

Annual Report  
**2011**



ASP Network for Parasitology



# Introduction

## WE ARE DELIGHTED TO PRESENT TO YOU THE 2011 ANNUAL REPORT FOR THE ASP NETWORK FOR PARASITOLOGY

This year began with our move to James Cook University, including the negotiation of a new funding model with the ASP that ensures the Network is sustainable until at least 2014.

The Network continued to offer Researcher Exchange, Training and Travel Awards and its Mentorship Scheme in 2011. Additionally, scientific exchange opportunities for malaria researchers were provided via the OzeMalaR Researcher Exchange Scheme, which was administered through the Network. These small grants have proven ability to influence the careers of our young researchers and we are thrilled to see that, in 2011, several past recipients won fellowships or grants to fund their research work. The Network also took over administration of the ASP Student Conference Travel Grants in 2011, formalising these awards as true grants to students.

There were many highlights for Australian parasitology in 2011. The ASP continued to develop its new Strategic Plan

Lisa Jones,  
Communications Coordinator



Professor Nick Smith, Convenor,  
ASP Network for Parasitology.

and even began implementing elements of it, most notably, launching a spin-off journal from The International Journal for Parasitology – IJP:DDR, which will focus on Drugs and Drug Resistance. Parasitology research in Australia continued to flourish, with over 420 research papers published in 2011, more than 50 million dollars worth of grants awarded, and some very high honours bestowed on several ASP Members.

Parasites in Focus made its final journeys in 2011, travelling north from Wagga Wagga and being displayed in Townsville and Cairns throughout 2011 before being loaned permanently to the Queensland Museum at the end of the year. The hands-on exhibition, which comprises four totally interactive exhibits as well as the 26 spectacular photos and images, which were featured in Cosmos in 2009, boasts an audience of over 200,000 in its travel around Australia over the last 4 years.

The success of the Network is due to the energy, time and commitment of every participant but several deserve special thanks for their efforts in 2011. First, the Researcher Exchange, Training and Travel Assessment Committee had an exceptionally hard job in 2011, with a huge number

## Introduction cont.

of quality applications to consider and limited funding to dispense. Our thanks to Una Ryan (Chair), Andrew Thompson, Geoff McFadden, Malcolm Jones, Jake Baum, Rowena Martin, Kate Hutson, Brendan McMorran and Deb Holt. We also thank the OzeMalR Researcher Exchange Assessment Committee: Geoff McFadden, Denise Doolan, Ric Price, Chris Engwerda, Dominique Soldati-Favre, Andy Waters, Kevin Saliba and Klaus Lingelbach.

The Cairns 2011 Parasitology Conference was, again, a highlight of the year, attended by over 200 delegates. We are grateful to our terrific organising committee, Alex Loukas, David Blair, Wayne Melrose, Kate Hutson, Soraya Gaze, Jason Mulvenna, Annette Dougall and Con Constantinoiu. We are also extremely thankful to Jason Mulvenna and Kate Hutson for organising hugely successful training workshops on bioinformatics and fish parasitology, respectively, in Cairns in July. And, finally, we thank Jamie Seymour, Mal Jones, Alex Loukas, Charlene Willis and Peter O'Donoghue for a thoroughly entertaining and informative Public Event in Cairns in July, 2011 – Parasitic and Venomous Encounters in the Tropics – which enthralled over 300 members of the local public.



A handwritten signature in black ink, appearing to read 'Nick Smith'.

**Professor Nick Smith**  
Convener

A handwritten signature in black ink, appearing to read 'Lisa Jones'.

**Lisa Jones**  
Communications Coordinator

### Cover

Stephanie Godfrey studies parasites in the territorial reptile, tuatara (*Sphenodon punctatus*). Photo courtesy of Annabel Smith. Stephanie is profiled on page 13 of this report.

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## Summary of Goals and Objectives

### A SUMMARY OF THE OVERALL GOALS AND OBJECTIVES, PROGRAMS AND RESEARCH PRIORITIES AND ANY CHANGES TO THESE THAT MAY HAVE OCCURRED DURING THE PAST YEAR

#### Objectives

The mission of the ASP Network for Parasitology is to:

- focus and enhance Australia's fundamental, strategic and applied parasitology research capabilities to understand parasitism, parasite biology and parasitic disease; and
- to use that understanding to discover and develop sustainable control strategies to improve and maintain the health and well-being of humans and animals.

The Network aims to:

- organize, support and raise funds for conferences, workshops and meetings for scientists, industry representatives, end-users (e.g. farmers, veterinarians, wildlife experts), government representatives and community groups, including participation by international experts;
- foster and finance exchange of staff between national and international research institutions to maximise access to key infrastructure, equipment, expertise and supervision and to encourage the growth of new collaborative relationships;
- provide mentoring, training and grant writing support for young investigators.

#### Contribution to the National Research Priorities

Participants in the Network for Parasitology contribute to all four of Australia's stated research priorities (see publication lists in the appendices to this report):

#### [1] AN ENVIRONMENTALLY SUSTAINABLE AUSTRALIA.

By assessing the susceptibility to, and monitoring the prevalence of, parasitic disease in wildlife the Network will generate new information that will assist in the management of terrestrial and marine ecosystems. The specific objectives of the Network are to enhance and focus Australia's parasitology research effort in order to:

- assess parasite diversity in Australian fauna; and
- ensure the sustainability of wildlife and ecosystem health.

#### [2] PROMOTING AND MAINTAINING GOOD HEALTH.

The young and the elderly are the most susceptible to parasitic diseases, both in the developed and the developing world. To address this, the Network will focus on the development of new vaccines and treatments for local and global populations and the creation of new technologies to monitor and prevent contamination of waterways with infectious stages of zoonotic parasites (a key source of disease). The specific objectives of the Network are to enhance and focus Australia's parasitology research effort to:

- better understand host-parasite relationships; and
- discover and develop sustainable parasite control strategies.

#### [3] FRONTIER TECHNOLOGIES.

A central goal of the Network is the development of

## Summary cont.

new tools and information resources in the battle against parasitic diseases. The specific objectives of the Network are to enhance and focus Australia's parasitology research effort to:

- discover and develop molecular and bioinformatics tools for studying parasite biology; and
- discover and develop anti-parasite vaccines and therapies.

Prof. Una Ryan (Chair; Murdoch University), Lisa Jones (Communications and Strategic Planning Coordinator, Executive Officer), Prof. Nick Smith (Convenor, James Cook University), Prof. Geoff McFadden (University of Melbourne), Prof. Andrew Thompson (Murdoch University), Dr Rowena Martin (Australian National University), Dr Malcolm Jones (Queensland Institute of Medical Research and The University of Queensland), Dr Brendan McMorran (Menzies Institute, Tasmania), Dr Kate Hutson (James Cook University), Dr Jake Baum (Walter and Eliza Hall Institute of Medical Research) and Dr Deborah Holt (Menzies School, Darwin.)

### [4] SAFEGUARDING AUSTRALIA.

Surveillance of our border areas and neighbours for exotic, emerging and re-emerging parasitic diseases, as well as monitoring of endemic parasites is a key priority. The specific objectives of the Network are to enhance and focus Australia's parasitology research effort to:

- better understand the epidemiology and transmission dynamics of parasites; and
- discover and develop better surveillance systems.

## Governance

The Network Convenor and Communications and Strategic Planning Coordinator report directly to the ASP Council and are responsible for implementing the strategies and initiatives agreed with Council. The Network has a specific committee for assessing Researcher Exchange, Training and Travel Awards:

## Progress on Initiatives

### Website and Newsletter

The ASP website is administered by Dr Jason Mulvenna and Lisa Jones and the address is [www.parasite.org.au](http://www.parasite.org.au). The ASP Annual Conference website is [www.parasite.org.au/arcnet](http://www.parasite.org.au/arcnet) and administered by Lisa Jones. The ASP Newsletter was published three times in 2011 keeping ASP Members up-to-date on developments and opportunities afforded by the ASP, the ASP Network and achievements of ASP members. Newsletters can be downloaded from the ASP website.

### Scientific Conferences and Workshops

**The 2011 annual meeting of the Australian Society for Parasitology Inc. was held at the Pullman Reef Casino Hotel, Cairns, Queensland, 10-13 July 2011 it was an outstanding success and attracted 205 International and Australian delegates.**

#### An overview of the event

The program was centred around the "One Health" concept integrating tropical parasitology for both animal and human health and the conference program included the following themes and invited speakers:

#### Headline Speaker

Patrick Lammie (Centres for Disease Control, USA)

#### "One Health"

Felix Guerrero (US Dept. of Agriculture)  
Peter Deplazes (University of Zurich)  
Mike Grigg (NIH, USA)  
Deb Holt (Menzies School of Health, NT)  
Andrew Thompson (Murdoch University)

#### Elsevier Lectures

Karl Hoffman (Aberystwyth University)  
Ricardo Gazzinelli (Universidade Federal de Minas Gerais & University of Massachusetts)

#### Tropical Marine Parasitology

David Blair (James Cook University)  
Rob Adlard (Queensland Museum)  
Nico Smit (North-West University)

#### Malaria

Balbir Singh (University Malaysia Sarawak)  
Stephen L. Hoffman (Sanaria Inc.)  
Stephen Rogerson (University of Melbourne)

#### Tropical Veterinary Parasitology

Con Constantinoiu (James Cook University)  
Brian Cooke (Monash University)  
Annette Dougall (James Cook University)

A free public event "Parasitic and Venomous Encounters in the Tropics" was held on Sunday 10th July at 6pm and audience numbers approximated 400 (including 300 members of the public).



## Progress on Initiatives cont.

### Event promotion

2011 ASP Annual Conference was promoted directly to the membership of the Australian Society for Parasitology Inc. (approximately 550 members) through the Society Newsletter and through regular email alerts for 12 months prior to the event.

The conference was also promoted through other societies, like the Australian Society for Microbiology (ASM), the Australian College for Tropical Medicine (ACTM), and Networks like the Queensland Tropical Health Alliance (QTHA) as well as Australian Institutes, Universities and Organisations with an interest in parasitology research. Promotion was via email notification and promotion on websites.

"Parasitic and Venomous Encounters in the Tropics" public event was promoted through print media with an advertisement in the Cairns Post on Sat 2<sup>nd</sup> July 2011 and this resulted in more free publicity as the Cairns Post ran another article mentioning the event in the following weekend paper. Local radio stations also picked up the advert and promoted the event with short mentions and interviews prior to and during the conference. The public event was also advertised in three community on-line event listings for the Cairns area.

For the first time this year in conjunction with the ASP conference, two **ASP Workshops** were held the weekend

prior to the 2011 ASP Annual Conference at James Cook University, Cairns Campus. These workshops were offered to students and early career researchers and other researchers. Postgraduate students were able to participate in either a Bioinformatics workshop, run by Jason Mulvenna, QTHA/JCU, or a Tropical Marine Parasitology workshop, run by Kate Hutson, JCU. Participating students have reported that both workshops were a wonderful learning opportunity, exceptionally well run and great fun. Some comments from workshop attendees:

"I learnt useful skills for the future e.g. how to use command-line programs to simplify the workload for processing a very large raw dataset. I learnt new jargon that has helped me to be able to discuss bioinformatics topic with colleagues."

"Best aspect? How the many different groups of parasites were discussed during the seminar part of the workshop, rather than just focusing on one group. This held my interest. I also enjoyed hearing from the international invited speakers, but I would have to say the best aspect was the afternoon practical session, it was informative and enjoyable."

"It was fantastic and I am glad I went!"

"The workshop allowed me to look at different groups of parasites rather than just trematodes (which is what I focus on)."



### ASP Annual Conference, Cairns 2011

Previous page: Geoff McFadden, Michael Duffy, Kathy Andrews, Mike Griggs, Jan Slapeta, Victoria Morin-Adeline

This page: Peter Deplatzes

Following pages: Professor and Mrs Peter O'Donohue, Lesley Warner, Kate Hutson, Maureen Engler, Terry Spithill, Graham Mitchell



## Progress on Initiatives cont.



"I learnt a lot of new things which was good"

**A "Bioinformatics" workshop was held Saturday 9 & Sunday 10 July 2011, James Cook University, Cairns Campus, Queensland, Australia and attended by 13 participants.**

This workshop was aimed at biologists with basic bioinformatics expertise and was comprised of four half-day sessions covering the following topics:

**1. Analysis and interpretation of mass spectrometry data.** In this module several different algorithms for searching tandem mass spectrometry data were examined (including Mascot, X! Tandem and OMSSA), including the theory behind the algorithms and practical exercises in performing searches. Other topics included search validation using PeptideProphet and ProteinProphet, statistical methods used to validate protein identifications and protein quantitation techniques using mass spectrometry, including label free and isobaric tagging methods. The workshop was designed to provide a theoretical background to the concepts behind protein identification using mass spectrometry as well as practical experience in the techniques discussed.

**2. A practical, bioinformatic workflow for the semi-automated analysis of large sequence datasets generated by next-generation sequencing.** In this session, individual components of a practical bioinformatic

workflow system for the semiautomated analysis of large transcriptomic datasets generated by next-generation sequencing were presented through remote connection to a server located at the Department of Veterinary Science, University of Melbourne (Gasser Lab). These components included assembly of large-scale nucleotide sequence data, sequence annotation and characterisation using information available in public databases, prediction and annotation of putative peptides, probabilistic functional networking of protein-encoding genes and prediction of essential molecules and putative drug targets. This workflow was intended to guide biologically meaningful analyses of large-scale sequence datasets in a time-efficient manner and is designed for researchers with basic bioinformatic expertise.

**3. A practical bioinformatics-flavoured introduction to data retrieval, storage, manipulation and presentation using Python.** In this session the scripting language Python was introduced and used in practical exercises illustrating techniques for the retrieval, storage and manipulation of massively large datasets.

**4. Parasite epidemiology.** This session was an introduction to epidemiology (including basic biostatistics) and data management. It enabled the parasitologist to interpret epidemiological publications and understand the principles of epidemiology for translation of work from the bench to field (specifically how to design, conduct and analyse epidemiological field trials). The session was informal and consisted of both theoretical and practical sessions. The practical session focussed on basic analyses using SPSS.

## Progress on Initiatives cont.



The instructors were Jason Mulvenna (QTHA) covering mass spectrometry, Cinzia Cantacessi (Uni. of Melbourne, Gasser Lab) covering next generation sequencing, Tim McComb (UQ and Ansaldo STS) covering python scripting and large datasets and Darren Gray (QIMR, McManus Lab) covering epidemiology. All of the presenters have a wealth of experience and have published extensively in their respective fields.

**Aquatic Parasitology Workshop: Detection and Diagnosis** was held in between two relevant events both being held in Cairns; The First Australasian Scientific Conference on Aquatic Animal Health (5-8 July) and the Australian Society for Parasitology Conference (10-13 July). Consequently, a number of aquatic animal health experts were in Cairns in July, enabling a tremendous opportunity to hold an Aquatic Parasitology Workshop. The workshop was a single intensive day held on Sunday 10th of July 2011 and attended by 40 participants. This workshop was supported by James Cook University, the Australian Society for Parasitology, Fisheries Research and Development Corporation and the Australian Biological Resources Study.

**The nature of the workshop** The aim of the workshop was to provide a program with broad appeal for marine parasitologists, veterinarians, aquaculture industry representatives, researchers and students and to share knowledge of practical methods used to best determine parasitic infections in aquatic animals with approximately equivalent seminar and laboratory time.

### Participants:

- Learnt how to recognise signs of parasitic infection and disease;
- Gained insight into the common microhabitats of major parasitic groups;
- Identified major parasitic groups in fresh and preserved material;
- Learnt and practiced methods to isolate and prepare quality specimens; and
- Expanded their aquatic parasitology network in Australia.

The workshop was organised and chaired by Dr Kate Hutson (James Cook University) and morning presentations were given by the following experts on major parasite groups:

Barbara Nowak, University of Tasmania (Protozoans);  
Rob Adlard, Queensland Museum (Myxozoans);  
Scott Cutmore, University of Queensland (Cestodes);  
Terrance Miller, Queensland Museum (Digeneans I);  
Kate Hutson, James Cook University (Digeneans II);  
Ian Whittington, South Australian Museum (Monogeneans);  
Shokoofeh Shamsi, Charles Sturt University (Nematodes);  
International invitation: Nico Smit, North-West University, South Africa (Isopods);  
Bob Lester, University of Queensland (Parasites as biological tags);  
Andreas Lopata, James Cook University (Immune response);  
and  
Nathan Bott, South Australian Research and Development Institute (Molecular methods).

In the afternoon, participants moved to the laboratory and practised necropsy, identification and preservation methods using fresh fish specimens. Presenters from the morning were available to demonstrate specific techniques in the laboratory and to talk with delegates.

**Laboratory Session** Convenors: Kate Hutson and David Blair also assisted by; Tom Cribb, Scott Cutmore, Bob Lester, Andreas Lopata, Shokoofeh Shamsi, Nico Smit and Ian Whittington.

## Progress on Initiatives cont.

### First International *Chromera* workshop

November 2011 saw the First International *Chromera* workshop take place, organised by **Prof Geoff McFadden** (University of Melbourne) and **A/Prof Dee Carter** (University of Sydney). The 2008 discovery of a new group of coral symbionts known as chromerids was hailed as one of the most significant microbiological finds of the decade. Related to apicomplexan parasites, like the malaria parasite, chromerids are photosynthetic organisms believed to live in corals. Apicomplexans may have been originally photosynthetic and likely evolved from a photosynthetic symbiont like chromerids so these fascinating algae fill in a missing link in the evolution of malaria parasites.

From 21-25 November, 2011 twenty chromerid biologists from all corners of the world gathered at Heron Island Research Station on Australia's Great Barrier Reef to share their findings, collect chromerids and immerse themselves in the wonderful ecosystem of a coral quay with nesting seabirds and turtles.

More Images of this highly enjoyable and successful meeting are online at [http://www.geoffmcfadden.com/McFadden\\_Lab/Chromera\\_workshop.html](http://www.geoffmcfadden.com/McFadden_Lab/Chromera_workshop.html)



## Progress on Initiatives cont.

### Researcher Exchange, Training and Travel Awards

In 2011, the ASP Network for Parasitology funded 22 new Researcher Exchange, Training and Travel Awards.

#### JD Smyth Travel Award winners

**Philippa Sharman** (James Cook University) for a Researcher Exchange to National Institute for Agriculture Research (INRA), France

**Laura González Poblete** (University of Tasmania) for a Researcher Exchange to study salmon parasites as reservoirs of salmon pathogens in Universidad de Chile (Prof. Pedro Smith) and ISA virus identification and analysis of Oceanographic parameters in Universidad de Concepcion (Dr. Rodrigo Gonzalez).

**Sarah Catalano** (University of Adelaide) for a Researcher Exchange to visit the laboratory of A/Prof Hidetaka Furuya, Osaka University, Japan March 2012

#### Network Researcher Exchange, Training and Travel Award winners

**Bjoern Schaeffner** (University of Melbourne) for a Researcher Exchange to University of Connecticut, U.S.A. for 7th International Workshop for Cestode Systematics and Observation of trypanorhynch material deposited at the University of Connecticut in the laboratories of Prof. Janine Caira

**Megan Dearnley** (La Trobe University) to attend the Woods Hole Biology of Parasitism Course in June 2011.

**Wan Hon Koh** (Murdoch University) for a Researcher Exchange to the University of Technology, Sydney to learn the latest microscopy techniques.

**Victoria Valdenegro** (University of Tasmania) to participate in the Fish Immunology Workshop, Wageningen University, The Netherlands.

**Kylie Easton** (Australian National University) for a Researcher Exchange with Prof Mack, Institut für Technische

Mikrobiologie, Mannheim, Germany and with Prof Cotini, Section of Infectious Diseases, Dept Clinical and Experimental Medicine, University of Ferrara, Italy, to study malaria biology.

**Haylee Weaver** (Australian National University), pictured left, for a Researcher Exchange to the laboratory of Prof Denis Richardson, Quinnipac University, Connecticut and to work with specimens at the University of Nebraska, U.S.A.

**Stephanie Godfrey** (Flinders University) for a Training Course to attend Ecology and Evolution of Infectious Diseases: Workshop on Modeling and Data Analysis University of California, Santa Barbara, U.S.A.

**Ian Whittington** (University of Adelaide) for a Researcher Exchange to network with, and collaborate on, primitive, blood-feeding fish parasites with Brazilian researcher, Professor Marcus Domongues.



**Gillian Fisher** (Griffith University) for a Researcher Exchange Training in the expression and purification of recombinant *P. falciparum* proteins at the CSIRO Melbourne in Tom Peat's laboratory.

**Nancy Trieu** (University of Queensland) for a training course in Marine Parasitology at James Cook University, Cairns.

**Christie Foster** (University of Sydney) for a training course in Bioinformatics at James Cook University, Cairns.

**Victoria Morin-Adeline** (University of Sydney) for a training course in Marine Parasitology at James Cook University, Cairns.

**Elizabeth Zuccala** (Walter and Eliza Hall Institute) for a World Practical Course on Microscopy: Imaging Infection – From single Molecules to Animals (CSIR, South Africa) Gene Expression & Biophysics Group, The Council for Scientific and Industrial Research (CSIR) Pretoria, South Africa.

**Hamish McWilliam** (Monash University) for a Researcher Exchange to visit Prof Yuesheng's lab at the Hunan Institute of Parasitic Diseases, China.

**Alexandra Umbers** (University of Melbourne) based in



## Progress on Initiatives cont.

Madang, Papua New Guinea for a Researcher Exchange to visit the laboratories of Dr Jocelyn Glazier and Professor John Aplin, Fetal and Maternal Health Research Centre, University of Manchester.

**Angelika Sturm** (School of Botany, University of Melbourne) for the Monash Micro Imaging Training course, Imaging facility of Monash University, Melbourne.

**Barbara Nowak** (University of Tasmania) Researcher Exchange to support visit from Prof Chris Secombes, University of Aberdeen, Feb-March 2012.

**Charlene Willis** (Queensland Institute of Medical Research), pictured below, Researcher Exchange to visit the laboratory of Conor Caffery UCSF, University of California to learn RNA interference in schistosomes.

**Michaela Petter** (Department of Medicine, RMH/WH, University of Melbourne) for a Training Course Life Cell Imaging Workshop at Monash University.

### Some Examples of Outputs

The Network for Parasitology provided Major **Alyson Auliff** from the Australian Army Malaria Institute with travel funds to study at the University of Notre Dame in Professor John Adams laboratory for the period of 27<sup>th</sup> October 2006 to the 12<sup>th</sup> Dec 2006. The purpose of her visit to the University of Notre Dame was to develop new skills that would allow Alyson to transfect *P. vivax dhfr* genes into *P. falciparum*

using the *piggyBac* system.

The travel scholarship from the Network for Parasitology led to a strong collaboration with Professor John Adams (now at the University of South Florida), which further led to Alyson's 2009 Australian-American Fulbright Queensland fellowship to continue the above *piggyBac* research. The results that she was able to achieve through the support of both the Network for Parasitology travel grant and her 2009 Fulbright scholarship led to recent R21 National Institutes of Health research grant between the Australian Army Malaria Institute and Professor John Adams laboratory at the University of South Florida to continue developing the *P. falciparum piggyBac* transfection system to study other *P. vivax* genes that may be responsible for drug resistance.

**Natalie Spillman** (ANU) used data generated from her Researcher Exchanges to the Department of Biochemistry, La Trobe University to both Alex Maier's and Nick Klonis' laboratories in her PhD thesis which was submitted in December 2011.

In 2007 **Philippe Boeuf** (University of Melbourne) won a Network Travel Award for a Researcher Exchange to visit laboratory of Prof Colin Sibley and Dr Jocelyn Glazier at St Mary's Hospital, Manchester University. Philippe taught this adhesion assay method to his student. He presented his research findings at BioMalPar (EVIMalaR) and Centre for Medical Parasitology (Copenhagen) seminar series in 2011. An NHMRC project grant resulted from this Researcher Exchange NHMRC Project Grant as CIA awarded (2011-2013), and new collaborations were initiated with Pr Stefan Magez (VIB, Brussels, Belgium) and A/Pr Ali Salanti (Copenhagen, Denmark) and Dr Fabio Costa (University of Sao Paulo).

To build on the research conducted during her Researcher Exchange at the Bernhard Nocht Institute (BNI) **Megan Dearnley** (Bio21/University of Melbourne) and colleagues are continuing a collaborative project with Tim Gilberger's group investigating the genesis of several inner membrane complex proteins in early gametocyte development. This will include utilizing the Advanced Microscopy Facility at the University of Melbourne to image early stage gametocytes using Structured Illumination Microscopy.





## Progress on Initiatives cont.

### CASE STUDY 1: STEPHANIE GODFREY

**Stephanie Godfrey and Mike Bull (Flinders University), and Jennifer Moore and Nicola Nelson (Victoria University of Wellington) published their article, "Social network structure and parasite infection patterns in a territorial reptile, the tuatara (*Sphenodon punctatus*)," in the November 2010 issue of The International Journal for Parasitology. Stephanie has just graduated with a PhD from this research and talks to Lisa Jones about her work.**

"My research is based on a theme of understanding how host-social organisation influences parasite transmission," Stephanie said. "We have been studying a reptile called the tuatara (*Sphenodon punctatus*). Tuatara are thought to be most interesting from an evolutionary perspective; they represent a rather primitive lineage of reptiles that is thought to be a sister lineage to snakes and lizards. Plus, they look fairly similar to fossils from 200 million years ago. However, I think they are even more interesting from an ecological perspective – they may live for over 100 years, have long generation times of 40-50 years and, are active at temperatures that most other reptiles wouldn't be. They have a really slow life history, taking at least 15 years to reach sexual maturity – most of the animals I was studying were probably older than me! On average, females reproduce only every four years, eggs take more than a year to incubate, and their sex is determined by temperature, with higher temperatures producing more males. And, despite their really slow approach to life, they have survived millions of years," Stephanie said.

"Although they were once distributed across the mainland of New Zealand, the introduction of mammalian predators, which didn't exist in New Zealand until the arrival of humans, and habitat alteration caused their extinction on the mainland. They have been able to survive on offshore islands that don't have mammals introduced to them – these islands are their last refuge," she said.

Stephanie explained the importance of the work she has been doing for the last 3 years: "Although a fair body of research has been done on the unique aspects of the biology of tuatara, such as their 'third' eye, and their



reproductive biology, very little is known from an ecological perspective, particularly with regard to their parasites. My PhD project was a part of a larger project, in collaboration with Victoria University of Wellington, aimed at increasing our understanding of the ecology of the tuatara, particularly in context of their conservation."

Stephanie said, "We've been working on Stephens Island, located in the middle of Cook Strait, which is home to the largest population of tuatara – it's estimated that 30-50,000 tuatara live on this 150 hectare island. Access to the island was via helicopter - we would catch a 40 minute helicopter flight from Wellington, through the beautiful Marlborough Sounds. Since Stephens Island has been protected from the introduction of mammal predators, there are many other animals that survive on Stephens Island that aren't common on the mainland either. It makes it a very special place to spend months at a time doing research!"

Tuatara live in a solitary territorial system, where individual tuatara defend their own territory, and have small amounts of overlap with neighbouring territories – which may allow the transmission of parasites among hosts. Stephanie wanted to find out how this social structure might influence parasite burdens of tuatara, using social networks to model the potential pathways for parasite transmission within the population.

Tuatara are infected by ectoparasitic ticks (*Amblyomma sphenodonti*), mites (*Neotrombicula* spp.) and a blood

## Progress on Initiatives cont.

parasite (*Hepatozoon tuatarae*), which is transmitted by the tick. Stephanie found that ticks and the blood parasites they vector were strongly associated with the social network of the tuatara but mites weren't. "Tuatara that were more strongly connected to others within the network had higher tick burdens. The ticks are host specific to tuatara, and only spend short periods in the off-host environment whilst moulting, and waiting for a new host. However, because mites are free living for a longer period of their lifecycle, they have a reduced dependence on their host – put another way, because mites are only parasitic in their larval stage whilst ticks are wholly parasitic, social networking is more important for ticks. Our results therefore suggest that social networks provide a powerful predictive tool for transmission dynamics of some parasites," Stephanie said.

In addition to the collaboration with Victoria University of

Wellington, Stephanie and Mike also worked with Jens Krause at the University of Leeds and Dick James at the University of Bath, who are both experienced in social network analysis – Stephanie received an ARC/NHMRC Research Network for Parasitology Researcher Exchange Travel Award for a trip to the UK to learn how to apply social network analysis to her research system. Stephanie is still researching social networks – she is now investigating the sleepy lizard, a pair-living lizard that, theoretically, should throw up quite different scenarios of parasite transmission. We wish Stephanie all the best for her future research and wait to hear about the next instalment in the social networks system story.

Download the IJP article at <http://www.sciencedirect.com/>

## Australia – Europe Malaria Research Cooperation



### OzEMalaR Travel Award Scheme

The NHMRC has provided OzEMalaR with funds to support exchange between Australian malariologists and members of EVIMalaR (European Virtual Institute of Malaria Research) through the Australia Europe Malaria Research Cooperative Travel Award Funding Assistance. Funding Assistance is available for Postdocs and PhD students to undertake research for short periods in European labs as part of their project. More senior investigators are also eligible for support where the primary objective is collaborative research.

### OzEMalaR Travel Award winners

In **2011** there were four funding rounds for the OzEMalaR Travel Award Scheme. The Assessment Committee awarded

**12** Travel Awards for Researcher Exchange Travel and Training. The winners for 2011 were:

**James McCarthy** (Queensland Institute of Medical Research) Researcher Exchange to visit Professor Robert Sauerwein, The Radboud University Nijmegen Medical Centre, Netherlands 7-11 March 2011. The purpose of this visit is to further enhance collaboration on experimental human malaria infections.

**Vanessa Mollard** (McFadden Laboratory, School of Botany, University of Melbourne) Researcher Exchange to visit A/ Professor Robert Ménard at the Pasteur Institute in Paris for three weeks 3 – 24 September 2011 and Professor Bob Sinden at the Imperial College in London 25-28 September 2011 to study both institutions mosquito husbandry and infection (*P. berghei* and *P. falciparum*) techniques to incorporate into their insectary.

**Melanie Rug**, (Walter and Eliza Hall Institute for Medical Research) Researcher Exchange to visit Drs. Marek Cyrklaff and Freddy Frischknecht, Department of Parasitology, University of Heidelberg, Germany to look at how proteins

## Progress on Initiatives cont.

that are exported beyond the confines of the malaria parasite are trafficked to their final destinations within the infected host erythrocyte. 1 – 21 May 2011.

**Clare Smith** (Menzies Research Institute, Foote laboratory). Researcher Exchange to visit Professor Odile Puijalon, Pasteur Institute, Paris, France 2nd July – 12th Aug 2011. The work conducted in the researcher exchange will validate if the Fech enzyme can be targeted as a novel host-directed antimalarial therapy.

**Megan Dearnley** (La Trobe University, Melbourne/Tilley lab) Researcher Exchange to visit Bernhard Nocht Institute for Tropical Medicine collaborating with Prof. Tim Gilberger and Dr. Tobias Spielmann and strengthen microscopy skills August 22nd – September 16th, 2011.

**Jo-Anne Chan** (James Beeson's lab, Burnet Institute) Researcher Exchange to visit Malaria Centre laboratories London School of Hygiene and Tropical Medicine, UK to gain experience with the *P. falciparum* gametocyte culture techniques and measurement of human antibodies to gametocytes using flow cytometry. 1 August 2011 – 1 October 2011.



**Phuong Ngoc Tran** (La Trobe University, Dr. Alex Maier's lab) Researcher Exchange to visit Professor Kai Matuschewski's lab, Parasitology Unit, Max Planck Institute for Infection Biology, Berlin, Germany. 29/03/2012 to 27/04/2012

**Jutta Marfurt**, (Menzies School of Health Research /Global and Tropical Health Division) To attend a Training Course with the Mahidol-Oxford Research Unit (MORU), Faculty of Tropical Medicine, Mahidol University, Bangkok (en route to the UK to participate in Sanger advanced course on "Genomic Epidemiology of Malaria", taught at Mahidol-Oxford Research Unit (MORU), Bangkok, Thailand 27 November – 2 December 2011) and Researcher Exchanges to London School of Hygiene & Tropical Medicine (LSHTM), London, UK, 3 – 8 December 2011 and then Wellcome Trust Sanger Institute (WTSI), Hinxton, UK; 8 – 14 December 2011.

**Michaela Petter** (Department of Medicine, RMH/WH, University of Melbourne) Researcher Exchange to visit A/Prof Till Voss from the Swiss Tropical and Public Health Institute, currently visiting at Nanyang Technological University (NTU) Singapore 4th -18th December 2011.

**Ashraful Haque** (Christian Engwerda's Immunology and Infection Laboratory at QIMR, Brisbane) Researcher Exchange to Dr. Oliver Billker, Malaria Programme, & Prof. Gordon Dougan. Wellcome Trust Sanger Institute, Hinxton, United Kingdom April 2012

**Jake Baum** (Walter & Eliza Hall Institute) Researcher Exchange to visit Pasteur Institute, Paris 1st June 2012 to 31st July 2012

**Michael Duffy**, (University of Melbourne, Dept of Medicine, Duffy/Brown) Researcher Exchange to visit Centre for Medical Parasitology, University of Copenhagen, Denmark, laboratory of Prof. Thor Theander, 12 July – 15 September

Left: Vanessa Mollard performing mosquito dissections while on a Researcher Exchange visit to the laboratory of A/Professor Robert Menard at the Pasteur Institute in Paris

## Progress on Initiatives cont.

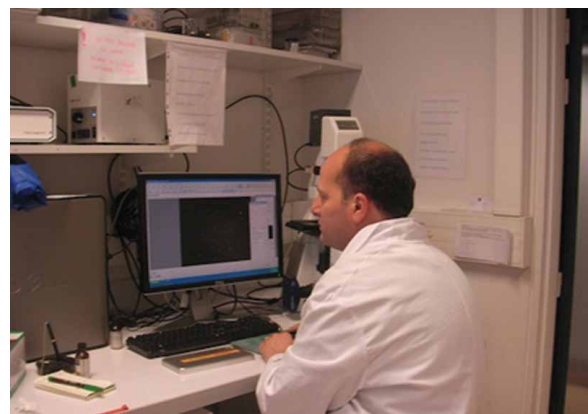
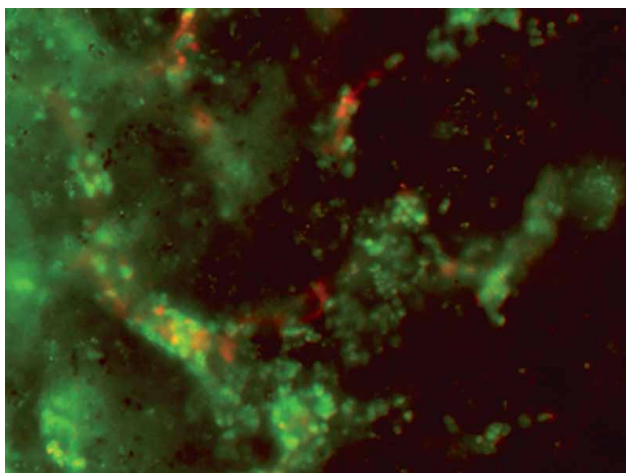
### CASE STUDY 2: DR GAETAN BURGIO

**In November 2010, Gaetan Burgio of the Menzies Research Institute, Tasmania, spent an intensive week and a half working in the malaria biology unit at Pasteur Institute, Paris with Prof. Robert Menard's group.**

Gaetan spent time working on mosquitoes; performing and analysing live imaging on infected mice with *P. berghei*, with Dr Joana Tavares. He performed live imaging at early stages of the *Plasmodium* infection, and on the liver stage using a confocal microscope Axiovert 200 (Zeiss inc) equipped with a spinning disk system (Perkin Elmer ultra view ERS, Perkin Elmer inc).

"We focused our studies on the liver stage of the infection, 30 minutes after IV injection of sporozoites. We visualized the sporozoites' invasion in the blood stream in a naïve mouse. In addition to these experiments, Dr Pascale Guierard and I also performed experiments using a fluorescent live imaging microscope and two-photon microscope to visualise the invasion of sporozoites in the blood stream after injection into the ear," said Gaetan

Dr Rogiero Amino and Gaetan have begun work to collect preliminary data for a project to assess parasite sequestration during malaria infection in ENU-induced mice that are resistant to malaria. For this purpose, they performed live imaging experiments on the spleen of infected mice with



*GFP-P. berghei* using the Axio Observer Z1 fluorescent microscope and a splenic fenestration technique to enable *in vivo* imaging under the fluorescent microscope at low excitation levels. The results showed considerable parasite sequestration, especially at the peak of the infection, encouraging the scientists to go further with their spleen sequestration project.

"At the end of this research exchange program at Pasteur Institute, Dr Amino and Pr Menard suggested that we should collaborate more closely during the next few months, especially on the live imaging of spleen sequestration during malaria infection. As a result of this decision, I will import to the Menzies Research Institute, Tasmania, GFP-parasite lines (*P. yoelii* and *P. berghei*). This will enable me to start working on parasite sequestration using live imaging in our ENU-induced mice that are resistant to malaria. I have also included some of the preliminary data in an ARC discovery grant proposal. I am also planning to spend more time on this specific project at Pasteur Institute for the next Researcher Exchange program," said Gaetan, adding, " This research program was incontestably a success for me".

Above: Gaetan Burgio working in Robert Menard's lab at Pasteur Institute using the Axio Observer Z1 (Zeiss Inc)  
Left: Parasite sequestration in the mouse spleen during infection with *P. Berghei* with 27% of infected red cells in the blood stream. The green spots mean sequestered parasites *P. Berghei* whereas the red spots represent circulating parasites.



## Progress on Initiatives cont.

### CASE STUDY 3: NANCY TRIEU

**Nancy Trieu, an Honours student from the University of Queensland, was awarded a Researcher Exchange Award and travelled to James Cook University in Cairns to attend the Aquatic Parasitology Workshop in July 2011.**

The Aquatic Parasitology Workshop attracted many experts, both nationally and internationally, who research aquatic parasites such as protozoans, myxozoans, cestodes, digeneans, monogeneans, nematodes, isopods and the important use of molecular tools in this field. The day started with a number of short lectures from experts in their field of research. A practical, hands-on session followed which allowed researchers and students to learn how to dissect a fish, identify infections and try to identify any parasites found.

"My Honours project is supervised by Dr Tom Cribb," said Nancy. "and therefore, I am focused mainly on trematodes. Being able to attend this workshop has given me the chance to increase my knowledge of other aquatic parasites which I am not currently researching. The lectures have widened my understanding of aquatic parasites, their associated pathology and opened my eyes to the diversity that is

actually out there.

"The practical session has taught me many new skills. My research only focuses on parasites within the stomach of a marine teleost, with very little focus on other parasites in other parts of a fish. I was shown how to remove and prepare muscle tissue to detect myxosporean infections. I learnt how to remove the heart to find blood flukes and also how to do a brain tissue squash to find cysts.

"In addition to the practical skills that I have developed, I was able to interact with other students and researchers. This was the first time that I had this kind of interaction with the scientific community outside of university. The workshop allowed me to start networking with other researchers and may lead to future post-graduate studies.

"I'd like to thank Australian Society for Parasitology for providing me with this Award. The grant has helped me financially with the cost related to attending the workshop. The workshop was a fantastic experience; I learnt new skills and developed networks with other researchers and students."





## Significant Contributions and Highlights for 2011

### 2011 WAS ANOTHER YEAR OF RECONITION FOR AUSTRALIA'S PARASITOLOGY STARS.

2011 saw an outstanding scientist made a Fellow of the ASP: **Alan Cowman** (The Walter and Eliza Hall Institute of Medical Research). It was a very big year for Alan who was also honoured by the Royal Society. The Royal Society was established in 1660, and Fellows include such prominent scientists as Sir Charles Darwin and Sir Isaac Newton, and Australians, Sir Macfarlane Burnet and Sir Gus Nossal. Alan also won the 2011 NHMRC Research Fellowship Achievement Award and led a team that included **Julie Healer, Sash Lopaticki, Wai-Hong Tham, Jennifer Thompson and Tony Triglia**, awarded the 2011 Eureka Prize for Infectious Disease Research, for their outstanding malaria research.

Several other ASP members featured in the Eureka Prizes; **Alex Maier** was a finalist in the People's Choice category for his malaria research, while the hookworm vaccine research team of **Alex Loukas, Mark Pearson, Naiju Ranjit and Mai Tran** were finalists in the Infectious Disease category.

The ASP recognised three of its young rising-stars by awarding them a JD Smyth Award: **Philippa Sharman** (James Cook University), **Laura Gonzalez Poblete** (The University of Tasmania) and **Sarah Catalano** (The University of Adelaide).

The Society also recognized the research achievements of several outstanding students and early career researchers at its 2011 conference: the ASP Early Career Researcher Awards went to **Charlene Willis** (Queensland Institute of Medical Research) and Best Student Presentation Prizes went to **Showgy Ma'ayeh** (Monash University), **Rina Wong** (The University of WA), **Josh Sweeny** (Murdoch University), **Ashlie Hartigan** (The University of Sydney) and **Sarah Catalano** (The University of Adelaide).

The ASP also recognized three excellent international colleagues with ASP 2011 International Invited Lectureships:

**Prof. Peter Deplazes** (University of Zurich, Switzerland) an internationally recognised expert on veterinary parasites;

**Prof. Karl Hoffman**, (Aberystwyth University, Wales, UK) a leading helminth biologist; and

**Dr Michael Grigg** (National Institutes of Health, Bethesda, USA), a leader in research on toxoplasmosis.

Other ASP Members honoured in 2011 included:

**Leann Tilley** (The University of Melbourne), who was the 2011 recipient of the ASBMB's Beckmann Coulter Discovery Science Award;

**Geoff McFadden** (The University of Melbourne), who was one of the 2011 Australian Academy of Science's "Fenner's Sceinec Today and Tomorrow" Lecturers; and

**Clare Smith** (The University of Tasmania) who was one of the few medical research students worldwide selected to attend the 61<sup>st</sup> Nobel Laureates Meeting.

### AN INTERVIEW WITH ALAN COWMAN

**Professor Alan Cowman, from the Walter and Eliza Hall Institute of Medical Research (WEHI), was made a Fellow of the Australian Society for Parasitology Inc. on July 13, 2011. Shortly afterwards, Alan was made a Fellow of the Royal Society. Alan said, "I'm very pleased to be made a Fellow of the ASP. I've been an ASP member for a long time and have tried to contribute and I'm really pleased to be recognised."**



Image by WEHI

Alan spoke further with Lisa Jones about his research career and the things that have affected his path as a parasitologist.

*Tell us how you become involved in parasitology research?*

## Significant Contributions cont.

"I grew up in Brisbane and studied at Griffith University. After my Bachelor degree, I decided I wanted to go somewhere else to do a PhD, so I wrote to Dave Kemp and Susan Cory at WEHI and also to people in the Molecular Biology Department at The University of Adelaide". Ultimately, Alan could have gone to either place but chose WEHI and started his PhD in 1980.

"My PhD research involved studying immunoglobulin genes with Dave Kemp," recalls Alan, "And my path to parasitology was a bit convoluted, working with *Drosophila* with Dave Kemp and Rob Saint (then at University of Adelaide) followed by a 2-year post-doctoral role with Gerald Rubin at the University of California, Berkeley, before really getting into malaria research full time. But malaria had always been on my mind as something really interesting and significant to study, probably partly because Dave was making a switch to parasitology research around that time too."

Alan got his opportunity after his postdoctoral stint in Berkeley, with the offer of a position at WEHI. "I wanted to return to Australia after my time in Berkeley. I found malaria fascinating and, at first, I worked on drug resistance. But I soon realised that I wanted, and needed, to develop a way to manipulate the malaria parasite; to find selectable markers for transfection of *Plasmodium falciparum*", Alan said.

*What interests you about working in malaria?*

"Malaria is a huge disease that affects humans, and I want to work on something that has such great public health importance", Alan said. "Also, the combination of molecular biology and malaria creates some very particular challenges and leads to very interesting experiments."

Alan has made a career studying the factors in the malaria parasite that are important for its invasion of red blood cells. "I'm fascinated how this parasite binds receptors on red blood cells as the first step in invasion and then, once bound, starts up a whole suite of machinery for invading".

"But I'm also interested in using all the knowledge we've gained over the years to develop a vaccine against malaria. If we can control or eradicate malaria, it will be the biggest thing we can do", said Alan.

"We're looking at two different types of malaria vaccine. We've got a genetically-attenuated malaria vaccine, which

we've been working on with Stefan Kappe in Seattle, currently in clinical trials in the US, and another combination, protein-based vaccine that's under development,"

*You've won a lot of awards this year, Alan – the ASP Fellowship, the Royal Society Fellowship and, most recently, the 2011 Research Fellowship Achievement Award from the National Health and Medical Research Council – that must be amazing?*

"It is nice to receive awards. I think I am lucky I had some great mentors, especially Dave Kemp and Susan Cory. But, in my experience it is best to share awards with the people in my lab so, actually, our Eureka Prize in 2011 for our malaria vaccine research, which was shared amongst six members of my lab, recognising a great collaboration, was a bit special and wonderful to celebrate", said Alan.

*What motivates you in science?*

"I think the two things I have learnt over the years are; you don't get results often, so enjoy them when you do, and share the results with the people you're working with", said Alan.

"One year into my post doctoral position at WEHI, after 12 months of pouring and running sequencing gels, I sequenced the same genes from two different strains and compared them when I got them assembled and together. It was 10pm on Sunday night and I got to the point where the computer diagonal plot gave an identical straight line. I thought that it had to be a mistake, that the genes had to be different, so I pressed the button again but the straight line came up again. I stopped and checked everything twice because I thought that maybe I'd made a mistake – it had been a long day – and that I was comparing the same thing to itself. But it turned out that the two genes were absolutely identical at each end but different in the middle – this explained the diversity of the S-antigen. The thing was, there was no one around to tell! I called Dave Kemp but got no answer – he was out, I think. So, I called Lyn Corpin (who had also been working on immunoglobulin genes and switched to malaria) and she came in and shared the moment with me! It was one of my defining moments in science", said Alan.

## Significant Contributions cont.

### Publications

With over 420 publications involving Australian parasitologists in 2011, there were innumerable highlights. However, at least a few deserve special mention. First, the environmentally aware parasitologists amongst the ASP membership, published a spate of papers documenting the discovery of new parasites and new pathologies in wildlife, with a particular emphasis on marsupials. **Lesley Warner's** efforts were of particular note: assisted by an ASP Network Researcher Exchange grant, Lesley described a number of new nematode and acanthocephalan parasites in birds and animals in Australia and the South Pacific. Meanwhile, the **McFadden** and **Tilley** labs helped to provide profound new insights into drug action and activity in *Toxoplasma* and *Plasmodium*, respectively, with publications in *J. Exp. Med.* (208: 1547-59) and *PNAS* (108: 11405-10). Australia's helminthologists were also highly influential in 2011, with **Aaron Jex** and colleagues publishing the genome of the nematode, *Ascaris* (*Nature* 479: 529-533), of particular note being that the "secretome" of this parasite is dominated by peptidases presumptively involved in the penetration and degradation of host tissues. And, **Erinna Lee** and co-workers discovered a Bcl-2-regulated cell death pathway in schistosomes, paving the way for adaptation of anti-cancer drugs that target these pathways (*PNAS* 108: 6999-7003).

### A New Journal, IJP:DDR



Finally, a major highlight for the ASP in 2011 was the launch of a spin-off journal from *The International Journal for Parasitology* – *International Journal for Parasitology: Drugs and Drug Resistance*. This was a direct result of an idea discussed at the ASP's Strategic Planning Workshop in February, 2010, that rapidly became a reality.

*IJP:DDR* was launched on June 15, 2011 by Elsevier, in association with the Australian Society for Parasitology Inc. The new Open Access Journal is dedicated to collaborations

and cutting-edge research in Parasitology.

The new electronic open access journal is closely affiliated with the leading parasitology journal, *International Journal for Parasitology*, and will address a critical area of research, covering anti-parasite drug identification, development and evaluation, and parasite drug resistance. The journal's remit also includes research into natural products as anti-parasitic agents, and bioactive parasite products. The Journal encourages critical comment and debate on matters of current controversy in the area of parasite drug resistance and anti-parasite drugs via "Current Opinions". Studies can be aimed at unicellular or multicellular parasites of human or veterinary importance.

The two founding Editors in Chief of *International Journal for Parasitology: Drugs and Drug Resistance* are Kevin Saliba (Australian National University) and Andrew Kotze (CSIRO), who are responsible for the editing of submissions in the area of unicellular and multicellular parasites, respectively.

Lisa Jones spoke with Kevin and Andrew.

Kevin said, "*IJP:DDR* is exactly in line with my own research priorities – biochemical and physiological processes of the malaria parasite – we aim to identify weaknesses in parasite and target these with drugs."

"I'm excited about being part of a new journal that might help synthesise a lot of these related articles around basic drug discovery and drug targets. It is our aim to put these discoveries into a single journal and create a single forum for discussing these issues collaboratively," said Kevin.

"We believe that *IJP:DDR* will enhance research focus, lead to collaborations and help generate new ideas for researchers. I'm looking forward to helping shape a new journal and hopefully *IJP:DDR* will be equally highly regarded as *IJP*."

Andrew Kotze has had 15 years with CSIRO looking at ways to kill intestinal parasites, and new ways to detect resistance. "I'm interested in killing parasites, so I look at potential drugs and the effect on worms and use various techniques to find new drug targets," Andrew said. "My research focuses on identifying weaknesses in parasites and so drugs and drug resistance is central to the research."

Andrew and Kevin encourage all researchers working on parasites and anything pharmacological related to parasites

## Significant Contributions cont.

to submit their manuscripts. *IJP: DDR* is an online journal, manuscripts come in, are processed and then issued online, and there is a fee for publishing.

Prof. Terry Spithill, (then President of the Australian Society for Parasitology), said, "The Society is delighted to have fostered the founding of this new journal, which we anticipate will provide a stellar forum for the dissemination of original discoveries in the pharmacological control of parasites of human and veterinary significance."

"We are delighted to continue our excellent relationship with the Australian Society for Parasitology, and we are confident that *IJP:DDR* will quickly establish itself as the leading journal for publishing the latest research into parasite drug treatment and resistance," added Executive Publisher Dale Seaton.

More information about the scope of articles accepted for submission are available on the [Journal's website](#). Article submissions for *IJP:DDR* can be made at <http://ees.elsevier.com/ijpddr/>

The following 20 leading scientists make up the specialist editorial board of *IJP: DDR*:

**Kathy Andrews**  
Griffith University, Australia

**Michael Barrett**  
University of Glasgow, UK

**Conor Caffrey**  
University of California, San Francisco, USA

**Tim Geary**  
McGill University, Canada

**Thaddeus Graczyk**  
Johns Hopkins University, USA

**Nick Jonsson**  
University of Glasgow, UK

**Ray Kaplan**  
University of Georgia, USA

**Richard Martin**  
Iowa State University, USA

**Aaron Maule**  
Queens University, UK

**Silvia Moreno**  
University of Georgia, USA

**James Morris**  
Clemson University, USA

**Ric Price**  
Menzies School of Health Research, Australia

**Stuart Ralph**  
University of Melbourne, Australia

**Georg von Samson-Himmelstjerna**  
Freie Universität Berlin, Germany

**Nick Sangster**  
Charles Sturt University, Australia

**Andrew Thompson**  
Murdoch University, Australia

**Adrian Wolstenholme**  
University of Georgia, USA

**Debra Woods**  
Pfizer Animal Health, USA



## Achievements and Outputs

THE ACHIEVEMENTS OF THE RESEARCH NETWORK, NETWORK PARTICIPANT CONTRIBUTIONS TO THE RESEARCH NETWORK AND OTHER OUTPUTS ACHIEVED RESULTING FROM THE USE OF THE FUNDS, INCLUDING ANY ADVANCES IN KNOWLEDGE, RELEVANT PUBLICATIONS, OR INTERNATIONAL COLLABORATION.

Progress and the development of national and international collaborative research through the Network Researcher Exchange, Training and Travel Awards are summarised above.

### Publications

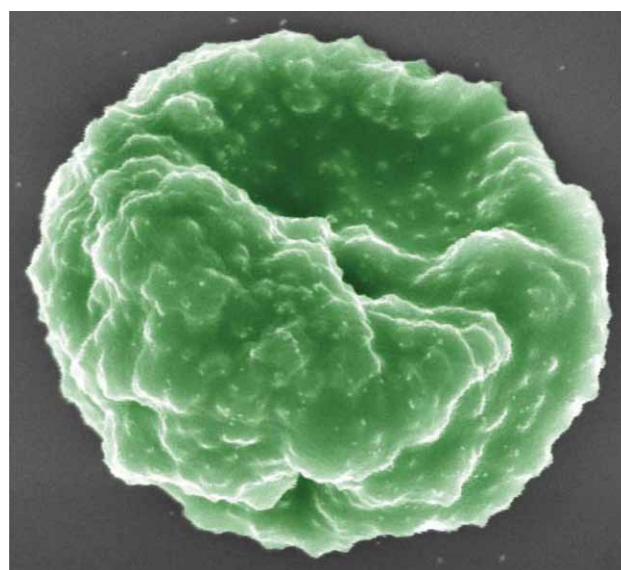
ARC/NHMRC Research Network for Parasitology Participants published 421 articles in journals or books during 2011. These are listed in **Appendix 1**, at the end of this report, under the National Research Priority that best describes the major theme of each paper. By presenting this list of publications, the ASP Network does not mean to claim undue credit for their production; rather, the list serves as a summary of the research activity of ASP Members, and as a benchmark for reporting and assessing the impact of the Network in subsequent years. The list is also a very useful reference source about and for Australia's parasitology research community.

### Grants

Research grants awarded to ASP members in 2011 are listed in **Appendix 2** at the end of this report, as a benchmarking record, without claiming undue influence of

the ASP Network in the success of the applications. In 2011, Australia's parasitologists secured more than \$50 million in new research grant funding from a diverse array of funding agencies, both at home and abroad. Network in the success of the applications. In 2011, Australia's parasitologists secured more than \$50 million in new research grant funding from a diverse array of funding agencies, both at home and abroad.

Scanning electron microscopy of a *P. falciparum*-infected erythrocyte immunolabeled with an antibody against a surface protein. The erythrocyte surface is distorted by protruding knobs. Image by Dr Eric Hanssen (La Trobe University and Bio21Institute)





## Media and Outreach

### IN 2011, OUR ASP MEMBERS ENGAGED IN NUMEROUS OUTREACH ACTIVITIES THAT HIGHLIGHTED THEIR RESEARCH

The audience was widespread, including school students, visitors to our zoos and museums, teachers, national and international health professionals and rural Australian communities. ASP scientists recognise the important role they can play in communicating to the wider community with the aim to stimulate more interest in science and health.

#### Outreach Presentations and Activities

ASP members were involved in many outreach presentations and activities across Australia during 2011. Public lectures and outreach activities help the Australian Society for Parasitology meet one of its aims in promoting Australia as a centre for parasitic research. Utilising these opportunities to showcase the hard work of Australian parasitologists is a perfect way to engage a curious public.

##### **ASP Free Public Event**

"Parasitic and Venomous Encounters in the Tropics" from 6.00 pm, Sunday 10 July 2011, Pullman Reef Casino Hotel, Urchins Room, Cairns. Attracted over 350 people joining our scientists as they talked their audience through the adventure of life in the tropics:

**Snails, stingers, stonefish and snakes.** Jamie Seymour from James Cook University described venomous encounters all within an hour from Cairns in a very lively performance.

**Bugs that bite, burrow and breed in our skin.** Charlene Willis from the Queensland Institute of Medical Research talked about parasites that you'd find in the tropics - lice, sand flies, scabies and flies that enjoy laying eggs in our skin such as the screw flies and the famous Bot fly.

**Finding cures for worms and using worms for cures.** Alex Loukas from James Cook University works on the most crippling disease of the tropics.

##### **Worms hold key to Great Barrier Reef's richness.**

Malcolm Jones from The University of Queensland talked about the hundreds of species visitors to the reef rarely notice: parasitic worms. These parasites are in almost every fish, bird, dolphin and turtle that is seen in the area. Find out why they are an important part of the hidden biodiversity of the reef.

##### **Living in the tropics – surviving protozoal diseases.**

Peter O'Donoghue from the University of Queensland described three cardinal rules for dealing with infectious tropical diseases caused by protozoan parasites.

"Living in the tropics – surviving protozoal diseases" is available to watch online on the ASP website:

[http://parasite.org.au/?page\\_id=279](http://parasite.org.au/?page_id=279)

or go to the website [www.parasite.org.au](http://www.parasite.org.au) and click on "Outreach" from the menu bar.

##### **Parasites in Focus - The Exhibition.**

Parasites in Focus exhibition featuring twenty six superb photographic prints showing the amazing microscopic world of the parasite accompanied by four hands-on parasite exhibits was on display in Townsville Aitkenvale Library in the first part of 2011 and then travelled to James Cook University, Cairns campus in June for their open day in August 2011. Visitors competed in the parasite game show "Who's my host?" and explored lots of different parasites found in Australia and around the world using "The microscopic world of parasites", "Look closer at parasites", and "Parasitic lifecycles" exhibits. Visitors also viewed the stunning animations of the life cycle of the malaria parasite by BAFTA and renowned Emmy award winning biomedical animator Drew Berry, on the lifecycle exhibit.

Parasites in Focus has entertained more than 200,000 Australian school students and general public visitors at 15 venues in every state and territory across Australia since 2007.

#### ASP Member Outreach Presentations and Activities

In total ASP members were involved in dozens of outreach activities across Australia during 2011. Public lectures and outreach activities help the ASP Network for Parasitology meet one of its aims in promoting Australia as a centre for parasitic research. Utilising these opportunities to showcase

## Media and Outreach cont.

the hard work of Australian parasitologists is a perfect way to engage a curious public. In addition to those activities associated with 2012 ASP Annual Conference and "Parasites in Focus" the following outreach activities by ASP members took place in 2011:

**Natalie Spillman and Richard Allen (ANU)** represented the ASP at 'Science meets Parliament', which was all about engaging with politicians.

### **Ian Whittington (SA Museum)**

- Coordinator and participant in a workshop to the aquaculture industry about FRDC Project No. 2003/221 "Innovative solutions for aquaculture: Assessment of *in situ* monitoring techniques and life history parameters for monogenean skin and gill parasites", held at Port Lincoln Marine Science Centre, Port Lincoln, South Australia on 15<sup>th</sup> February 2011
- Helped to develop, and played a role in, a 'movie trailer' video posted to YouTube (<http://www.youtube.com/watch?v=Uyfeouc-Np0>) that was used to preface a presentation at the 8th International Symposium on Fish Parasites held in Viña del Mar, Chile, 26–30 September 2011 and allied to a paper presented there *Paladini G. et al: A beginner's guide to "flukology"*.
- Member of Network for Aquatic Animal Health in South Australia, a network established in August 2011 to promote information exchange, a forum for topical discussions and an expert panel for policy direction. Bimonthly meetings held in August, October and December 2011.
- Museum scientist involved in 'Be a Beach Comber' event during Science Week 2011, South Australian Museum, 17<sup>th</sup> August 2011
- Identifications of parasites and expert advice in reports to Biosecurity Queensland, Department of Employment, Economic Development & Innovation, Queensland, Australia for the Gladstone Harbour Fish Health investigations for the Queensland Government. October and December 2011.

**Felicity Smout (James Cook University)** participated in "Dog Health Day at Yarrabah Aboriginal Community" 17

Sept 2011. Yarrabah Animal management organised and conducted a dog care day at Bishop Malcolm Park. This dog care day saw the provision of treatment and veterinary consultation to over 35 dogs and aimed to provide:

- flea, tick, mange and worm treatment to dogs in the community
- information about new dog laws/ registration
- information about the parasites infecting dogs.

**Bernd Kalinna (University of Melbourne)** is associated with the CSIRO Scientists in Schools Program and has partnered with Deutsche Schule Melbourne which is a German – English bilingual school. Bernd runs science experiments with the Prep to grade 6 pupils and has a regular session talking about bugs and hygiene, and worms. In 2011 there were also a few cases of threadworm infections at the school and Bernd presented a talk on "*wormy kids and what to do...*". and prepared a document about worms for their records.



Ian Whittington

## Media and Outreach cont.

**Stephanie Godfrey (Flinders University)** was involved in a workshop "Social Networking in Lizards" run as a part of National Science Week 2011 held at the South Australian Museum (organised through Flinders University). During the workshop microscopes were set up to look at lizard parasites, and Stephanie gave presentations to the public and school groups, which mentioned the implications of social networks in lizards for parasite transmission.

**Rina Wong (University of Western Australia)** presented "The fight against malaria" at Swan Districts Rotary Club, Western Australia in November 2011.

**Alexander Maier (La Trobe University)** gave presentations to public for Open Day 2011 and engaged in Outreach activities with Coburg Primary School (Coburg) – "Flies – fascinating and (sometimes) dangerous" and Charles La Trobe College (Bundoora) – "Malaria".

**Rob Adlard (Queensland Museum)** gave floortalks for Sharing Science – Queensland Museum Scienceweek August 2011 – Parasites: the diversity within.

**Joanna Browne (Griffith School of Environment and Australian Rivers Institute - Coast & Estuaries / Melbourne Museum)** gave the following presentations:

- My marine career. Australian Marine Sciences Association Victoria branch 'My friend the jellyfish & other stories' careers information session for undergraduate students (Queenscliff, 19 March 2011.)
- My marine career. Marine Careers Discovery Day (presentation to high school students) (Queenscliff, 15 April 2011)

**Nicole Kirchhoff (National Centre for Marine Conservation and Resource Sustainability, AMC University of Tasmania)** gave three presentations:

- The making of a happy healthy tuna. 28 September 2011, Partnership for Environmental Education, Jupiter, Florida, USA. (oral presentation)
- The making of a happy healthy tuna. 22 September 2011, Schoodic Series, Schoodic Education and Research Center Institute, Winter Harbor, Maine, USA. . (oral presentation)
- Endeavours to make a happy healthy tuna.

21 September, 2011, Center for Cooperative Aquaculture Research, University of Maine, Franklin, USA. (oral presentation)

All three presentations were quite similar, but the audience was drastically different. The first was to high school students and their parents, the second to the United States National Park Service- including general public, wildlife officers, and administration, and the third was to a University research group. Web page which promoted the talk at the National Park <http://www.sercinstitute.org/schoodic-series-making-happy-and-healthy-ranched-bluefin-tuna>

**Clare Smith (Menzies Research Institute / University of Tasmania)**

- public seminar on new antimalarial therapies for the Royal Society of Tasmania
- invited speaker at the Biology Teachers Association of Tasmania conference. This talk was aimed at high school and college biology teachers to keep them updated with science happening in their state and giving them ideas for to take back into the classroom

Clare Smith



**Rowena Martin (ANU)**

The invited speaker at a lunch for the Australian Museum Foundation President's Circle. The President's Circle consists of those members who donate >\$10,000 to the Australian

## Media and Outreach cont.

Museum Foundation. The event focused on generating discussion and encouraging awareness of drug resistance in human pathogens. Held at the Australian Museum, Sydney on 04/05/2011.

### Media Reports

Scores of stories promoting parasitology and research achievements of ASP members were reported in the media in 2011 on radio, online, TV interviews and newspaper articles.

#### **Media coverage before, during, and after 2011 ASP Annual Report**

*The following media releases were distributed with associated media coverage detailed:*

1. Media Release 8 July 2011 - Your Survival Guide to Parasitic and Venomous Encounters in the Tropics



Michael Good

2. Media Release 11 July 2011 - "One Health" movement tackles infectious diseases
3. Media Release 12 July 2011 - Malaria eradication through vaccination – a life-long quest and the passion of science

ABC Far North (Cairns)  
Drive - 08/07/2011 - 04:10 PM  
Richard Dinnen

Interview with Professor Nick Smith, a Tropical Research Leader at James Cook University, and Lisa Jones from the Network for Parasitology. Dinnen notes that the 2011 Australian Society for Parasitology Annual Conference is being held in Cairns, and Smith and Jones describe some parasites. Smith explains that tropical regions have more parasites, and mentions the risk posed by malaria and tapeworm. Smith explains the risks posed by pets, and Jones says that Speedos might protect people from a parasitic fish in the Amazon. Jones discusses an upcoming public talk at the casino.

Interviewees: **Lisa Jones**, Spokeswoman, Network for Parasitology; **Professor Nick Smith**, Tropical Research Leader, James Cook University  
Duration: 12:53

The Cairns Post newspaper  
"Our microscopic world revealed"  
Saturday 9 July 2011

ABC Far North (Cairns)  
Breakfast - 12/07/2011 - 07:11 AM  
Kier Shorey

Shorey interviews Dr David Blair from James Cook University about the Conference for Parasitology taking place in Cairns. Blair describes the parasites that are in Far Northern waters and that there is a great deal yet to be known. Blair mentions a parasite that lives in the circulatory system of sea turtles, but parasites tend to be specific and don't jump species. Blair describes a variety of parasites.

Interviewees: **Dr David Blair**, Parasitologist, James Cook University (Duration: 6:57mins)

ABC Far North (Cairns)  
Drive - 12/07/2011 - 04:12 PM  
Richard Dinnen

Interview with Professor Michael Good, pictured left, the leader of research on a vaccine to prevent malaria. Dinnen notes that the Australian Society for Parasitology Annual Conference is being held in Cairns, and that malaria is the biggest killer. Good discusses efforts to tackle malaria, and explains the approach of his research team. Good



## Media and Outreach cont.

discusses how the vaccine may be trialled and the role of mosquitoes in transmitting the disease. Dinnen notes that drug companies have not been interested in researching the vaccine, because malaria is a disease of the developing world. Good explains his scientific background, and Zonca notes that Good has a Fellowship at the Griffith University and is a member of the Qld Tropical Health Alliance.

Interviewees: **Professor Michael Good**, Malaria Research Leader, Malaria Vaccine  
Duration: 8:14

"Australia: Dingo Poo Spreading Deadly Parasites to Humans"  
Peter Michael interviewed **Dr David Jenkins (CSU)**  
The Courier Mail, Australia newspaper  
Wed, 13 Jul 2011

The Cairns Post  
"Hope for malaria cure" interview with **Prof Michael Good** (Griffith)  
Thursday 14 July 2011

Wednesday 13 July 2011, aap reporter interviewed **A/Prof Malcolm Jones** (QIMR) and **Dr Charlene Willis** (QIMR)  
"Cruel and cunning parasites"  
Tracey Ferrier  
Sunday Examiner, Launceston  
31 Jul 2011

## Media highlights from our ASP members

### **Dr. Jan Slapeta and Ashlie Hartigan (University of Sydney)**

Jan and Ashlie had great media coverage from their study identifying two new parasite species causing disease in endangered Australian frogs and showing that the cane toad did not in fact introduce the parasite to Australian native frog populations. Rather, they suggest that the mere presence of the cane toad in Australia has increased the prevalence of a native parasite in endangered Australian frogs via an ecological process known as 'spill-back'.

- "Big leap in understanding frog threat" Campus Daily.com.au, 25 May 2011
- "Big leap in understanding frog threat" PHYSORG.com, 25 May 2011

- "Cane toads aren't culprit after research" The Daily Telegraph, 26 May 2011
- "New parasites found in frogs" Science Alert, 26 May 2011
- "Cane toads help spread parasites to frogs" Australian Geographic (website front news story)
- "Parasite of the Day" dailyparasite.blogspot.com, 4 July 2011
- "The Jellyfish that conquered land – and Australia" Jennifer Frazer, Scientific American (website front news story), 15 July 2011

### **Ian Whittington, (SA Museum)**

Cover image (ectoparasite, *Argulus diversicolor* [Arthropoda: Maxillopoda: Arguloida: Argulidae] of *Marine & Freshwater Research* (Volume 62, issue 1) published in January 2011



Sarah Catalano

containing Catalano, Hutson, Ratcliff & Whittington (2011) paper.

### **James Beeson (Burnet Institute)**

- Interview about malaria on ABC TV News24

## Media and Outreach cont.

(Newsline with Jim Middleton), April 2, 2011

- Interview and discussion about malaria on Radio Australia

### Bill Callow

Bill self-published a memoir about some of his experiences as a scientist, manager and international consultant. The book called 'Vet in the Lab- Seduced by Science' has ISBN978-0-646- 57470-7.

### Megan Dearnley (Bio21/Melbourne University)



Megan Dearnley

Megan published a paper "[Origin, composition, organization and function of the inner membrane complex of \*Plasmodium falciparum\* gametocytes](#)" in the *Journal of Cell Science*. The University of Melbourne issued a media release entitled: "Malaria goes bananas before sex". The press release can be accessed at <http://newsroom.melbourne.edu/news/n-758> The work has attracted significant local and international media attention. The press release was picked up in print and on-line media by journalists in Australia (Australian Geographic & New Scientist) and in the USA (livescience.com) and India (Times of India, largest English

paper, 7.3 million readers).

### Leann Tilley (Bio21/Melbourne University)

Leann received considerable media interest around the PNAS publication on artemisinin action.

- The Conversation: "Malaria breakthrough shines light on drug resistance". Sunanda Creagh, June 27, 2011. <http://theconversation.edu.au/malaria-breakthrough-shines-light-on-drug-resistance-2047>
- "An end to malaria? Mission definitely not impossible." Matt De Neef. June 28, 2011. <http://theconversation.edu.au/articles/an-end-to-malaria-mission-definitely-not-impossible-3357>
- La Trobe University Website: <http://www.latrobe.edu.au/news/articles/2011/article/insight-for-new-malaria-treatment>
- ABC AM (with Tony Eastley). Report by Mary Gearin with interview of Leann Tilley. "Research gives vital insight into how anti-malarial drugs work" June 29, 2011. <http://www.abc.net.au/am/content/2011/s3256078.htm>
- "Iron Helps Trigger Artemisinin's Activity". Carmen Drahl. Chemical & Engineering News, 89(27), July 04, 2011. [http://pubs.acs.org/subscribe/journals/cen/89/i27/toc/toc\\_i27.html](http://pubs.acs.org/subscribe/journals/cen/89/i27/toc/toc_i27.html)
- The Age. "Malaria battle moves to new level". July 11, 2011. Geoff Maslen. <http://www.theage.com.au/national/education/malaria-battle-moves-to-new-level-20110711-1ha9x.html#ixzz1RqAbJEL6>
- Laurie Sullivan, Editam. "Drug action to beat malaria revealed" Indian Express. <http://www.indianexpress.com/news/drug-action-to-beat-malaria-revealed/810295/>
- "Insight for new malaria treatment" Health Canal <http://www.healthcanal.com/medical-breakthroughs/18428-insight-for-new-malaria-treatment.html>
- Heidelberg Leader (12 Jul 2011), Whittlesea Leader (19 Jul 2011). Raelene Wilson. "Drug hits malaria with iron"

## Media and Outreach cont.

- MUSSE (Melbourne University Staff / Student E-news) July 2011. "Seeing is believing: New microscopies are driving a revolution in cell biology". <http://www.musse.unimelb.edu.au/print/july-11-65/leann-tilley>
- Melbourne University Voice. Volume 7 Number 9 September 12 - October 9 2011 "Devil is in the detail". <http://voice.unimelb.edu.au/volume-7/number-9/devil-detail>.
- Supplement in The Age. Monday Sept12, 2011.
- Synergy, Summer 2011. Bulletin of the La Trobe University Faculty of Science Technology & Engineering. Women in Science. The article describes Leann Tilley work under the headline "Women are leading the way in research at La Trobe University". <http://www.latrobe.edu.au/scitecheng/news/documents/Synergy-Summer2011-web.pdf>
- Interviewed for Millions Against Malaria Foundation Documentary about a journey by Ken Evers and Tim Pryse around the world in a GA8-TC Airvan to raise money for the fight against malaria. April 21, 2011.
- Vanderbilt and University of Melbourne fund joint research projects. <http://news.vanderbilt.edu/2011/11/vanderbilt-and-melbourne/>

### Rowena Martin (ANU)

- Canberra medical breakthrough could save millions, 666 ABC Radio. Interviewed on 22/08/2011 by presenter Ginger Gorman (duration: 15 min).
- Meet a Scientist, ABC Science. Interviewed by journalist Rebecca Jenkins for ABC Science Online.
- 10x10 Canberra Stories: Celebrating 100 Years of International Women's Day, ABC Local. One of 10 Canberra women invited to speak for 10 min about their work and life. Held at the Canberra Museum and Art Gallery on 11/03/2011. The talks were also broadcast on ABC Local.

- Resurrecting a wonder drug, Australasian Science Magazine.

### David Jenkins (Charles Sturt University)

- July 2011 Interview with Peter Michael Courier Mail. Subject: parasites.
- ABC Townsville with Alex Chambers. Subject: parasites
- ABC Maroochydore. Subject: wild dogs/hydatids



David Jenkins

### Rina Wong (University of Western Australia)

- Sep 2011: Lake Joondalup Baptist College, Interview, School Newsletter article. "From palettes to parasites".
- Summer 2011: "Uniview" The University of Western Australia, Magazine interview "Staying a step ahead of the cleverest parasite."

### **Josh Sweeny (Murdoch University)**

Josh had media coverage for his industry awards:

- Edith Cowan University New Investigator Award at the 21st Annual Combined Biological Sciences Meeting, The University Club, University of Western Australia, 2011. Validation and application of a molecular diagnostic technique for identification of naturally acquired nematode infections in lambs using faecal DNA extractions.
- Developing and Applying Novel Molecular Tools Award at the School of Veterinary and Biomedical Sciences Research Poster Day, Murdoch University, 2011. The molecular movement! - the future in stronglyid worm veterinary diagnostics

### **Alexander Maier (La Trobe University)**

- Khwarizmi International Award led to news article in Iran and Germany and TV coverage in Iran
- Nomination Eureka Prizes People's choice award – led to airing of profile on "Catalyst", on-line question forum, coverage in print media (locally and Germany)

### **Ala Lew (The University of Queensland QAAFI Institute)**

Ala produced the following media releases,

- 15<sup>th</sup> August, 2011 Cattle ticks do battle against unique control measure and DEEDI media release. <http://www.qaafi.uq.edu.au/index.html?page=163337&pid=148101>
- 15<sup>th</sup> November 2011 "Queensland scientists give cattle tick the flick"

These resulted in the following media stories:

- ABC Rural "Breakthrough in cattle tick research. <http://www.abc.net.au/rural/news/content/201108/s3294975.htm>
- Queensland Country Life, p.86 18.08.2011 <http://qcl.farmonline.com.au/news/state/livestock/cattle/cattle-tick-vaccine-is-step-closer/2258945.aspx>
- The Rural, p. 3, 18.11.2011
- The Courier Mail, p. 67, 10.12.2011

### **Aaron Jex (University of Melbourne)**

- <http://www.abc.net.au/am/content/2011/s3348984.htm>
- <http://www.abc.net.au/science/articles/2011/10/27/3349715.htm>
- <http://www.news.com.au/breaking-news/one-step-closer-to-beating-roundworm/story-e6frfku0-1226177861906>
- [http://www.lifescientist.com.au/article/405485/genome\\_sequence\\_puts\\_roundworm\\_ropes/](http://www.lifescientist.com.au/article/405485/genome_sequence_puts_roundworm_ropes/)

### **Stuart Ralph (Bio21/University of Melbourne)**

University PodCast on computational approaches too drug development for Malaria <http://upclose.unimelb.edu.au/episode/153-mosquito-bytes-fighting-malaria-computational-science>

### **Rob Adlard and Terrance Miller (Queensland Museum)**

- Adlard RD. Contributing chapter author to popular publication 'Wild Guide to Moreton Bay and Adjacent Coasts' on subject areas: protozoa; marine worms; echinoderms. Queensland Museum publication, 2 volumes 274 & 322pp, Brisbane.
- Adlard RD. Radio interview –ABC Queensland Central Coast, CReefs Parasites of coral reef fishes.
- Miller TL BBC Horizons episode entitled: Death of the Oceans? - Television interview discussing parasites of coral reef fishes and biodiversity exploration as part of CReefs – Census of Marine Life expedition to Ningaloo Reef in Western Australia.

### **Tommy Leung (UNE)**

Tommy runs the Parasite of the Day blog (<http://dailyparasite.blogspot.com>), and actively communicates about parasitology and some other form of life science on social media (such as Google Plus). Tommy writes about 3 posts per month for the POTD blog on the latest research published in fields relating to parasitology, and during 2011 the blog received on average 20K views per month.



### Malcolm McConville (University of Melbourne)

- 8 August, 2011. Radio Australia interview; impact of leishmaniasis on world health
- 4th August 2011 University of Melbourne news release. What parasites eat is the key to better drug design by Sally Sherwen, <http://newsroom.melbourne.edu/news/n-595>
- 22 August 2011 Cosmomagazine.com "Designing drugs based on what parasites eat" by Oliver Chan, <http://www.cosmomagazine.com/node/4649/full>
- Article in Microbiology Australia (by Saunders E, De Souza D, MacRae J, Likic V, McConville MJ (2011) Metabolomics analysis of protozoan parasites. *Microbiology Australia* 32, 144-146

### Robin Gasser (University of Melbourne)

Media surrounding the publication of:

Jex AR, Liu S, Li B, Young ND, Hall RS, Li Y, Yang L, Zeng N, Xu X, Xiong Z, Chen F, Wu X, Zhang G, Fang X, Kang Y, Anderson GA, Harris T, Campbell BE, Vlaminc J, Wang T, Cantacessi C, Schwarz EM, Ranganathan S, Geldhof P, Nejsun P, Sternberg PW, Yang H, Wang J, Wang J, Gasser RB (2011) *Ascaris suum* draft genome. *Nature* Published Oct 26 2011.

- [http://zeenews.india.com/news/health/health-news/cure-to-parasitic-roundworm-found-in-its-genes\\_14369.html](http://zeenews.india.com/news/health/health-news/cure-to-parasitic-roundworm-found-in-its-genes_14369.html)
- <http://visitbulgaria.info/17549-researchers-find-cure-parasitic-roundworm-its-genes>
- <http://au.ibtimes.com/articles/240177/20111031/giant-worm-s-secrets-unveiled-au-ibtimes.htm>
- <http://www.abc.net.au/science/articles/2011/10/27/3349715.htm>
- [http://www.lifescientist.com.au/article/405485/genome\\_sequence\\_puts\\_roundworm\\_ropes/](http://www.lifescientist.com.au/article/405485/genome_sequence_puts_roundworm_ropes/)
- <http://au.ibtimes.com/articles/238695/20111027/parasitic-parasite-worm-ascariasis-roundworm-symptoms-fever-vomiting.htm>

- <http://www.heraldsun.com.au/news/breaking-news/one-step-closer-to-beating-roundworm/story-e6frf7jx-1226177861906>
- <http://medicalxpress.com/news/2011-10-drug-revealed-giant-parasitic-worm.html>
- <http://news.aweb.com.cn/20111031/460115836.shtml>
- <http://www.biotech.org.cn/news/news/show.php?id=90953>
- <http://www.ebiotrade.com/newsf/2011-10/20111027143431920.htm>

### Clare Smith (Menzies Research Institute / University of Tasmania)

- "Clare's road to research" Hobart Mercury, 30 Jul 2011 [http://www.themercury.com.au/article/2012/04/27/322651\\_todays-news.html](http://www.themercury.com.au/article/2012/04/27/322651_todays-news.html)
- An interview with Nobel Laureate Elizabeth Blackburn for [nature.com](http://www.nature.com) called "A life in science" as part of the Landau film series. <http://www.nature.com/landau/2011/index.html>



Elizabeth Blackburn (left) and Clare Smith (far right) in the Landau series film "A Life in Science" available on [nature.com](http://www.nature.com)

## Contribution to the National Benefit

The contribution of ASP Network for Parasitology to Australia's fundamental, strategic and applied research effort is evident in the quantity and quality of publications listed in Appendix 1 for the research priorities identified at the point of origin of the Network to address Australia's National Research Priorities. With regard the Network more directly, 2011 has been a year where national and international collaboration has been strongly fostered by the Network through its Researcher Exchange, Training and Travel Fund and through the continuation of formal links with international networks in Europe and North America. Additionally, the Network has created substantial training and networking opportunities for research students and early career researchers, again through the Researcher Exchange, Training and Travel Fund. Young researchers are publishing their research undertaken on Network funding and winning grants and fellowships, either as spin-offs of research undertaken under the Network Researcher Exchange, Training and Travel Award scheme or as a result of linkages forged at Network-sponsored events. Fostering the exposure, profile and opportunities of young researchers is seen as key to the future of parasitology research in Australia and is, therefore, a high priority for the ASP Network.

*Pediculus humanus*

Image courtesy  
of Cath Covacin,  
Stephen Barker  
and Rick Webb,  
University of  
Queensland  
(Australia).



## Activities and Strategies for 2012

### Future Planning

In addition to managing and administering Network Researcher Exchange Travel Award Scheme, OzEMalaR Travel Award scheme, JD Smyth grants, ASP Student Travel Awards and the ASP Invited Lectureship Grants, and raising the awareness of Australian parasitology with the general public through the development of outreach initiatives, the Network was able to further the strategic development of Australian parasitology research by holding two workshops for students and Early Career Researchers in conjunction with the 2011 Annual Conference, helping to implement the ASP's Strategic Plan. Parasites in Focus exhibition has moved permanently to the Queensland Museum, on loan permanently and intended to be out on display at the Queensland Museum in between major exhibitions. The Network will continue to contribute to the implementation of the ASP's Strategic Plan by continually looking for ways to improve the annual conference, invigorate the Society's Outreach Program (one goal being to apply for *Inspiring Australia* funding) and by coordinating discussions and planning for an advanced postgraduate training course in modern parasitology.

# Statistical Snapshot 2011

## Number of active members

- Australian Society for Parasitology Incorporated (ASP) had 446 financial members

## Number of members funded to do various activities

- 44 ASP Student Members (including research students) were given funding assistance to attend 2011 ASP Annual Conference via the ASP Student Member Conference Grant scheme.
- 22 members were awarded ASP Network Researcher Exchange, Training and Travel awards in 2011.

## Number of workshops, conferences or seminars conducted

- One conference – 2011 ASP Annual Conference attended by 205 researchers.
- First International *Chromera* Workshop attended by 20 researchers

## Number of visits by international researchers to Australia

- The ASP funded or co-funded nine international visitors to Australia (as invited lecturers to 2011 Annual Conference) including three ASP Invited International Lecturers.
- In total, 22 international visitors spent time in Australian parasitology groups during 2011 – they came from the UK (2), the USA (9), Germany (3), France (2), Spain(2), Indonesia (2), Japan (1), Switzerland (1)

## Number of publications produced

- 421 printed publications
- In 2011, Australia's parasitologists secured more than \$50 million in new research grant funding

### ASP web site

<http://www.parasite.org.au>

### ASP Facebook page

<http://www.facebook.com/ASParasitology>

### ASP Twitter account

[https://twitter.com/#!/AS\\_Para](https://twitter.com/#!/AS_Para)

### OzEMalar website

[www.ozemalar.org.au](http://www.ozemalar.org.au)

### OzEMalaR Facebook page

<http://www.facebook.com/ozemalar>

### OzEMalaR Twitter account

<https://twitter.com/#!/OzEMalaR>

## ASP Membership

**H Abeywardena**

University of Melbourne  
Student Member

**A Achtman**

Walter and Eliza Hall Institute of  
Medical Research  
Member

**R Adlard**

Queensland Museum  
Executive Secretary

**H Ahmed**

Australian National University  
Student Member

**E Aitken**

University Of Melbourne  
Student Member

**R Allen**

UQ & ANU  
State Rep, ACT

**G Allerton**

Merial Australia Pty Ltd  
Member

**L Alleva**

Australian National University  
Member

**S Al-Qassab**

University of Technology, Sydney  
Member

**C Alvarez**

University of Melbourne  
Student Member

**G Anderson**

Virbac (Australia) Pty Limited  
Member

**K Andrews**

Griffith University  
Treasurer

**M Andrews**

Kinki University  
Member

**R Andrews**

Khon Kaen University  
Member

**F Angrisano**

Walter and Eliza Hall Institute of  
Medical Research  
Student Member

**B Angus**

Life Member

**B Anthony**

Queensland Institute of Medical  
Research  
Member

**S Apte**

Queensland Institute of Medical  
Research  
Member

**S Armstrong**

Student Member

**J Arundel**

Fellow

**A Ash**

Murdoch University  
Student Member

**A Asher**

Macquarie University  
Student Member

**S Atkinson**

University of Queensland  
Student Member

**V Avery**

Griffith University  
Member

**A Aziz**

James Cook University  
Student Member

**J Bailey**

Novartis Animal Health  
Member

**G Banik**

University of Technology, Sydney  
Student Member

**S Barber**

University of Melbourne  
Member

**I Barker**

University of Guelph  
Life Member

**S Barker**

University of Queensland  
Member

**T Barnes**

University of Queensland  
Member

**L Barnett**

CQUniversity  
Student Member

**J Barratt**

University of Technology, Sydney  
Student Member

**A Barry**

Walter and Eliza Hall Institute of  
Medical Research  
Member

**D Barton**

South Australian Museum  
Member

**N Barton**

Life Member

**J Baum**

Walter and Eliza Hall Institute of  
Medical Research  
Member

**N Beebe**

University of Queensland  
Member



## ASP membership cont.

**J Beeson**

Burnet Institute  
Member

**C Behm**

Australian National University  
Fellow

**E Bennet**

Member

**B Besier**

Department of Agriculture & Food  
WA  
Member

**I Beveridge**

University of Melbourne  
Fellow

**F Bieri**

Queensland Institute of Medical  
Research  
Student Member

**P Blackburn**

SARDI & University of New England  
Student Member

**D Blair**

James Cook University  
Fellow

**J Boddey**

Walter and Eliza Hall Institute of  
Medical Research  
Member

**P Boeuf**

University of Melbourne  
Member

**J Boray**

Fellow

**A Botero Gomez**

Murdoch University  
Student Member

**N Bott**

South Australian Research &  
Development Institute  
Member

**V Bowles**

University of Melbourne  
Member

**M Boyle**

Burnet Institute  
Member

**R Bradbury**

University of Tasmania  
Member

**L Bradshaw**

Dept of Primary Industries &  
Fisheries  
Member

**A Brazenor**

James Cook University  
Student Member

**P Brindley**

George Washington University  
Member

**E Brock**

University of Adelaide  
Student Member

**Y Brockwell**

Charles Sturt University  
Member

**P Brook-Carter**

Monash University  
Member

**C Brown**

Griffith University  
Member

**G Brown**

University of Melbourne  
Member

**J Browne**

Melbourne Museum  
Student Member

**C Bryant**

Fellow

**M Bryant**

Queensland Museum  
Member

**H Bullen**

Burnet Institute  
Student Member

**T Burger**

University of Queensland  
Student Member

**A Burgess**

Queensland Institute of Medical  
Research  
Member

**G Burgio**

Menzies Research Institute  
Member

**M Burke**

Monash University  
Member

**S Burman**

Virbac Animal Health  
Member

**G Busch**

Von Berky Veterinary Services

Member

**A Butcher**

SA Pathology  
Member

**A Butterworth**

Queensland Institute of Medical  
Research  
Student Member

## ASP membership cont.

**J Byron**

Queensland Institute of Medical  
Research  
Student Member

**B Callow**

Fellow

**S Cameron**

CSIRO Ecosystem Sciences  
Member

**B Campbell**

Member

**N Campbell**

Life Member

**L Cannon**

Fellow

**C Cantacessi**

James Cook University  
Member

**F Cardoso**

Queensland Institute of Medical  
Research  
Member

**I Carmichael**

South Australian Research &  
Development Institute  
Member

**T Carvalho**

Monash University  
Member

**S Catalano**

University of Adelaide  
Student Member

**J Chan**

Burnet Institute  
Student Member

**X Chan**

Australian National University  
Student Member

**S Charnaud**

Burnet Institute  
Student Member

**R Chevis**

Member

**N Chilton**

University of Saskatchewan  
Member

**V Choomuenwai**

Griffith University  
Student Member

**C Chua**

University of Melbourne  
Student Member

**C Chuah**

Queensland Institute of Medical  
Research  
Student Member

**S Cobbold**

Australian National University  
Student Member

**D Cole**

Cole Consulting  
Life Member

**A Colebrook**

Member

**J Conlan**

Murdoch University  
Student Member

**G Conner**

Westmead Hospital  
Member

**C Constantinoiu**

James Cook University  
Member

**M Cook**

Sydney Children's Hospital  
Member

**B Cooke**

Monash University  
Member

**J Copland AO**

Life Member

**C Covacin**

University of Queensland  
Member

**A Cowman**

Walter and Eliza Hall Institute of  
Medical Research  
Fellow

**B Crabb**

Burnet Institute  
Member

**M Cremin**

University of Queensland  
Fellow

**M Crespo**

La Trobe University  
Member

**T Cribb**

University of Queensland  
Member

**J Cripps**

University of Melbourne  
Student Member

**S Cutmore**

University of Queensland  
Member

**L Cuttall**

University of Queensland  
Student Member

**J Cutts**

Student Member

**J Dalton**

McGill University  
Life Member

## ASP membership cont.

**A Dargantes**

Murdoch University  
Student Member

**K Dash**

Life Member

**M Davenport**

UNSW  
Member

**A De Chambrier**

Natural History Museum  
Member

**T de Koning-Ward**

Deakin University  
Member

**M Dearnley**

University of Melbourne  
Student Member

**J Dempsey**

Veterinary Health Research P/L  
Member

**R Dempster**

Virbac Australia Pty Ltd  
Member

**L Dent**

University of Adelaide  
Member

**M Dixon**

University of Melbourne  
Member

**R Dobson**

Life Member

**T Dolstra**

BAMBI, ANU  
Student Member

**A Donald**

Fellow

**D Doolan**

Queensland Institute of Medical  
Research  
President

**C dos Santos**

Australian Maritime College  
Student Member

**A Dougall**

James Cook University  
Member

**B Douradinha**

Queensland Institute of Medical  
Research  
Member

**A Downie**

University of Queensland  
Student Member

**D Drew**

Burnet Institute  
Member

**P Driguez**

Queensland Institute of Medical  
Research  
Student Member

**M Duffy**

University of Melbourne  
Member

**J Dunlop**

Department of Environment and  
Conservation  
Student Member

**M Duong Chi**

La Trobe University  
Student Member

**N Dybing**

Murdoch University  
Student Member

**K Easton**

Student Member

**H Edwards**

Murdoch University  
Student Member

**F Ehlgren**

Student Member

**F El-Assaad**

University of Sydney  
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## 2011 ASP Network Budget Report

### INCOME

ASP Gift	\$77,273
Researcher Exchange Award Funding	\$59,091
OzeMalaR contribution	\$27,272
Student Conference Travel Funding	\$45,455
Refund, unused Travel Award	\$181

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<b>TOTAL</b>	<b>\$209,272</b>
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### EXENDITURE

Salaries and on-costs	\$65,463
Parasites in Focus	\$6,322
Researcher Exchange Awards and Mentoring Scheme	\$53,921
Student Conference Travel Awards	\$40,040
Cairns2011 Conference (invited speakers, printing costs etc)	\$10,069
Conference Organisation	\$7,953
Office costs	\$3,516

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<b>TOTAL</b>	<b>\$187,284</b>
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### Note

It is important to note that the apparent \$21,988 surplus is not real as there are commitments to Researcher Exchange Awards (\$19,771) and Student Conference Travel Grants (\$5,415) that have not yet been claimed.

# Appendix 1

## PUBLICATIONS BY ASP MEMBERS IN 2011

Where applicable, links to abstracts in PubMed have been provided in the online version of this report.

### [1] AN ENVIRONMENTALLY SUSTAINABLE AUSTRALIA

Abd Rani PA, Coleman GT, Irwin PJ, Traub RJ. [Hippobosca longipennis--a potential intermediate host of a species of Acanthocheilonema in dogs in northern India](#). *Parasit Vectors*. 2011 Jul 22;4:143.

Abd Rani PA, Irwin PJ, Coleman GT, Gatne M, Traub RJ. [A survey of canine tick-borne diseases in India](#). *Parasit Vectors*. 2011 Jul 19;4:141.

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## Appendix 1 cont.

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## Appendix 2

IN 2011, AUSTRALIA'S PARASITOLOGISTS SECURED MORE THAN \$50 MILLION IN NEW RESEARCH GRANT FUNDING FROM A DIVERSE ARRAY OF FUNDING AGENCIES, BOTH AT HOME AND ABROAD, INCLUDING:

### NHMRC Dora Lush Biomedical Scholarships

**Alice Butterworth**, *Targeting the transmissible life stages of the malaria parasite, Plasmodium falciparum*, Queensland Institute of Medical Research

**Natalia Sampaio**, *Suppression of immunity by malaria parasites*, Walter and Eliza Hall Institute

### NHMRC Career Development and Early Career Fellowships

**Dr Ashraful Haque**, *Understanding the host immune, response to blood-stage malaria*, Queensland Institute of Medical Research

**Dr Erinna Lee**, *Cell death in parasites*, Walter and Eliza Hall Institute

**Miss Brioni Moore**, *Evaluation of azithromycin plus piperazine as intermittent presumptive treatment in pregnant Papua New Guinean women*, University of Western Australia

**Dr Neta Regev-Rudzki**, *Export of effector proteins by P. falciparum to the infected erythrocyte*, Walter and Eliza Hall Institute

**Dr Jonathan Richards**, *Antibodies to the invasion ligand, EBA175 and, protection from Plasmodium falciparum malaria*, Macfarlane Burnet Institute for Medical Research and Public Health

**Dr Danny Wilson**, *Unravelling the sequence of signals required for invasion of the malaria parasite Plasmodium falciparum: identifying new targets to stop an old foe in its tracks*, Walter and Eliza Hall Institute

### NHMRC Senior Research Fellowships

**Prof. Alan Cowman**,  
Walter and Eliza Hall Institute

**Prof. Denise Doolan**,  
Queensland Institute of Medical Research

**Prof. Alex Loukas**,  
James Cook University

### NHMRC Program Grant

**Prof. Michael Good, Prof. Don McManus, Prof. Istvan Toth, Prof. Nick Anstey, Prof. Denise Doolan, Dr Chris Engwerda, Prof. Alex Lukas, Prof. James McCarthy, Prof. Ric Price**,

*Tropical Disease – Immunity, Pathogenesis and Vaccine Development: Global Transition*,

Griffith University, Queensland Institute of Medical Research, University of QLD, Menzies School of Health Research, James Cook University

### NHMRC Project Grants

**A/Prof. Jonathan Baell**, *Discovery of New and Better Treatments for Human African Trypanosomiasis*, Walter and Eliza Hall Institute

**Dr Alyssa Barry**, *Mapping Plasmodium falciparum population structure and the source of outbreaks in Papua New Guinea*, Walter and Eliza Hall Institute

**Dr Jacob Baum**, *Dissecting the molecular basis of actin filament disassembly in the malaria parasite*, Walter and Eliza Hall Institute



## Appendix 2 cont.

**A/Prof. Qin Cheng**, *The control and regulatory mechanisms of artemisinin induced dormancy in P. falciparum*, Queensland Institute of Medical Research

**Dr Valery Combes**, *Microparticles are pathogenic elements in the pathophysiology of cerebral malaria*, University of Sydney

**Dr Tania De Koning-Ward**, *Functional characterisation of the malaria protein export machinery*, Deakin University

**Dr Diana Hansen**, *The role of chemokine networks in severe malaria and the control of parasite density*, Walter and Eliza Hall Institute

**Prof. Nicholas Hunt**, *The astrocyte: a crossroads in cerebral malaria pathogenesis*, University of Sydney

**Dr Gabriela Minigo**, *Age-and species-related regulation of host inflammatory responses in falciparum and vivax malaria*, Menzies School of Health Research

**Dr Kate Mounsey**, *Inside the skin: understanding different host responses in scabies*, Queensland Institute of Medical Research

**Prof. Ivo Mueller**, *Dynamics of malaria transmission stages in host and vector: bottlenecks and their impact transmission and parasite population diversity*, Walter and Eliza Hall Institute

**Prof. Raymond Norton**, *Inhibitors of Inducible Nitric Oxide Synthase (iNOS) Regulation as a Basis for Novel Anti-Infective Agents*, Monash University

**Prof. Raymond Norton**, *A New Class of Anti-Malarial Agents Targeting Apical Membrane Antigen*, Monash University

**Prof. Stephen Rogerson**, *Malaria in pregnancy: exposure, immunity and complications*, University of Melbourne

**Prof. Allen Ross**, *Towards sustainable control and elimination of schistosomiasis in the Philippines*, Griffith University

**Dr Julie Simpson**, *Optimising severe malaria treatment using pharmacokinetic pharmacodynamic modeling*, University of Melbourne

**Dr Christopher Tonkin**, *Functional Dissection of Invasion Motor Regulation in Toxoplasma gondii*, Walter and Eliza Hall Institute

**Dr Wai-Hong Tham**, *The role of parasite adhesins in Plasmodium falciparum invasion of human erythrocytes*, Walter and Eliza Hall Institute

**Dr Tonia Woodberry**, *Understanding dendritic cell dysfunction and apoptosis in malaria in endemic populations*, Menzies School of Health Research

### NHMRC Equipment Grant

**Dr Rowena Martin**, **Prof. Stefan Bröer**, and **Prof. Kieran Kirk**, *Multichannel Systems "Roboinject Robot"*, Australian National University

### ARC Early Career Researcher Awards

**Dr Stephanie Godfrey**, *Using social network models to understand the factors driving parasite transmission in bettong populations*, Murdoch University

**Dr Darren Gray**, *Transmission dynamics modelling of zoonotic neglected tropical diseases*, The University of Queensland

**Dr Erinna Lee**, *Targeting cell death pathways in parasites*, The University of Melbourne

**Dr Kate Mounsey**, *A porcine model to provide new insights on scabies immunopathology*, University of the Sunshine Coast

**Dr Neta Regev-Rudzki**, *Export of effector proteins by Plasmodium falciparum to the infected red blood cell*, The University of Melbourne.

### ARC Future Fellows

**Dr Norelle Daly**, *Development of disulphide-rich peptides for drug design*, James Cook University

## Appendix 2 cont.

**Dr Andreas Lopata**, *Molecular and immunological approaches to manage Australia's seafood allergy epidemic*, James Cook University

### ARC Discovery Projects

**Davenport, Prof Miles P; Haque, Dr Ashraful; Wykes, Dr Michelle; Cromer, Dr Deborah; Moormann, A/Prof Ann M**, *Understanding the dynamics of malaria infection*, The University of New South Wales, Queensland Institute of Medical Research

**Grutter, Dr Alexandra S; Bshary, Dr Redouan; Madin, Dr Elizabeth M; Meekan, Dr Mark G; Warner, Prof Robert R**, *What happens to coral reefs without cleaner fish?* The University of Queensland

**McMorran, Dr Brendan J; Foote, Prof Simon J**, *Analysing the protective role of platelets during malaria infection*, University of Tasmania

**Meeusen, Prof Els N; O'Hehir, Prof Robyn E**, *Designing new generation adjuvants for allergy and parasite vaccines*, Monash University

**Ralph, Dr Stuart A; Hanssen, Dr Eric; Baum, Dr Jacob; Frischknecht, Dr Friedrich**, *Unlocking malaria invasion by ultraresolution microscopy*, The University of Melbourne, Walter and Eliza Hall Institute

**Shao, Dr Renfu; Gu, Dr Wenyi; Barker, A/Prof Stephen C**, *Evolution and function of fragmented animal mitochondrial genomes*, The University of Queensland

**Waller, Dr Ross F; van Dooren, Dr Giel G**, *Composition, assembly and functions of the pellicle of apicomplexan parasites: a structure pivotal to disease transmission and progression*, The University of Melbourne

### ARC Linkage Projects

**Meeusen, Prof Els N**, *Exploiting the lymphatic system for next generation vaccine development*, Monash University

**Quinn, Prof Ronald J; Hofmann, A/Prof Andreas; Vandal, Dr Omar H; Kaneko, Dr Takushi**, *Fragment based screening to deliver drugs targeting tuberculosis and*

*the gametocyte and liver stages of Plasmodium*, Griffith University

**Todd, Dr Matthew H; Wells, Dr Timothy N**, *Open source drug discovery for malaria*, The University of Sydney

### ARC LIEF Grants

**Daly, Dr Norelle L; Loukas, Prof Alex C; Mulvenna, Dr Jason P; Seymour, A/Prof Jamie E; Craik, Prof David J; King, Prof Glenn F; Fairlie, Prof David P; Rosengren, Dr Karl J; Schirra, Dr Horst J**, *High-resolution and high-throughput Nuclear Magnetic Resonance (NMR) facility*, James Cook University

**Foote, Prof Simon J; Reid, Prof James B; Hilder, Prof Emily F; Gell, Dr David A; McGuinness, Dr David S**, *Purchase of a high resolution Nuclear Magnetic Resonance spectrometer with liquid chromatography module*, University of Tasmania

**Kvansakul, Dr Marc; Ryan, Prof Michael T; Heras, Dr Begoña; Maher, Dr Megan J; Hawkins, Dr Christine J; Perugini, A/Prof Matthew A; Parker, Prof Michael W; Cappai, Prof Roberto; Ralph, Dr Stuart A; Griffin, Dr Michael D**, *Melbourne and La Trobe rapid integrated X-ray diffraction facility*, La Trobe University

**Tilley, Prof Leann; Harper, A/Prof Ian S; Ryan, Prof Michael T; Gleeson, Prof Paul A; Furness, Prof John B; Tiganis, Prof Tony; Nugent, Prof Keith A; Hartland, Prof Elizabeth L; Jans, Prof David A; Lackmann, A/Prof Martin; Maier, Dr Alexander G; Baum, Dr Jacob; Rogers, Dr Kelly L; Cowman, Prof Alan F**, *A cellular nano-imaging facility: Probing cellular complexity*, The University of Melbourne

**Ward, Prof Alister C; Mak, Prof Johnson; Wang, Dr Linfa; Stambas, Dr John; Lowenthal, Dr John W; Tripp, Prof Ralph A; de Koning-Ward, Dr Tania F; Buttemer, Prof William A**, *Collaborative high bio-containment immunological research facility*, Deakin University

### Human Frontier Science Program

## Appendix 2 cont.

**Baum Jacob, Frischknecht Friedrich, Kovar David,**  
*Dissecting cytoskeletal dynamics across the malaria parasite lifecycle,* Walter and Eliza Hall Institute

Bill & Melinda Gates Foundation

**Quinn R, Vu H, Van Voorhis W, Crowther G, Trenholme KR, Gardiner DL, Andrews K, Campitelli, M.** *Fragment Based Screening to deliver Drugs Targeting Tuberculosis and the Gametocyte and Liver Stages of Plasmodium.* Griffith University, Queensland Institute of Medical Research

National Institutes of Health

**Gardiner DL, Trenholme KR, McCarthy JS, Brown CL.** *Assay Development for lead identification of anti-gametocidal agents.* Queensland Institute of Medical Research, The University of Queensland

National Institutes of Health Tropical  
Medicine Research Centre

**Drs Shyam Sundar, Jenefer Blackwell, Michaela Fakiola,**  
*Molecular and cellular action of HLA class II molecules, the major genetic risk factors for visceral leishmaniasis,* The University of Western Australia.

Australian Biological Resources Study

**Prof. Lesley Warner,** *A Checklist of the Acanthocephala from fish hosts.,* South Australian Museum

**Prof. Lesley Warner,** *Undertake a taxonomic revision of the genera of the Acanthocephala occurring in fresh water and marine fish by re examining described material.* South Australian Museum

Australian Academy of Science International  
Exchange Awards

**Dr Shookefeh Shamsi,** Charles Sturt University

**Ms Clare Smith,** University of Tasmania

Australian Poultry CRC

**Dr Jess Morgan,** *Characterizing population structure and diversity of Australian Eimeria,* The University of Queensland

Elanco Research Agreement

**Drs Rodriguez-Valle and Lew-Tabor,** *Genomic approach to develop a vaccine and or treatments for Ixodes holocyclus,* The University of Queensland

ANU Connect Ventures

**A/Prof. Carol Behm,** *Development and evaluation of an in vitro assay to discover new classes of anti-nematode drugs,* Australian National University