections & Travel" featured 59 internationally renowned speakers presenting in a total of 148 sessions over 3 days which included plenary sessions, symposia, general workshops, destination workshops, ABCs, nurses' sessions, meet-the-experts, and an interactive panel discussion. It also had several pre-conference satellite meetings including the 8th Travel Clinics Australia National Conference, the ISTM Certificate in Travel Health™ Examination which had 128 examinees, the Pre-Conference Consultation on Travelers Health in Asia organized by Shoreland, and the WHO/ITH Consultation on Strategies for Travel and

Health in Asia Pacific.

This term the small parasitology contingent of Central Queensland University are busy: **Richard Bradbury** is busy with teaching and research, and settling into his role, while **Lee Barnett** is concentrating on teaching this term. Lee was accepted into the ASP Concepts of Parasitology course later this year and is looking forward to expanding her parasitology knowledge. **Richard** has been conducting parasitology training and capacity building with **Emeritus Prof Rick Speare** from JCU and staff at the Atoifi Adventist Hospital in East Kwaio, the Solomon Islands. He has also recently received funding through the CQU Health CRN for parasite survey work in a Queensland Aboriginal Community in collaboration with **Prof Bronwyn Fredericks (CQU)**, **Dr Felicity Smout (JCU)**, **Dr Steve Kopp (UQ)**, **Dr Andrew Kotze (CSIRO)** and the Gasser laboratory at UniMelb.

### QIMR Berghofer Medical Research Institute

#### Scabies Research Group

Thanks to the sponsorship by the Lowitja Institute, Year 9-12 students of Cloncurry State School in Far North Queensland were treated to an opportunity of a lifetime by **Katja Fischer** and the scabies research group from the QIMR Berghofer Medical Research Institute. For two days the school's science laboratory was transformed into a 'real-life' research lab with everyone in white lab coats and protective wear.

Students and their teachers were shown basic lab techniques from the world of medical research. These were aptly described by the students as 'very much CSI material'. The students had opportunity to participate in many activities. These included a series of presentations from researchers at the forefront of Medical Parasitology and Microbiology,



## State News continued

several laboratory workshops with hands-on experiments using state-of-the-art equipments, a quiz on 'My Favourite Parasite' for the students to earn the school Science educational materials and a 'Career in Health and Medical Research' workshop, which stimulated many, many interesting discussions. Subsequently, four high school students and the science teacher have since travelled to Brisbane for a week long 'work experience' at the QIMR Berghofer Institute, including various orientation activities in Brisbane's major Universities.



So...what was the feedback? Judging by their school newsletter..... 'It was absolutely mind blowing and we can't wait to have them



back!'

And what do we think being mainly lab-based medical researchers? 'We can't believe we didn't do this earlier – what an eye opener'. The enthusiasm of the teachers, the principal and the students was very rewarding.

This project was aimed to relay the importance of medical research and health related professions to senior high school students in a rural/remote area of northwest Queensland, particularly targeting engagement of students with Indigenous background. We would like to acknowledge the Lowitja Institute,

Australia's National Institute for Aboriginal and Torres Strait Islander Health Research, for making this experience possible for us and for the high school students.

## James Cook University

### Cairns campus, QTHA/AITHM - Loukas Laboratory

**Mic Smout** won the Famelab national finals in Perth earlier this year after taking out the state finals in Brisbane earlier in the year. Famelab is an international science and engineering communications and promotions vehicle with more than 23 countries participating in the competition. Mic has enthralled Aussie audiences with his story of worm spit, told using only props, and travelled to Cheltenham, UK, to compete in the international finals in June.

Here's the media release from the JCU website:

"Cairns-based parasitologist Dr Michael Smout has won Australia's first Famelab competition, in which scientists have just three minutes to give an entertaining and informative account of their research. Competing against 11 other scientists from across Australia, Dr Smout used a large teddy bear, an oversized worm and a velvet liver to explain how liver parasites cause cancer, and how they might also assist in the development of treatments for non-healing wounds.

"It's not a high-tech performance, but it's a good story," he said from Freemantle. "Throughout Southeast Asia there's a very high rate of a particular form of liver cancer. It's caused by chronic infection with a parasitic worm, or liver fluke, which is found in one of the staple foods – uncooked fish," he said from Freemantle, where the national finals were held.

One-sixth of infected people develop liver cancer, and in Thailand alone 20,000 people die of this cancer each year.

"My research focuses on 'worm spit', molecules secreted by the parasites that cause cells to multiply faster than they normally would," Dr Smout said. "That's a key factor in the initiation of many cancers, and I've been able to isolate a molecule, granulin, that causes excessive cell growth."

By making worm granulin in the laboratory, Dr Smout has found that it is not just a potent human cell growth stimulator – it also promotes wound healing.

"We don't know yet how this works, but we suspect that as the worm feeds on the liver it also heals the wounds it creates. In the short term this would be beneficial to the human host, but the repeated wounding and healing over decades could lead to this form of cancer, which has a dismal prognosis. Our work on this project is two-fold," he said. "Firstly we aim to develop treatments or a vaccine to prevent liver fluke infection, which in turn will dramatically reduce the incidence of liver cancer in Thailand and surrounding countries. Secondly we believe that an in-depth understanding of liver fluke biology, particularly focusing on how it heals the wounds it creates, could lead to new treatments for non-healing wounds which are an increasing problem with smokers, diabetics and an aging population."

Dr Smout will be packing up his props and heading to the UK in June to represent Australia at the International Famelab competition, held at the Times Cheltenham Science Festival. Professor Ian Wronski, Deputy Vice-Chancellor of JCU's Division of Tropical Health and Medicine, congratulated Dr Smout and wished him luck for the next stage of the competition.

"Science communication is complicated work at the best of times, but making a showbiz success out of a liver parasite is really impressive," Professor Wronski said. "Parasitology is not the most glamorous field of science to work in, but Michael's work is an excellent example of why it's one of our priorities – the parasite he researches is carried by many millions of people in the tropics, and infections are closely linked to a deadly cancer."

## State News continued

**Mic Smout** is now back home after having travelled to Cheltenham in the UK to compete in the Famelab international finals. He was up against some stiff competition from 26 countries (including an explanation of Quantum Entanglement that killed bunny rabbit puppets) and unfortunately, despite ripping a stuffed liver from his teddy bear, complete with plush liver worm, did not take out the top honour. However, Mic has done a great job of representing the country and exposing his worm to the world. Well done Mic!

2014 was the first year that Australia participated in Famelab and was, by all accounts, an unbridled success. It will certainly become a yearly event and is a fantastic way to take your science to the world so those of you who are 5 years post-PhD or less and have a story to tell should consider entering.

## Marine Parasitology Laboratory

**Kate Hutson, Terry Miller, PhD student Giana Gomes, Masters student Alejandro Trujillo González, Masters minor project student Soronot Chotnipat, Honours student Luke Barron, Special Topic student Tim Jenkins and undergraduate parasite enthusiast Marie Tan** of the Marine Parasitology Laboratory, Townsville/Aquatic Parasitology Laboratory, Cairns thoroughly enjoyed the scientific and social aspects of the 50th ASP conference in Canberra. Congratulations to all students who presented excellent oral and poster presentations on aquatic parasites of fishes. Well done to **Alejandro** who won the 2 minute 'speed dating' student prize with his promise of a cosy conversation about his work using fluorescent markers to track live monogeneans on fish.

Congratulations to PhD students **Alexander Brazenor and Giana** who recently won JCU Graduate Research Awards. These awards involved applications for internal competitive funding for PhD research. **Alex** plans to use this funding to determine the biochemistry of monogenean eggs and thereby quantify the biochemical energy available to embryos.

**Giana** plans to use the funds to characterise pathogenic species of protozoan parasites impacting freshwater farmed barramundi in tropical Queensland (pictured below Giana Gomes working in the field at a freshwater



Barramundi (*Lates calcarifer*) pond farm in far north Queensland.)

Giana plans to validate the use of environmental DNA as a monitoring tool for identification and quantification of parasitic ciliates in fish farms.

The lab farewells **Daniel Brady** from Ireland who has been working with us since February on redescrptions of Australian marine argulids (*Branchiuridae*). We wish Daniel every success with his future studies in molecular parasitology in Glasgow, Scotland. **Kate** recently travelled to the University of Adelaide to catch up with ASP members **Sarah Catalano** and **Ian Whittington** to finalise some (long overdue) research on aporocotylids infecting temperate fishes.

Members of the Marine Parasitology Laboratory are enjoying a productive semester which has included grant success, travel and finalising manuscripts for publication. **Kate Hutson and Terry Miller** have commenced a new research project on parasites of ornamental fishes funded by the Fisheries Research and Development Corporation in collaboration with the University of Sydney. There is little information available on parasitic disease agents carried by imported ornamental fish and health certification at exporting countries and Australian quarantine are insufficient to detect and prevent ornamental fish with subclinical infections of exotic pathogens from entering Australia. It is paramount to identify parasitic infections

of imported ornamental fish to assess the risk to wild fish populations and aquaculture industries. This project will examine imported fish species for protozoan and metazoan parasites and identify them using a combined morphological and molecular diagnostic approach.

**Giana Gomes** is currently working in the Microbial Diversity Laboratory at UMass-Amherst (Program in Organism and Evolutionary Biology) led by Professor Laura A. Katz. Giana was thrilled to receive support for her Researcher Exchange through an ASP Network Researcher Exchange, Training and Travel Award. **Alexander Brazenor** has finalised molecular work with Terry in the Cairns laboratory where he has sequenced three gene regions for more than 50 *Neobenedenia* isolates from Australia and around the world. This research, in collaboration with **Terry Bertozzi** and **Ian Whittington** (South Australian Museum), aims to identify the *Neobenedenia* species associated with outbreaks on farmed fishes in Australia. Sadly, Ian passed away recently.

Congratulations to Masters student **Alejandro Trujillo-González**, who has had his first manuscript accepted for publication in the Journal of Fish Diseases. Congratulations also to Masters minor project student Soronot Chotnipat who submitted a robust thesis characterising diplectanid monogeneans infecting wild and farmed barramundi, *Lates calcarifer*.

## The University of Queensland

### School of Chemistry and Molecular Biosciences

Staff survived the cold of Canberra but had a great time at the ASP50 conference. Met up with numerous old and new acquaintances, had some great food, and tipped a 'few' drinks. **Peter O'Donoghue** (POD) arrived home to present a workshop on Public Speaking to our current crop of Research Higher Degree students, summing up with "Enthusiasm is infectious!" He is

## State News continued

looking forward to long service leave for the remainder of 2014, interrupted only by the ASP Concepts in Parasitology Workshop in Kioloa in November. Should be intense!

**Rebecca Dunne** has finally and proudly submitted her PhD on the karyotyping and genome annotation of *Trichomonas vaginalis* strains varying in metronidazole susceptibility. She consistently recovered 6 chromosomes and demonstrated considerable plasticity in gene copy number and location. Took a while but covered a lot of territory. PhD student **Linda Ly** has finished her lab work on the symbiotic flagellates of lower termites in Australia, and is now writing up her results (she is describing a total of 44 flagellate species). Woe betide her examiners!

**Steve Barker** is currently globe-trotting – a long stint in Ethiopia working on body lice and recurrent fever, and then off to a tick workshop in South Africa. **Tom Cribb** is currently teaching helminthology to our on-campus biomedical parasitology students, but gets to do a few island visits while hosting classes of international marine biology students. Hard life! **Bob Lester** was an invited speaker at ICOPA XIII. He chaired two sessions (with mixed success) and spoke on parasite tags including the storage of old data sets on a cloud accessible to all. The paper was co-authored by Brad Moore, SPC, New Caledonia.

## Queensland Alliance for Agriculture & Food Innovation

**Jess Morgan (UQ)** is working with **Lexa Grutter (UQ)** and **Buz Wilson** (Aus Museum) on a proof of principle project to test if modern molecular technologies will work on taxonomically challenging gnathiid isopods, which have so far proved to contain difficult DNA. **Ala Lew-Tabor and Manuel Rodriguez Valle** continue to work on paralysis tick and cattle tick vaccines. **Tom Karbanowicz** is completing his honours currently where he developed a yeast surface display system for tick proteins. **Greta Busch** (PhD) continues to study paralysis toxin sequences, and has set up a brain synaptosome binding assay for screening

toxin proteins. We welcome **Beibei Chen and Chian Teng Ong** who have commenced Masters and Honours on paralysis tick this year. Also new to the lab is **Ezequiel Balmori** as casual staff helping with all toxin yeast expression. **Bronwyn Venus and Ala** have been working on developing new genotyping tools for *babesiosis* live vaccine support. **Jess Morgan** has been joined by UQ Biotechnology student **Azin Delavari** who is helping out with the gnathiid isopod molecular diagnostics project. **If you have any gnathiid isopods, either frozen, or stored in ethanol in your collections, we are on the hunt for samples to screen (Jessica.morgan@uq.edu.au).** **Manuel Rodriguez Valle** is busy with staff and students on the paralysis tick project. **Chian Teng Ong** who is undertaking Biotechnology Honours has completed some great transcriptome analyses; **Beibei Chen** has done some good ELISA work for her Masters and **Tom Karbanowicz** is working as a casual expressing toxins in yeast. **Greta Busch is collecting paralysis ticks during the tick season for analysis for PhD studies – if you can help please email her on g.busch@uq.edu.au.**

**Ala Lew-Tabor, Manuel and Cathy Minchin** finished the first cattle tick vaccine trial on a new Meat & Livestock Australia grant (4 more trials to go !). PhD candidate **Tao Xu** (Manuel as Principal Advisor) recently submitted his PhD thesis entitled 'Identification, expression and characterization of *Rhipicephalus (Boophilus) microplus* serine protease inhibitors (serpins)' – congratulations Tao! **Ala and Manuel** recently attended the 8th International Conference of Ticks and Tick-borne Pathogens (TTP8) in Cape Town, South Africa. At TTP8 - Manuel and Ala were recognised as part of a consortium associated with the cattle tick genome project (awarded to Dr Felix Guerrero from the USDA and Prof **Matt Bellgard** of Murdoch University). **Australia is hosting the 9th TTP in Cairns in 2017!!!!!! Ala is looking for support from Australian tick and tick borne disease researchers. Please contact Ala if you are interested to be part of the local organising committee (a.lewtabor@uq.edu.au). Congratulations to ASP for 50 years!!!**

## Griffith University

### The Eskitis Institute for Drug Discovery

The Eskitis Institute for Drug Discovery at Griffith University launched its "Sponsor a Sample" campaign to ensure that the 45,000 samples of plants and marine invertebrates from Australia, China, Malaysia and Papua New Guinea present in their "Nature Bank" are preserved into the future. Parasitologists at the Eskitis Institute, including Assoc. **Prof. Kathy Andrews** and **Dr Tina Skinner-Adams**, are working together with chemists to investigate compounds originating from Griffiths' 'Nature Bank' a potential new therapeutic starting points for malaria. Tina has become actively involved in the Scientist in Schools program and has made several visits to her assigned high school discussing careers in science, teaching students about anatomy and malaria. She has also visited a scouting group in North Brisbane where she discussed parasites and DNA and included an activity where the Joey Scouts made DNA using marshmallows and toothpicks.

## Tasmania

### University of Tasmania

Welcome to new ASP member **Danielle Davenport**. Danielle recently started her Honours at the University of Tasmania under the supervision of **Dr Phil Crosbie and Professor Barbara Nowak**.

In April **Professor Barbara Nowak** went to Scotland and Ireland where she visited research institutions and fish diagnostic laboratories and gave four presentations about Amoebic Gill Disease research. In May **Barbara** was invited to speak at the Gill Health Initiative meeting in Oslo Norway, the meeting was attended by over 100 delegates



from Europe and focused on Amoebic Gill Disease which is becoming a problem for salmon industry in Europe.

ASP member **Melissa Beata Martin** is currently based at RMIT Bundoora, Melbourne under the ASP Network Researcher Exchange, Training and Travel Award. After much head cracking with **Dr Nathan Bott and Dr Esmaeil Shahsavari**, she has finally been successful in amplifying DNA from certain cymothoid isopods from museum collections. Melissa will share her experience in the upcoming ASP conference in Canberra.

Congratulations to ASP student members **Mark Polinski and Megan Stride** who recently submitted their PhD research. We wish both Mark and Megan well with their future endeavours. Also congratulations to **Mean Torchareon** who recently submitted her Honours research. To celebrate Mean travelled to New Zealand for a well-deserved holiday.

## Victoria

### The University of Melbourne

#### Faculty of Veterinary Science

Drs **Abdul Jabbar, Fiona Sansom and Neil D. Young** received CASS Foundation travel grants to travel to Mexico to attend the 13th International Congress for Parasitology.

#### Significant publication

Inpankaew T, Schär F, Dalsgaard A, Khieu V, Chimnoi W, Chhoun C, Sok D, Marti H, Muth S, Odermatt P, Traub RJ. High Prevalence of *Ancylostoma ceylanicum* Hookworm Infections in Humans, Cambodia, 2012, 2014. *Emerg Infect Dis.* 2014 Jun;20(6).

The study forms part of **Tawin Inpankaew's**

PhD studies. It reflects the continued emergence of this canine zoonosis in southeast Asia advocating for a One Health approach to its control. The multiple collaborators involving the University of Copenhagen, the Swiss Tropical and Public Health Institute, National Centre for Parasitology, Entomology and Malaria Control, Phnom Penh and the University of Melbourne.

A PhD student **Thomas Teoh**, has recently joined Dr **Rebecca Traub's** lab and he will be working on the epidemiology and genotypes of *Rickettsia felis* in Australia. **Dr Sze Fui Hii**, visiting Honorary Research Fellow from the School of Veterinary Science, the University of Queensland, is joining Traub's lab in May and will be spending the next 12 months in Rebecca's laboratory, also working on *Rickettsia felis*.

#### Open Day at the Faculty of Veterinary Science

**Dr Abdul Jabbar** arranged an outreach activity under the auspice of the Australian Society for Parasitology on an Open Day on Sunday the 16th of March 2014. Approximately 8,000 visitors attended the Veterinary Science and Hospital Open Day. This event was an opportunity to engage prospective students and their parents (including international students), members of the community with an interest in animals and veterinary science (clients and prospective clients of the Veterinary Hospital). It was a wonderful day, as always, and showcased the Veterinary Hospital and Faculty through exhibits and public lectures. **Dr Jabbar** arranged a display of a wide range of parasite materials for the general public and thousands of people from all walks of life aging from 12 months to 85 years enjoyed the weird and interesting creatures of parasites.

### La Trobe University

#### Centre for AgriBioscience

Based at the Centre for AgriBioscience at La

Trobe University in Bundoora, **Jane Kelley** is studying the most widespread vector-borne parasitic disease in the world—the liver fluke—and its effect on dairy cattle in Victoria. This year she was the recipient of 2014 Science and Innovation Awards for Young People in Agriculture (Dairy Australia Award). The title of her project is "Establishing the prevalence and economic cost of liver fluke infections in dairy cattle, in three irrigation districts, in North-eastern Victoria". For more details click on the following link: <http://www.daff.gov.au/ABARES/Pages/conferences-events/scienceawards/default.aspx>

Recently, she has been interviewed in a number of radio and newspaper interviews including: ABC radio – Country Hour (<http://www.abc.net.au/news/2014-03-10/vch-liver-fluke/5310154>), WIN news – Gippsland and Shepparton, Channel Ten – Weeknights Shepparton, Weekly Times and Gippsland Times.

### St Vincent's Melbourne

**Dr Harsha Sheorey** and colleagues (John Walker and Beverley-Ann Biggs) have published the next edition of their book "Clinical Parasitology: A Practical Handbook for Medical Practitioners and Microbiologists". For more details click on the following link: <http://www.amazon.com.au/Clinical-Parasitology-Practical-Practitioners-Microbiologists-ebook/dp/B00J323ICS>

### The Walter and Eliza Hall Institute of Medical Research

#### Significant publication:

**Alan Yap** (a fellow Ph.D student in **Alan Cowman's** lab) published a significant

# International news

## Transfer of the US-National Parasite Collection

Contributed by Eric P. Hoberg<sup>1</sup> and Anna J. Phillips<sup>2</sup>

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<sup>2</sup> Department of Invertebrate Zoology, Smithsonian's National Museum of Natural History, Washington, DC 20560, USA

Over the past 120 years since its founding in 1892, the United States National Parasite Collection (NPC), a cornerstone of global and North American parasitology, has been maintained by scientists and curators of the Agricultural Research Service of the United States Department of Agriculture (USDA). Initially held in Washington, D.C., for over 70 years the collection has been curated at the Beltsville Area Research Center in Maryland. The NPC holdings include in excess of 100,000 catalogued specimen lots (potentially thousands of individuals per lot) of animal parasites focusing on helminths and to a lesser extent other groups; included are approximately 3,000 holotypes and 7,000 type series. Historically among the most active parasite collections in the world, annual growth is estimated to be between 1,000 and 1,500 specimen lots, and loan activity has been significant in support of a broad global community. The history of the collection has been summarized previously (Becklund, 1969, Andrews, 1987, Lichtenfels et al., 1992, Hoberg, 2002). In addition to the collections at the Harold W. Manter Laboratory of Parasitology (University of Nebraska - Lincoln) and the Parasitology Division, Museum of Southwestern Biology (University of New Mexico), the NPC is one of the largest museum repositories and archives for parasites in North America, and among the most significant in the world, serving as an irreplaceable resource for research programs emphasizing biodiversity and systematics of parasites and complex host-parasite systems.

### Transfer details

In 2013 an agreement was articulated between the USDA/ARS and the Smithsonian Institution to transfer the NPC in its entirety (fluid specimens, slide specimens, frozen tissues, and reprints) to the National Museum of Natural History (NMNH) in Washington, D.C. Current collections staff, including senior curator Dr. Eric P. Hoberg and support scientists/managers from the ARS will be transferred with the collection and with adjunct appointments in the NMNH will provide continuity and assistance for curation and accessibility during and after the relocation. New curatorial controls will be established under NMNH guidance by Dr. Anna J. Phillips and collections management policy of the NMNH as implemented by the Department of Invertebrate Zoology.

### Operational responsibility for curation and management of the NPC, including new accessions, cataloging, loan processing, information requests and visitor support will be shifted from the ARS to the NMNH on 2 June 2014.

Smithsonian protocols will be adopted, and stakeholders and users of the collection are asked to refer directly to the NMNH. Information about procedures for donation of specimens, policies for loans, including requests for destructive sampling, and arranging scientific visits can be found at the website for the NMNH Department of Invertebrate Zoology Collections (<http://invertebrates.si.edu/collections.htm>). The web interface of the NMNH Department of Invertebrate Zoology specimen catalog can be accessed at: [collections.nmnh.si.edu/search/iz/](http://collections.nmnh.si.edu/search/iz/). During the transition, the final version of the NPC database as it exists on 30 May 2014, will be available as a single downloadable Excel file from the NMNH Department of Invertebrate Zoology website. We anticipate a migration of this database into the EMu platform of the NMNH during the coming 24 months.

### New material/specimens should be sent with advance notice to:

ATTN: IZ Collections Manager – NMNH Invertebrate Zoology, Smithsonian Museum

Support Center, 4210 Silver Hill Road, Suitland, MD 20746, USA.

The physical move of the collection is expected to begin in October 2014. In anticipation of this process we ask the community to: (1) Return all outstanding loans of NPC specimens (to ARS, Beltsville) prior to 2 June 2014 or retain the loans until the transfer has been completed, (2) Expect that new loans during this period (up to the time the transfer is completed) will not be processed, other than in exceptional cases and at the discretion of the current curator, (3) Accept our apology for the disruption of normal services (loans and accessions) during the time frame of 18-24 months following the transfer of operations. After 2 June 2014, individuals planning to deposit large series of specimens (i.e. greater than 50 lots) are encouraged to either retain materials until after the transfer of the NPC is completed or to arrange for deposition in alternate parasitological collections. During this period, NMNH on a case-by-case basis and with advance notice may be able to accept specimens with a high scientific priority (i.e. publications pending and types).

Please go to the NMNH Department of Invertebrate Zoology website (<http://invertebrates.si.edu>) for updates.

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