NEWS AND EVENTS

AAS Boden Research Conference Website

The Australian Academy of Science Boden Research Conference on Bacterial Cell Biology: “New insights on host-pathogen interactions” now has a website:

The conference is jointly organised by Prof Trevor Lithgow (Monash) and Prof Jenny Stow (University of Qld) and will take place on October 18th - 21st 2011, at The Shine Dome in Canberra.

3-min Thesis Competition


Assoc Prof Martin Stone will be coordinating the Dept’s competition, the winner of which will represent the Dept in the SOBS competition. The SOBS winner will compete in the Faculty Final (July 21) for the right to compete in the University Final on August 16.

Dates will soon be finalized and all students are encouraged to enter.

Lab Head | New Staff Member | Position
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Prof David Jans | Mr Mohammad Aljofan | RA
Prof Trevor Lithgow | Dr Matthew Belousoff | NHMRC Training Fellowship
Prof Ed Nice | Dr Zon Weng Lai | RF
Prof Jamie Rossjohn | Mr Andrew Gibb | RA
Prof Tony Tiganis | Ms Katja Loewe | RA
Dr Ana Traven | Dr Branka Jelićić | Go8 Fellow
Prof James Whisstock | Dr Hilary Hoare | NHMRC Training Fellowship

Seminar in June

4 pm on Wednesday in Building 13A, Lecture Theatre M3

June 8th
Angel F Lopez (SA Pathology)

New mechanisms of cytokine receptor activation

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Please send suggestions for future speakers to committee members: Martin Stone, Travis Beddoe, Catherine Itman, Melanie Pritchard or Peter Boag

A list of all seminars for Semester 1 can be found on the Biochem webpage www.med.monash.edu.au/biochem under “About”
Introducing Dr. Branka Jeličić, Go8 Fellow

Croatian early career researcher Dr. Branka Jeličić has been awarded the prestigious Go8 Fellowship to join Dr. Ana Traven’s lab for a six-month period. Branka is the first Go8 Fellow in the School of Biomedical Sciences. In the Traven lab, Branka will study how the human fungal pathogen Candida albicans makes drug-resistant biofilms, with a view to identifying new avenues for future antifungal drug development.

**On the benefits from tenure of the Go8 fellowship, Branka stated:** “The Go8 fellowship will enable me to visit the laboratory of Dr. Ana Traven and start a new project to understand the contribution of gene expression regulators to virulence and antifungal drug resistance of the human fungal pathogen Candida albicans. I’m excited at this opportunity to apply my expertise in gene expression to a medically relevant field of research. Dr. Traven and I collaborated in the past, while we briefly overlapped in the laboratory of Dr. Mary Sopta at the Rudjer Boskovic Institute in Croatia in 2002. The Go8 fellowship would enable us to start a new collaborative project and gain data to prepare an application for a grant from the Croatian Unity through knowledge fund (UKF). UKF supports collaborative projects between Croatian scientists in Croatia and abroad and a project with Dr. Traven is a unique opportunity for me to get access to this funding source. To my knowledge, there are currently no laboratories in Croatia studying human fungal pathogens. Thus, on my return to Croatia, I will have an opportunity to establish a new medical research area in Croatia and the tenure of the Go8 fellowship will be critical in fostering this transition.”

Branka discussed her major research achievements: “My PhD studies aimed at understanding mechanisms of gene expression control in eukaryotes. I focused on the transcriptional activator Gal4 from yeast. Gal4 is one of the most extensively studied transcriptional activators and has long served as a paradigm for studies of transcriptional activation in eukaryotes. The activity of Gal4 is regulated by a classic transcriptional switch which is controlled by carbon source. I discovered that Gal4 also responds to the functional state of mitochondria, demonstrating for the first time that metabolic signals additional to carbon source regulate this prototypical activator (Jelicic et al FEMS Microbiol Lett 2005). Furthermore, I studied how the activity of Gal4 is regulated by posttranslational modifications, focusing on phosphorylation of the DNA binding domain (Jelicic et al 2010 in preparation). By using site-directed mutagenesis, combined with chromatin immunoprecipitation (CHIP) and reporter gene expression analysis, I have identified several serine residues in the Gal4 DNA binding domain which are required for promoter occupancy and transcription activation by Gal4 in vivo. My data further suggests that the DNA binding domain of Gal4 functions not only in binding to the cognate DNA element in promoters of Gal4-regulated genes, but also contributes to protein-protein interactions with the general transcription machinery and thus stabilizes Gal4 binding at promoters. This has important consequence for understanding the function of transcriptional activator in gene expression.

In addition to these primary research articles, I co-authored a review for the leading journal EMBO Reports, which presented an updated view of the Gal4 system and how it contributed to understanding of gene transcription in higher eukaryotes”. (Traven, Jelicic and Sopta 2006)

Since 2008, Branka has been a teaching assistant for undergraduate chemistry and biology students and she is a postdoctoral Fellow in Dr. Mary Sopta’s laboratory, Department of Molecular Biology, Institute Rudjer Boskovic, University of Zagreb. There, she is using the yeast model system to study eukaryotic transcription regulation.

**Publications:**


**Manuscripts in preparation:**


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Newsletter: May 2011, Issue 12

Department of Biochemistry and Molecular Biology
POSTGRADUATE MATTERS

PhD Graduates

Nigus Dessalew Ambaye
Thesis: "Discovery and optimization of Grb7 antagonists as potential antituumour therapeutics"
Supervisor: A/Prof Jackie Wilce

The Organizing committee for this years Departmental Research conference has been convened - keep an eye out for updates.

STUDENT SOCIETY

NOTDRS (Necessary Outlets for Tertiary Doctoral Research Students)

PhD Oration Program (POP) (held in M1)
Upcoming Speakers:
Chris Langendorf - July 1
Craig Don Paul - July 8

Beer Club
Level 1R, Bld 77, 4:30pm
June 10

To find out more about NOTDRS please visit:
Or find us on facebook:

OHS MATTERS

The Department of Biochemistry and Molecular Biology is in need of 2 people on every floor buildings 76 and 77 to undergo training to handle the breathing apparatus. Recent incidents within the department have highlighted an inadequate number of trained staff and students (currently we have none in either 76/77). Willing volunteers should seek permission from supervisors before nominating themselves. Please contact Gavin Higgins for further details.

Craig Don Paul, our student OHS representative is rapidly approaching the end of his PhD candidature. We are desperate to find another student rep and a deputy, to join the OHSE committee. The positions do not require a lot of work. Essentially, they only have to attend one OHS meeting every 3 months and report on any concerns or issues related to OHSE that students would like raised or addressed by the Department of Biochemistry and Molecular Biology. We would love to have at least one candidate from building 76/77, given the majority of students are located there. Please contact craig.donpaul@monash.edu

MBio Induction Session

Any newly enrolled Postgraduate students who were unable to attend the MBio Induction Session on April 20, please contact Mibel (mibel.aguilar@monash.edu).

Applications for the mid-year postgraduate scholarship round close on May 31. Details can be found at:
http://www.mrgs.monash.edu.au/scholarships/apply

Link to MBio e-bulletin:

All queries on Postgraduate matters: Please contact Prof Mibel Aguilar
mibel.aguilar@monash.edu

QUICK OVERVIEW OF WHAT TO DO WHEN AN EMERGENCY ARISES:

1. Remain CALM…
2. Yell out for a First Aider (don’t go looking for one yourself, get someone else to go looking)
3. First Aiders: Read MSDS before treating any chemical injury
4. First Aiders: Call Med Centre if necessary ext. 53175
5. First Aiders: Call the Safety Officer and/or Safety Representative as soon as possible
In 2005 I attained my bachelors degree in Chemistry at Universidad Nacional Autonoma de Mexico (UNAM). As a Chemist I was curious about the chemical reactions of life, in particular the function of the mitochondria, the powerhouse of the cell. This interest drove me to enrol in the Masters degree program in Biochemistry one semester before I completed my bachelors. I joined the newly established laboratory of Prof. Xochilt Perez-Martinez at the Cellular Physiology Institute, UNAM, studying the mechanisms of mitochondrial gene expression in *Saccharomyces cerevisiae*. During this time I studied the association of Pet309 protein with the mitochondrial inner membrane. Pet309 is a protein essential for respiratory involvement, in the translation of the mitochondrial COX1 gene, which encodes subunit I of the cytochrome c oxidase (CcO).

My increased interest in mitochondrial protein expression spurred me to start my Ph.D studies in Prof. Perez-Martinez’s lab. In the course of these years I worked with the translation and feedback regulation of mitochondrial Cox1 protein, the largest subunit of the CcO. Through mutagenesis of the mitochondrial COX1 gene we found that the last 15 amino acids of the C-terminal domain of Cox1 are necessary for its co-translational down-regulation. This was really important as it is the first time and the only example, at the moment, that a mitochondrial encoded protein undergoes self-regulation of its translation by sensing its assembly state in the mitochondrial inner membrane. I got the opportunity to learn and be trained about yeast genetics and mitochondrial transformation using micro-projectile bombardment under the direction of Prof. Thomas D. Fox at Cornell University in 2008. That was also exciting, as I had never experienced living at -25°C and below 30 cm of snow.

On September 10th, 2010 I gave my Ph.D dissertation and on that same night my wife and I boarded the plane to Australia. I started my postdoctoral training at Monash University under the guidance of Prof. Trevor Lithgow, now working with nuclear encoded proteins targeted to mitochondria. My research is focused on the family of Tail-Anchored (TA)-proteins, a distinctive class of membrane proteins that are located in the mitochondrial outer membrane (MOM) by a single transmembrane domain in the C-terminal end with a large N-terminal region exposed to the cytosol. TA-proteins are involved in a variety of important cellular functions, such as mitochondrial fission, Golgi-Endoplasmic Reticulum transport, vesicle trafficking, electron transfer and apoptotic mechanisms. In fact, it has been predicted that at least 300 TA-proteins are expressed in humans and up to 50 in yeast. Despite ongoing efforts to define the mechanism of targeting and insertion of TA-proteins into the MOM the role of mitochondrial import complexes remains controversial. I am studying how mitochondrial TA-proteins reach their correct place in the mitochondrial outer membrane and hopefully I expect to elucidate part of this complex targeting mechanism of these proteins. This postdoctoral training is giving me the skills that will enable me have my own research group and encourage more people in the remarkable world of the mitochondria. I am happy about the opportunity to live in Australia and to meet really good friends.

**SPOTLIGHT ON: Dr. Miguel Shingu-Vazquez**

**Post-Doc Career Seminar**

On the 20th of May NOTDRS supported a student-organized information session for PhD students entitled “So you want to be a post-doc?”. The seminar was held to assist students in applying for their first post-doc positions. The session saw Nita Eng from the Monash Research Office present the variety of fellowships available to students, and Dr Natalie Borg, Dr Pascal Wilmann and Dr Andrew Perry discussed these in the context of their own experiences. Prof Trevor Lithgow concluded the seminar and gave advice to students on what lab heads look for in prospective post-docs. The event, primarily brought together by Michael D’Angelo, was timed to allow completing students close to a full year to apply for fellowships before next year’s deadline.

**50th Anniversary Trivia Night**

To celebrate the 50th anniversary of the department’s establishment, NOTDRS are organizing a Trivia Night in the evening of the 7th of July at the Monash Club, starting at 4:30pm. We encourage both staff and students to attend. We ask all interested members of the department to register their teams of eight by June 20th. All those who wish to attend but have no team can be assigned to one. Please register yourself or your table of 8 by emailing Natalie. Rynkiewicz@monash.edu.

**UPDATING WEBPAGES**

To ensure that Departmental webpages are current, staff are requested to check their personal pages and lab pages.

If any changes or updates are required, please send relevant text and photos/images to Yvonne.Dooley@monash.edu

Any staff who do not have a personal webpage and would like one created, please also contact Yvonne.

**Cartoon of the enzyme GAD65 showing the flexibility in the C terminal domain thought to be important for its autoantigenicity and neuroendocrine properties.**

Photo courtesy Dr Ashley Buckle

www.med.monash.edu.au/biochem/staff/abuckle
I first grew protein crystals during my PhD at the CSIRO in Parkville/University of Melbourne. So, the natural progression was to use X-ray crystallography to determine the three-dimensional structure of my protein. My protein of interest was a surface glycoprotein of the Parainfluenza virus III and the structure beautifully complemented some functional data to help shed light on how this remarkable viral protein works. Having had this first exposure to X-ray crystallography, I was keen to explore the technique further as a post-doctoral researcher. Coincidentally the year prior, the Protein Crystallography Unit had been established at Monash University, boasting an in-house X-ray source and shortly thereafter a crystallization robot. In 2003 I joined Prof. Jamie Rossjohn’s research team to study adaptive immunity, particularly how TCRs interact with MHC molecules presenting peptide antigens. My role was to understand the impact of MHC polymorphism on peptide presentation and TCR recognition. As my post-doc progressed I became focused on how TCRs recognise glycolipid antigens presented by MHC-like molecules. Using X-ray crystallography, we were the first ever to visualize such an interaction and showed TCRs recognize glycolipids quite differently to peptides. The long-awaited demand for this structure led to the work being published in ‘Nature’ and this was a grand highlight of my career that opened many doors.

My post-doc was a highly productive and enormously fulfilling time. I was not only exposed to X-ray crystallography but numerous other techniques and I was also gaining first hand experience at the competitive nature of fellowship and grant-writing. During my post-doc and in 2006 I was awarded an NHMRC Peter Doherty Fellowship and then in 2008 an NHMRC Career Development Award. Coupled with a L’Oreal Fellowship for Women and a Clive and Vera Ramaciotti Establishment Gift I decided to pursue independent research and launch my own research laboratory. I chose to remain at Monash University as the Protein Crystallography Unit had grown to become one of the best in Australia and here I have the support and mentorship of many amazing colleagues. Along with my research laboratory I launched new research objectives and these were inspired by my research exposures to date – virology and immunology.

I have long been intrigued by the complexity of the anti-viral immune response and particularly how viruses manipulate signaling to cause disease. Most cellular processes are regulated by a post-translational modification known as ubiquitination. Anti-viral immunity is no exception and ubiquitination is used as a means to regulate signaling. My research team investigates how host proteins use ubiquitination to regulate anti-viral immunity and also how viral proteins specifically interfere with signaling. This area is captivating as while many viruses have tricks to avoid being detected by the immune system, the vast majority of these are poorly understood. This area is of significant interest as viral infections are a significant cause of global mortality and economic burden. Deepening our understanding of anti-viral immunity is crucial to the treatment and prevention of viral infection.

As I move into independent research I have had the pleasure of developing new research questions and projects, growing a research team from the ground up and establishing new exciting collaborations. In 2010 I was awarded the Applied Biosystems Edman Award and I used the funds to travel to Genentech and the laboratory of Vishva Dixit to learn new techniques that I could bring back to my own research team. The resources at Genentech were phenomenal as were the scientists who were willing to share their knowledge and expertise with me. In 2011 I was in a position to apply for my first nationally competitive grant from the ARC. This funding now enables me to follow my research directions. As a newbie to the field of ubiquitin I also organized the ‘ubiquitin and ubiquitin-like protein’ conference in 2011. This was an intense experience, but was highly rewarding and a great way for me to meet those in my new scientific circle. To date the journey into independent research has been challenging, but also highly stimulating and rewarding. I love how science can offer many opportunities and take you on a journey that you would least suspect.
**RECENT PUBLICATIONS**

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