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In this issue....

Dear Network Participant,

Welcome to the Special Edition
ARC/NHMRC Research Network for
Parasitology Conference Newsletter.

This newsletter gives you some highlights
of and information for the 2008 ASP &
Network Conference and also a brief report
about what happened at the 2007 ASP &
Network Conference with interviews from
some of our invited speakers.

***Don't forget that we have
extended the registration and
submission of abstracts deadline
for the 2008 ASP & Network
Conference until 18 April 2008!***

Best wishes

Lisa.

(Lisa Jones, Communications Coordinator,
ARC/NHMRC Research Network for Parasitology;
lisa.jones@uts.edu.au)

Highlights of the upcoming 2008 ASP & Network Conference

early career researchers and students event...

Following the success of last year's Network ecr and student breakfast the Network is once again organising and sponsoring a free early career researchers and students event at the 2008 Conference to enable postdoctoral researchers and students to speak to prominent parasitologists about their career and to meet like-minded peers. To attend this event please confirm your booking with Wendy Relf by email Wendy.Relf@uts.edu.au or by telephone 02 95144006 preferably by April 18 but definitely no later than April 24, 2008. This event could potentially be held on Sunday July 6 (12 – 5pm) or Thursday July 10 (10am – 3pm). Please indicate which you prefer when replying to Wendy.

early career researchers prize...

Don't forget that the Network will, once again, be awarding up to two prizes to "Early Career Researchers". The prizes will be for the best conference presentations (whether poster or oral presentations) by postdoctoral researchers (currently based in Australian institutions) who are within 10 years of receipt of their PhD. To be eligible for consideration, candidates must be in non-tenured positions and be the first author and presenter of a talk or poster at the annual conference. The prizes will be in the form of travel grants (valued up to

\$4000-5000) to attend, and present at, the annual meetings of one of our sister networks in Europe, Canada or Southeast Asia.

If you would like to be considered for one of the Early Career Researcher Awards, you should register with Wendy Wendy.Relf@uts.edu.au with the title of your presentation and a statement about your qualifications (i.e. date and place of award of PhD) and your current position. Please note that if it is more than 10 years since the award of your PhD but you have experienced career interruptions, you may still be eligible for consideration - please include a statement explaining why you believe you should be eligible despite more than 10 years passing since the award of your PhD.

ASP student members who have a poster or who are presenting at the conference should register with Lois Small (Executive Secretary of the ASP) lois.small@nt.gov.au so that they are eligible for the ASP student prizes.

Parasites in Focus – photography exhibition at the South Australian Museum

The Network organised "Parasites in Focus" Parasite Photography Exhibition will be on display at the South Australian Museum July 2008, during the conference. This exhibition is supported by the ASP, Questacon – The National Science and Technology Centre, and DEST. This exhibition shows a series of stunning images of parasites photographed by Australian researchers. We are looking for

future hosts for this exhibition – if you would like to see this photographic display at a venue near you or if you would like to see your own parasite images become part of this exhibition please contact Lisa Jones by email Lisa.Jones@uts.edu.au or telephone Lisa or Wendy on 02-95144006.

2007 ASP & Network Conference in Canberra...

Congratulations to the winners of the 2007 ARC/NHMRC Research Network for Parasitology Awards

ARC/NHMRC Research Network for
Parasitology Early Career Researcher
Award for the best presentation:

**Rowena Martin (Australian National
University)**
Jake Baum (WEHI)

Congratulations to the winners of the 2007 ASP Student Awards

ASP Student Award for the Best Poster:
**Simon Cobbold (Australian National
University)**

ASP Student Award for the Best
Poster/Oral Presentation:
**Alison Knight (Australian National
University)**

ASP Student Award for the Best Oral
Presentation:
Nichola Hill (Macquarie University)
**Kate Mounsey (Menziess School of
Health Research, Darwin)**

Congratulations to A/Prof Tom Cribb from the University of Queensland for winning the 2007 ASP The Bancroft- Mackerras Medal for Excellence.

Hypothetical – Global Warming and Parasites was held at New Parliament House, Canberra, ACT.

The Network organised and hosted the highly entertaining “Hypothetical – Global Warming and Parasites” public event which was held in the Great Hall at New Parliament House on Wed 11 July 2007 and enjoyed by over 300 audience members. This lively debate was hosted by the **ABC's Robyn Williams** and featured an expert panel of scientists, legislators and politicians:

- **Senator Lyn Allison**, Leader of the Democrats and spokesperson for Education; Health and Ageing; Resources, Energy and Infrastructure; Treasury and Commonwealth-State Relations.
- **Dame Bridget Ogilvie**, Companion to the Order of Australia for services to science policy and parasitology. Former chief of the Wellcome Trust and researcher on parasite immunology.
- **Lieutenant Colonel Bob Cooper**, Director of the Army Malaria Institute.
- **Prof Bart Currie**, Head of the Tropical and Emerging Infectious Diseases Division at the Menziess School of Health Research in Darwin, Senior Infectious Diseases Physician at Royal Darwin Hospital and Professor in Medicine at the

Northern Territory Clinical School,
Flinders University.

- **Dr Peter Daszak**, Executive Director of the Consortium for Conservation Medicine in the U.S.A.
- **Dr Eva Bennet-Jenkins**, acting CEO of the Australian Pesticide & Veterinary Medicines Authority.

Interviews with some of our invited speakers at the 2007 ASP & Network Conference



Artur Scherf is a CNRS Director of Research and a laboratory head at the Institut Pasteur in France; he directs the Biology of Host Parasite Interactions Unit and is Director of the laboratory for The Genetic and Molecular Bases for Eukaryotic Cell Interactions. He is also the Director of BioMalPar- (Biology and Pathology of Malaria Parasite), a Network of Excellence supported by the European Commission. Artur sits on the Advisory

Committee of the ARC/NHMRC Research Network for Parasitology and recently gave a symposium presentation at the 2007 ASP & Network Annual Conference in Canberra. Whilst at the conference, Artur spoke to Lisa Jones about his research.

Artur describes himself as a malaria researcher, in the area of vaccine development. Twenty years ago Artur helped to develop a putative malaria vaccine after joining the Pasteur Institute, when this was trialled in monkeys the vaccine failed. Since then Artur has devoted his research career at the Pasteur Institute to studying the biology of the malaria parasite and has been pursuing the question posed by many malaria researcher's "How does the malaria parasite live in such a hostile environment as the human host?" Artur describes himself as initially a "curious biologist" who was challenged by this research question. He says that the intellectual challenge for him is to understand how the malaria parasite operates and that, since visiting malaria wards in Africa, he has been inspired to pursue his research with more than just intellectual curiosity – especially with the knowledge that this research will potentially help millions of people who suffer from malaria each year.

Genomic plasticity of the parasite, the many different forms that exist, mean that the malaria parasite is complex and developing a vaccine against it is challenging. Artur spends much of his time researching the malaria parasite and its biology, and the remainder trying to develop new interventions to help people who are exposed to the malaria parasite.

Artur says that we don't understand "protective immunity" against this parasite very well. He says that malaria drugs are a lot easier to understand than how a vaccine works – that our understanding of immunology in malaria is so little that we still need to develop anti-malaria drugs. In fact, recently, scientists have shown that certain drugs work hand-in-hand with the immune system, and some drugs that don't kill the parasite 100% will actually kill the parasite enough so that we can harness the immune system to finish the job.

One of Artur's interests is malaria in pregnant women. Women who are pregnant have a gap in their immunity against malaria. Generally, when women are exposed to the malaria parasite in their first pregnancy, they get very sick or their baby gets very sick. Their body then builds up its own immunity to the malaria parasite and they are not sick for subsequent pregnancies.

One important question for Artur and his team is how to apply a vaccine so that local people at risk are immunised before they become infected with the malaria parasite. Artur says they would have to immunise woman at a certain age, or time of their life, just before they are most likely to fall pregnant. Ideally these women would be immunised just prior to becoming infected and before they fall pregnant. The vaccine has to remain effective for at least 1 – 2 years and this has to be applied in the field. Artur says that they will rely on health education and promotion to try to immunise young women at the right time of their lives and he agrees that this may be difficult,

especially as many communities that need this vaccine are rural communities.

Artur and his team collaborate with many other malaria research teams who are working on a malaria vaccine, including teams in the US and in Africa. They also collaborate with WEHI and have some links with QIMR in Australia. Artur says that malaria is such a complex disease that researchers must put their research efforts together to find a solution through vaccine development. He says that even with groups where they compete for the same research funding they have collaborations.

Artur says that it is in this very concept of collaborative research that the European Community Initiative BioMalPar started three years ago. With the aim to build up a "virtual institute" for collaborative studies across European malaria research institutions this model has developed into a very successful collaborative network. BioMalPar started with 45 labs and since it started they have included new members each year so now there are 60 malaria research labs involved from European countries and some countries where malaria is endemic and this helps to build up the research infrastructure in those countries, and train their students. Building up trust between institutions takes time, Artur says, and he welcomes support from his external advisors from around the world, including the ARC/NHMRC Research Network for Parasitology.

Of course, Artur says, it has been (and still is) a learning experience; but the most positive outcome from BioMalPar is the school they have created – a PhD training

programme for young talented scientists. BioMalPar has led to collaborations between malaria labs who are part of the network that traditionally don't usually work together; and, he says, that the PhD projects and the students themselves have aided this collaborative research. Artur believes that the PhD students are the true "engagement" of BioMalPar and he thinks that this is the best thing that the network could do. He says that the way forward will be to nurture these brilliant young researchers as they graduate from EMBL. This new generation of researchers see no barriers posed by country borders or different institutions; their research has already crossed into being truly international research. So far the programme has recruited 36 students, in two intake rounds so far and they are about to recruit a third cohort.

Artur hopes (as we do) that the future of BioMalPar will include links with other research institutions from across the world, including malaria researchers in Australia through the ARC/NHMRC Research Network for Parasitology. Ideally, Australian agencies would support PhD students from Australia to become part of the BioMalPar programme and to promote research exchanges between BioMalPar labs and Australian malaria research labs.

When asked about what inspired him in his research Artur said that he just couldn't imagine working on anything else at this stage in his career – that when you ask one question it opens up twenty more! Artur describes the malaria parasite as an extremely well adapted parasite and a major pathogen – and that we should

consider it to be a serious opponent to the health and well being of people.

It was a real pleasure to interview Artur and hear about all of the exciting advances in malaria research that are happening, especially through BioMalPar. We wish him all the best with his vaccine development and hope to see more formal collaborations between BioMalPar and the ARC/NHMRC Research Network for Parasitology in the near future.



Dr Sheila Donnelly, researcher in IBID at the University of Technology, Sydney (UTS), was an invited speaker at the recent 2007 ASP & ARC/NHMRC Research Network for Parasitology Annual Conference. Here Sheila talks to Lisa about her research.

Sheila describes herself as a parasite-immunologist and studies the immunology of the host response to parasite infection and the host-parasite relationship. She works as part of a team that are interested in finding molecules that helminth parasites secrete to modulate the immune system.

Sheila has been working at UTS since 2004; she started her science career studying microbiology at Dublin City University and did a PhD in virology at Trinity College (Dublin) followed by post-doc work in the 1990's at Maynooth (Ireland), where she was working on the immune response to whole-cell bacterial vaccines. During her work at Maynooth, Sheila was researching whether whole-cell bacterial vaccines induced neurological side-effects – namely seizures. During this time Sheila was also collaborating with researchers in Prof. John Dalton's lab, became interested in their research and then moved across. When John moved to UTS in 2003 he brought some of his researchers and Sheila moved across in January 2004.

Discussing her recent research, Sheila says that, during infections, parasites secrete various molecules and, whilst looking at these secretions, they have found two immuno-modulating molecules, peroxiredoxin and cathepsin-L. Sheila and her group focus on the macrophage as it is important in the response against parasite infections. The effect of peroxiredoxin is to convert macrophages to an activated phenotype that promotes the TH2 response; this response is required by the parasite so that it can survive in the host long-term.

Sheila and her team look at two helminth parasites, *Fasciola Hepatica* (liver fluke) and *Schistosoma Mansoni* (blood fluke). They now have recombinant versions of peroxiredoxin and cathepsin-L and they use these proteins to monitor the effects on

mouse cells either in-vitro or in-vivo in an effort to answer the question, "How does the parasite control the host immune response?" They also believe that peroxiredoxin and cathepsin-L are potentially good vaccine targets - the antibodies produced in response to vaccination with these molecules may help to suppress the TH2 response and allow an effective TH1 response to flourish.

Sheila says, "It's unusual to have identified the molecules involved in the immune response, and this has given us a good tool to investigate the host-parasite interaction in more detail." Sheila finds investigating how parasites manipulate their host absolutely fascinating and she likes the fact that there is an applied medical end to the problems that she is investigating.

We wish Sheila all the best for her future research and thank her for a stimulating presentation at the 2007 ASP & Network Conference.



Professor Akhil Vaidya is Director of the Center for Molecular Parasitology, Department of Microbiology and Immunology at Drexel University, Philadelphia, U.S.A. and recently gave a symposium presentation at the 2007 ASP & Network Annual Conference in Canberra. Whilst at the conference, Akhil spoke to Lisa Jones about his research.

Professor Akhil Vaidya gained his Ph. D. at the University of Bombay in 1972. He trained under Dr Sirsat and worked in India as a retro-virologist for the first 20 years of his career. Following that Akhil, took a position in the USA in Dr Dan Moore's laboratory, and this led to running his own lab at Drexel University.

In the mid-1980's Akhil switched to malaria research after his lab discovered that the mitochondrial DNA of malaria parasites was very unusual. The DNA is very small and encodes only three proteins as well as having very unusually organised ribosomal RNA genes. This discovery led to another insight into mitochondrial DNA - that it was very similar to chloroplast DNA and this discovery changed the whole way that researchers thought about the evolutionary origins of malaria parasites. Akhil said that

they had found something so unusual that his whole career since has been spent on looking at malaria.

Akhil says, "The problem of malaria remains unabated in much of the world with 40% of the human beings at risk of being infected with malaria parasites. Our laboratory focuses on understanding basic molecular functioning of malaria parasites with a view to develop new antimalarial drugs."

It is now well established that a 35-kb circular malaria DNA molecule, originally thought to be the mitochondrial genome, is in fact a derivative of a chloroplast-like genome. Akhil's team of researchers have shown that both these molecules are inherited maternally by malaria parasites. These observations have had profound implications on the view of evolutionary origins of malaria parasites: they are likely to have some plant-like physiological processes, a suggestion that is amply supported by the recent genomic sequencing. These studies have pointed out new avenues to identify excellent targets for drug development; because the mitochondrial functions are unusual they are good targets for malarial drugs.

One example is atovaquone, a new antimalarial drug, a selective agent that works against the parasite mitochondria. Akhil's lab has shown that atovaquone preferentially collapses mitochondrial membrane electropotential in malaria parasites. However, resistance to this drug arises quickly, and is mediated by subtle changes within the mitochondrially encoded cytochrome b protein.

Visualization of these changes has revealed an atovaquone-binding domain within the parasite bc1 complex. His team's investigations on atovaquone-proguanil combination treatment have shown a possible new mechanism of drug synergy and they are collaborating with GlaxoSmithKline to develop the next generation of anti-mitochondrial drugs.

So what keeps Akhil motivated? Akhil says "40 million Disability Affected Life Years (DALYs) are lost per year to malaria - we need new drugs for malaria. The drug we work with, Malaron, is still very expensive, treatment is at least \$100 US and this is simply unaffordable for many who suffer from malaria in developing countries. We need to develop cheap, effective drugs to help treat malaria sufferers."

Akhil is still fascinated by this parasitic organism as a continuously evolving organism. He says, "The malaria parasite changes its transgenic structure as soon as it enters a new host, which is remarkable. And, although we know a lot more about malaria today, especially with advances in gene technology so that we now have the genetic sequence of the parasite, there is still a lot to be learnt about pathogenesis and immunity towards malaria".

Akhil says that "science is a wonderful adventure" and is encouraged by the idea that he can contribute a little bit towards scientific knowledge that will help people.

Scientists like Akhil are so inspirational to talk to and on behalf of the Network I thank him for his time and wish him well in the future.



Richard Grecis is Professor of Immunology at The Faculty of Life Sciences, the University of Manchester in the U.K. Richard gave a symposium presentation at the 2007 ASP & Network Annual Conference in Canberra and as an ASP Visiting Lecturer spoke to members of IBID at UTS. After his fascinating lecture Richard spoke to Lisa Jones about his research.

Richard has always worked on gut nematodes, "Intestinal nematodes are very successful" Richard says "and very difficult to study in humans". He looks at the immune response to gut nematodes, host resistance, and why some people are resistant or susceptible.

As an undergraduate Richard became interested in parasitology through a series of inspirational lectures at Nottingham University. After completing his PhD in 1982 under the supervision of Derek Wakelin the Wellcome Laboratories for Experimental Parasitology, University of Glasgow Richard moved with Derek as a post-doc to the MRC Experimental Parasitology Group at University of

Nottingham University. Richard subsequently moved to Manchester University in 1987 joining the Immunology Department and says this is an exciting place to be as there have been many changes to life sciences over this period, lots of collaborations, investment and support.

Richard wants to understand why a host has a specific response against the gut nematode – he knows the mechanism of the response, but doesn't know why some animals are resistant and others susceptible to the parasite. He uses the mouse model to look at mechanisms of immunity. Hosts who are resistant to nematodes have immunity, and evoke a type 2 cytokine response. Richard says this response could one day be used as a therapeutic agent for IBD (Irritable Bowel Disease).

Richard's current research aims to (1) identify molecules from parasites that help in the modulation of immune response (in mice) and (2) develop new transgenic systems to study cellular immunology to infections more effectively.

Richard studies the nematode *Trichuris muris*, which is the natural whipworm of mice. It is over-dispersed in wild mice (most are infected and a few have large numbers) and is similar to the human counterpart *Trichuris trichiura*. The Sanger Institute are sequencing this parasite's genome and over the next 5 years they should gain some good genomic information. "Working on worms, compared with protozoan parasites," Richard says "is relatively unexplored territory and genetic

information will open up more possibilities. Genomic information about any animal is important as there are lots of similarities in human parasites."

Trichuris lives in the large intestine. The parasite penetrates epithelial cells and as these cells are being continuously shed the parasite has to constantly move. Richard asked the question, "As epithelial cells move could the worm be expelled?" Richard and his team assessed the turnover of epithelial cells and found that when it was faster this was something to do with IL13. They then looked at the worm burden and found a direct relationship to an increase in the turnover of cells. The next question was "How to switch on a good IL13 response?" Richard is trying to understand how the worms are expelled and thus how to induce a certain immune response. He wants to understand the consequences of worm infections (chronic infections) – how these are maintained without the host getting really sick. Then he will understand the regulation of worms, which is a finely balanced situation – if you disturb it, you will change the balance and, perhaps, end up with diseases like IBD.

Richard is also interested in worm infection on other immune responses. Is the worm infection important for people who get infected with other parasites? Richard is also looking at co-infection patterns. He says that, for example, clearing helminth infections may help people who are infected with malaria.

Richard enjoys travelling to promote his research, he says that he gains new ideas after talking with people in different

laboratories and is able to set up new collaborations and instigate researcher exchanges. He enjoys teaching and doing research and he finds that his enthusiasm often rubs off to those working with him.

Richard says "The fantastic thing about parasitology is you have to know about everything, and be a biologist across the board if you want to succeed. Don't be restricted by techniques," he says. "Asking the right question is most important. Everything you do generates more questions and this will keep your motivation up!"

Richard says he still has an enormous amount to learn, particularly about helminths, and plenty in parasitology. He sometimes has to step back so as not to get bogged down in a wealth of information.

Richard gave a series of excellent lectures in Australia last year. We wish him all the best with his gut nematode research and hope to see more from his collaborations with Australian researchers in the near future.

General information about the 2008 ASP & ARC/NHMRC Research Network for Parasitology Annual Conference

Early registration and abstract submission closes in less than 2 weeks, on the 18 April, for the 2008 ASP & Network Annual Conference.

Please register online for this conference

<http://www.conftool.net/parasitology2008/>

For full details of the 2008 ASP & Network Conference check the conference website

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

Registration Fees

	ASP Members+		Non-Society Members	
	Student	Regular delegate	Student	Regular Delegate
Friday April 18, 2008 Early Bird registration and abstract deadline	\$260	\$390	\$360	\$490
Friday June 13, 2008 Standard registration deadline	\$360	\$490	\$460	\$590
Friday July 4, 2008 Late registration deadline	\$460	\$590	\$560	\$690

+ Or another parasitological society (COST B22, COST 857, BioMalPar, Quebec Centre for Host-Parasite Interactions, NZSP) please specify which society when registering.



After July 4 2008, Day Registration, by cheque to the ASP, on site, will be the only possibility at \$250 per day.

Registration fees are quoted in Australian dollars and include: entrance to all sessions; the evening Welcome Reception on 6 July 2008; lunches, and morning and afternoon teas from 7/7/08 to 9/7/08 inclusive; Poster Viewing sessions with drinks and buffet dinner; the Conference Dinner with pre-dinner drinks on 9 July 2008 (including transportation to Conference Dinner venue).

Please note that registration does not include accommodation. Conference delegates must book their own accommodation for this conference. For accommodation options please check the advice pages on the conference website

<http://www.parasite.org.au/arcnet/conference/advice.html>

Don't forget that student ASP members are eligible for generous financial assistance to attend the conference from the ASP provided they have been members for a minimum period before the conference – so download an ASP membership application form now from the ASP website <http://www.parasite.org.au/member.htm>

Abstracts

To submit an abstract for this conference you will first need to register as a participant and then, once you have logged on, submit a contribution through the online conference system.

To register and submit an abstract, please visit our online conference system at <http://www.conftool.net/parasitology2008/>

Participants who wish to contribute a paper are requested to register and submit an abstract online before 18 April 2008. The Organising Committee will be responsible for selection of the final form of presentation (either poster or oral) but if you do not wish to give an oral presentation you may request to submit a poster display only. You may also request to give an oral poster presentation rather than a contributed paper presentation.

Please check the website for all matters regarding the conference, including additional tickets for guests, hotel accommodation, the social programme and submitting an abstract.

If you have any conference queries please contact Wendy Relf by email Wendy.Relf@uts.edu.au or telephone 02-95144006.