ARC/NHMRC RESEARCH NETWORK FOR PARASITOLOGY

Network Newsletter, Friday, 3 March 2006

Dear Network Participant,

The March edition of the ARC/NHMRC Research Network for Parasitology Newsletter holds the following items for you:

[1] Register now for the 2006 ASP & ARC/NHMRC Research Network for Parasitology annual conference

Registration and Abstract Submission for the 2006 ASP & Network annual conference are now open, register for the conference and submit your abstract online http://www.parasite.org.au/arcnet/conf06/index_06.html.

A fantastic program of invited speakers has been arranged and registration fees have been kept very low. Early registration (before 24 March 06) starts from $100 for students and $200 for regular delegates and includes lunches, dinners, tea breaks and more – join the ASP now at http://www.parasite.org.au/member.htm to be able to take full advantage of these low fees and other benefits of being a member of a great society.

[2] Network Participant Annual Survey

We would like to survey all Network participants about being part of the Network, and its current and future activities. The survey should not take more than a few minutes to complete and results will be published on our website and in our annual report as part of our ARC grant requirements. I will send a separate link to the survey through the Network's mailing list shortly.

[3] "Vaccine for Malaria", an interview with Michael Good from QIMR

Queensland Institute of Medical Research (QIMR) scientists have found that that, in animal studies, an immune response can protect against infections of different strains of the Malaria parasite. Malaria vaccine trials in humans are expected to start in Brisbane later this year.

Professor Michael Good from QIMR talked to Carly Johnson about the Malaria vaccine trials on Monday 27 February 2006.

How does this vaccine work?

> "The vaccine works by stimulating an immune response that recognises the infection, the real infection when it comes, and destroys it or limits its growth. The real challenge in malaria vaccines is to identify a way to stimulate an immune response which will cover all strains of the parasite and be effective in controlling their growth. Most people are looking at what are called single antigen or subunit vaccines. The difficulties with these approaches are that single antigens are often poorly immunogenic and secondly they're often polymorphic. In other words, the parasite changes its coat.
>
> The approach that we've been pursuing recently is to revisit ways to use the whole parasite. The whole parasite contains all the proteins of the parasite so you limit problems of antigenic variability and typically it's more immunogenic. What we've found is if we use a low dose of the

parasite, as opposed to say a large dose, the immune response is even more immunogenic again. It's focused on cell mediated immunity in preference to an antibody focus. Now, that's important because we find that the target antigens in cell mediated immunity are highly conserved where as the target antigens of the antibody are the ones that tend to be polymorphic."

How is this vaccination different from the traditional approach to malaria treatment?

"Malaria treatment is to kill the parasite with a drug once it's in your body and that doesn't in itself induce an immune response which will protect you against subsequent infection. In fact, there's a lot of evidence that when you have a malaria infection your immune response to the parasite is diminished. The infection causes apoptosis of the specific T-cells and memory B-cells and that limits your ability to respond effectively to the parasite next time. So a vaccine, unlike a treatment, aims to stimulate the immune response, rev it up so that the antibody, or the T-cells in our case, will kill the parasite."

How was the idea for the "whole parasite approach" developed?

"We found out that when you get a malaria infection in an animal model the T-cells which were responding to that parasite were apoptosed. The parasite was causing cell death of the T-cells which were supposed to kill the parasite. So we thought that since apoptosis is often associated with a high dose of antigen or parasite that maybe a low dose would prevent apoptosis. We tried a very low dose, so low that you couldn't see the parasites in a blood infection, and we found that that was successful. It didn't cause apoptosis and it stimulated a very potent immune response."

How long has it taken to get to this stage?

"We've been working on this low dose approach for about 7 to 8 years."

How many scientists have been working on this vaccine?

"Not a great number. We've had a student from Thailand (Chakrit Hirunpetcharat), post docs Huji Xu, David Pombo, Salenna Elliott and Alberto Pinzon-Charron. Some research assistants in the lab (Virginia McPhun, Xue Qin Liu). Some are still here, others have come and gone."

What challenges did you face using this approach?

> "The biggest challenge in this approach I think is the idea of convincing people that we can make a safe vaccine when you inject whole organisms grown in red blood cells. People are understandably concerned about inducing immune responses to the red blood cells. We have to go to extraordinary lengths to make sure that doesn't happen, and to make sure that the blood that we culture the parasites in isn't infected with other organisms such as viruses. We have to make sure the blood product is safe."

How is this vaccine different from the one that Dr Stephen Hoffmann in the US is producing?

> "He and his company Sanaria are looking at a different stage in the lifecycle. The malaria lifecycle starts when the mosquito injects the sporozoites which travel to the liver, then leave the liver and go into the red blood cells. The red blood cells are responsible for all the symptoms and pathology of malaria. Our approach is focused on the red blood cells stage. Steve Hoffman's is focused on the sporozoites that come from the mosquito to the liver."

How will this vaccine be taken?

> "We anticipate it will be given by intramuscular injection."

Is this vaccine suitable for children?

> "We would hope so. One of the important parts of doing any vaccine trial is to look at safety and immunogenicity. As part of the vaccine trial work up we would be looking initially at safety and immunogenicity initially in adults, and then if it was safe and immunogenic in adults we would look at children."

What are the dangers of vaccinating people with live parasites?

> "We probably won't use live parasites. We will use whole parasites which have been killed. With live parasites obviously you would have to be sure they were attenuated and weren't in themselves able to cause disease which is a big problem. But with a dead parasite that won't be an issue."

How stable is the vaccine and what is its shelf life?

> "Until we actually test that, we don't know. These are questions we don't have answers for yet."

What sort of issues might there be for using this vaccine in other countries?

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Supported by the Australian Research Council, the National Health and Medical Research Council and the Australian Society for Parasitology.

> "The main ones are showing immunogenicity in different populations and issues of shelf life."

Can you describe the human trials process and tell us what happens next?

> "It's anticipated that human trials should start in about one year's time. After that, the next thing to do is grow the Plasmodium falciparum parasites at GMP cells. Obviously we do grow Plasmodium falciparum parasites now, but we don't grow them in a way that would be regulated or allowed by the TGA to inject into people. We would have to use blood which we know is safe and clean and we have to grow these parasites under very stringent, reproducible conditions so that we can do the same thing again and again and again. And we have to produce the adjuvant at GMP."

What is the significance of this vaccine in the fight against malaria?

> "There are about 2 million deaths every year from malaria, most are children and mostly in Africa. Any vaccine which could diminish that number would have a big impact on public health."

What is the vision for the development and distribution of this vaccine?

> "If this vaccine works as we hope it will, it may be that these processes could be taken up by companies in developing countries around the world and made locally."

What about the future of this vaccine?

> "What excites me most is to find a way to get this vaccine, if it works, distributed. So whatever it takes."

Carly Johnson interviewed Professor Michael Good, QIMR, on 27 February 2006. This interview is also published on the Network website http://www.parasite.org.au/arcnet/news.shtml

[4] Testimonials for Parasitology

Professor John Sprent, foundation President of the Australian Society for Parasitology and editor of the International Journal of Parasitology (1974-1993), says

> "I have been very disappointed over the untimely demise of the Department of Parasitology at the University of Queensland, the reduction in teaching of Parasitology in medical and veterinary curricula, and the dwindling membership of the Australian Society of Parasitology. I have been anxious about the dangers of lowering our

standards in our attitude to parasites, parasitism and parasitic diseases.

I am now delighted to learn that plans are afoot for a renaissance on the Parasitology scene. After reading about the aims and objectives of the ARC/NHMRC Research Network for Parasitology, I found myself in complete agreement in all respects and was very impressed, not only with the overall master plan, but with the careful consideration given to all details involved in effective operation. Altogether I find the project exciting, exhilarating and a source of great personal relief and satisfaction."

Professor Graham Mitchell, co-founder of Foursight, Immunologist and member of the Network's advisory board, says

"Parasites hit the headlines less than viruses or bacteria. Yet they have major economic impact in our rural industries and wreak havoc as human diseases in many neighbouring countries. Now more than ever, a consortium approach to developing new tools for detection and control is needed and I therefore applaud and strongly endorse the work of the new ARC/NHMRC Research Network for Parasitology"

The Hon. Santo Santoro, Senator for Queensland and federal Minister for Ageing, says

"Parasite research is critical to ensuring the health and wellbeing of all Australians as well as improving the lives of our regional neighbours. Our rural industries, to, benefit from this important work. I applaud the ARC/NHMRC Research Network for Parasitology for the critical role it plays in facilitating and coordinating this nation's world-class research effort in this field."

[5] Get involved in National Science Week 2006

National Science Week runs from 12 – 20 August 2006 and we would like to see as many Network participants being involved as possible across Australia. Please contact me by email Lisa.Jones@uts.edu.au or by telephone 02 9514 4006 for more information or if you would like to participate, or are planning to participate, in National Science Week 2006.

[6] 2006 Australian Museum Eureka Prize

Entries are now open for the 2006 **Australian Museum Eureka Prizes**. The 2006 Eureka Prizes consist of 20 awards worth over $200,000. The 2004 winner of the UNSW Eureka Prize for Scientific Research was parasitologist and Network Participant, Dr Sabina Belli, for her work describing the genesis and development of the oocyst wall of coccidian parasites – we'd like to see another parasitologist amongst the finalists in 2006, so think hard about

potential nominees. See the Eureka Prize website http://www.amonline.net.au/eureka/ for information and entry forms. Entries close on **Friday 5 May 2006**.

Network Profiles

[7] Nick Smith – Network Convenor

Associate Professor Nick Smith is the Convenor for the ARC/NHMRC Research Network for Parasitology. He graduated from the Australian National University with a PhD in Parasitology in 1988 and after two years at the ANU as a National Research Fellow moved to Zurich to work with Prof John Eckert in the Institute of Parasitology at the University of Zurich. Nick moved to the Queensland Institute for Medical Research in 1994 to work with Prof Michael Good and has been based at University of Technology, Sydney (UTS) since 1996.

Research

Nick works in the Institute for the Biotechnology of Infectious Diseases (IBID) at UTS developing vaccines for *Eimeria* in poultry and studying the immunology of infection with *Toxoplasma*. He says the *Eimeria* vaccine is being marketed in several countries and that they are still in the early stages of work on immunity to *Toxoplasma*.

Nick feels that vaccine development is the best way to prevent diseases and enjoys the challenges associated with making them.

Advice for aspiring scientists

"You need to be passionate about your area of research, mentally tough and focus on your successes," Nick advises future parasitologists "and it is very exciting when you do make a discovery."

He comments that being a parasitologist is "hard work but worthwhile", and has always felt that he was doing something meaningful.

Greatest career highlight

In 2003 the first three of Nick's PhD students graduated on the same day that Peter Dougherty received an honorary doctorate from UTS. "Obviously, that was an enormous thrill for those three students to finally reap the rewards for all their hard work but I think it was at least as exciting and satisfying for me." says Nick.

The future

Nick wants to see both an *Eimeria* and a *Toxoplasma* vaccine through to final development, building a solid understanding of immunity to *Toxoplasma* along the way. Nick likes to create new things and build new teams and has enjoyed being part of the development of IBID at UTS and the ARC/NHMRC Research Network for Parasitology, so watch this space over the next five years….

Conferences

[8] 12th International Congress on Infectious Diseases in Lisbon

The scientific program for the 12th International Congress on Infectious Diseases in Lisbon is nearing completion, and an outstanding line up of speakers and topics for anyone active in the fields of infectious and emerging diseases has been assembled. Dr. Barry Marshall, 2005 Nobel Laureate, will join the distinguished list of plenary speakers at the Congress. His lecture, "From Social to Infectious Disease, Ulcers and the Discovery of *Helicobacter pylori*," promises to be a fascinating look at a discovery that fundamentally changed our understanding and treatment of a major global health problem.

Take advantage of reduced registration fees by registering on or before April 15, 2006. Please visit http://isid.org/12th_icid/ for complete information including Congress registration, hotel reservation and abstract submission instructions.

International Society for Infectious Diseases
181 Longwood Ave.
Boston, MA 02155 USA
Tel: 617-277-0551
Fax: 617-731-1541
Email: info@isid.org

Positions vacant, Postdoctoral positions and PhD opportunities

[9] Parasite Immunologist (Assistant/Associate Professor)

The Institute of Parasitology at McGill University (http://www.mcgill.ca/parasitology/) seeks to appoint a tenure track Assistant Professor (equivalent to an Australian Lecturer/Senior Lecturer) or Associate Professor (equivalent to an Australian Associate Professor/Reader) with experience and research interests in the immunology of parasite infections. The appointee will hold a PhD and have a demonstrated track record in immunology and attracting research funding. Applicants will ideally have research experience in mechanisms of acquired immunity, immunopathogenesis, immunomodulation of host responses and/or vaccine discovery. The appointee is expected to develop a research program supported by external funding and teach in the undergraduate and graduate programs at McGill. The appointee will become a member of the FQRNT Centre for Host-Parasite Interactions (http://www.mcgill.ca/chpi/). McGill has a dynamic research community with a commitment to develop research and teaching in infectious diseases and the application of genomic and proteomic approaches.

All qualified candidates are encouraged to apply, however, Canadian citizens and permanent residents of Canada will be given priority. McGill University is committed to equity in employment.

Background information

The Institute has benefited from considerable infrastructure support since 2002 and offers an up to date research environment.
http://www.mcgill.ca/parasitology/equipment/

The Institute also hosts the FQRNT Centre for Host-Parasite Interactions which brings together 34 scientists studying various aspects of parasite biology: the new appointee will become a member of this Centre.

New faculty appointees in Canada are eligible to apply for considerable infrastructure support from the Leaders Opportunity Fund of the Canadian Foundation for Innovation to establish their laboratory, see http://www.innovation.ca/programs/index.cfm?websiteid=393. The Leaders Opportunity Fund (LOF) builds on the New Opportunities Fund, the Canada Research Chairs Infrastructure Fund, and Career Awards Fund, and is designed to assist universities in attracting excellent faculty to Canadian universities as well as retaining the very best of today and tomorrow's leading researchers for Canada.

An international hire (or a returning Canadian or a returning permanent resident of Canada) appointed to a professorial position in a Quebec University may be eligible for a provincial tax exemption from the Government of Quebec, provided that the eligibility criteria set out by the Government are met. This exemption applies to the taxable salary paid by the University for a maximum of five years, see
http://www.academic.mcgill.ca/newfac/info/tax_holiday.htm

Interested individuals should contact Professor Terry Spithill for further information. Applicants should forward a CV, a summary of proposed research plans and the names of three referees by 17 March 2006 to:

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Director, Institute of Parasitology
Canada Research Chair in Immunoparasitology
Director, FQRNT Centre for Host-Parasite Interactions
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Web: www.chairs.gc.ca

[10] Postdoctoral position: Research on immunity to malaria during pregnancy

A position is available for a postdoctoral appointment in the laboratory of Dr. James Beeson in the Division of Infection and Immunity at the Walter and Eliza Hall Institute (WEHI), Melbourne. This is an excellent opportunity for someone interested in conducting clinically-relevant research and investigating important issues in malaria immunity and disease.

Malaria remains one of the world's leading health problems and malaria during pregnancy contributes to hundreds of thousands of infant deaths annually. The research project would focus on identifying the principal targets of antibodies that protect against malaria during pregnancy. The project combines laboratory investigations to define the nature and specificity of immune responses with clinical cohort studies of pregnant women living in malaria-endemic regions of Africa, Asia, and Papua New Guinea. Excellent opportunities exist for undertaking research visits at collaborating institutes in malaria-endemic countries. WEHI has a dynamic program of research in infectious diseases, including four research groups working on malaria, and outstanding research facilities.

Applicants must have a relevant PhD and the position is open to science and medical graduates. Research experience in malaria, immunology, or microbiology is preferred and prior experience working in a malaria-endemic or resource-poor country, or a strong interest to do so, would be an advantage. The appointee would work in a team environment and may also be involved in supervising research students and junior staff. The position is available for an initial appointment of 2 years. Salary will be according to experience and qualifications.

For further details contact James Beeson at WEHI on telephone +61(0)3 9345 2555 or Email: beeson@wehi.edu.au

[11] PhD Scholarships in Molecular Parasitology at The University of Melbourne, Faculty of Veterinary Science

The University of Melbourne is seeking high calibre research students to undertake PhD programs in molecular parasitology, genomics and genetics. Current topics are:

1. investigating developmental and reproductive processes in socio-economically important parasites using genomic approaches,
2. developing molecular tools for the diagnosis of parasitism, and
3. mitochondrial genomics of parasitic nematodes.

Scholarships offered will be in accordance to University scales: http://www.services.unimelb.edu.au/scholarships/pgrad/local/available/index.html

Applications to: Robin Gasser, Professor in Parasitology, Department of Veterinary Science, The University of Melbourne; Email: robinbg@unimelb.edu.au.

[12] Lecturer/Associate Lecturer Veterinary Parasitology

This position offers an exciting opportunity for the right person to develop his or her own career by participating in an exciting phase of development and expansion of our School's activities in the veterinary and animal sciences.

Responsibilities

The successful applicant will be expected to teach in the field of veterinary parasitology in the veterinary and animal science programs in conjunction with other academic staff. He/she will be expected to contribute to the professional activities in the parasitology section of the Veterinary Diagnostic Laboratory in conjunction with the Laboratory Manager. Additionally, the appointed person will be expected to contribute to the development of strong research activity within the School. This responsibility will include obtaining funding from industry and other sources, and attracting and supervising postgraduate research students. The incumbent will also contribute broadly to the implementation of the developing veterinary curriculum and the maintenance of linkages between the School, the veterinary profession, industry and relevant scientific societies.

Essential

- A PhD in a field relevant to the requirements of the position
- An ability to teach and engage undergraduate students in learning
- Knowledge of the major parasitological diseases affecting livestock production in Australia
- A demonstrated interest in research in fields relevant to veterinary parasitology
- Demonstrated ability to work in a team environment

Desirable

- Experience and skills in parasitology research including molecular parasitology
- Degree in veterinary science which is registrable in New South Wales.
- Experience of working in a veterinary diagnostic laboratory
- Demonstrated skills in time management to ensure efficient delivery of a diagnostic service to clients
- Superior ability to communicate with staff, clients and livestock producers
- Experience in the supervision of higher degree students.

Applicants are encouraged to submit their applications by Monday 27 March 2006. However, the University continues to consider applications until positions are filled.
It is not the University's policy to acknowledge receipt of applications. However, all applicants will be notified of the outcome of the selection process.

Eligibility to Apply:
Due to Australian immigration requirements preference may be given to citizens and permanent residents of Australia.

Essential Links

- For information on How to Apply go to http://wwwdb.csu.edu.au/division/hr/jobs/jobsp3.htm
- For an Application Form http://wwwdb.csu.edu.au/division/hr/jobs/academic/academicp15.htm

Further Enquiries

- For Human Resources Issues go to http://wwwdb.csu.edu.au/division/hr/jobs/jobsp1.htm#Wagga or email rechrwagga@csu.edu.au

Academic Issues:
Contact Prof Kym Abbott, School of Agriculture & Veterinary Sciences on telephone: +61(0)2 6933 4353, or email: kabbott@csu.edu.au
Please do not send your application to Prof Abbott; it should be sent to the Division of Human Resources at Wagga.

If you have any parasitology news stories for the Network website please contact me by email Lisa.Jones@uts.edu.au or telephone 02-95144006. Don't forget that the Network newsletters can now be downloaded http://www.parasite.org.au/arcnet/Newsletter/Newsletter_030306.pdf

Please send me items for the next newsletter by 24 March 2006.

Best wishes,

Lisa
Communications Coordinator,
ARC/NHMRC Research Network for Parasitology