

## FROM THE DIRECTOR



I was privileged to present some of the Centre's bacterial genomics research at an invited plenary session at the International Leptospirosis Conference held in India in September. Centre PhD student Deanna Deveson was also selected for an oral presentation on her work on immunity and vaccine development in bovine leptospirosis. It is particularly appropriate for Centre staff and students to participate in

meetings such as this one, which highlight the fact that the diseases which we seek to understand through our laboratory experiments have devastating health and economic impacts on animals and humans. I think that sometimes, especially our younger researchers, can lose sight of the very real impact that our research has on improving animal welfare and productivity as well as on associated human health. This is particularly so for zoonotic infections such as leptospirosis.

As detailed later in this Newsletter, the Centre's Annual Scientific Meeting was a superb event which highlighted the Centre's applied and basic research. It was a particular pleasure to introduce our younger researchers to our new international board members Profs Joachim Frey and John Prescott. I extend my personal thanks and appreciation to them for making the long trip to Melbourne, and also to Prof James Whisstock and his committee for putting together such a stimulating program.

Finally, to all Centre staff and students, my gratitude for making 2009 yet another very successful year. Please take extra care, especially when driving over the holiday season and I wish you all a relaxing break.

Ben Adler  
Director

## HIGHLIGHTS

### Gottschalk Medal awarded to Centre Chief Investigator James Whisstock



The Australian Academy of Science's Gottschalk medal for 2010 has been awarded to one of our Chief Investigators, Prof James Whisstock.

This medal is awarded annually to a young researcher in recognition of their outstanding achievements in the field of medical research. Bestowed by the Australian Academy of Sciences, it is named in honour of the late Dr Arthur Gottschalk, FAA, formerly from Germany, who was a leading glycoprotein research scientist in Australia for more than 20 years.

James works in the field of infection and immunity and studies how animals and humans combat infection by bacteria, viruses and parasites using tools in structural biology and synchrotron science.

Recently, James showed how the perforin-like family of immunity proteins function to eliminate bacteria, virally infected and pre-cancerous cells. James's work may one day help develop new ways to control the unwanted activity of these immunity proteins in transplant rejection and diabetes.

James commented "I'm delighted and honoured to win the Gottschalk medal. This award also reflects the great support I've received from my research team, my collaborators and Monash University"

The Centre congratulates James on his wonderful achievement. The Centre is privileged to now have two recipients of the Gottschalk Medal leading Centre research projects.

## Centre Associate Travis Beddoe receives Pfizer Fellowship



The Centre congratulates one of our Associates, Dr Travis Beddoe, who has been awarded a \$1 million Pfizer Fellowship.

Travis will research the structure determination of microbial effector proteins involved in host-pathogen interactions.

His research is vital for gaining insights into infection and

immunity in a climate where there is a dearth of new antibiotics that can be used to treat infections with resistant pathogens. His personal vision is to develop drugs that can be used to fight diseases like tuberculosis, whooping cough, Alzheimer's disease, Parkinson's disease and some cancers, that kill millions worldwide.

The prestigious Pfizer Fellowship covers salary, travel and other establishment costs for five years.

## Centre Research Fellow Trudi Bannam awarded Excellence Award at recent Poultry CRC workshop



Earlier in October, a team comprising Centre Director Prof Ben Adler, Chief Investigator Prof Julian Rood, Research Fellows Drs Marina Harper and Trudi Bannam and Associate Dr Rob Moore participated in the Poultry Cooperative Research Centres (CRC) workshop on 'Exchange of

Ideas' to plan strategies for the CRC's research program over the next seven years. This was an opportunity for the Centre to enhance our already strong linkages with the poultry industry. The team presented Centre research of key relevance to the Australian poultry industry. Trudi subsequently won the Poultry CRC Excellence Award for her presentation, in particularly her work on necrotic enteritis.

## Ovine footrot research goes further with international funding

A research grant worth over AUD\$1.6 million dollars from the Research Council of Norway has just been awarded to a research team including Centre CI Prof Julian Rood and Centre Research Fellows Drs Ruth Kennan and Xiaoyan Han, to explore ovine footrot and related contagious bovine claw diseases in Norway. Ovine footrot research is a well-established program in the Centre. Extending this program overseas, Julian and his team will lend their expertise on this Norwegian project in collaboration with colleagues from the Norwegian School of Veterinary Science and the National Veterinary Institute of Norway. Over the course of the next four years, the research team hopes to characterise the bacterial species causing footrot and other bovine claw diseases in Norway and to develop

improved diagnostic tools against these diseases for the industry.

Complementing this grant, Julian's team has also been awarded a joint Monash-Warwick Strategic Funding Initiative to further foster and enhance animal health research at both universities. This grant will strengthen the existing relationship and allow the exchange of knowledge and expertise developed in both universities, namely molecular genetics and genomics at Monash and microbial ecology and systems biology at Warwick, to tackle the problem of ovine footrot.

## Annual Scientific Meeting



An exciting showcase of the Centre's research was presented at the Centre's Annual Scientific Meeting on 15-17 November. The event took place at the Yarra Valley Conference Centre and about 60

participants who attended the meeting were treated to delightful surroundings over the 3 days which also created the opportunity for all participants to interact and mingle with each other after the scientific presentations. Indeed, participants took every opportunity to talk with the Centre Scientific Board members, Chief Investigators, guest speakers, Centre Research Fellows and Associates and Centre students at mealtimes and also in the evenings over drinks. The meeting was also enriched by the attendance of the Centre's two international adjunct members of the Scientific Advisory Board. Both Profs John Prescott and Joachim Frey from University of Guelph, Canada and University of Bern, Switzerland were invited to come to Melbourne to present at the meeting. This also gave them the opportunity to meet staff and students working within the Centre for the first time. Prof John Prescott opened the meeting with his plenary talk 'Adventures of bacterial diseases: Is the future now?'

The diverse program was centred around six central themes:-

- Immunity
- Emerging new diseases
- Mechanisms of pathogenesis
- Applications of high throughput sequencing
- Structural function of virulence factors
- Translational outcomes of research

Right: Prof Ben Adler opening the meeting, Below: Prof Graham Mitchell (Scientific Advisory Board member) presenting at a session



Presentations in the program were contributed not only by Centre staff and students but also invited external speakers Prof Rob Pike, Head of Department of Biochemistry and Molecular Biology at Monash University and Assoc Prof Liz Hartland from University of Melbourne.

The meeting also included a competition for Centre PhD students to present their work in 3 min and using only 1 slide. It was a challenge for them to try and convey the significance of their work and their findings within these constraints, but a task that they all completed with skill and perspicacity. At the end, Wilson Wong was chosen by the judges as the winner of \$100 book prize sponsored by the Centre.

## OTHER NEWS

### International Visitors

In the last few months, a number of international researchers visited the Centre. Prof Tamotsu Yoshimori from the Research Institute for Microbial Diseases at Osaka University, Japan visited the Centre on 9 September and presented a seminar entitled 'Autophagy: Molecular machinery, regulation and roles in diseases'.



Left: Prof Rod Devenish (Centre Deputy Director) and Right: Prof Tamotsu Yoshimori



Left to Right: Prof Julian Rood (Centre Chief Investigator), Dr Hannah Jørgensen, Dr Ruth Kennan (Centre Research Fellow) and Dr Xiaoyan Han (Centre Research Fellow)

Dr Hannah Jørgensen from the National Veterinary Institute, Norway spent a few weeks with the Rood laboratory in late October. The purpose of her visit was to exchange and further consolidate the research ideas for a Norwegian research proposal on ovine footrot.



Left to Right: Prof Laura Frost and Prof Julian Rood

The Centre also had the privilege to invite Prof Laura Frost from the University of Alberta, Canada to give a lecture on 'The Turning Point: Must women choose between science and family?' Prof Frost has her own lab which conducts research on mechanisms of bacterial conjugation. She also held the Aigner Rollett Chair in Women's and

Gender Studies at the University of Graz, Austria and armed together with her own personal experience, provided valuable insight on the societal and professional biases towards women and some solutions to overcoming them. The lecture was well attended by both men and women.

### International Lab Visit by Centre Student



In September, PhD student Kunkun Zhang presented her work at the 9<sup>th</sup> Awaji International Forum on Infection and Immunity in Awaji Island, Japan. With a grant that she received from the Centre, she went on to visit Prof Chihiro Sasakawa's laboratory at the Institute of Medical Science at the University of Tokyo, Japan.

Prof Sasakawa is a leading expert on mechanisms of bacterial-induced macrophage cell death and *Shigella* vaccines. She had the opportunity to interact with some of the lab members there and also discussed her project where she got valuable feedback and suggestions from Prof Sasakawa.

"This conference and laboratory visit trip provided a great chance for me to learn a lot in the microbiology field, which will benefit my research work in both short and long term".

The Centre is pleased to announce that these funds will be made available next year for Centre students to visit other researchers and labs both nationally and internationally in conjunction with conference travel. This aim of this grant is to provide Centre students exposure to other labs and practices as well as opportunities to network with other researchers.

If you would like more information about this funding opportunity, please see Desmond Gul or Prof Ben Adler.

### VIIN Student Symposium Oral Presentation Prize

The Centre would like to congratulate Wilson Wong again for winning 2<sup>nd</sup> prize, competing with over 20 other students in the oral presentations, at the Victorian Infection & Immunity Network (VIIN) Student Symposium on 1 October.

### Stories of Australian Science

The Centre is now profiled in Stories of Australian Science 2010, which is published by Science in Public that 'helps scientists and science organisations present their ideas in public space'. This publication is a second collection and goes out to science journalists and television producers as well as consulates and trade commissions. It was recently given to the 500 delegates at the World Congress of Science and Factual Producers.

To view the stories online, please visit their website [www.scienceinpublic.com/stories](http://www.scienceinpublic.com/stories).

## STAFF PROFILE

### Jérôme Le Nours



Jérôme is originally from France and received his Masters and Bachelor degrees at the University of Brest, France. In 2001, Jérôme joined Prof. Sine Larsen's laboratory at the University of Copenhagen (Denmark) as a PhD student. Over this period, he was trained as a protein crystallographer and worked on the structural investigations of various carbohydrate degrading enzymes that led to the publication of four research articles. In 2005, he joined as a research fellow Prof. Ted Baker's group at the University of Auckland (New Zealand). His work focussed on the structural investigations of enzymes from *Mycobacterium tuberculosis* that are involved in various biosynthesis pathways essential for the survival of the bacteria.

Jérôme recently joined the Centre and works with Chief investigator Prof Jamie Rossjohn on the structural characterization of enzymes (glycosyl transferases) involved in the biosynthesis of the *Mycobacterium* cell wall and on the newly discovered AB<sub>5</sub> toxin (SubAB) from the Shiga toxicogenic *Escherichia coli* (STEC).

Jérôme does enjoy living in Melbourne and dedicates his spare time windsurfing in Port Phillip Bay.

## STUDENT PROFILE

### June Treerat



Puthayalai (June) Treerat is a Centre PhD student who works with Professor Ben Adler and Centre Associate Dr. John Boyce in the Department of Microbiology, Monash University. Her research project focuses on the characterisation of putative genes in the Type III secretion system of the pathogen *Burkholderia pseudomallei*, the cause of melioidosis in animals and humans. These putative genes are believed to have a role in the pathogenesis of *B. pseudomallei*, especially in invasion of the host and evasion of host autophagy.

June completed her B.Sc. in Thailand, and M.Sc. in Sydney specialising in Microbiology. While she was waiting for her graduation, she worked on multidrug-resistant bacterial pathogens isolated from ICU patients, aiming to categorise any resistance genes by bacterial strains and species. In early 2009, June was the successful recipient of a Monash Graduate Scholarship (MGS) and a Monash International Postgraduate Research Scholarship (MIPRS), and has since commenced her PhD. June is proud to be part of ARC Centre and has enjoyed studying and living in Australia. Apart from listening to her favourite music and exercising at the gym, she also likes

spending most of her time learning and having fun in the lab.

## UPCOMING EVENTS

### Prato Conference on Pathogenesis of Bacterial Diseases of Animals

The Centre is currently organising the above-mentioned conference which is scheduled for 6-9 October 2010 and will take place at the Monash Prato Centre, Italy.

This conference will focus on veterinary pathogens and will involve an integrated examination of the latest exciting data on disease epidemiology, bacterial adhesion, intracellular pathogens, extracellular pathogens and toxins, host-pathogen interactions, innate and acquired immunity, and vaccines, all as they apply to bacterial pathogens of animals.

More details will be released later and can also be found on the website: [www.vetpath2010.org](http://www.vetpath2010.org)

## CONTACT

Suggestions for articles are welcomed, as well as requests to be placed on the mailing list, and should be sent to:

[Desmond.Gul@med.monash.edu.au](mailto:Desmond.Gul@med.monash.edu.au)

The ARC Centre of Excellence in Structural and Functional Microbial Genomics is an Australian Research Council (ARC) funded institute through the Centre of Excellence program. It aims to elucidate key aspects of microbial pathogens and the hosts they infect. The ARC Centres of Excellence are an Australian Government initiative designed to create prestigious hubs of expertise where high-quality researchers can maintain and develop Australia's international standing in research areas of national priority.

Contact or visit us at:

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The Centre works in partnership with the following organisations:

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