Newsletter: Issue 11, December 2014

A Message from the Director:

Professor Kurt Krause
Webster Centre Director

Although it has been ages since our last newsletter communication, much has been going on with the Webster Centre behind the scenes and we would like to catch you up on the following few pages. One of the biggest changes involves the addition of administrative help in the form of Raelene Abernethy who has joined the Centre as its Administrator. Raelene is taking care of correspondence, scholarships and grants, sponsorships, and the website. She has been a huge help in keeping things going over the past year. Have a look at the new Webster Centre website and I hope you will appreciate her updates.

University of Otago, Dunedin, NZ

Most recently, the Centre has been active in granting summer studentships and student travel scholarships. The 2014 winners are described in this newsletter and the previous years' winners are up already on our website.

The Centre has also sponsored a number of meetings and speakers throughout New Zealand during the last couple of years. Perhaps as we begin to think about next year's Webster Centre meeting, now is a good time to review our last NZ-wide infectious diseases symposium which took place in Queenstown in 2013. There are pictures and stories about this symposium within, and an interview with Dr Kyu Rhee of Cornell University in the States. Finally special mention should go to Professor Greg Cook for receiving the Otago Distinguished Research Medal for outstanding scholarly achievement in 2014.

Otago Distinguished Research Medal 2014 awarded to Professor Greg Cook

Professor Greg Cook

Professor Greg Cook is the first microbiologist to win the University's prestigious distinguished research medal and is a world leading authority on mycobacteria as well as on how bacteria grow and survive in extreme environments. "This award reflects the. contribution made by my team to research performed at Otago," Professor Cook says. "I'm very proud to be the first Microbiology recipient of the medal and would like to acknowledge the strong mentorship from my senior colleagues and the collegial environment of our Department."

Professor Frank Griffin - Farmers Weekly, Country-Wide Magazine

Professor Frank Griffin

Infectious diseases cost the rural community more than $500 million a year with Johne's Disease draining at least $100 million a year through lost production, reduced fertility and deaths.

Professor Frank Griffin and his Disease Research Lab are working to protect livestock against infectious diseases by identifying a group of gene markers linked to greater immunity to pathogens. They hope these markers, when targeted by new vaccines, will provide increased protection to livestock from infectious diseases.

Save the Date: 2015 Webster Centre Symposium to be part of the 2015 QMB Meeting

The next Webster Centre for Infectious Diseases meeting is going to be on 30-31 August 2015 and will be held in association with the 2015 Queenstown Meeting. Our Co-Convenors will be Professor Greg Cook and Dr. Deborah Williamson.

Undergraduate Summer Student Scholarship Winners 2014

The Webster Centre for Infectious Diseases is pleased to announce George Poulter, Samuel Wojcik and Terry Zhang as the recipients of the 2014 Undergraduate Summer Student Scholarships. George Poulter will be supervised by Professor Greg Cook of the Department of Microbiology & Immunology. The research George will be undertaking involves the rapid and specific detection of multi-drug resistant (MDR) *Mycobacterium tuberculosis.* Samuel Wojcik will be supervised by Associate Professor Russell Poulter of the Department of Biochemistry. His research is using the CRISPR/Cas9 genome-editing system to analyse the virulence of *Pseudomonas.* Terry Zhang's research is phenotyping Langerhans cell like cells after the treatment of microparticles from HPV16E6 expressing keratinocytes. He will be supervised by Associate Professor Merilyn Hibma, Department of Microbiology & Immunology.

Summer Scholarship Winners: *Sam Wojcik, George Poulter & Terry Zhang*

Postgraduate Travel Student Scholarship Winners 2014

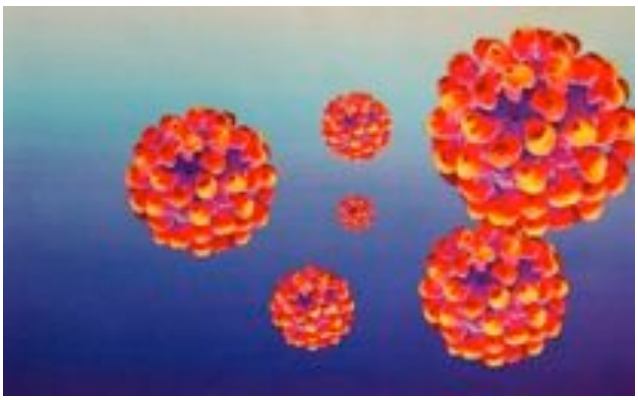
Travel Scholarship Winners: Sam Norton, Edward Taylor & Elyse Dunn

The Webster Centre for Infectious Diseases is also pleased to announce Edward Taylor, Sam Norton and Elyse Dunn as the recipients of the 2014 Postgraduate Travel Student Scholarships. Both Edward Taylor and Sam Norton will be travelling to the Australasian Society for Immunology Conference in Wollongong in December. Edward will be presenting his research on T cells in the alimentary tract. Sam will be presenting his research on macrophages in the alimentary system. Sam and Edward are both in Dr. Ros Kemp's laboroatory in Microbiology & Immunology. Elyse Dunn will be traveling to the Gordon Conference on Bioenergetics in June 2015 in Andover, New Hampshire to present her research on NADH-2 in mycobacteria. Elyse is supervised by Professor Greg Cook also from Microbiology & Immunology.

OSMS Photo Competition 2014

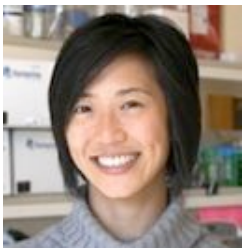
Professor Vernon Ward
Microbiology and Immunology

The Webster Centre was pleased to be a sponsor of the 2014 OSMS photo competition at which Professor (now Dean!) Vernon Ward won a Webster Centre prize for his "Sea of Viruses" photo cryo-electron microscope image of virus-like particles derived from rabbit hemorrhagic virus in a collaborative project with Dr Tom Smith, Dunforth Centre, St Louis,Missouri, USA.



Webster photo prize entitled "Sea of Viruses" at the OSMS Photo Competition

Sponsorship



Dr Aimee Shen, University of Vermont, USA

In February this year Dr Aimee Shen, University of Vermont, USA, was sponsored by the Webster Centre for Infectious Diseases to attend the Biochemistry Dept to present her research on *Clostridium difficile* spore formation and germination.

Frontiers of Biology: From Protein Structure and Function to Drugs

The Webster Centre was pleased to help sponsor the Frontiers of Biology: From Protein Structure and Function to Drugs meeting this month at Wellington. The NZSBMB satellite meeting was held 16 – 17 November with several international keynote speakers attending. Dr Liz Carpenter from Oxford University in the UK presented on human membrane protein structural biology; Associate Professor Richard Callaghan from the Australian National University, Canberra, Australia presented on drug efflux pumps and drug discovery; and Holger Golke from Heinrich-Heine University in Germany presented on molecular modeling in drug discovery. Professor Greg Cook, a member of the Webster Centre, also spoke on the discovery of metabolic inhibitors active against *Mycobacterium tuberculosis*.

International keynote speakers at Frontiers of Biology Meeting:

Dr Liz Carpenter Oxford University, United Kingdom

Prof Holger Gohlke Heinrich-Heine University, Germany

Associate Professor Richard Callaghan, Australian National University, Canberra

Flash from the past!: Webster Centre Meeting, Queenstown, 2013

In August of 2013 nearly 100 of New Zealand's infectious diseases researchers came together in Queenstown to share their research results with colleagues from around New Zealand and, in some cases, internationally. The meeting was convened by an *august* triumvirate consisting of Siouxsie Wiles, Deborah Williamson and Greg Cook. The theme of the meeting was *Of Microbes and Men*, an allusion to John Steinbeck's novel with a related title, and the meeting was held during the QMB week at Rydges Hotel. The meeting was spread over two days with talks from each of the main focus groups. Student attendees were encouraged to bring posters promoting their work, and the Centre was able to sponsor several students to attend under a travel award programme. The meeting included dedicated poster sessions and following these sessions, the top three posters were chosen.

The premier award went to Hannah Read for her poster on bioluminescence of *Citrobacter rodentium* whereas 3 general awards were granted to Htin Aung on cAMP mycobacterial receptor proteins; Xiaoyun Ren for her work on *Neisseria meningitis* and Chelsea Vickers for her work on VapBC in mycobacteria.

International Speakers at WCID Symposium: Professor Kurt Krause, Director of Webster Centre for Infectious Diseases; Professor Jane Hill, University of Vermont, Canada; Dr Barry Bochner, Biolog Inc, Hayward, California; Dr Nico Petty, The iThree Institute, University of Technology, Sydney, Australia; Dr Steven Tong, Menzies School of Health Research, Darwin, Australia; Associate Professor Tim Stinear, University of Melbourne, Australia; Dr Kyu Rhee, Weill Cornell Medical College, New York, USA; and Associate Professor Bill Hanage, Department of Epidemiology, Harvard School of Public Health, Boston, USA.

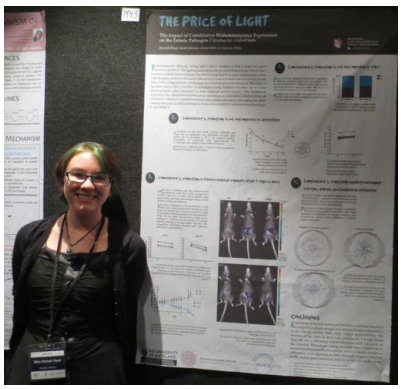
Combined Attendees at 2013 QMB Webster Symposium, Of Microbes and Men

QMB Poster Award Winners 2013

A small sampling of the posters presented at the 2013 QMB *Of Microbes & Men* Satellite Meeting at Queenstown in August last year. Each of the following posters were chosen for awards.

Premier Award:

The Price of Light: the impact of constitutive bioluminescence expression on the enteric pathogen *Citrobacter rodentium*



Hannah Read

Student Travel Awardees 2013 Webster Centre for Infectious Diseases Meeting Sinothai Poen, Roman Mortuza, Htin Lin Aung & Chelsea Vickers

General Awards:

Deciphering the physiological role of cAMP receptor proteins (CRP) in mycobacterium smegmatis

Htin Lin Aung

Household contact Neisseria meningitis disease-carriage pairs: a tool to dissect virulence

Xiaoyun Ren

Regulation and biochemistry of VapBC systems via the transcriptional regulator AmtR

Chelsea Vickers

Webster Centre Profiled Researcher: Dr Kyu Rhee

Dr Kyu Rhee
Weill Cornell Medical College, New York, NY, USA

The Webster Centre was fortunate to have as their special guest at the 2013 Webster Centre symposium, Dr Kyu Y. Rhee. Dr Rhee is an Associate Professor of Medicine and of Microbiology and Immunology at Weill Cornell Medical College in New York City, New York. He is active in the fields of microbial pathogenesis and medicinal chemistry as well as metabolomics. For the 10th edition of the Webster newsletter, we had the great pleasure of including this interview with Dr Rhee conducted by Kurt Krause.

Dr Rhee, how did you decide to go into sciences?

After finishing my undergraduate degree at Cornell I was able to obtain a position in the laboratory of Professor Paul Sigler at Yale University. This was at the time that Dr Sigler was doing his much admired work on the tryptophan receptor. While I was in Professor Sigler's laboratory I mostly carried out basic bench research using techniques like isothermal calorimetry, or filter binding assays. I found my association with Professor Sigler so inspiring that I decided to go into science. Many other people were inspired by Prof. Sigler as well. In fact, the laboratory was so busy that all the benches were filled to overflowing. As a result, no-one had a permanently assigned bench space. Instead people signed up for 8 hour shifts at the bench which were scheduled around the clock in order to get an opportunity to do their work in the laboratory!

How did you end up training in infectious diseases?

Following medical school I accepted a residency in Internal Medicine at Cornell University. Internal Medicine made the most sense to me because I had been a part of the Medical Scientist Training Programme in medical school and internal medicine is a very scientifically oriented specialty. Because of my interest in microbiology I was naturally drawn to infectious diseases in which I took a fellowship following my residency. Interestingly, if I had not trained in internal medicine I think I might have chosen surgery. It is a decisive field and you can make important interventions with direct immediate clinical benefit to your patients.

Do you prefer bench research or clinical work?

I actually enjoy both. In my current position I spend about 85% in the laboratory and 15% on the clinical wards. That turns out to be one month a year on a clinical service. As a result most of my time is spent focusing on my research which is quite ideal for the kind of work I like to do.

What is your big research question? What are you hoping to discover?

I probably have two main research areas. The first area I am very interested in, is developing new drugs for tuberculosis. This topic is quite important because of the rising incidence of tuberculosis worldwide and growing problems with resistance. New drugs are a major need and it would be great to have a role in this process. In terms of discovery sciences I am also quite interested in what it is about the tuberculosis bacterium that makes it so difficult to treat, and so virulent. Other bacteria I have an interest in are Group D *Streptococcus* and *Staphylococcus aureus*.

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