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The Australian Society for Parasitology Inc.

NEWSLETTER

Volume 31 Issue No.1 January 2020

Happy new year from the ASP

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10TH INTERNATIONAL SYMPOSIUM FOR FISH PARASITOLOGY

AUSTRALIAN SOCIETY FOR PARASITOLOGY ANNUAL CONFERENCE

ISFPX CAIRNS 2020

CAIRNS, AUSTRALIA
6-9 JULY 2020

The Australian Society for Parasitology Inc.

ISFPX

We are pleased to announce that the 10th International Symposium on Fish Parasites will be held in conjunction with the annual meeting of the Australian Society for Parasitology in Cairns, Australia from 6 - 9 July 2020.

Cairns boasts wonderful weather in July, with temperatures between 17-26 °C and very little rain, and is perfectly placed for exploring everything Queensland has to offer, being on the doorstep of both the Great Barrier Reef and the tropical north Queensland rainforest.

We look forward to seeing you in Cairns in 2020!

Barbara Nowak & Thomas Cribb
Conference Co-chairs

Virbac

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IJP International Journal for Parasitology: Drugs and Drug Resistance

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The Australian Society for Parasitology Inc.

NEWSLETTER

Volume 31 Issue No.1 January 2020

IN THIS ISSUE

From the President's Desk

Dear Members,

I would like to thank everyone for a wonderful year and, in particular, for all your support which made my job so much easier and more enjoyable.

I'd like to thank the ASP Council for their support this year. At our ASP Council meeting held by Zoom on Thursday 31st 1-2 pm EST, October 2019 the ASP Council appointed the following positions: Lisa Jones was appointed as the ASP secretary; Leann Tilley was appointed as the new ASP Fellows rep; Coralie Boulet was appointed as student representative. The ASP Fellows and Student Representative positions will be elected at the AGM on 9th 2020. Don't forget that all of the ASP Council meeting minutes and other ASP meeting minutes and documents can be viewed and downloaded from the WildApricot membership website in the members only section https://asp.wildapricot.org/memberresources

We have a lot of fantastic stories in the Newsletter featuring the achievements and activities or many ASP members, as promised, you can read about the 2019 BMM winner, Rebecca Traub, and our new ASP Fellows Kevin Saliba and Alex Loukas. I would like to congratulate everybody whose achievements are covered in this Newsletter. In particular, I would like to congratulate Rob Adlard on being awarded Queensland Museum Medal in recognition of his contributions to science and society, and the significant role he played as a respected ambassador for Queensland Museum. I am incredibly sorry I could not be at the ceremony but unfortunately it was not possible due to work commitments. Terry Miller spoke at the ceremony on behalf of all of us whose lives have been impacted by Rob and in particular mentioned his service to ASP. Rob has not only been twice on ASP Executive but also recruited many ASP members, including me, I don't think I would be here now if it wasn't for him. For me Rob has been an inspiration, role model and a great friend. I'm looking forward to celebrating his QMM next time I see him.

I would also like to congratulate, ARC and NHMRC grant winners and all undergraduate ASP award winners and others featuring in this Newsletter. If you have a story about your research or other achievements, please share them with us through your State representative.

As you can see from the photos in the Newsletter 2019 ASP Conference was really a great success and I would like to acknowledge all those involved in

From the President's Desk continued

organizing the conference, in particular Lisa, Nick, Danny and Ryan and all the other members of organizing committee, who all worked hard to make the conference enjoyable to everybody. We are well on track organizing ASP conference for next year. We are running the conference together 10th International Symposium for Fish Parasitology, this is the first time this international conference will be in Australia and we are very happy we could bring this event here. As usually Lisa Jones is doing an amazing job organizing the conference and I really appreciate her all her efforts, corporate knowledge and organizational skills. There is more information about the 2020 conference on ASP website and the registration and abstract submissions have opened. Abstract submission closes on 23 March 2020.

I have had a great pleasure to contribute to ASP Concepts in Parasitology this year. It wasn't exactly what I expected as almost immediately when we arrived at ANU field station in Kioloa we were evacuated due to Currowan fire and spent the next two days at Ulladulla Sandpiper Motel. I would like to thank Stuart Ralph for his leadership and keeping the participants safe and their spirits high despite the circumstances. I would also like to mention Michelle Powers who stayed with us longer to provide additional support to the participants and Terry Miller and Dan Huston who taught their sessions in a motel room. A big thank you goes to the Ulladulla Sandpiper Motel for being so accommodating. I would like to acknowledge all course participants for keeping their enthusiasm for parasitology under those difficult conditions. Thank you to the ASP Executive and Lisa for their fast decisions and support to ASP CiP in those difficult circumstances. Our hearts go out to everyone who has suffered in the terrible fires that are continuing to burn and the devastation to animals and wildlife.

For me 2019 has been a big year. I would like to thank the ASP Council and all of you for your support and to wish you all the best in 2020 – hope this will be another amazing year for everybody and for ASP.

Best regards,

Barbara Nowak
President of the ASP

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

Rebecca Traub BMM

Professor Rebecca Traub of the University of Melbourne was presented with the 2019 Bancroft-Mackerras Medal of the Australian Society for Parasitology during the annual conference in Adelaide. We publish her medal citation below.

Rebecca Traub with Una Ryan

Professor Rebecca Traub has made enormous contributions to veterinary public health, with a focus on the epidemiology, diagnosis and control of companion animal parasites and vector-borne diseases transmitted between animals and humans.

Upon completing her PhD, Rebecca was awarded the John Frederick Adrian Sprent Prize of the Australian Society for Parasitology in 2005, for her outstanding PhD thesis on "Dogs, humans and gastrointestinal parasites; unravelling epidemiological and zoonotic relationships". Since then, she has had a stellar career, being awarded more than $4 million in research funds, including from the Australian Research Council, the National Health and Medical Research Council, the Australian Centre for International Agricultural Research, the Australian Biosecurity Cooperative Research Centre and the Bill and Melinda Gates Foundation. She has collaborated at a local, national and international level with over 100 colleagues to publish over 100 manuscripts, which have been cited nearly 3,000 times. In the last 5 years alone, she has published more than 50 articles. She has supervised ten PhD students to completion and is currently supervising six PhD students.

Rebecca is passionate about improving human and animal health and has demonstrated great leadership in this area. She is an internationally recognised expert on the molecular diagnostics and control of hookworm and was the first to identify that Ancylostoma ceylanicum was an emerging zoonosis in the Australasian region, which translated to significant changes in human hookworm control. These included clinical trials by veterinary pharmaceutical companies to expand registered label efficacy claims for their canine and feline deworming products in Asia and Australia to include A. ceylanicum. The Bill and Melinda Gates Neglected Tropical Disease Division also made it a priority to develop and validate molecular diagnostic assays for the detection and quantification of A. ceylanicum in human stool, for which Rebecca is involved as an expert consultant. She is also a Key Opinion Leader with Bayer, Boehringer Ingleheim and Zoetis, a measure of the esteem in which she is held by industry, and plays a leading international role in driving research in prevention and treatment of companion animal vector-borne diseases as an invited member of both the World and the Asia-Pacific Companion Animal Vector-Borne Disease Forum.

Rebecca makes significant contributions to veterinary care in both developing communities and disadvantaged groups via un-paid consultancies for Vets Beyond Borders and Animal Management in Rural and Remote Indigenous Communities. Given the incidence of zoonotic parasitic diseases in these communities, this is an important and very meaningful contribution. Rebecca has also been very proactive in driving best practice management of companion animal diseases. For example, in 2015, she founded the not-for-profit, Tropical Council for Companion Animal Parasites Ltd, which aims to improve animal and human health by providing free educational resources in the form of guidelines, case-studies and webinars and which has over 6,000 followers. In 2017, she organised and chaired the inaugural Canine Endoparasite Guidelines Committee meeting in Bangkok, which established guidelines for the diagnosis, treatment and control of canine endoparasites in the tropics. These guidelines were launched at the World Association for the Advancement of Veterinary Parasitology Conference, in Kuala Lumpur, in September 2017.

In view of her unselfish and outstanding contributions to the science of parasitology, Rebecca Traub is an extremely worthy recipient of the Bancroft-Mackerras Medal of the Australian Society for Parasitology.

Alex Loukas FASP

Professor Alex Loukas, a Distinguished Professor at James Cook University, was made a Fellow of the Australian Society for Parasitology at the 2019 Annual Meeting

Alex obtained a BSc Hons in 1990 and a PhD in 1995 from University of Queensland in the field of immunoparasitology. He then conducted postdoctoral work at the University of Edinburgh and undertook an assistant professorship at George Washington University in the US to work with Peter Hotez and the Human Hookworm Vaccine Initiative. In 2004, he returned to Australia as an NHMRC Career Development Fellow at the Queensland Institute of Medical Research where he established the Helminth Biology laboratory. In 2010 he moved to James Cook University in Cairns, where he established the Centre for Biodiscovery and Molecular Development of Therapeutics (CBMDT). Since then he has held consistent NHMRC funding in the form of fellowships and is currently senior principal research fellow.

Prof Loukas' research focuses on three of the most debilitating human helminths - hookworms, blood flukes (schistosomes) and the carcinogenic liver fluke. They are responsible for hundreds of thousands of deaths and millions of DALYs lost each year in developing countries. They have been eradicated from developed countries, but their disappearance has been accompanied by an increase in the prevalence of autoimmune and allergic diseases.

Key outcomes of his research include translating his findings of hookworm and schistosomiasis vaccine antigens into clinical trials with phase I clinical trials for vaccines for schistosomiasis and hookworm completed. He is part of a team that recently completed a clinical trial showing that experimental hookworm infection enables coeliac disease subjects to tolerate large quantities of dietary gluten. This latter finding in particular will revolutionise the way we view parasitic helminths and treat inflammatory diseases in the future. Alex is also the lead founder and head of research of a new biotechnology company (Paragen Bio) using hookworm recombinant proteins to treat autoimmune diseases. Series A investors include US pharma giant AbbVie and Australian VC groups Brandon Capital and One Ventures.

Prof Loukas is internationally recognised scientist with an h index of 73 (Google scholar) and has published >300 articles with more than 18,600 citations in journals including Nature Medicine, Nature Genetics, Nature Reviews Microbiology, Nature Reviews Disease Primers, Lancet, New England Journal of Medicine, Lancet Infectious Diseases, and most recently Science Translational Medicine. He has also been very successful in obtaining research funding and has been CI on 3 Program and 7 NHMRC grants and 5 Fellowships totaling ~$60M. He has been CI on grants from international governments, philanthropic and industry organisations totaling >22M and recently raised $6M for the biotechnology company that he founded, Paragen Bio.

Alex has also been a very active member of the ASP and served as Editor-in-Chief of the International Journal for Parasitology for six years and steered the journal through its highest ever impact factor.

In view of his outstanding contributions to science, parasitology and the society, Alex Loukas is an extremely worthy recipient of the title, Fellow of the Australian Society for Parasitology.

Kevin Saliba FASP

Professor Kevin Saliba, Head of the Division of Biomedical Science and Biochemistry at the Research School of Biology at The Australian National University, was made a Fellow of the Australian Society for Parasitology at the 2019 Annual Meeting.

Kevin obtained a BSc in Chemistry and a PhD in Pharmacology from the University of Cape Town, South Africa before working as a post-doctoral fellow for Professor Kiaran Kirk at ANU between 1997 and 2004. In 2004, he took up a lectureship at The ANU Medical School. He was promoted to senior lecturer in 2008, Associate Professor in 2014 and Professor in 2019.

Kevin's research revolves around the key question: "What nutrients are vital for the malaria parasite and how can we stop the parasite from accessing them?". In particular he focusses on investigating vitamin utilisation pathways in the red blood cell stage of the human malaria parasite Plasmodium falciparum as potential drug targets for new antimalarials. He is not only true to his original training as a pharmacologist by exploring new drug classes and repurposing existing ones, but he is also an outstanding cell biologist investigating the physiological interplay between parasite and host and thereby uncovering general principles like nutrient uptake mechanisms, principle of cellular homeostasis and drug resistance. His constant endeavour to convert research finding to outcomes for the field is exemplified by a granted patent and a current patent application. Kevin's research, his outstanding research training and his teaching has inspired countless students and colleagues.

Kevin has published >65 manuscripts which have resulted in >4,000 citations, including publications in Nature (2x), Nature Communications and PLoS Pathogens. He has received >$3.5M in research funds over the course of his career including a Bill & Melinda Gates Foundation grant for USD 1M for a project entitled "Novel sensor and biomarkers for diagnosis of malaria using human breath." This project is developing a highly sensitive low-cost and low-invasive diagnostic test for malaria that detects volatile chemicals in exhaled breath and will assess the predictive power of their signature for breath diagnosis of malaria in patients in eastern Sudan.

His scientific standing in the community is evidenced by being an invited speaker at 25 conferences and a session chair at 14 conferences. He has served numerous times as a panel member of the Australian National Health and Medical Research Council Grant Review Panel He is a regular reviewer for a wide range of journals including Proceedings of the National Academy of Sciences, Cell Reports, EMBO Reports, PLoS Pathogens, Journal of Bacteriology and Molecular Microbiology.

In addition to his excellence in research, Kevin has made a major contribution to the Australian Society for Parasitology (ASP). Kevin was an integral member of the ARC/NHMRC Research Network for Parasitology Management Committee, valued for his integrity, wisdom, and thoughtfulness. Kevin was also a driving force of OzEMalaR, co-authoring the successful application for funding (with Professor Geoff McFadden) and, between 2010 to 2015, serving on the Researcher Exchange Assessment Panel for the Australia-Europe Malaria Research Cooperation Scheme for OzEMalaR) and the European scheme equivalent, EviMalaR. Kevin's efforts and influence were a critical part of the effort to bind together the Australia's animal and human health parasitology research communities. More recently, Kevin was the founding Co-Editor-in-Chief (with Andrew Kotze) of the sister journal to the International Journal for Parasitology, IJP: Drugs and Drug Resistance. The journal is growing in stature and number of published articles per year. The journal currently has a five-year impact factor of 3.611 (2017) (Thomson-Reuters). Since 2011, he has served on the ASP Council, has made major contributions to parasitology outreach activities, been recognized by the ANU as an outstanding supervisor of higher degree research students and has provided mentorship to a post-doctoral fellow under the ASP mentorship program.

In view of his outstanding contributions to science, parasitology and the society, Kevin Saliba is an extremely worthy recipient of the title, Fellow of the Australian Society for Parasitology.

Undergraduate Prizes

UTAS: Andy Hilliard

Congratulations to Andy Hilliard who was recipient of the 2018 Best Undergraduate Student Prize in Parasitology at the University of Tasmania, sponsored by the ASP. The prize value was $400. Andy has joined ASP and is looking forward to starting his Honours next year while working in salmon industry. His employer, Huon Aquaculture, is proud of Andy's achievement which is an important recognition of his effort and the importance of workplace learning.

La Trobe: Mikaeylah Davidson

Congratulations to Mikaeylah Davidson who was presented with the ASP Undergrad Parasitology student award at a full day symposium at La Trobe University in December 2019.

$400 Undergraduate Prizes

The Australian Society for Parasitology is pleased to announce that it will be offering undergraduate student prizes of $400 each to Australian Universities identified as offering a suitable course in parasitology, for presentation to the best undergraduate student in parasitology (highest passing mark/grade).

The course(s) must be taught by a financial member of the ASP (of more than one year standing), and must comprise at least 30% parasitology. **Requests for 2020 prizes must be made by the eligible University to the ASP Treasurer by the 30th September 2020. Please complete the online application form: www.parasite.org.au/awards/asp-undergraduate-prizes/**

Science Meets Parliament

ASP Member Haylee Weaver recently attended Science Meets Parliament 2019 and met Senator Janet Rice, member of the Australian Greens, former councillor and mayor of Maribyrnong, environmentalist, facilitator and one of the founding members of the Victorian Greens

Fresh Science from QIMR

Dr. Shiwanthi Ranasinghe was selected as one of the 10 Fresh Science QLD finalists

Shiwanthi was chosen from a couple of hundred nominations, for her significant discovery of a potent neutrophil elastase inhibitor secreted by the canine tapeworm Echinococcus granulosus. Fresh Science QLD is an annual competition for post docs within 5 years after their PhD graduation to showcase a significant discovery of their research. This protein promotes apoptosis in cancer cells and disrupts cell cycle without affecting normal cells. In vivo mouse model experiments showed that treatment with EgKI-1 significantly reduced the growth of triple negative breast cancer and melanoma. These results were published in PLOS One (https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0200433) and Scientific Reports (https://www.nature.com/articles/s41598-019-52609-4).

The finalists of Fresh Science QLD competition had media training workshop to improve the skills to communicate scientific breakthroughs with general public. Then there was a public event to present the findings in lay language within a minute, https://freshscience.org.au/events/south-queensland.

This story recently went to air in Channel 7 news as well, https://7news.com.au/lifestyle/health-wellbeing/australian-researchers-make-cancer-breakthrough-learning-that-tapeworm-could-hold-key-to-fighting-deadly-disease-c-568470

Women in Technology WA Tech[+] Award

Rina Fu's academic and community work recognised

On the 24th October 2019, the ASP's very own Rina Fu was was thrilled to be a recipient of the "Women in Technology WA Tech[+] Award" (WiTWA) for Science & Technology 2019. This was relating to the work she does at and beyond the university, including voluntary work in the community and making science accessible for toddlers, school children, grandparents and also for children in low socio-economic / regional areas, and especially for children with special needs. Rina was also delighted to make the Top 5 in the People's Vote award. The WiTWA award was judged by a panel based on 3 selection criteria: personal determination, technical strength and leadership. Rina extends her heartfelt thanks to her ASP colleagues for the kind words of support and votes. **(Story: Alireza Zahedi)**

Call for support

Rina is seeking sponsorship and fund-raising towards her second storybook "My Mummy's Pet Parasites". She continues to go above and beyond with her science outreach work, whilst juggling two young children. Since the launch of her debut picture storybook in 2018, Rina has engaged with over 8000 members of the general public, with more than half being children, including those from disadvantaged backgrounds. She is also actively mentoring and equipping younger scientists to share their passion. If you would like to support this work by giving, please contact Rina: Rina@rinafu.com

Rina has received feedback from the Publisher on her storyboard sketches and is now working on the 'roughs' which are full size illustrations.

Rob Adlard honoured by Queensland Museum

Dr Robert Adlard has been awarded the 2019 Queensland Museum Medal in recognition of his contributions to science and society, and the significant role he has played as a respected ambassador for Queensland Museum. Here we reproduce the Medal Citation and a few words of appreciation by Rob's colleague and friend, Terry Miller.

Citation

Dr Adlard's contributions to Queensland have been extensive, most notably in the fields of scientific research, applied research and advice to Government, student training, executive leadership within scientific governing bodies, and public education. His commitment to Queensland Museum as a leader, scientist, public educator and colleague has also been exemplary.

As an internationally recognised expert in the fields of parasitology, aquaculture and veterinary epidemiology,
Dr Adlard has played an important role throughout his career in providing expert advice to Government and the community. Dr Adlard is widely recognised as an international authority on myxozoan and other parasites of marine fish, and malarial parasites of birds. With an outstanding April 2019 ISI H-index of 30, including 97 abstracted publications and over 2,700 citations (over 4,000 citations in Google Scholar), his research has had a demonstrably significant reach and influence.

As Queensland Museum's first curatorial co-appointment with a university, Dr Adlard pioneered the scholary engagement of museum staff within the Tertiary sector. His commitment to student training – including graduate supervision and the development of specialist teaching workshops in both Australia and the USA – has always been exemplary.

Dr Adlard is currently a member of the Specialist Editorial Board for the International Journal of Parasitology, is an Invited Member of the World Register of Marine Species, and was a Regional Resource Expert for the Network of Aquaculture Centres of the Asia-Pacific (NACA, Bangkok). Most recently he was appointed to an advisory committee of the Office International des Epizooties (OIE), the world organisation for animal health, and has held positions on the Council and Executive of the Australian Society for Parasitology, where he was also inducted as a Fellow in 2014.

As a staff member within the Biodiversity and Geosciences Program at Queensland Museum, Dr Adlard has evidenced ongoing commitment to research excellence, public programming and staff leadership over a 23 year career. His scientific achievements have always informed his commitment to public education, for which he has been an engaging and passionate advocate for the sciences of parasitology and marine biology. Under Dr Adlard's leadership, Queensland Museum's Parasitology collection has continued to grow, and it is now the largest and most significant such collection in the Southern Hemisphere.

Following his recent retirement, Dr Adlard has been nominated as a Queensland Museum Honorary Associate, which is testament to his career contributions, and his intention to continue to support Queensland Museum in the future.

Clearly, through his dedication, his passion, his productivity and his long service, Dr Adlard has demonstrated outstanding commitment to increasing scientific knowledge, conserving biodiversity, promoting our native fauna and championing the Queensland Museum.

Above: Rob Adlard being presented with the Queensland Museum Medal

Rob Adlard continued

Personal appreciation

Thank you Jim and thanks to the board for allowing me to say a few words tonight about my mentor, colleague and friend.

I was a disappointed when the media team told me I would not be able to present a powerpoint slideshow to share embarrassing photos of Rob, and that I could only say NICE things about him... However, come speak to me after this if you want to see some photos etc.!

An interesting fact I just learned, and to give you all some context as the significance of the QM Parasitology Collections and Research, is that since 1976 there have been two full-time curators of Parasitology, both of who are here in this room tonight and have now both received QM medals for their service. Well done gentlemen!

I've had the privilege of knowing Dr Adlard now for 15 years, which began in 2004 when I was a green and naïve PhD student, through to spending 3 years as a postdoc with him here at the museum and till now as a colleague and friend.

The couple of minutes I have been given here to certainly won't do justice to Rob, but I would like to share a few things I have learned about him over the years.

First, he is fiercely competitive, which I quickly learned while sharing morning coffees with him and colleagues in the museum. These conversations generally consisted of who had the most rain in their Nylex 1000 rain gauge.

Second – he has an extreme fear of being late for flights. To give you an example, if we had a 1pm flight Rob would quickly suggest he pick me up at 5am! The number of hours of my life wasted, sorry enjoyed, waiting in airport terminals with Rob I will never get back…

Third – the greatest inspiration I have taken from Rob as my mentor is his passion for serving something greater than himself, which is exemplified through his service to the Australian Society for Parasitology and his service to the Queensland Museum and its stakeholders, the public. His passion for serving the greater good has been an inspiration to me in my career as a scientist in the public service in Western Australia.

There is one key phrase that Rob threw at me which has had one of the biggest impacts on my approach to life and work and that is "Don't come to me with problems, but with solutions". My initial reaction was one of "Gee thanks Rob" but in the end this was actually paradigm shifting for me. What it forced me to do was to think critically about problems and presenting possible solutions for feedback rather than just highlighting an issues and expecting my supervisor or mentor to miraculously solve. This mantra now defines how I address problems that arise and how I get my own staff to approach issues.

So on behalf of everyone here whose lives you have had an impact on, Thanks Rob, well done and congratulations.

Terry Miller

Clockwise from top left:
Rob Adlard with

Terry Miller
Lester Cannon
Mal Bryant
Tom Cribb

2019 Odile Bain Memorial Prize (OBMP)

Amanda Duarte Barbosa was presented with the OBMP during WAAVP in Madison, Wisconsin

Dr Amanda Duarte Barbosa was presented with the 2019 Odile Bain Memorial Prize (OBMP) at the 27th Conference of the World Association for the Advancement of Veterinary Parasitology (WAAVP) in Madison, Wisconsin, USA in July 11th, 2019

This award has been established by Parasites & Vectors in association with Boehringer Ingelheim Animal Health, to perpetuate the memory of Odile Bain (28/04/1939 – 16/10/2012) in recognition of Odile's outstanding contribution to medical and veterinary parasitology, her role in encouraging productive collaborations among biologists, veterinarians, physicians, and fundamental and applied parasitologists worldwide and her enthusiasm for parasitology.

The Award consists of a cash prize of 1500 Euros, a waiver of the charges for publication of one article in Parasites & Vectors.

Dr Barbosa's merits as an excellent early career scientist have been fully recognised mostly in relation to the significant improvements in the limited knowledge on the prevalence, host-range, biogeography, genetic diversity and taxonomy of vector-borne protozoan pathogens in Australian native mammals. Of particular interest were her studies aiming to describe a novel trypanosome species and an innovative next-generation sequencing-based technique for the characterisation of trypanosome polyparasitism.

Season's Greetings from IJP.
Wishing you a happy and successful 2020.
Brian, Alex, Jan and Maria

Upcoming events

Eastern Mediterranean Region VIII Parasitology Summer Course (ParSCo)

5th-14th June 2020
Esfahan, Iran

ParSCo is a residency course on parasites, arthropod vectors and transmitted pathogens in the Eastern Mediterranean region.

We are pleased to announce the eighth edition of the Parasitology Summer Course (VIII ParSCo) organized by the Parasitology Unit of the Department of Veterinary Medicine, University of Bari (Italy) and the School of Public Health, Tehran University of Medical Science (TUMS) and the Iranian Society of Parasitology (ISP) with the support of the European Veterinary Parasitology College (EVPC), of the World Health Organization (WHO) and of Parasites & Vectors.

In 2020, ParSCo will be held in Iran, a wonderful country in the Eastern Mediterranean Region (EMRO), and we will refer to this as EMRO-ParSCo. Over the past seven years, more than 95 attendees from all continents have attended ParSCo, which was traditionally held in Southern Italy.

More information: http://en.tums.ac.ir/en/content/167/parsco-eastern-mediterranean-region-viii-parasitology-summer-course

Application deadline is 19 January 2020

Si-o-Seh Pol (the bridge of 33 arches) in the beautiful city of Esfahan

Rina Fu's school and community outreach

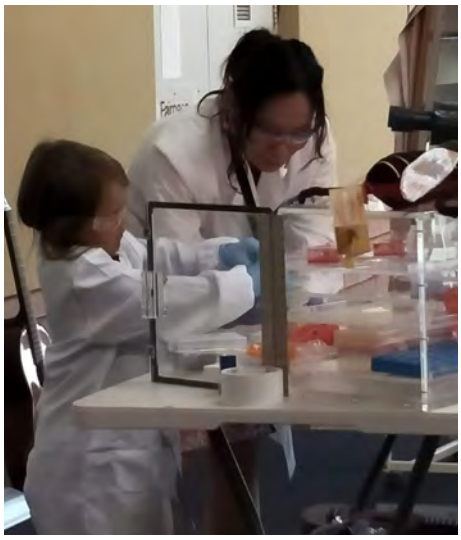
Rina has continued her energetic schools outreach, visting many places in Western Australia over reccent months.

Hampton Senior High School

Year 9 and 10 Students, exploring about 'mad scientists' is it a myth or reality? We also fed some parasites in our session. (14 Nov 2019)

Nollamara Primary School: Kindy to Year 3 students

Rina introduced cells and microbes through interactive story reading of 'My Mad Scientist Mummy" (ASP sponsored). Year 4 to Year 6 students, got a glimpse of what real scientists get up to in the lab, many unsung heroes tackling global diseases. It was a pleasant surprised when the students voted on the parasite feeding activity over rocket launches! Rina also wore an 'fm' device around her neck to make her speech accessible for a child who is hard of hearing. Prior to her group session, Rina also had a special one-to-one 'kinaesthetic learning' session with a child who is blind (8 Nov 2019).



Cannington Library

Children aged 4 to 6 with their parents enjoyed hands-on experiments and sing-along with Dr Rina, invited author-illustrator-scientist (11 Oct 2019)

Takari Primary School 50th Anniversary

Rina incorporated a number of materials donated by ASP members and sponsored by the ASP outreach fund to engage the community. (16 Nov 19)

Rina Fu continued

Community Outreach & Playdate at the Toy Library

Big bugs, small bugs & microscopic bugs! Dr Rina and her team had lots of fun with little scientists learning how to look through a microscope and prevent mozzie bites! (23 Nov 19)

High School Outreach

Year 12: Parasite workshop (16 Sep 19)

ROLA Judge – The Bugs Song

As one of the invited judges for the children's literacy competition 'Read Out Loud Awards', with the help of a teacher, Rina loosened up the kids with her new bugs song with actions. The ASP sponsored the production of the original recording. Rina the ran 7 other sessions engaging with the entire primary school, from Kindy to Year 6. (9-29 Sep 19)

GTAC: Parasites in Focus 2019

The Parasites in Focus student program is a special event program developed and run as a collaboration between the Gene Technology Access Centre (GTAC) and the ASP.

This program aims to raise awareness of the societal and economic consequences associated with parasitism through impacts on ecosystem dynamics, agricultural security, and human health. The program also exposes secondary school students to a diverse range of careers that are supported by training in parasitology.

The program was launched with an opening address by leading field parasitologist, Assoc. Prof. Aaron Jex (Laboratory Head, Division of Population Health, Walter and Eliza Hall Institute of Medical Research). Assoc. Prof. Jex introduced students to the ecological niche and adaptations of parasites, the global economic and medical burden of parasitism, and the work undertaken by parasitologists.

Students then participated in three 60-minute workshops:

Workshop 1: Hooked on Parasites

Working with scientist mentors in the GTAC laboratories, students applied techniques of the veterinary pathologist to diagnosing a parasitic infection of sheep. An assessment of clinical signs, faecal egg counts, and examination of larvae and adult worms led students to deduce the sheep were infected by the nematode, Haemonchus contortus. Students concluded by proposing strategies to manage the health of the flock.

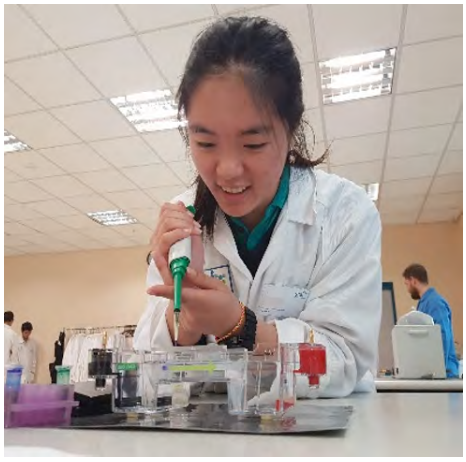
Workshop 2: A Case of Cross-Border Detection

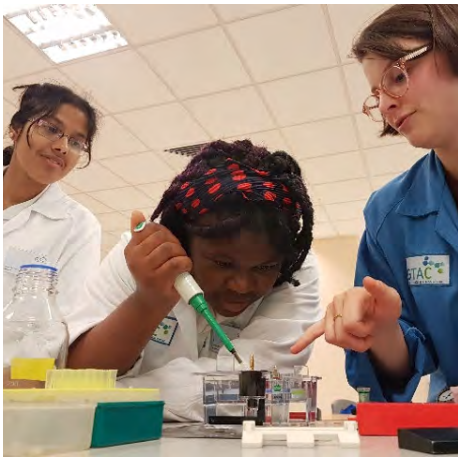
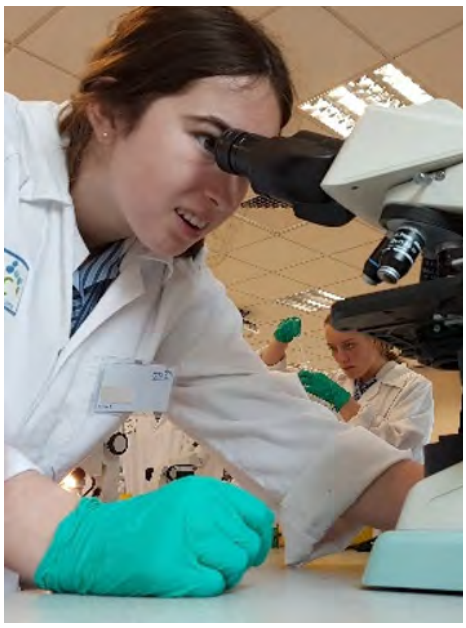
Working in the GTAC laboratories with scientist mentors, students used biotechnology to identify the specific malarial parasite infecting a tourist who had returned from overseas. Applying polymerase chain reaction and gel electrophoresis experiments, students determined the tourist was infected by the deadliest type, Plasmodium falciparum. The result is crucial for informing the patient's treatment.

Workshop 3: Parasites Getting it Under Control

Working in the GTAC computer laboratory, students used the computer simulation software, NetLogo, to investigate the

GTAC continued




effects of various natural enemies on populations of the light brown apple moth, a pest of the grape industry. Evaluation of their mathematical models led students to conclude that the parasitoid wasp, Trichogramma was the most suitable biological control.

The program ran on Friday 25th October 2019 with a total of 89 students and 7 teachers attending. Program features included

- Immersion in contemporary approaches to research in the life sciences
- Use of cutting edge technologies
- Collaboration with practicing scientists
- Three specialist workshops

The Parasites in Focus student program remains a perennial favourite on the GTAC and ASP calendar. The program sustains the mutual benefits of promoting GTAC's mission to engage students in STEM through innovations in Life Sciences education and the ASP's vision to promote parasitology to the broader community. In 2019, Parasites in Focus continued to attract positive feedback for all aspects of the program. It was encouraging to see the jump in student interest in parasitology as a result of doing the program.

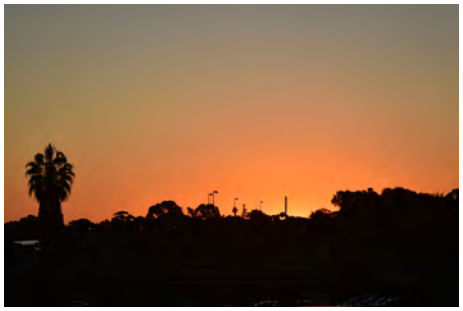
The next incarnation of the program is scheduled for October 2020. By that time, GTAC's new Discovery Lab will be operational. The prospect opens possibilities for replacing one of the existing workshops with a brand new laboratory workshop. It is recommended, however, that the established program structure remains the same.

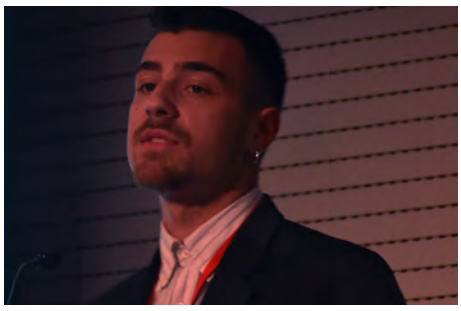
Report by Tony Chiovitti (Deputy Director, GTAC)

Images from the Annual Conference Part 2

Tuesday evening

Poster evening is always a highlight at ASP Conferences starting with 30 fast and furious 2-minute poster talks and then afterwards all of the poster authors have the chance to talk about their research standing in front of their poster.



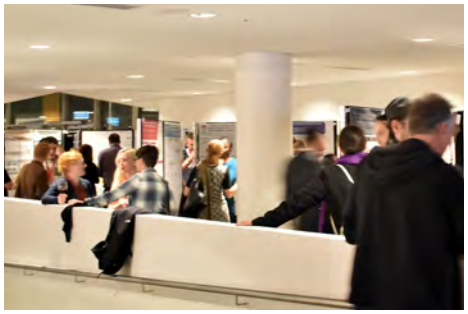


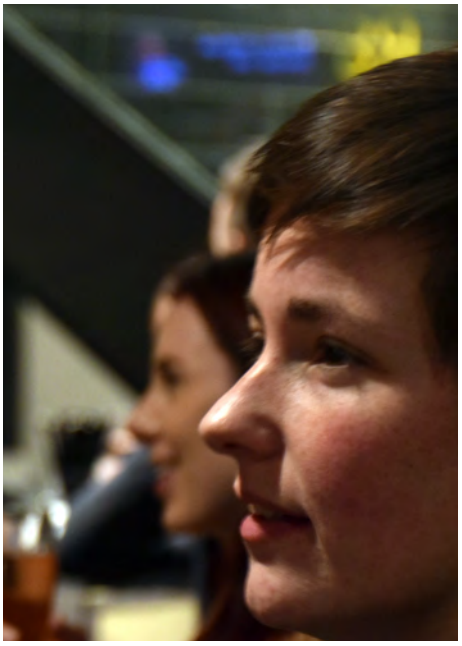
Images from the Annual Conference continued

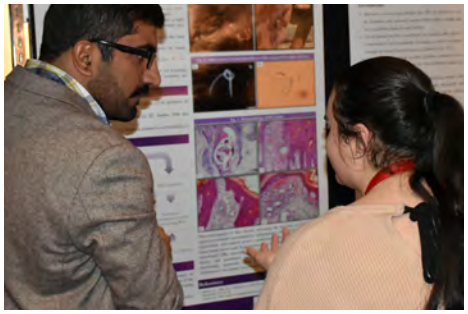
Tuesday evening

Images from the Annual Conference continued

Tuesday evening

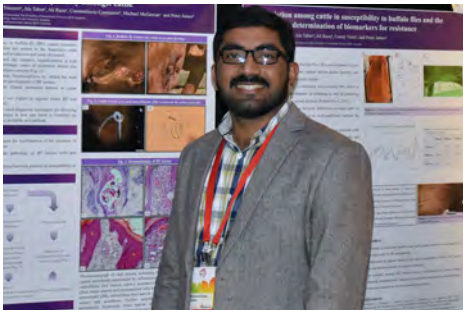


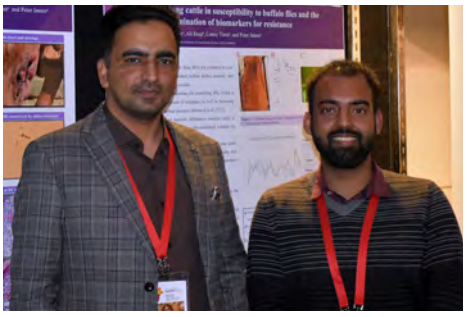




Images from the Annual Conference continued

Tuesday evening



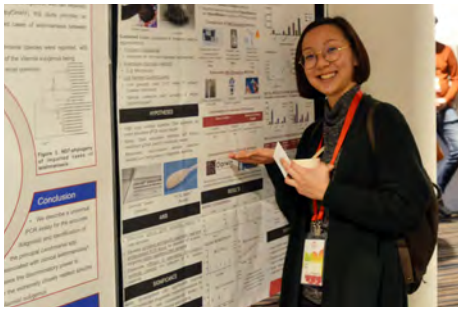


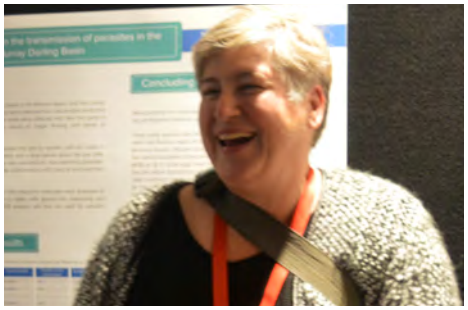
Images from the Annual Conference continued

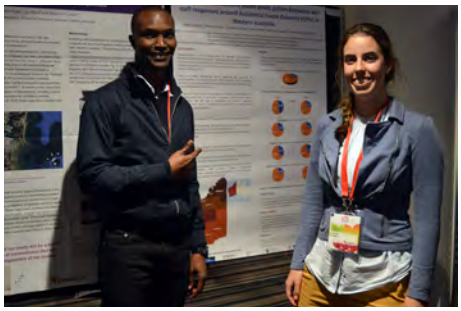
Tuesday evening







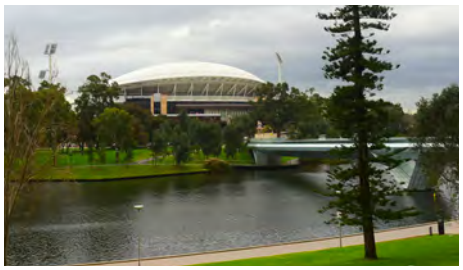




Images from the Annual Conference continued

Wednesday

Plenary speakers were Elissa Hallem, University of California giving the Elsevier Plenary as the IJP Lecturer and Barbara Nowak, University of Tasmania, giving the Parasites and Feeding the World Fish Plenary talk. The program finished on Wednesday with parasitology Outreach & Education talks and a fun interactive workshop "Parasite diagnostics using Clickers Technology" with Harsha Sheorey.



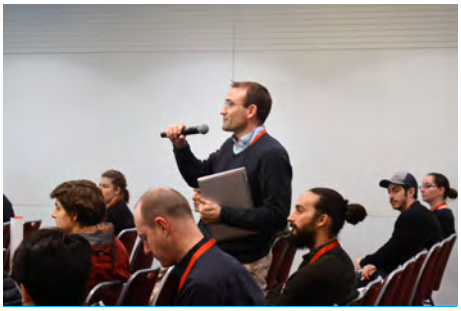
Images from the Annual Conference continued

Wednesday

Images from the Annual Conference continued

Thursday morning

Plenary speakers were Alexis Kaushansky, Seattle Children's Research Institute giving the Elsevier Plenary as the IJPDDR Lecturer and Sarah Perkins, Cardiff University giving the Elsevier Plenary as the IJPPAW Lecturer.



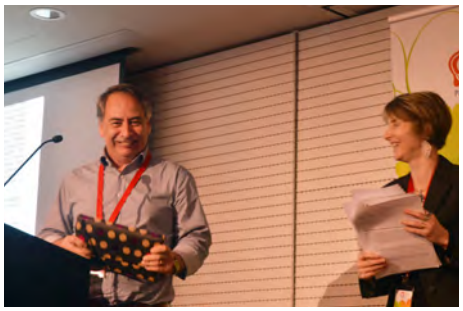
Images from the Annual Conference continued

Thursday afternoon

The 2019 ASP AGM was held as the last conference session and we thanked our awesome volunteers who helped to run the conference so smoothly and saw the changeover of the ASP Executive team with Barbara Nowak, University of Tasmania becoming the new ASP President and Una Ryan, Murdoch University stepping down.

Images from the Annual Conference continued

Thursday afternoon



Images from the Annual Conference continued

Thursday evening

The end of the 2019 ASP Annual Conference was celebrated with our conference dinner and the award of student and early career researcher prizes.

We are looking forward to seeing everyone back in 2020 for our joint ISFPX & ASP Annual Conference in Cairns!

Images from the Annual Conference continued

Thursday evening












Images from the Annual Conference continued

Thursday evening

NATIONAL CLIMATE EMERGENCY SUMMIT 2020

14-15 FEB
MELBOURNE

SHAPING AUSTRALIA'S
EMERGENCY TRANSITIONS

News from the ASP Network for Parasitology

Joint ISFPX & 2020 ASP Annual Conference

We are pleased to announce that registration and abstract submission is now open for the joint 10th International Symposium for Fish Parasitology (ISFPX) and 2020 Australian Society for Parasitology (ASP) Annual Conference which will take place at the Shangri-La Hotel Cairns, Australia from 6-9 July 2020.

Register and submit you abstract online www.conftool.org/parasitology2020/ abstract submission closes on Friday 23rd March 2020. Register before the early bird deadline on 5th April 2020 for great value for money. Please note to be eligible for an ASP Student Conference Travel Grant (https://www.parasite.org.au/awards/asp-student-travel-award/) you must have a valid ASP Student membership by 7 April 2020 and meet all of the other criteria.

The Joint ISFPX and 2020 ASP Conference will take place at the Shangri-La Hotel in Cairns, Queensland, Australia, from Monday July 6 – Thursday July 9, 2020, inclusive. We anticipate that 400 Australian and international scientists will meet at the Conference to discuss the latest research and state-of-the-art technologies in parasitology. The program will include an outstanding mix of quality international and Australian scientists with the following confirmed invited speakers:

Opening address and public lecture

- **Lexa Grutter** (University of Queensland, Australia)

Elsevier Plenary Lecture Series - IJP Invited Lecturer

- **Meta Roestenberg** (Leiden University Medical Centre, Netherlands)

Elsevier Plenary Lecture Series - IJPPAW Invited Lecturer

- **Elizabeth Warburton** (University of Georgia, USA)

Elsevier Plenary Lecture Series - IJPDDR Invited Lecturer

- **Jane Hodgkinson** (University of Liverpool, U.K.)

Plenary Lecturer

- **Tim Littlewood** (Natural History Museum, U.K.)

Plenary Lecturer

- **Sho Shirakashi** (Kindai University, Osaka, Japan)

Plenary Lecturer

- **Jerri Bartholomew** (Oregon State University, U.S.A.)

Symposium Lecturer

- **Tina Oldham** (Norwegian Institute of Marine Research, Norway)

Symposium Lecturer

- **Clare Anstead** (University of Melbourne, Australia)

Symposium Lecturer

- **Mark Fast** (University of Prince Edward Island, Canada)

Symposium Lecturer

- **Shokoofeh Shamsi** (Charles Sturt University, Australia)

Symposium Lecturer

- **Ken MacKenzie** (University of Aberdeen, U.K.)

Symposium Lecturer

- **Tania de Koning-Ward** (Deakin University, Australia)

Symposium Lecturer

- **Mic Smout** (James Cook University, Australia)

Symposium Lecturer

- **Scott Carver** (University of Tasmania, Australia)

Public lecture on the Photography of Marine Life in the Wild

- **Jon Bryan** (Jon Bryan Photography)

Horizon Scanning Workshop on Fish Parasitology workshop run by Nico Smit will take place on Wednesday 8th July 2020 at ISFPX & 2020ASP. This workshop has been sponsored by North-West University.

The Conference will open on Monday July 6, 5pm with the Opening Address and public lecture by Lexa Grutter (University of Queensland) followed by a Welcome Reception at the Cairns Aquarium sponsored by Virbac. Poster night will take place on Tuesday July 7 at the Shangri-La Hotel and the Conference dinner will take place on the last evening of the program, Thursday July 9 at Hemingway's Brewery Cairns Wharf. Early Career Researchers are invited to a breakfast event on the first morning, Tuesday 7th July 2020 and to a social event on Wednesday 8th July 2020. ECR's can add these events when registering for the Conference.

ASP Student Conference Travel Grant

To be eligible for a 2020 ASP Student Conference Travel Grant you must have a valid ASP Student membership by 07 April 2020 and meet all of the other criteria.

To apply, ASP student members should download the Guidelines for the 2020 ASP Student Conference Travel Grant (https://www.parasite.org.au/awards/asp-student-travel-award/). Please apply online through your conference registration by 07 April 2020 https://www.parasite.org.au/awards/asp-student-travel-award/

ISFP Young Scientist Award

The ISFPX will offer a small (limited) number of free (partial or total) registration fee grants for Early Career Researchers (Post-doctoral researcher within 5 years of their PhD, PhD, Master or Undergraduate student) who present an abstract on fish parasites either as a contributed paper or a poster at the joint ISFPX and 2020 ASP Conference. To apply for the grant please read the grant conditions on the website https://www.isfpx.org/ and then register for the Conference (https://www.conftool.org/parasitology2020) and select the ISFP Young Scientist Award option.

Once again we will offer a parents/carers and children room during the conference separate from the lecture theatres so that parents/carers will be able to watch and listen to the conference presentations live online using their own devices. Check the advice pages for accommodation options nearby, post and pre conference tour options and other helpful advice: https://www.isfpx.org/

The policy on gender equality is on the Conference website https://www.isfpx.org/

Follow the conference on social media with the hashtags **#2020ASP #ISFPX**

Check the Conference website https://www.isfpx.org/ for more information and we look forward to seeing you in Cairn in July 2020!

We would like to acknowledge the generous support of our 2020 ASP conference sponsors, thanks to Virbac, Elsevier Parasitology and the International Journal for Parasitology (IJP), IJP DDR and IJP PAW, North-West University and New England Biolabs.

Network Mentorship Scheme

Network Mentorship Scheme Early career researchers are encouraged to apply to the Network Convenor (nick.smith@parasite.org.au), in strict confidence, for funding to participate in the Network Mentorship Scheme. The scheme allows young investigators to be paired with experienced, successful academics 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 and covers mentorship across all aspects of working in parasitology including research, teaching, leadership, communication and outreach and other areas of professional development.

JD Smyth & Travel Award

Please read about our JD Smyth & Travel Award recipients who have recently returned from their researcher exchange and training programs. Lachlan Coff, PhD candidate, RMIT University, reports on his Researcher Exchange with Associate Professor Daniel Kolarich of Griffith University's Institute for Glycomics, Gold Coast Campus. Sarah Jackson, Monash University, reports on her 2018 Researcher Exchange between Professor Christian Doerig's laboratory in Melbourne, Australia to Professor Andrew Tobin's laboratory in Glasgow, Scotland.

Congratulations to the 2019 JD Smyth Travel Award Recipients:

Sanduni Hapuarachchi, PhD candidate, Australian National University, to attend the Biology of Parasitism course, Woods Hole, USA and a researcher exchange to visit laboratories in Boston, New York and Philadelphia, USA to better understand the prevailing research gap in addition to the current approaches being utilised by different researchers from around the world.

Olivia Maria Silva Carmo, PhD Candidate, The University of Melbourne, for a Researcher Exchange with Dr. Tobias Spielmann, in Hamburg, Germany and then attend the Biology of Parasitism: Modern Approaches, Marine Biological Laboratory (MBL), Woods Hole and visit labs in Germany, and in Seattle, USA.

Jaclyn Swan, PhD candidate, La Trobe University, for a researcher exchange to Prof Iain Wilson and Dr Katharina Paschinger from the Universitat fur Bodenkultur Wien, University of Natural Resources and life Sciences in Vienna to study parasite glycans and receive training.

Congratulations to the 2019 ASP Travel Award Recipients:

Emily Crisafulli (PhD student), The University of Melbourne, for a Researcher Exchange to lab of Dr Lilach Sheiner at the University of Glasgow to utilise a method to measure mitochondrial translation in Toxoplasma gondii and Lab visits to Dr Julian Rayner at the Wellcome Sanger Institute, Dr Ross Waller at the University of Cambridge and Prof David Baker at the London School of Hygiene & Tropical Medicine to engage with their research and technical expertise.

Network news continued

Isabelle Henshall, PhD Candidate, University of Adelaide, for a Researcher Exchange to visit A. Prof. Robert Moon's Laboratory, London School of Hygiene and Tropical Medicine.

Abdul Ghafar, Mr, PhD student, The University of Melbourne, for a Training Course at Anses, Animal health Laboratory, UMR BIPAR, Université Paris, Maisons-Alfort, France to learn theoretical and practical aspects of microfluidic real-time PCR for the detection of pathogens in ticks.

Damian Oyong, PhD student, Menzies School of Health Research, Darwin for a Researcher Exchange to visit Faith Osier's Laboratory in Heidelberg Germany for anti-malarial vaccine research and to attend a Training Course "Bioinformatics for Immunologist" by European Bioinformatics Institute (EBI) at Wellcome Genome Campus in Cambridge.

Dr Elizabeth Aitken, Peter Doherty Institute, University of Melbourne, for a Researcher Exchange to the laboratory of Morten Nielsen at Centre for Medical Parasitology, University of Copenhagen to use systems that measure antibody immunity for our malaria vaccine work.

Lachlan Coff, PhD candidate, RMIT University, for a Researcher Exchange with Associate Professor Daniel Kolarich of Griffith University's Institute for Glycomics, Griffith University, Gold Coast Campus to study helminths and the interactions with its host.

Dr Catherine Gordon, Post Doc, QIMR Berghofer, for a Researcher Exchange from an African student Vanessa Rosine NKOUAYEP, Ph.D student, University of Dschang, Cameroon to visit our lab at QIMRB in Australia for the project "Prevalence and molecular characterization of Ascaris, Trichuris and Hookworms in Bandjoun, West Cameroon"

Dr Samantha Emery (Corbin), Postdoctoral Fellow, Walter and Eliza Hall Institute, for a Researcher Exchange to visit the laboratory of Professor Staffan Svärd at Uppsala University in Sweden.

Mohammad Farouq Sharifpour, PhD student, University of Adelaide, (under supervision of Dr Milton McAllister) for a Researcher Exchange to the laboratory of Markus Meissner, Ludwig Maximilian University of Munich, Germany.

Petra Quezada, PhD candidate, University of Tasmania for a Researcher Exchange to Research visit Dr Neil Ruane and Dr Jamie Downes at the Marine Institute (MI), Galway, Ireland and a visit to the Gill Health Initiative (GHI, Stirling, UK) research gill health.

Dr. Cassandra Davitt BVSc MANZCVS, PhD Candidate, University of Melbourne, for Serological and RT-PCR based training and laboratory work to be carried out at Leipzig University, Germany.

Theresa Störiko, PhD candidate, Maier lab, ANU for a two week Researcher Exchange with Aaron Jex at Walter and Eliza Hall Institute and Stuart Ralph at the University of Melbourne for DNA sequencing and analysis of sequencing data.

Barbara Nowak, Professor, University of Tasmania, for a Researcher Exchange for Prof Kenneth MacKenzie (Professor Emeritus, University of Aberdeen Scotland) (3 July – 23 July 2019) Prof MacKenzie will deliver a keynote presentation at the 2020 ASP conference (joined with International Symposium on Fish Parasites), give lectures at two universities (including at two locations at University of Tasmania) and run a workshop on parasites as biological tags. This visit will result in training opportunities for budding fish parasitologists, particularly those who are interested in the use of fish parasites as biological tags.

Congratulations to all recent ARC and NHMRC grant winners highlighted below. If we have missed your grant announcement please email Lisa. Jones1@jcu.edu.au

ARC Discovery Project Grants in Parasitology 2019

Dr Giel van Dooren, Professor Kiaran Kirk (The Australian National University) Regulating nutrient uptake in intracellular parasites. Parasites impose a major economic and medical burden on human societies. In order to grow and reproduce, parasites scavenge nutrients from their animal or human hosts. As they move within and between hosts they encounter different levels of nutrients; how they adapt to these differences is poorly understood. This project aims to investigate the mechanisms by which the model parasite Toxoplasma senses and responds to the nutrients in its environment, thereby shedding light on how they adapt to the different environments that they inhabit and, in the longer term, informing novel

Closing dates for ASP awards

ASP Fellowships
9 January 2020

ASP Researcher Exchange, Travel and Training Awards & JD Smyth
22 March 2020,
25 September 2020

John Frederick Adrian Sprent Prize
30 September 2022

Bancroft-Mackerras Medal for Excellence
30 September 2020

More information
www.parasite.org.au

treatment strategies that aim to limit the parasites' nutrient supply. $460,000

Associate Professor Michael Gardner, Professor Steven Cooper, Dr Terry Bertozzi, Professor Robert Miller, Professor Andrew Sih, Dr Stephanie Godfrey (Flinders University) Can parasites cause host population divergence? . Parasites have been proposed to be drivers of population divergence, and ultimately speciation, yet the dynamics of this process are not well understood. This project will utilise new genomic techniques, novel hybrid zone analyses, and data on mate choice, to investigate the hypothesis that parasites drive population divergence through an interaction with immune response genes in the sleepy lizard Tiliqua rugosa. This species provides an unprecedented system, backed by 37 years of long term host-parasite and behavioural data, and recent genetic analyses. This project intends to produce significant data to allow an examination of the early stages of host-parasite evolution in action, providing novel insights into the speciation process. $401,030

Associate Professor Clare McArthur, Associate Professor Michelle Power, Professor Iain Gordon (The University of Sydney) Linking individual traits, the gut microbiome and parasite load in wildlife. This project aims to apply principles of community ecology to the gut microbiome of an urban exploiter – the common brushtail possum - to reveal how animal traits influence individual variation in the load of gut parasites that cause disease in both humans and wildlife. By combining assays defining the behavioural and physiological states of individuals with sophisticated analyses of their gut microbiome, our project will provide a new, yet crucial, perspective on how and why diseases spread. Our discoveries will help understand and manage the burden of infectious diseases from parasites in and beyond our cities and across the human-wildlife interface; essential for improving human and wildlife health in an increasingly urbanised Australia. $504,000

NHMRC Grants December 2019

Synergy Grants

Prof Susan Charman (Monash University) Multidisciplinary catalyst to discover and progress novel antimalarial drugs. $5,000,000

Clinical Trials and Cohort Studies Grants

Dr Kamala Ley-Thriemer (Menzies School of Health Research) Effectiveness of novel approaches to radical cure of vivax malaria. $1,599,228

Ideas Grants

Dr Daniel Opi (Burnet Institute) Enhanced identification of targets of immunity to advance P. vivax vaccine development. $608,764

Dr Matthew Grigg (Menzies School of Health Research) Parasite and human genetic risk factors for emerging Plasmodium knowlesi (Pk) malaria. $653,377

A/Pr Ashraful Haque (QIMR Berghofer Medical Research Institute) How do CD4+ T cells preserve memories? $1,510,934

A/Pr Stuart Ralph (University of Melbourne) What causes delayed death in malaria parasites? $653,580

Dr Michelle Boyle (QIMR Berghofer Medical Research Institute) Manipulating T follicular helper cells to improve human malaria vaccines. $742,700

Prof Tania de Koning-Ward (Deakin University) Deciphering the molecular constituents, assembly and structure of the Plasmodium new permeability pathways. $726,660

Dr Giel van Dooren (Australian National University) Targeting the mitochondrial electron transport chain of apicomplexan parasites. $637,700

Prof Malcolm McConville (University of Melbourne) Targeting carbohydrate metabolism in Leishmania. $1,146,560

A/Pr Christopher Tonkin (Walter and Eliza Hall Institute of Medical Research) Understanding Toxoplasma's interaction with the brain. $680,305

A/Pr Brendan McMorran (Australian National University) Developing targeted antimalarial drug leads from host defence peptide-drug conjugates. $1,063,037

International Collaborations

Prof Darren Gray (Australian National University) Eliminating the major Helminth Neglected Tropical Diseases from the Lower Mekong Basin. $1,298,861

Prof Alexander Loukas (James Cook University) Diagnosing infections with carcinogenic liver flukes. $510,337

*

With best wishes and Happy New Year!

Nick and Lisa

ASP Researcher Exchange Travel Awards

Lachlan Coff of RMIT University visited the Institute for Glycomics, at Griffith University to pursue research into Cardicola forsteri, which threatens Southern bluefin tuna.

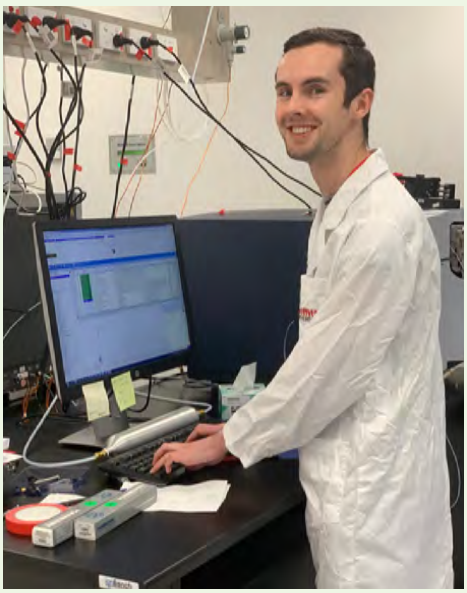
Research overview

Southern bluefin tuna (*Thunnus maccoyii)* ranching was pioneered in Port Lincoln in the early 1990s and is now the largest sector of the South Australian aquaculture industry but is threatened by a number of diseases that arise in aquaculture, foremost of which are parasitisms by *Cardicola forsteri* and C. *orientalis. Cardicola* spp., the largest genus in the family of fish blood flukes Aporocotylidae, are hermaphroditic and have a two-host life cycle. During infection of southern bluefin tuna, their eggs are carried by the bloodstream to the afferent branchial arteries, where they become lodged in the gill filaments and embryonate, causing inflammation and lesions that interfere with gas exchange. It is primarily the resulting respiratory distress that, combined with other stresses, can lead to mortalities and reduced productivity for the industry. While antibody responses against unknown *C. forsteri* antigens have been identified, helminths are known to modulate the host immune response and transcriptional studies have indicated minimal cell-mediated and inflammatory responses to *C. forsteri* infection.

Following published work on *Schistosoma mansoni* and *Fasciola hepatica*, the glycans of *C. forsteri* were characterised with the aim of identifying antigenic glycoconjugates and elucidating attachment, invasion, and immune evasion mechanisms. Adult C. forsteri specimens have been collected from the hearts of southern bluefin tuna, ranched in the lower Spencer Gulf. The glycome has been characterised for the first time by mass spectrometry in collaboration with Associate Professor Daniel Kolarich of Griffith University's Institute for Glycomics, following established protocols. The Institute for Glycomics has state-of-the-art mass spectrometry equipment for glycomic analysis and is a world centre for glycomics.

The collaboration between RMIT University (Lachlan Coff, Dr. Nathan Bott, and Associate Professor Paul Ramsland) and the Kolarich Laboratory at Griffith University's Institute for Glycomics will allow for the first glycomic analysis of an aquatic helminth and could encompass other parasites in the future. While often overlooked, a glycomic approach is crucial to gaining a better understanding of host–parasite interactions and could lead to the discovery of novel drug or vaccine candidates. This cross-disciplinary collaboration will bring together a diverse group of researchers, with expertise in fish parasitology, immunology, structural biology, glycobiology, and mass spectrometry. The research will lead to a series of publications, incorporating a variety of techniques, such as immunofluorescence, histology, mass spectrometry.

C. forsteri has a longstanding contribution to the Australian parasitology community, having first been described from Australian southern bluefin tuna in 2000. Likewise, its secondary host was discovered in Australian waters by ASP Council members Nathan Bott and Barbara Nowak in 2011. The discovery of praziquantel as an effective control measure by Barbara Nowak and colleagues in 2012 has since been implemented in Japanese, Mexican, and



Mediterranean bluefin tuna aquaculture and has reduced mortalities to below 1%. Therefore, further research into control measures is not only of immediate local relevance to the South Australian southern bluefin tuna ranching industry, but also of global relevance.

Research outcomes

Data collected from a visit to Institute for Glycomics the previous year suggested that *Cardicola forsteri*, unlike *S. mansoni*, does not synthesise 1–3 linked core-fucosylated N-glycans. This year, the ASP funded a second visit to the Institute for Glycomics, which had the following research aims:

1. to gain a consensus of *C. forsteri* N-glycans by repeating mass spectrometry analyses with exoglycosidase treatments;

2. to observe less abundant N-glycans in the MS2 spectra by repeating mass spectrometry analyses at higher concentrations, and;

3. to determine whether any glycans from the tuna blood meal were

ASP Researcher Exchange Travel Awards continued

contaminating the samples by characterising N- and O-glycans from whole haemolysed tuna blood.

Each of these aims were achieved, and preliminary results can be reported here. In addition to oligomannose and core-fucosylated N-glycans, like *S. mansoni, C. forsteri* synthesises core-pentose

N-glycans, which have been shown to induce host TH2 responses in vitro. Unusually, many of the

O-glycans appear to comprise hexuronic acids, which could represent a novel biosynthetic pathway. However, more data analysis is required to comprehensively characterise the O-glycans. The tuna blood profile was distinct from that of C. forsteri, and so contamination is unlikely to account for any observed structures. Additionally, some preliminary glycoproteomic data was collected, which will assist in future genome annotation work.

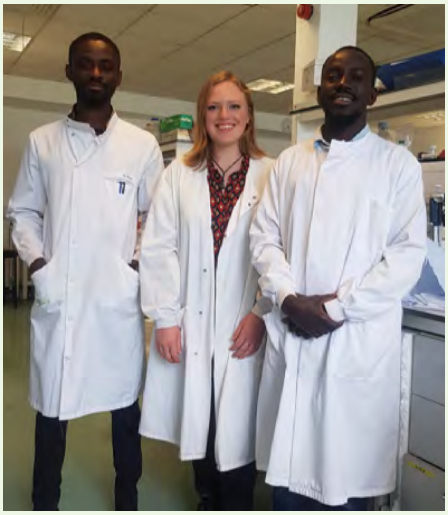
It is now my primary focus, and that of my colleagues at RMIT University and the Institute for Glycomics, to publish this data in a scientific journal. This publication will include micrographs of whole flukes stained with fluorescently labelled lectins, which indicate specific carbohydrate motifs, and the mass spectrometric data collected during this researcher exchange. The focus of this publication will be on glycans potentially relevant to host–parasite interactions, and how the glycome of C. forsteri differs to that of terrestrial trematodes.

More importantly for me, this experience has been invaluable for my personal and professional development. I have developed highly specialised skills in parasitology and glycomics by directly conducting a research project between two institutions. I have also made personal connections with researchers from another institution.

Sarah Jackson from Monash University reports on a visit to Professor Andrew Tobin's laboratory in Glasgow, Scotland.

As a 2018 Honours graduate from Professor Christian Doerig's laboratory at Monash University, I was fortunate to receive the ASP Network Research Exchange, Training and Travel Award. This Award allowed me to travel to Professor Andrew Tobin's laboratory at the University of Glasgow. The purpose of the exchange was to perform proteomics experiments on asexual blood stages of P. falciparum under drug treatment with a host-targeted kinase inhibitor. We also aimed to assess the proteomic profiles of parasite lines generated during my Honours project, which exhibit an intriguing drug-dependency phenotype. We also were able to show that this drug-dependency phenotype is linked to mutations in a specific gene in the parasite's genome.

This grant not only allowed me to complete the required treatments and learn proteomics techniques but also provided opportunities to develop my



skillset in parasite culture and molecular biology. It was a privilege to work with Professor Andrew Tobin, Dr Omar Janha and Dr Louis Dwomoh as leading researchers in their field; they provided excellent supervision and support during my stay. Additionally, completing my experiments at the University of Glasgow provided the opportunity to network with other researchers in fields not directly related to my own area of research. I was able to attend meetings of other laboratories, including Professor Matthias Marti, and listen to lab talks on P. falciparum gametocyte stages – an area I had not yet had much exposure to.

Glasgow is a beautiful city that is conveniently close to the highlands, I took tips from the lab team and made the most of the great weather I had during my Scottish stay on the weekends. I am incredibly grateful to have received this travel grant from ASP and for the training and time given by the Tobin laboratory

throughout the exchange – it has given me confidence and developed my skills to move forward into a future career in research before starting a PhD.

State News

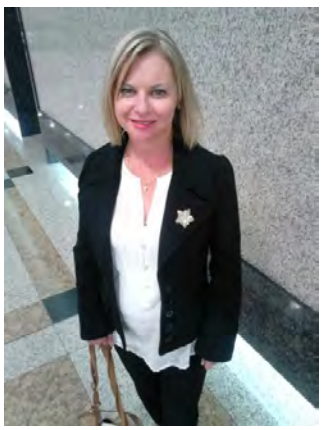
Western Australia

Murdoch University

Troublesome ticks

After some delays and logistical challenges, the NHMRC project "Troublesome ticks: Determining the aetiology of DSCATT in Australia" is at last underway. Based at the Vector and Waterborne Pathogens Research Group at Murdoch, this project aims to determine causation of tick-associated illness in humans in Australia and involves a prospective cohort study of tick-bitten patients, with two external control groups. A wide range of organic and inorganic parameters will be evaluated, including routine pathology, immune profiling, psychometric profiling, and the search for microbial associations using metagenomics, serology, virus isolation and tissue culture. Collaborating institutions are the Australian Rickettsial Research Laboratory, University of Queensland, Monash University and the Australian Red Cross Blood Donor Service, together with medical practitioners nationwide. Drs Amanda Barbosa and Jill Austen have been appointed to post-doctoral research positions on this project, that is being led by Profs Peter Irwin and Una Ryan, and Dr Charlotte Oskam

Below: Jill Austen and Amanda Barbosa



Tasmania

University of Tasmania

Jimena Balli Garza completed her PhD on molecular detection of tuna parasites. She graduated this December and is currently working for salmon industry.

Above: Dr Jimena Balli Garza with Professor Barbara Nowak.

New South Wales

University of New England

Tommy Leung

Read Tommy Leung's an article about parasites for the UNE Research Plus magazine https://blog.une.edu.au/uneresearch/the-hidden-world-of-parasites-unseen-stagehands-in-the-theatre-of-life/

University of Sydney

Laboratory of Veterinary Parasitology @ McMaster Building

Jan Slapeta

Read Jan Slapeta's blog post for the Bug Bitten blog – the official blog for the journal Parasites and Vectors – summarising his research group's recent paper about how climate change can affect potential changes in flea distribution throughout Australia. https://blogs.biomedcentral.com/bugbitten/2019/06/18/fleas-are-ready-for-a-climate-change/

Jan has added a new module to his horse parasitology course, with contributions from Nichola Calvani, Anne Beasley, Shokoofeh Shamsi and Kris Hughes. It can be accessed on the Best website at https://www.best.edu.au/lesson/?id=117718

State News continued

Northern Territory

Menzies School of Health Research

Grant

Menzies has been awarded a $2.9 million grant from ACIAR-DFAT for the project entitled 'Evaluating zoonotic malaria transmission and agricultural land use in Indonesia'. This 2.5-year project will be led by Dr Matt Grigg and will commence in early 2020.

Fellowship

Dr Kamala Thriemer was awarded a CSL Centenary Fellowship to develop and optimise treatment programs against vivax malaria in SE Asia and the Horn of Africa. The Fellowship will allow Kamala to generate country-specific roadmaps to guide public health programs. https://www.cslfellowships.com.au/fellows-archive/dr-kamala-thriemer-bio

Award

Dr Sarah Auburn received the Georgina Sweet Award for women in Quantitative Biomedical Science in recognition of her ground-breaking research on P.vivax genomic epidemiology. https://biomedicalsciences.unimelb.edu.au/news-and-events/georgina-sweet-awards-recipients-announced

Right: Sarah Auburn

Below: Lizard Island, Far North Queensland, where the ASP Treasurer Nathan Bott has been working in the field

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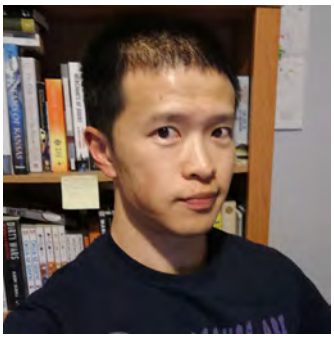

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