



## **Queensland Tropical Health Alliance Travel Awards Scheme for Students and Early Career Researchers**

In 2011 funding assistance has been made available to support travel for students and early career researchers based at a QTHA partner institution to:

- undertake a researcher exchange at QTHA partner institutions
- attend the 2011 QTHA/ACTM Conference, 16 & 17 July, Cairns.

In 2011 there were ten QTHA Travel Award winners (8 out of the 10 were students). Awardees were:

**Dr India Bohanna**, James Cook University \$240 to attend the 2011 QTHA Conference.

**Doctor of Public Health student Jan Robertson**, James Cook University \$55 to attend the 2011 QTHA Conference.

**PhD student Dulangi Sumanadasa**, Griffith University \$791.99 to attend the 2011 QTHA Conference.

**PhD student Franziska Bieri**, Queensland Institute of Medical Research \$775 to attend the 2011 QTHA Conference.

**PhD student Leigh Schulte**, Queensland Institute of Medical Research \$1396 for a Researcher Exchange to James Cook University to visit Dr Jason Mulvenna in Cairns to learn new techniques in proteomics and to access to mass spectrometry equipment.

**PhD student Sandip Kamath**, James Cook University \$941.25 to attend the 2011 QTHA Conference.

**PhD student Shruti Saptarshi**, James Cook University \$941.25 to attend the 2011 QTHA Conference.

**PhD student Shanshan Sun**, James Cook University \$941.25 to attend the 2011 QTHA Conference.

**Dr Hayley Joseph**, James Cook University \$855.19 to attend the 2011 QTHA Conference.

**PhD student Conan Wang**, Griffith University \$997.30 to attend the 2011 QTHA Conference.



*From left: Conan Wang, Shruti Saptarshi, Dulangi Sumanadasa, Hayley Joseph, Sandip Kamath, Shanshan Sun.*



*From left: India Bohanna and Jan Robertson*

**Reports from individual Travel Awardees are included below.**

*Dr India Bohanna is a post doctoral researcher at James Cook University and won her QTHA Travel Award to attend the 2011 QTHA Conference. India reports on attending the conference below:*

The QTHA travel award was invaluable, as it gave me the opportunity to communicate my research to scientists and have my research informally peer-reviewed. In addition, it allowed me to promote my research to the community. My research attracted positive media attention, and was featured in the Cairns Post as well as on local and national ABC news radio. It also allowed me to further develop the manuscript reporting this research, which is now under consideration at Drug and Alcohol Review. As a result of the media coverage of our research at the conference, discussions have been held with funding bodies with the possibility of extending the research further throughout Queensland. The conference was also a unique opportunity to network with other scientists and QTHA researchers. All of these opportunities were in part made possible by the QTHA Travel Grant and thus the award has helped to strengthen my Track Record, critical at this Early Career stage.

## Cape confronts cannabis abuse

A TEAM of researchers from James Cook University has found cannabis abuse among the indigenous communities of Cape York is getting worse.

Dr India Bohanna (pictured) told a medical conference in Cairns that almost half the people in a survey of 300 residents reported using cannabis almost on a daily basis.



An abstract of the research presented is below:

**Introduction and Aims:** High rates of cannabis use and dependence are significant issues in remote Indigenous communities. We have previously shown extremely high rates of cannabis use, dependence and adverse mental health impacts in Arnhem Land. This study reports the first data on cannabis use and its mental health impacts in Cape York. **Design and Methods:** We interviewed over 300 Aboriginal people aged 16-40 years in three remote Cape York communities. Data was gathered on rates of cannabis use, mental health impacts including dependence and withdrawal, and reasons for quitting. **Results:** One in two individuals interviewed was using cannabis, with most using cannabis daily or weekly. Approximately 70% reported cannabis dependence. Encouragingly, more than 70% of current users were considering quitting/cutting down or had made previous attempts. In current users, seeking or starting employment was the most common motivation for wanting to quit, whilst former users quit primarily for family reasons. Users reported negative mental health impacts of cannabis. One in four reported 'stressing out' when cannabis was unavailable, suggesting withdrawal. Anger/irritability, paranoia, auditory hallucinations thoughts of suicide/self-harm, and memory impairment were reported in up to 10% of users. **Discussion and Conclusions:** Rates of use and dependence are much higher than national rates (4.9% of males and 2.2% of females nationally used cannabis in the past week, 21% exhibiting dependence), and are similar to Northern Territory rates. One in four Aboriginal users in remote communities may be suffering mental ill health. Interventions should enhance quit support and employment opportunities and strengthen families.

**Jan Roberston**, is a Doctor of Public Health student at James Cook University and won her QTHA Travel Award to attend the 2011 QTHA Conference. Jan reports on attending the conference below:

I am in my second year of a Doctor of Public Health at James Cook University and my research focuses on identifying effective interventions to reduce tobacco use in Indigenous communities in the Top End of Northern Territory / Arnhem Land.

The QTHA Travel Award enabled me to attend and present at the 2011 ACTM / QTHA Conference. I presented the non-thesis research component of my Dr PH on “Social determinants of health: Empowerment through increased financial capability” an evaluation of financial literacy programs in remote Far North Queensland communities.

Attending and presenting at the 2011 ACTM/QTHA Conference enabled me to network with representatives and health professionals from remote communities in the Northern Tropical regions of Australia. It was also wonderful for my own professional development. Thanks for the opportunity to attend and I hope to do so again in 2012.



**Dulangji Sumanadasa**, pictured here with QTHA Director Louis Schofield, is a PhD student at Griffith University and won her QTHA Travel Award to attend the 2011 QTHA Conference. Dulangi reports on attending the conference below:

Antimalarial drug resistance is a significant problem around the world and this is driving the need for discovery and development of new antimalarial drugs. Therefore my PhD study focuses on identifying new antimalarial drugs and drug targets for existing drugs for malaria using biomolecular interaction technology as a tool. Three *P. falciparum* proteins (carbonic anhydrase, histone deacetylase 1 and

plasmepsin X) that are under development as new experimental antimalarial drug targets are being used as model proteins in my project.

The award of a QTHA Travel Grant gave me an invaluable opportunity to present part of my findings at 2011 QTHA conference in Cairns. I presented a poster on the in vitro and in vivo activity of a new histone deacetylase inhibitor that is also undergoing Phase I trials for cancer. Presenting a poster at this conference allowed me to get feedback and suggestions on my project from other researchers and students who are currently working in my field. I was able to learn how to frame my findings and present everything in an understandable manner. I learnt a lot, including advice on aspects how I presented my work and ideas to make it simpler for others to understand. This kind of feedback is very important in this early stage of my PhD as it will help me improve my experimental design and presentations skills, and also inspire me to explore new research areas that I haven't yet focused in my study. This conference also offered a unique opportunity to meet experts in tropical health and neglected tropical diseases and listen to different styles of presentations. I was very impressed by listening to talks given by other parasitologists on scabies mites and dengue fever as examples. Talking directly with researchers who presented these results was fascinating and I was able to get their feedback to improve my experiments further. Moreover this conference granted a great chance for me to listen to research in other areas given by outstanding speakers to broaden my knowledge and to gather information about current unpublished research results and new research analysis techniques. I was able to gather updated information about other emerging viral diseases such as chikungunya which I worked on earlier before I started my PhD. This conference also offered a perfect opportunity to me as an international student to socialise with colleagues and friends, enjoying Australian food, in a stunning coastal setting in northern tropical region of Australia.

Therefore I strongly believe that attending to this conference was extremely beneficial for my PhD studies and personal and professional development. I would like to thank the QTHA for the excellent opportunities receiving this grant provided me.

***Franziska Bieri**, is a PhD student at Queensland Institute of Medical Research and won her QTHA Travel Award to attend the 2011 QTHA Conference. Franziska reports on attending the conference below:*

### **Project outline**

Title: An educational cartoon to prevent soil-transmitted helminth (STH) infections in Chinese schoolchildren

More than 2 billion people worldwide are infected with soil-transmitted helminths (STH), commonly known as intestinal worms. In China, STHs impact substantially on public health, affecting an estimated 154 million people. Albendazole chemotherapy has been successful as a treatment for STHs. However, due to rapid re-infection, a need for health education and behaviour change has been clearly indicated.

Our objective is to determine if an education package underscored by an educational cartoon, targeting STH prevention at school, can widen students' knowledge and changes their behaviour, resulting in fewer STH infections.

A 9-months cluster-randomized intervention trial (n=1934) involving parasitological and questionnaire surveys and behaviour observations, was carried out in Linxiang County, Hunan Province, China to measure the effect of the educational package.

The project will broaden the knowledge of 2000 school children on STH infection risks and potentially prevent them from STH infection/re-infection. If successful, the cartoon can be shown in other STH endemic regions in China and beyond.

### **How the QTHA Award has helped my research**

The QTHA conference was beneficial and inspiring for my present research and future professional development in many different ways. Many excellent talks such as keynote speaker Patrick Lammie, Alex Loukas, Andreas Suhrbier, Hayley Joseph, Humpress Harrington and the discussions after the talks have led to interesting ideas, allowed me to think out of the box, keep up to date on the latest findings in the field and get an understanding for a wider conceptual framework of my research. The small size of the conference has allowed me to personally address the speakers, which has provided great networking opportunities during tea breaks and lunches. I recall inspiring discussions with David Porter and John Aaskov about future career options; with Lee Smyth, about the role of social science in research, resulting in a few lines of thought that will contribute to the discussion chapter of my thesis.

The opportunity to present my work on a poster allowed me to receive some constructive and positive feedback from Patrick Lammie, who encouraged me to share my research finding with health education division of the World Health Organization in order to facilitate the dissemination of the educational video developed within my PhD project. I also very much appreciated to discuss the possibility of an educational video in other cultural settings such as the Solomon Islands with Humpress Harrington from Atoifi Adventist Hospital, Solomon Islands and the Dr Jane Mills from James Cook University. All these contacts may be important for future collaborations.

Please find below a list of contacts established at QTHA conference:

- David Porter, ACTM president
- Patrick Lammie, CDC Atlanta, USA
- John Aaskov, QUT, Brisbane
- Humpress Harrington, Atoifi Adventist Hospital, Solomon Islands
- Lee Smyth, Supervising Scientist, WHO/FAO Collaborating Centre for Reference and Research on Leptospirosis, Brisbane
- Andreas Suhrbier, QIMR, Brisbane
- Hayley Joseph, WHO Collaborating Centre for Control of Lymphatic Filariasis and Soil-transmitted Nematodes.
- Dr Jane Mills, Senior Lecturer, School of Nursing, James Cook University, Cairns.

I would like to thank the organizers for the opportunity to present my work and QTHA for the generous travel grant, which allowed me to attend this conference.

Franziska Bieri, 1/9/2011

**Leigh Schulte**, is a PhD student in Malcolm Jones' laboratory at Queensland Institute of Medical Research visited Dr Jason Mulvenna, JCU Cairns through his QTHA Researcher Exchange Travel Award, July 18 – 29 2011. Leigh reports on his Exchange below.

### **Outcomes linked to the Researcher Exchange**

I am investigating protein-protein interactions within the *Schistosoma mansoni* tegument. I am using a series of techniques including Blue Native-PAGE and two different protein crosslinkers, these techniques "fix" protein complexes in their native state. After the whole schistosome worm is treated with one of the above techniques the tegument is isolated and separated by SDS-PAGE. The next step is to identify proteins at each point along the SDS gel, this is done by performed an in gel digest for each gel slice and identifying peptides by mass spectrometry. From this data we can infer information about protein interactions within the tegument. If a series proteins occur at a height higher than expected by its molecular weight we can speculate about an interaction between these proteins. I am analysing the entire tegument and the results obtained from these experiments will provide data about protein interactions in the entire tegument. I am particularly interested in Dynein Light Chains (DLCs) and Tegument Allergen-like Antigens (TALs), future work will focus on these proteins and how they contribute to tegument biogenesis and renewal over the life of the worm.

My PhD project relies heavily on proteomics techniques and equipment. The QTHA travel grant enabled me to visit Dr Jason Mulvenna, James Cook University, Cairns who taught me new techniques in proteomics and allowed access to mass spectrometry equipment required. I had performed a number of Blue Native-PAGE and protein crosslinking experiments at QIMR. In Cairns, I was able to complete these experiments, beginning with the In Gel Tryptic Digests to analysing the samples by mass spectrometry, performing MASCOT searches and then analysing the peptide data. We will do immunoprecipitation experiments in the future to confirm the binding partners of DLCs and TALs and to validate the proteomics data obtained during my visit to Cairns. We are currently working toward publishing this data in a high impact proteomics journal. Translational benefits of this work will be better understanding of vaccine targets against schistosomes.



*Parasite Cell Biology Laboratory at QIMR*



**Sandip Kamath**, pictured here with QTHA Director Louis Schofield and chair of the QTHA board Dr Cherrell Hirst AO, is a PhD student at James Cook University and won his QTHA Travel Award to attend the 2011 QTHA Conference. Sandip reports on attending the conference below:

#### **My Research outline.**

My research focuses on the identification and characterization of the major allergens from Australian shellfish species. Shellfish is considered among the “Big eight” food groups which cause food allergies the most. Over 2% of the world population is affected by shellfish allergy. There is a great lack of information about the IgE antibody binding on the major allergens. In addition, the effect of heat processing on the allergenicity of shellfish proteins and its interaction with different physiological sugars is poorly understood. People are often accidentally exposed to allergens via different routes such as ingestion, inhalation and even contact. Therefore the detection of shellfish allergens in the environment and in food as well as the early diagnosis of allergy is also of importance.

The primary goal of my project is to analyse the major allergenic protein, Tropomyosin in various shellfish species and look at its clinical reactivity using allergic patient’s blood serum. In addition, we also look at the effect of thermal processing on protein profiles of Australian prawns as well as the changes in the clinical reactivity patterns of the prawn extracts. My research also focuses on the design and expression of recombinant shellfish allergens to better understand the IgE antibody binding patterns which may assist in improving the current allergy diagnostic methods. We intend to analyse the interaction of the major allergen tropomyosin with the naturally present sugars and study the effects of such interactions on the allergenicity of shellfish.

#### **How has QTHA’s Travel award benefitted me?**

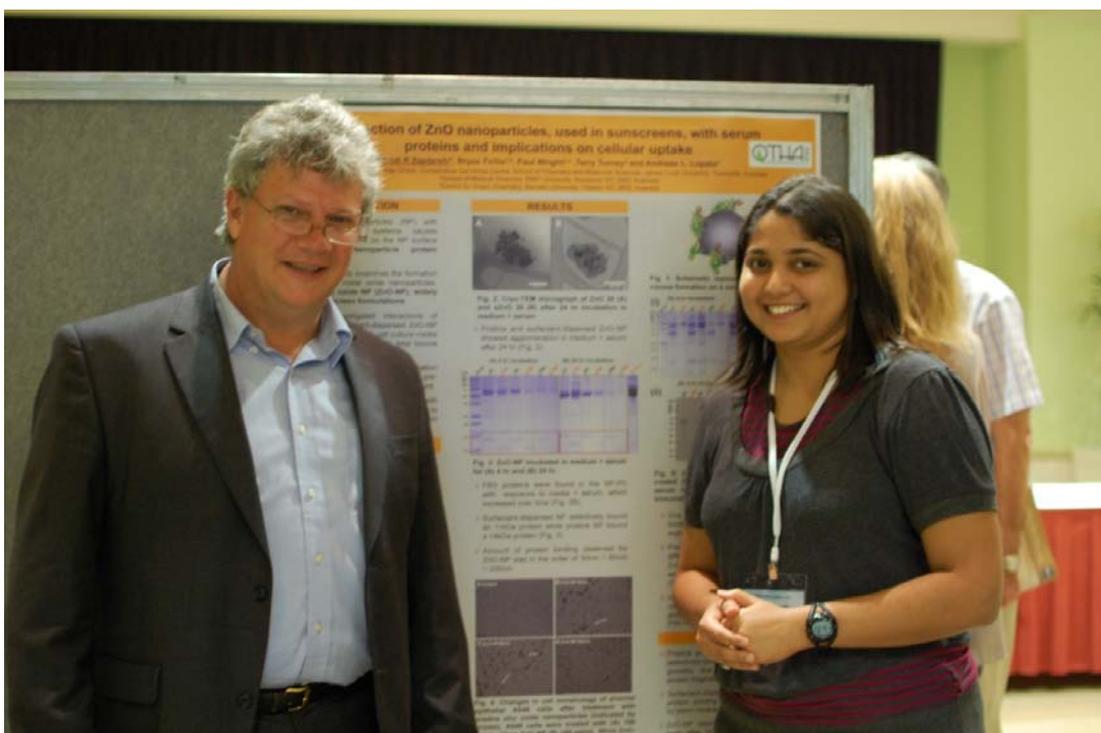
The QTHA travel award has helped me immensely in widening my research boundaries. It has given me an opportunity to meet experts from various disciplines of immunology and proteomics and showcase my research. Conversely, it gave other attendees to study my research (poster presented) and get involved in a healthy discussion on various scientific topics.

In particular, I had the great opportunity of meeting Dr Jason Mulvenna and Professor Alex Loukas from the James Cook University (Cairns Campus) and explain my research issues to them. Fortunately, we may now have a prospective joint work on the line to analyse our purified natural and recombinant allergens using the Mass Spectrometry facility at their department in the JCU, Cairns campus. The results from this work may lead to novel findings related to allergen structure and interaction.

Apart from promoting my research and looking at potential collaborative work, it was a great opportunity given to me to meet people from various research institutes from around Australia and to enhance my “lateral thinking” in research. I also got a chance to explore James Cook University’s Cairns Campus and the beautiful town surrounding it, which would not have been achievable without QTHA’s travel award.

I would really like to express my sincere gratitude to the QTHA committee for having provided me with such a wonderful opportunity. I hope that the joint work will prove to be very beneficial and I wish the very best to QTHA’s future endeavours and future travel award plans.

Sincerely,  
Sandip



**Shruti Saptarshi**, pictured here with QTHA Director Louis Schofield, is a PhD student at James Cook University and won her QTHA Travel Award to attend the 2011 QTHA Conference. Shruti reports on attending the conference below:

### Research Outline

Nanotechnology is an emerging field and nanoparticles have a vast array of applications due to their unique size and physico-chemical properties. Nanoparticles interact with proteins in complex biological systems which results in alteration of their surface properties. One such prominent alteration is the formation of nanoparticle-protein corona (NP-PC). The NP-PC is dynamic in nature and greatly influences the interaction distribution of the nanoparticles within the system.

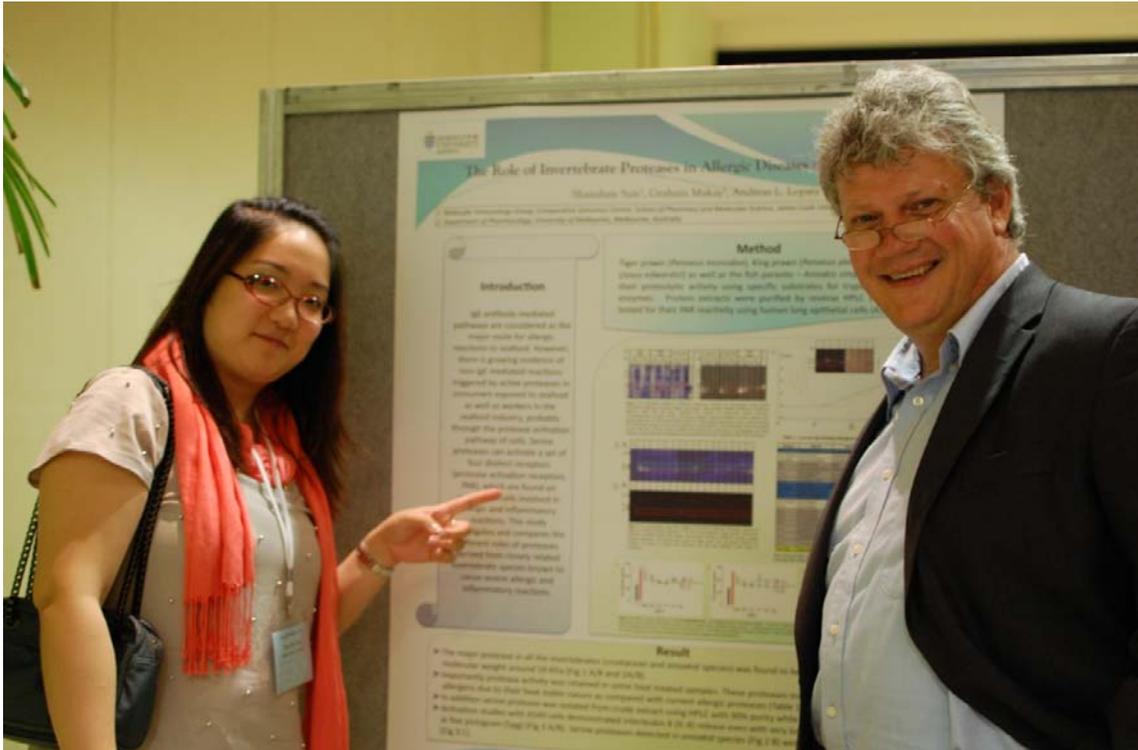
Nanoparticles can also induce refolding of bound proteins which can form the so-called "cryptic epitopes" which can have allergy eliciting potential. Interestingly very little is known about the health effects of proteins loaded nanoparticles on our immune system. Hence it is imperative to explore further into this area. This knowledge will also help in the development of better nano-medicine applications.

### **Research Objectives**

My research focuses on studying the immunotoxic interactions between proteins from biological fluids such as serum with most commonly used zinc oxide and titanium dioxide nanoparticles. These metal oxide nanoparticles are used in sun screen formulations and also in most personal care products. The main objectives of my research include investigating differential binding of protein on to the nanoparticle surface using proteomics approach. I will also study changes in protein conformation after interacting with the nanoparticle surface. My *in vitro* aims include study of uptake of nanoparticles by human alveolar basal epithelial cells (A549) and assessing their immunotoxic potential.

### **QTHA travel award benefit**

I would like to thank QTHA for the travel support award to attend the QTHA conference in Cairns. It gave me a great opportunity to be a part of an inter-disciplinary symposium which was a valuable learning experience for me. Several talks especially on proteomics interested me particularly. I also got excellent feedback and interesting suggestions for my poster presentation which was very encouraging. The financial support gave me the chance to visit the James Cook University campus in Cairns wherein I was able to establish useful contacts with Dr. Jason Mulvenna at the proteomics facility for future collaboration on my project. Lastly I was able to experience the warm and beautiful weather and the extremely beautiful surroundings of the lovely city of Cairns thanks to this award. I look forward to attending this conference next year.



**Shanshan Sun**, pictured here with QTHA Director Louis Schofield, is a PhD student at James Cook University and won her QTHA Travel Award to attend the 2011 QTHA Conference. Shanshan Sun reports on attending the conference below:

I would like to express my profound gratitude for the QTHA annual conference travel scholarship award, which made it possible for me to participate in 2011 ACTM / QTHA Conference 16th & 17th July in Cairns, Australia.

The conference attracted key local scientists, clinicians, doctors from different universities and hospitals, medical services, which formed a great network to communicate and improve each other's research. Even though it was not a large scale conference, the stimulating scientific program featured a broad spectrum of tropical diseases and immunotherapy in different countries. It allowed me to enjoy each of different venues without missing any valuable master speech.

Of particular value was the bioinformatics workshop before conference started which also organized by QTHA. It aims to train all young researchers how to analyze their complicated data obtained from mass spectrometer. Real case study and practice with professional sequence database in a brand new computer lab. It was excellent opportunity to learn such difficult technique with real specialist.

Highlights of the scientific program for me included transformational technologies session in the first day and Australian disease / Immunology joint session in second day. Especially interesting were talks by Don McManus on the epidemiology and control of Schistosomiasis in China. As I came from China originally, I was surprised there was a fantastic engaged cooperation between Australia and China. I am so excited to know that there are many excellent Australian scientists use their extensive knowledge to help public health issues in developing countries. This reminds me the real meaning of science is that it can help human beings live well. At the afternoon of following day, Nick Smith gave a talk on gut inflammation which is more related to my work. We all were interesting with oral infection with parasite. What the major symptoms are and what the best inflammatory marker is; How to establish more susceptible mice model and so on. This great talk allowed me to know more collaborators within my campus and national wide. It not only opens up my thought about my topic but also encourages me that I am not alone within my research area.

I presented my current research as a poster entitled “**The Role of Invertebrate Proteases in Allergic Diseases and Inflammation**”. It attracted great interest amongst attendees. I was able to discuss my current study with other attendees, received helpful feedback about my work which along with my favorite session and workshops has given me insights into the field as a whole and guidance on the directions of my own work.

Overall the conference was a very rewarding experience, providing not only invaluable scientific exposure but also social networking opportunities including the conference poolside cocktail mixer and wonderful dinner. I would like to thank QTHA again for making my attendance possible and giving me this great chance to enjoy beautiful Cairns.

Yours sincerely,

Shanshan Sun



**Dr Hayley Joseph**, is a post doctoral researcher at James Cook University and won her QTHA Travel Award to attend the 2011 QTHA Conference. Hayley reports on attending the conference below:

## **Report for QTHA travel award**

**Dr Hayley Joseph**

I am the research officer at the World Health Organization Collaborating Centre for the Control of Lymphatic Filariasis and other Soil-Transmitted Helminths at James Cook University in Townsville. I was fortunate enough to receive a QTHA travel award to enable me to travel to Cairns, Australia, to attend the annual ACTM/QTHA tropical medicine conference in July 2011.

Although I have attended many conferences over the years, the conference in Cairns was by far the most important for my career. As an early career researcher, just having completed a PhD, it was imperative for me to collaborate with other laboratories in order to determine the next step in my career. Of course this can be done my email/telephone, but face-to-face meetings are preferable. In addition, it gave me the opportunity to communicate my PhD findings in an oral presentation and further my reputation as a promising candidate for a potential post-doctoral position. I was also given the opportunity to orally present the importance of correct lymphatic filariasis diagnosis for Australian physicians and the relevance of diagnostic methods for endemic versus non-endemic infections. This was a separate oral presentation to my PhD findings. This was also the first time I was granted the opportunity to present two oral presentations.

A second advantage for having received the QTHA travel award was that it enabled those important people in QTHA to “hear my name” so to speak and lessen my anonymity in the tropical medicine field. As we are all aware, in the field of research networking, collaborating, and being reputable all contribute to a promising career. This is especially true as tropical medicine becomes even more multi-disciplinary.

Lastly, I thoroughly enjoyed the way the conference was organised, allowing me to attend sessions on topics outside my expertise. Other conferences I’ve attended in the past seem to have too much scheduled at once, so I’ve always only been able to see those sessions relevant to filariasis. Having attended sessions on other parasites/topics has given me insight not only to the broader picture, but how methodology can be cross-disciplinary. Overall my experience at the conference was thoroughly rewarding. I look forward to next year!



**Conan Wang**, is a PhD student at Griffith University and won his QTHA Travel Award to attend the 2011 QTHA Conference. Conan reports on attending the conference below:

## **QTHA Travel Award Report – Conan Wang**

I am interested in studying the shape of biomolecules, particularly proteins, and how they interact with other molecules because I believe this information can be used to help develop novel drugs and vaccines. I am a post-doctoral researcher working in the Structural Chemistry Program under the supervision of A/Prof Andreas Hofmann at the Eskitis Institute for Cell and Molecular Therapies, Griffith University. In collaboration with researchers at the Queensland Institute for Medical Research, I have recently started studying proteins from blood-feeding hookworms and looking at their potential as vaccine candidates. I am grateful for the opportunity to present some of our recent results at the 2011 ACTM/QTHA conference in Cairns.

The conference brought together experts from different fields, from researchers who are involved in the development of novel treatments for tropical diseases to physicians who are bringing existing treatments to the broader community. As a research scientist who has only started in the area of parasite research last year, I found many of the talks to be informative, fascinating and inspiring. The seminars gave me a greater awareness and appreciation of the many challenges in tropical health and their significance for research, development and implementation. Diseases that are prevalent in tropical climates, such as parasitic diseases, affect millions of people around the world, highlighting the importance of research in developing improved treatments for these diseases. Sometimes, laboratory-based research requires complete focus on a specific problem, and so it is important to be reminded how individual research efforts fit into the 'bigger picture'.

It was interesting to listen to how other research scientists were approaching their research questions. I particularly enjoyed talks by Denise Doolan describing her bioinformatics-based method for screening potential vaccine peptides and Louis Schofield describing the use of different imaging and biophysical methods for vaccine development. During the talks, I was constantly thinking about how I could apply the methods used by other researchers to tackle my specific research questions. Indeed, after attending these talks, I have some new hypotheses that can be tested on the protein systems on which I am currently working.

The breaks between the talks presented a casual setting for meeting other people in the field of tropical medicine. I thoroughly enjoyed talking to a range of people, including physicians, pathology scientists, and immunologists. I also met up with our current collaborators including Alex Loukas and Malcolm

Jones, and had very stimulating conversations with Kathy Andrews and Louis Schofield. It will be exciting to work with the people that I have met during the conference in the future and make a significant contribution towards addressing the challenges in tropical health.