

ANZSCDB Newsletter

Australia and New Zealand Society for Cell and Developmental Biology INCORPORATED



December 2012



Dear Friends and Colleagues,

As 2012 winds to a close it is of course time to reflect on a busy year of society activities. As usual there has been a large amount of effort placed around

this year's ComBio in Adelaide, our annual meeting, which has seen the honouring of a number of our members, which we highlight in the newsletter. Furthermore, the State and NZ chapter activities continue to grow and we report on the local efforts and meetings that have occurred during the year. Membership remains a critical issue for the society and how to grow the membership remains an issue that receives much attention and discussion amongst the executive. I wish to thank the members of the executive who have been very supportive in the collective decision making process this year, particularly Ian Smyth and Kieran Harvey for their professionalism and dedication to their roles as Secretary and Treasurer respectively. I also wish to acknowledge Edna Hardeman's critical role as past president in helping us not to "reinvent the wheel" and Carol Wicking as President elect in guiding decisions. I can report that we have an effective and motivated executive in charge

of the society's interests and activities.

More broadly this has been an interesting year for science in Australia, with the McKeon review being undertaken with the aim of recommending a 10-year strategic health and medical research plan for the nation. The six-person panel includes our own Prof Melissa Little who was also a member of the 1998 Wills Health and Medical Research Strategic Review. A draft consultation paper has been released http://www.mckeonreview.org.au/10857/Consultation_Paper/ and we now await the review's full report, which will be sent to the Minister in the near future. We wish Melissa well as she grapples with issues associated with this weighty task. On another front Universities are struggling with the Governments decision to freeze the Sustainable Research Excellence (SRE) in Universities Initiative, that was designed to progressively increase funding for the indirect costs of research. This has left Universities with the difficult task in suddenly having to deal with a budget shortfall to fund much needed research infrastructure and initiatives. This decision will negatively impact on most of us and it is clear 2013 will be a very interesting year for many of the society's members with many

President's Report

Read Up On:

ComBio 2012

Profile - Marilyn Renfree

Meeting reports

Regional activities from
Australia and New
Zealand

Member highlights

Opinion - Woods Hole Em-
bryology Course

changes and challenges ahead.

State/NZ Chapter Activities

The local society meetings and activities appear



President's Medal

to be gaining some considerable momentum and the regional society meetings remain an excellent venue for younger scientists to present their work. After personally attending both the NSW and Victorian society meetings this year I have been most impressed with the quality and depth of the science presented at these meetings. The Victorian meeting was held in November, a report on which follows in this newsletter. A packed audience at the brand new Murdoch Research Institute facility heard some excellent talks and a number of awards were made. Funding from the society allowed presentations from interstate and international keynote speakers that have become a feature of these meetings. These local regional meetings are the responsibility of the society's local reps in each region and they each play an extremely important role in coordinating the activities of the society. Each year at the Annual General Meeting the new reps are voted in to replace those who have completed their terms. I thank the retiring state reps for their hard work and dedication to the role. Many thanks to the Secretary Ian Smyth for pushing hard to make sure we had quality nominations for all positions. This represents the largest cohort of State and NZ reps we have had so far and I encourage members to put themselves forward for these roles, which are critical to the societies success, and provide a valuable addition to the CV to indicate the commitment to society and committee work that is so critical come grant and fellowship time. The coming and going of the State Reps are listed below.

Retiring:

VIC Julian Heng (ARMI)
QLD Michael Piper (QBI)
NSW Anthony Kee (UNSW)
SA Quenten Schwarz (CCB)

NZ Peter Dearden (Uni Otago) and Justin O'Sullivan (Massey Uni)

Ongoing:

VIC Jeff Mann (MCRI)
QLD Annemiek Beverdam (Uni of QLD)
NSW Will Hughes (Garvan)
SA Tash Harvey (CCB, SA Pathology)
WA Archa Fox (WAIMR)

Elected:

VIC Jake Baum (WEHI)
QLD Kelly Smith (IMB)
NSW Matt Naylor (Uni of Syd)
SA Donna Denton (CCB, SA Pathology)
ACT Kristen Barratt (ANU)
NZ Megan Wilson (Uni of Otago) and Julia Horsfield (Uni of Otago)
WA Evan Ingley continuing

ComBio2012

This year's ComBio meeting produced one of the strongest line-ups of international speakers that we have ever had at our annual meeting. Over 800 people registered for ComBio 2012 in Adelaide, an exceptional result for a non Melbourne or Sydney based-meeting. We wish to extend our thanks to A/Prof Stuart Pitson, Centre for Cancer Biology, SA Pathology for his role as chair and ANZSCDB members A/Prof Paul Thomas, University of Adelaide and Professor Sharad Kumar, Centre for Cancer Biology, SA Pathology for their roles on the committee, and all the session chairs and stream coordinators for their efforts in putting together an exciting meeting. A report on the meeting is contained below. One issue that is worth noting is that the student grants that are offered for registration at ComBio are very much under subscribed again this year. These are very widely advertised and it remains unclear why individuals are not applying for them. We know students are attending the meetings we can only assume that their supervisors are unaware that their registration can be covered by these bursaries. We hope to see better uptake and use of these awards at the next ComBio.

Society Awards. As previewed in the winter news letter ComBio saw the official awarding of the society's major awards. The President's Medal, the society's highest honour was bestowed on Prof Marilyn Renfree. A full account of Marilyn's

research contributions is highlighted later in the newsletter, but her presentation was a real tour de force of marsipual development and reproduction. Marilyn's clear passion for her subject matter was in evidence and we warmly congratulate her on the award. The Society is most grateful for Sigma Aldrich's continued support of the President's Medal.

The ANZSCDB Young Investigator Award recognises the up-and-coming leaders in the discipline of Cell and Developmental Biology. This year's winner was Dr Aleksandra Filipovska. Aleksandra is an ARC Future Fellow at the Centre for Medical Research at the University of Western Australia. Aleksandra gave a presentation on mammalian mitochondrial RNA-binding proteins and their role in RNA metabolism in healthy cells and cell models of disease at ComBio as part of her award. We congratulate her in her success and look forward to continued success in year upward career trajectory. We also wish to thank Zeiss Australia for their continued sponsorship of this award.

A number of other awards were made at ComBio to our younger members.

- Dr. Lachlan Jolly Neurogenetics Research Program, S.A. Pathology. The Toshiya Yamada Early Career Award
- Daniel Colquhoun, Australian Regenerative Medicine Institute, Monash University. The Keith Dixon Prize in Developmental Biology. -
- Tia DiTommaso, Department of Biochemistry, Monash University. The David Walsh Student Prize
- Eiman Saleh. Centre for Cancer Biology/University of Adelaide. ANZSCDB Cell Biology Student Poster Prize.

We warmly congratulate all our society awardees.

ComBio 2013 will be held from 29th September to 3rd October 2013, at the Perth Convention and Exhibition Centre, which is a new venue since the last time ComBio2004 was in Perth. Perth is beautiful at this time of year and the Convention Centre is a great venue. I invite you all to join us in Perth in September next year!

Announcement of a new travel award

In this news letter we announce a new travel award for student members of the society. One of the most frequent requests of the society executive is for travel stipends for its more junior members.

We are therefore pleased to announce that we have secured funding for one such award via the very generous support of Leica Microsystems. The "ANZSCDB Leica PhD Student International Travel award" will be earmarked for PhD student travel to an international Conference in the last two years of their PhD. Details of the criteria for judging and the timing of award will be announced in the new year. However, it will be a requirement that both the student and his or her supervisor be members of the society. We are most grateful to Leica for their support of our young members.

Membership Fees going up get in quick!. At ComBio 2013 the executive proposed that the fees of the society be increased to bring our membership fees into line with a number of our sister societies. Bench marking places ANZSCDB as one of the cheapest societies to join while having a portfolio of activities supported that is similar to many other societies. A situation that in the long term is not sustainable. We think it is appropriate to bring the fees inline with sister societies such as ASBMB. The following price rises were proposed and unanimously endorsed by member vote at the last AGM at ComBio 2012 in Adelaide.

| | |
|--|-----------------------|
| Australian member (p/a) | \$AUD80.00 to \$100 |
| Australian member (3 year package) | \$AUD220.00 to \$250 |
| Australian Student / Retired Member (p/a) | \$AUD25.00 to \$35 |
| Australian Student / Retired Member (3 year package) | \$AUD60.00 to \$80 |
| Corporate Member (p/a) | \$AUD340.00 to \$400. |

A decision has been made to delay the implementation of these new fees until the new year, so act early to take advantage of this Christmas special. Members can renew or join online at <http://www.anzscdb.org/ANZSCDB-Membership.html>



Marilyn Renfree

Research career spent on the hop

Fiona Wylie

Renfree is an eminent, highly awarded and widely published research scientist, who also happens to be tremendously down-to-earth and passionate about Australian flora and fauna, and indeed that passion has underpinned all aspects of her working life. While Renfree has studied many mammalian species during her impressive research career, including the ubiquitous mouse and the elephant, her ongoing fascination lies with our very own marsupial species, and her model animal of choice for many years now has been the cute and size-manageable tammar wallaby.

Renfree's single career regret is that more Australian researchers and funding bodies do not seem to share her passion for this unique set of animals as "ideal" experimental models for studying the normal and abnormal development of all mammals, including humans.

Following the passion

Since her earliest research days at the Australian National University, Renfree's ongoing questions have surrounded how these cuddly Australians reproduce and what happens biologically between then and

when they eventually leave home. She did her Honours and PhD in the early 1970s with Dr Hugh Tyndale-Biscoe who worked on marsupial reproduction. "I was very lucky because this was one of the few places in Australia that I could have done what I did. In fact, when I went to see him and my Honours co-supervisor, Dr Chris Bryant, about doing Honours I declared that I wanted to do biochemistry and fieldwork...and they laughed at me."

Despite this start, Renfree found Tyndale-Biscoe to be an extraordinarily generous and supportive mentor who was very influential in her career path and never treated her any differently from her male counterparts, which was not the norm in those days. Renfree also declares proudly that "biochemistry and fieldwork" is still basically what she is doing.

Current pursuits

One of Renfree's current pursuits at the University of Melbourne, which has been her research home since 1991, remains the



long-standing issue of how marsupials develop perfectly good embryos in the absence of an inner cell mass (ICM). Unlike the so-called "placental" mammals (she prefers the less emotive "eutherian mammals"), there is no obvious demarcation in the single layer of cells that makes up the marsupial blastocyst - so how does it segregate into the embryo and extra-embryonic cells that will form the placenta?

"So, we have been looking at the genes and protein expressed early in embryogenesis for some time, although it is a lot easier

and quicker since we published the tammar genome last year. For instance, my PhD students can now clone a gene in a week when not too long ago the same task could take up to a year."

Aussie gold mine

Their findings in this area are not only highly informative and important biologically and physiologically,...but have also revealed key differences with the extensive mouse literature. "The results further highlight why the mouse is not the only model we should look at to study human embryology, and in fact, that it may not be the best model. However, the mouse has had an inordinate influence in this and other fields largely because of its usefulness in making transgenic individuals...and unfortunately we can't do that with wallabies yet. But maybe one day we will - it is certainly one thing I would really like to do.

"In Australia we are sitting on an absolute gold mine with our marsupials, but sadly it is difficult to get funding and it is hard work to do as it involves all aspects, right down to having to catch and rear your own animals...so there is hardly anyone left working on them."



Another focus of Renfree's research is sexual differentiation using marsupials, which are also perfect models for understanding sexual disorders of development in humans and other mammals for several reasons. For one, they are born with undifferentiated gonads and all of their sex differentiation happens after birth in a stepwise fashion. "So you have the ideal situation where each of the important urogenital organs are differentiating at a different point in time and that means you can look at the signals controlling this development much more easily than in a mouse for example in which it all happens very rapidly. Secondly, in a wallaby we can just open the pouch to administer hormones or inhibitors to

the very accessible developing young."

Highlights and influences

Personal highlights for Renfree include completing her PhD, especially as she came from an era when girls were not expected to go to university let alone make a great career of it. She was also very proud to receive her DSc award in 1988, particularly as it was a great opportunity to acknowledge some of her influences along the way. As with many high achievers, Renfree had several strong academic and personal influences, but she also had some spectacular intersections amongst them.

Born in Brisbane, Renfree grew up and studied in Canberra when her lawyer father became the Commonwealth Crown Solicitor. Already a big fan of being outside, especially in the Australian bush (which was most of Canberra in those days), Renfree's high-school biology teacher, Mrs (Dr) Nicholson, provided the first real catalyst for her interest and knowledge of science as a discipline. "Mrs Nick" was a remarkable person and very enthusiastic about her science. She was one of the first women in Australia to be awarded a Doctor

of Science, which was an inspiration to us girls - her husband was AJ Nicholson, the famous population biologist (then Chief of the CSIRO Division of Entomology). Often on Saturday mornings, she used to even trot us off to the old Institute of Anatomy to catch us up on the curriculum since we had only one year instead of the usual two to cover it due to the illness of the previous teacher."



Keeping it in the family

Another influence, at least indirectly, came via Renfree's older sister Bev who worked as Frank Fenner's technician when he was developing the Myxomatosis program. "In fact, in the famous photograph of Fenner with the myxo-infected rabbit, Bev is the one holding the rabbit! While I was quite young I often used to visit her in the John Curtin School, and many years later, between school and university, I worked there myself for a short time in the Department of Microbiology."

However, one of Renfree's favourite lines when asked about her career influences is clearly that surrounding her two major ones, and it is indeed a beauty - "I became best friends with one of my scientific heroes and married the other!" The two she is referring to are of course the renowned developmental biologists, Anne McLaren and Roger Short, respectively.

Renfree first met McLaren very early in her career at a conference in Canberra. "Anne offered me a postdoc so after completing my first postdoc at the University of Tennessee (on a Fulbright Scholarship), I went to work with Anne at the Institute of Animal Genetics as a Ford Foundation Fellow in Edinburgh until she moved to London. In fact, she moved to London to head up the MRC Mammalian Development Unit the same week that I left for Perth to take up my first academic appointment as a foundation member of staff at the newly formed Murdoch University. Then, many years later I

got together with Roger, who was my other academic hero, and he became my husband. If you had predicted those outcomes when I was a PhD student, I would have laughed in your face."

Renfree remained firm friends with McLaren until her tragic death in a road accident in 2007. "We always stayed with her in London, usually with small children in tow, and Anne visited me in Australia many times. I even drove her across the Nullarbor a couple of times, and she loved coming to Kangaroo Island to help us with the work. I still miss her a lot actually and think of her every day - she was a terrific mentor and an amazingly supportive person...particularly of women in science because there certainly weren't many back then."

Pinnacle of a mountain of achievements

"Amongst all of this, the best thing I have ever done in my life is have my two daughters, Tamsin and Kirsten," declares Renfree. "Family is an incredibly important part of this whole thing." Admittedly I was already well established when I had them as I held my own NHMRC fellowship - that was marvellous and I don't think I could have combined it all as easily with a research career in different circumstances."

When asked if they followed in their parents' footsteps, Renfree recalls them both swearing black and blue earlier on in their lives that they wouldn't touch science with a barge pole. However, Ren-

free's eldest daughter now has a D.Psych in Forensic Psychology and the other has just submitted her PhD in Microbiology and will take up a CJ Martin Fellowship in the Netherlands. Looks like the combined power of nature and nurture won out!

Translating the passion

It is clear that many of Renfree's current and future findings about marsupial reproduction and lactation as well as embryo differentiation, growth and fetal reprogramming could have scientific and clinical implications for a variety of growing human medical issues including obesity, reproductive health and cancer. Renfree also has a list of things she would like to understand about the tammar and marsupials in general for their own sake and for their conservation. She is also passionate about her PhD students, and has now graduated 50 of them!

On a positive note, Renfree thinks that we might be losing our Aussie cultural cringe and slowly turning the corner regarding the acceptance of marsupials as a valid mammalian model. "Indeed, last year we contributed to a Cold Spring Harbour publication (Emerging Model Organisms), about new model animals that are better for various inves-

tigation - much the same suite of genes are there as in other mammals. For example, many of the tammar genes are more similar to the equivalent gene in human than is that gene between mouse and human. Marsupials are really perfectly good mammals!"

"The other thing to remember is that these are wild animals and there was not much known about them when we started, so we have had to do everything from field collection to laboratory experiments. On the good side, this means being involved in an incredible range of research topics." And Renfree's swag of career achievements and awards attests to her success and international peer recognition in mastering the lot...and she still loves it all!

Indeed, since Renfree was first sent off to Kangaroo Island by Tyndale-Biscoe 40 years ago

to catch her own wallabies and establish a research colony, she and a team of eager staff and students return to the Southern Island every January for about 3 weeks to collect samples and do experiments. These days they have a relatively sophisticated mobile lab - the Wallavan - (think caravan of biology) that is kitted out with as much technology as the surroundings allow. "We set it up in the middle of a paddock and away we go. It is hard work, especially because these animals are nocturnal, so we work night and day, but I wouldn't change a thing." Renfree's attitude to these trips (and one suspects, to all aspects of her life) clearly reflects her career mantra, which is possibly summed up best by her own advice to younger researchers - "If you are interested and enthusiastic, the rest is easy."





ComBio 2012

Wrap Up

This year it was Adelaide's turn to host the annual ComBio conference. and Paul Thomas reports the ANZSCDB view

Over 800 delegates gathered at the Adelaide Convention Centre from September 23-27 to attend one of the largest COMBIO conferences to date. Many thanks to all of the members of the local organizing and program committees for putting together a terrific program-in particular, I would like to acknowledge the contributions of Yeessim Khew-Goodall, Sharad Kumar, Greg Goodall (Chair Program Commit-

tee), Stuart Pitson (Convener) and my co-coordinator of the Developmental Biology Stream Patrick Tam, as well as all of the session chairs. The sessions were stimulating and well attended and included some old favorites such as Organogenesis, Signaling and Stem Cells and as well as more contemporary themes such as Systems Biology of Development and Cellular Function. This year's program also included 18 Plenary speakers of which three were particularly Cell and Developmental Biology focused-Prof. Andy McMahon (Harvard, USA), Robin Lovell-Badge (NIMR, UK) and Michael Shen (Columbia, USA). Each delivered a tour de force and, importantly, were more than happy to talk science at the end of the day over a glass of wine or two. The posters and colloquia sessions were also very strong this year and I would like to congratulate the



four winners of the ANZSCDB awards: Lachlan Jolly, Tia Tommaso, Daniel Colquhoun and Eiman Saleh.

The annual ANZSCDB dinner has become one of the highlights



of the social program and this year's was no exception. It was a lively affair that included fine Italian food, copious quantities of red wine (at my table at least!) and a tough gig for Peter Currie, as he took on both Society members and unsuspecting members of the Adelaide public in his "Presidential address". The Conference Dinner too was a great night out, with many Society members (and Plenary Speakers!) keen to strut their stuff on the dance floor. All in all, a most enjoyable conference-see you next year in Perth for COMBIO 2013!

A/Prof Paul Thomas
Deputy Convener and co-coordinator (Developmental Biology Stream) COMBIO 2012

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ComBio 2012

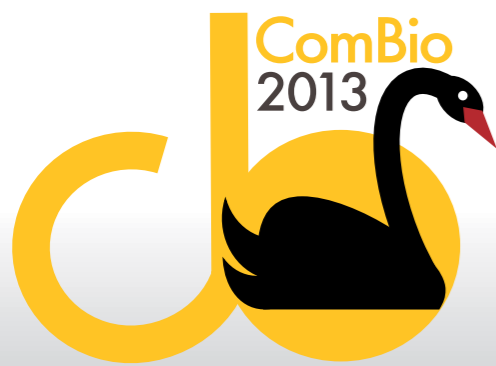
Honoured on the Night



Photographs:

Top - L to R: President's Medal Winner Prof Marilyn Renfree with Katherine Carey from Sigma Aldrich (left) and Peter Currie (right)- Young Investigator Dr Aleksandra Filipovska and ANZSCDB President Peter Currie
Bottom - clockwise: ANZSCDB President Peter Currie presents prizes to Dr. Lachlan Jolly, Daniel Colquhoun, Tia DiTommaso and Eiman Saleh.





ComBio2013

Perth Convention and Exhibition Centre

29 September to 3 October 2013

Early Registration and Abstract Deadline:

Friday, 5 July 2013

Provisional Conference Streams

Cell Biology

- Stem cells (ESC and iPSC)
- Chromosome instability
- Organelle biogenesis
- Cell membranes and trafficking

Gene Regulation

- Transcription
- Micro and long non-coding RNA

Cell Signalling

- Cancer-related pathways
- Responses to biotic and abiotic stresses in plants
- Inflammation
- GPCR pathways in disease

Protein Structure and Function

- Macromolecular complexes
- Folding and misfolding
- Enzyme structure and function
- Consequence of oxidative stress
- Membrane proteins
- Proteomics
- Computational studies of proteins

Developmental Biology

- Regulation of leaf and root development
- Specification of germ layers
- Sex determination
- Epigenetic mechanisms
- Adult disorders arising from prenatal developmental defects

Plant Biology

- Photosynthesis and respiration
- Membrane transport
- Symbiotic associations
- Secondary metabolites
- Metabolism

Genomics and Bioinformatics

- Epigenetics
- GWAS
- Plant systems biology

Plant Ecophysiology

- Water relations / water stress
- Seed germination
- Phosphorus physiology
- Abiotic stress
- Global change physiology

Tissue Engineering and Regeneration

- Inflammation
- Fibrosis
- Cell therapy
- Bioscaffolds



Incorporating the annual meetings of

- Australian Society for Biochemistry and Molecular Biology
- Australian Society of Plant Scientists
- Australia and New Zealand Society for Cell and Developmental Biology

Representatives of the following societies will assist the programme committee:

- Australian Society for Stem Cell Research
- Australian Society for Microbiology

Further information:

Conference: George Yeoh
George.Yeoh@uwa.edu.au

Registration/Exhibition: Sally Jay
combio@asbmb.org.au



www.asbmb.org.au/combio2013

Active in late November 2012



The 14th annual Australia and New Zealand zebrafish meeting

Registration and abstract submission is now open

<http://www.otago.ac.nz/anzzebrafish/>

Where: The Skyline Complex overlooking beautiful Queenstown and Lake Wakatipu, New Zealand.

When: Feb 3-6, 2013.

Invited speakers: EMBO lecture by Erez Raz (Germany), Dave Jones (USA), Tom Schilling (USA), Philippe Collas (Norway).

Website details: www.otago.ac.nz/anzzebrafish/

Adelaide Meeting

The second meeting of the South Australian Cell and Developmental Biology community was held on November 23rd this year at the University of Adelaide.

Our plenary speakers were Professor Alpha Yap and Dr Ben Hogan, both from the Institute for Molecular Bioscience in Brisbane. The meeting was attended by approximately 60 members of the South Australian cell and developmental biology community, with the University of Adelaide, Centre for Cancer Biology, UniSA and Flinders University all well represented.

Our program began in visually spectacular style with the first plenary speaker, Ben Hogan, who demonstrated the power of forward genetic screens as a tool to identify genes important for lymphatic vascular development in the zebrafish embryo. Ben's talk was followed by four short presentations from postdoctoral fellows. The judging panel had a hard time selecting the most outstanding of these; Leila Belle from the Centre for Cancer Biology was a deserving recipient for her talk entitled "Protein Tyrosine Phosphatase Pez - a novel regulator of breast cancer metastasis and the cancer cell secretome".

Alpha Yap again demonstrated the wealth of information gener-

ated from real time imaging in his plenary presentation, which focused on the cytoskeletal and adhesive mechanisms that control cellular tension. In addition to presenting outstanding science, Alpha provided great insight into the evolution and development of projects over time. Following Alpha's presentation, there were four short talks from PhD students. Once again, all were excellent, the judges awarded the most outstanding to Joey Puccini from the Centre for Cancer Biology for his work "Caspase-2 deficiency augments tumorigenesis and enhances genomic instability in Atm-deficient mice". The award for most outstanding poster of the day went to Cindy Xu, also from the Centre for Cancer Biology, for her work on novel developmental cell death pathways involving autophagy in *Drosophila*.

Overall, the meeting provided a great opportunity to hear about the exciting cell and development biology going on across Adelaide and to interact and build networks that will hopefully facilitate future collaborative work. Many thanks again to our sponsors of the meeting: ANZSCDB, UniSA, Carl Zeiss Australia, Genesearch and Millenium Science and to all of the participants for an extremely interactive and stimulating day. We look forward to next year's event!

Natasha Harvey and Quenten Schwarz

SA State Reps

WA Meeting

Archa Fox and Evan Ingley

The 22nd Annual Combined Biological Sciences Meeting was held at the University of Western Australia on August 24th 2012. This meeting aims to showcase the breadth of biological science research occurring in Western Australia with an additional objective of fostering collaboration and ensuring that researchers are aware of services and equipment currently available in WA. In excess of 300 delegates and traders attended a variety of sessions featuring invited guest speakers, early career and student speakers and covering a wide range of topics. The Australian and New Zealand Society for

Cell and Developmental Biology kindly provided a student poster prize of \$300, and this was won by Alison Louw (pictured below with Associate Prof Evan Ingley) from Anatomical Pathology, Royal Perth Hospital (School of Pathology and Laboratory Medicine, University of Western Australia) for her poster which was titled "RMND5 Proteins target the prostatic tumour suppressor, NKX3.1 for proteasomal degradation". Congratulations to Alison, and many thanks to the ANZSCDB for supporting CBSM in 2012.



Brisbane Research Conference

Annemiek Beverdam

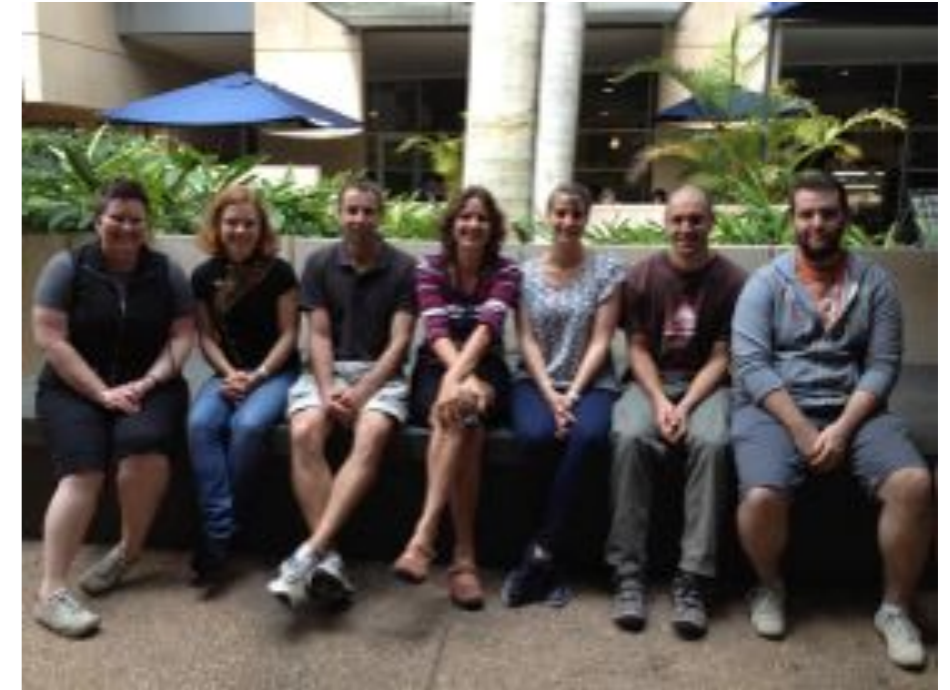
On 4 October 2012, the Queensland arm of the Australian and New Zealand Society for Cell and Developmental Biology (ANZSCDB) held a 1-day **Cell and Developmental Biology Meeting** at The Queensland Brain Institute at the University of Queensland. This meeting was made possible with generous support from the ANZSCDB and others. It showcased the fantastic research into cell and developmental biology being performed in Queensland. The overseas plenary lecture was presented by Professor Robin Lovell-Badge who discussed the role of Sox9 in neural progenitor regulation during brain development. And we had two

young and dynamic Australian researchers present the other plenary lectures, namely Dr. Michael Samuel who discussed the role of Rho Kinase in actomyosin-mediated cellular tension and skin cancer, and Dr. Quentin Schwarz, who talked about the role of 14-3-3 ζ in neuronal development and in the etiology of schizophrenia. Both national plenary speakers are based at the Centre for Cancer Biology, SA Pathology. As well as this, we had a number of fantastic short oral presentations delivered by one brave Honours student, 3 PhD students and 4 Postdocs from around the Brisbane region. This year we held two different poster sessions to accommodate all 60 early career researchers. The poster sessions

were well attended and exhibiting exciting work in the two fields. Prizes were awarded to the best oral and poster presentations. This year Baptiste Coxam (Institute for Molecular Bioscience) and Dr. Grace Shin Lah (School of Biomedical Sciences - UQ) won the awards for best oral presentations, while Honours student Joshua Eeles (School of Biomedical Sciences - UQ) and Dr. Tara Roberts (Queensland Institute for Medical Research) were named runners up. Joanna Rakoczy (School of Biomedical Sciences - UQ) and Dr. Conor O'Leary (Queensland Brain Institute) won prizes for the best posters, with Dr. Jatin Patel (The University of Queensland Centre for Clinical Research) and Elanor Wain-

wright (Institute for Molecular Bioscience) named the runners up. Thanks must go to the QBI which turned out to be a fantastic location for the meeting, and to all of those who contributed to the smooth running of this symposium. Overall, the meeting, which had over 125 registrants, was a great success, and we look forward to the next installment of this meeting in 2013.

On behalf of the organizing committee of the Cell and Developmental Biology Meeting (Pictured right L to R: Annette Shewan, Kelly Loffler, Guy Barry, Annemiek Beverdam, Anne Lagendijk, Michael Piper, Gregory James).



Invited Speakers L to R: Dr. Quentin Schwartz, Professor Robin Lovell-Badge, Dr. Michael Samuel

Melbourne Cell and Developmental Biology

Julian Heng and Jeff Mann

On the beautiful Spring Day of November 2nd this year, the Victorian Chapter of the ANZSCDB held its annual Melbourne Cell and Developmental Biology meeting at the Murdoch Children's Research Institute, situated within the new Royal Children's Hospital. More than 100 registrants packed the Cox/Walford room and settled on chairs and cosy lounges. Attendees on the day hailed from Monash, Melbourne, LaTrobe and Deakin Universities and affiliated research Institutes, and looked forward to the day's events. This year's meeting featured, for the first time, poster presentations along with orals selected from abstracts submitted by postgraduate students and postdoctoral researchers. There were 14 talks assigned to four sessions: (i) 'Organ formation during development and disease'; (ii) 'Symmetry, cell fate specification and inheritance during development'; (iii) 'Cell signalling and morphogenesis during development'; and (iv) 'Gene expression regulation and development'. In addition to the stimulating presentations from students and postdocs, we were thrilled also to have had secured Professor Edward Manser (Institute of Medical Biology, Singapore) and Professor John Carroll (the new Head of the School of Biological Sciences at Monash University) to deliver wonderful presentations on their research. Ed spoke in detail on his research on Rho protein signalling in early development, while John presented remarkable research on the distribution of intracellular signalling gradients

within the oocyte during early mouse development. The audience were captivated by all the presentations on the day, with lively discussions heard throughout all session breaks, poster communications and tea breaks.



Oral session of the 5th MCDB Meeting held in the Cox/Walford room of the MCRI

Through the generous support of our corporate sponsors (Sigma Aldrich, Roche, Life Sciences, Scientifix and Merck Millipore), as well as the Society through its membership fees, we were able to offer five cash prizes for presentations on the day. Not bad, given a meeting that is Free to Register! All communicating authors gave outstanding presentations which, in the end, made final decisions on prize winners very difficult. We would like to congratulate the winners of the following prizes for their presentations:

Badia Barakat (Monash University)
"Integrin-linked kinase regulates embryonic cerebellar development through

Hedgehog pathway interactions in the primary cilium"
Sigma Aldrich Best Postdoctoral Oral Presentation

Lucas Dent (Peter MacCallum Cancer Centre)
"Control of the Hippo pathway

by a Rho-GEF and ARF-GAP"
Roche Best PhD student Oral Presentation

Stephen Frankenburg (University of Melbourne)
"Molecular analysis of the marsupial conceptus reveals non-conserved mechanisms for early cell lineage specification in mammals"
Scientifix Best Postdoctoral Poster Presentation

Avnika Ruparelia (Monash University)
"Zebrafish models of Filamin related myofibrillar myopathy"
Life Technologies Best PhD student Poster Presentation

Tia DiTommaso (Monash University)
"Keratin 76 mediates epidermal

homeostasis, barrier function and tight junction stabilization"
Life Technologies Highly Commended Research Presentation

We are grateful to our sponsors Life Technologies, Merck Millipore, Roche, Scientifix and Sigma-Aldrich for their generous support in offering prizes, as well as for providing morning and afternoon tea. We would also like to thank the judges for their hard work in determining the winners on the day. Our thanks is also extended to Harry the Hirer who provided rental on poster-boards free of charge, and also to Sarah Leavitt and Helen Godsall of the Murdoch Institute who assisted in organizing the venue. Finally, we would like to convey our sincere thanks to attendees and presenters which have altogether made this year's meeting such a wonderful event indeed! We look forward very much to seeing everyone at next year's meeting, and for the continuing support from our sponsors, members and life scientists within Victoria and across the country.



Mr Lucas Dent receiving his prize for best oral presentation by a PhD student. Many thanks to the Two Nikki's for presenting prizes on the day! (also pictured, Julian Heng and Jeff Mann).



PrizeWinners (L to R): Lucas Dent, Julian Heng, Nikki Tsoudis, Tia DiTommaso, Stephen Frankenburg, Badia Barakat, Nicole Pardini, Avnika Rupelia, Jeff Mann.

Science Meets Parliament

Michael Dobbie and Dagmar Wilhelm

Science Meets Parliament 2012 – Working together for the common good.

Science & Technology Australia (STA), the peak advocacy body for Australian scientists, is succeeding in changing the way non-scientists regard science. STA gathered 200 scientists into the parliamentary domain for the 13th annual Science Meets Parliament conference 17-18th September, two days of tuition and discussion on the parliamentary processes and effective communication, culminating in small group meetings with MPs and senators. The ANZSCDB sponsored Dagmar Wilhelm and Michael Dobbie to participate in this year's event.

The contrasting cultures of science and politics can often be a source of misunderstanding and confusion with either camp wondering and trying to make sense of what the other is saying. Parliament generally seeks certainty in policymaking based on relatively quick decisions from briefing notes prepared on the fly with little time to gather evidence. Science on the other hand is characterised by the formulation of well researched, considered opinion with a healthy respect for the reality of uncertainty and risk.

In this context, there is a significant shift in attitudes as demonstrated by the following events that took place during the two days:



o Launch of APS200 Project:

The Place of Science in the Policy Development in the Public Service.

o Launch of the Parliamentary Friends of Science Group, which aims to ensure that science underpins policy and informs political debate. Is your local MP a member?

o Delivery of the new book "The Geek Manifesto: Why Science Matters" by Mark Henderson to every MP and senator. This is an agenda-setting book that builds a strong case for the necessity of science to be central to government and national conversation. We are shown how science can become more politically compelling. An inspiring read!



o An exemplary demonstration of effectively communicating the centrality of science to everyday life and current national debate by our latest scientific superstar, the 2011 Nobel Laureate Professor Brian Schmidt, who addressed the National Press Club.

The participants gained insights into the policy making cycle from Patricia Kelly (DIISRTE Deputy Secretary) and the Federal budget process from Bill Brummit (Dept of Treasury). Sophie Mirabella MP recognised that (i) scientific input should be considered in all facets of decision-making, including non-scientific domains since there is a scientific component in most if not all policy areas, (ii) national challenges should be debated using sound scientific data, and therefore (iii) the importance of broad scientific literacy to help make robust policy.

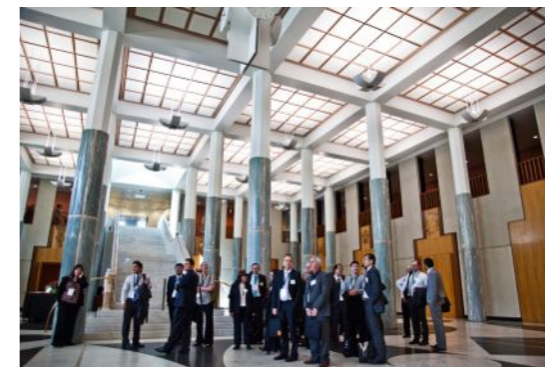
The following issues in science funding policy were openly recognised and are reassuringly on the parliamentary agenda:

- Discontinuous and inconsistent funding, which threatens job security for specialised personnel could be addressed by a bipartisan long-term sustainable investment strategy.
- The decreased funding for international collaborations.
- The low level of engagement of research scientists with industry thereby hindering the rapid and innovative application of research discoveries.

In addition to learning about how to talk to politicians and get the most out of these precious opportunities, the conference was an exceptional opportunity for networking across disciplines and the press. During these two days we talked with physicists, geneticists, geographers, chemists, biologists, as well as political and scientific journalists. Our meetings with MPs and a senator left the lingering impression that politicians believe that the government is giving enough money to science, and the problem is that scientists are spreading this money too thin instead of prioritising the very best applications. However, if you have been, for example, on an NHMRC grant review panel, you will know how many excellent applications already are not being funded because of the shortage of available money. The two areas politicians believe need improvement and support are firstly, the decreasing interest in pursuing science by school and University students and secondly, the lack of PhD graduates in non-university sectors. It is understood that these deficits are being addressed.

Shortly after the Smp2012 event the importance of science and technology

in all areas of policy making and government was exemplified by the Australian visit of the UK Government Chief Scientific Adviser, Sir John Beddington. Hosted by the Australian Academy of Science, Sir John delivered an inspiring presentation that surveyed the many UK parliamentary and national issues that required scientific input during his term of office (e.g. climate change;



announced the new position of Chief Scientist in his Department (DEEWR), at the same time challenging other ministers to introduce a similar position in their department. Things are looking up! The fact that scientists and policy makers are building improved rapport gives hope for improved recognition of the central importance of science and our vision of a prosperous and healthy society.

We congratulate STA, in particular the CEO Anna Maria Arabia and her team, for the tightly organised conference, the excellent speakers, generating great enthusiasm for science communication, and effectively coping with the continually changing availabilities of parliamentarians and fluid meeting scheduling.

In summary, these two days were stimulating and provided an important insight into the workings of parliament so that we can better communicate with policy makers to promote the centrality of science to Australia's future. We strongly commend other ANZSCDB members to participate in future Science Meets Parliament conferences.

Dagmar Wilhelm
Department of Anatomy and Developmental Biology
Monash University

Michael Dobbie
The Australian Phenomics Facility
The Australian National University

Photo acknowledgement: "Image credit: Lorna Sim / Science & Technology Australia"

Giving hope to the Tin Man

Professor Richard Harvey and his team from the Victor Chang Cardiac Research Institute and the University of New South Wales hit the headlines a year ago for their landmark discovery of a cardiac-resident population of stem cells that could one day “mend a broken heart”. With heart disease the biggest killer each year in many countries including Australia, the team’s findings were published in *Cell Stem Cell* and made news worldwide, from the Sydney Morning Herald to Nature, as one of the major biomedical breakthroughs of the past year.

For years, it remained unclear whether stem cells found in the heart had native title or had migrated from elsewhere in the body - an issue that has important implications for the potential clinical application of such cells because stem cell origins probably influence their capacity for tissue repair. “What we wanted to know was, did these cells derive from those general bone marrow cells, or were their origins from much earlier on and specific to the heart?” said Harvey. Harvey’s team used mouse transplantation models and genetic lineage tracing to prove for the first time that multipotent, adult stem cells were indeed a real and cardiac-specific phenomenon and that they had been in the heart-making business since the early days of embryogenesis.

“So, the functions of these adult heart stem cells are likely to be highly dedicated to that organ, and thus highly tuned

to its regenerative processes,” explained Harvey. “This allows us to think differently about how we might use those cells. Rather than stimulating the bone marrow to deliver them as a package, we’re more interested in what these cells do in the heart and how we might stimulate repair after a heart attack or even just to help in everyday wear and tear scenarios.”

“This could bode very well for regeneration therapies that are just beginning to be trialed around the world with other populations of stem cells.



Ref: Chong et al. 2011 *Cell Stem Cell*, 9: 527-540.

Caveolae packed with promise

Another research highlight of the year was led by the 2011 President’s medal winner Professor Rob Parton at The University of Queensland and published in the August 17 issue of *Cell*. The team’s findings reveal fundamental new insights into cellular roles for the ever-surprising caveolin protein that also hold potential to deliver innovative and much sought-after solutions for drug delivery.

Caveolin is the star player in forming the morphologically characteristic cell-surface pits called caveolae, which are found in most mammalian cells and amongst other functions, act to engulf material that needs to be transported into the cell. However, the fundamental principles of caveolae formation have been slow to reveal themselves. Parton’s latest experiments using a genetically engineered prokaryotic bacterial host lacking any intracellular membrane system have now provided proof-of-principle that caveolin expression alone can drive the formation of caveolae-like cytoplasmic vesicles. Cryoelectron tomography confirmed that the caveolin-induced membrane domains are equivalent in size and caveolin density to native human caveolae. Following formation, these uniformly sized and genetically encoded vesicles underwent normal scission from the cell surface to form a sea of fluid-filled packages in the bacteria, ripe for collection and purification. Parton also showed that the purified ‘caveolae’ could be tailored for cell-specific targeting via further engineering of the caveolin protein itself, without disrupting caveolin’s caveolae-forming function, and that biologically relevant small proteins (e.g., toxins,

proteases) could be introduced into the caveolae lumen and purified efficiently with the engineered particle.

The team already demonstrated the feasibility of this principle by successfully delivering molecules into breast cancer cells in culture via targeted vesicles. So, by virtue of a single polypeptide entity driving a simple cellular biogenesis process, these potential caveolae-based delivery vesicles are entirely defined and both the contents and cellular targeting signal are highly controllable. Voila – the ideal drug delivery vehicle!

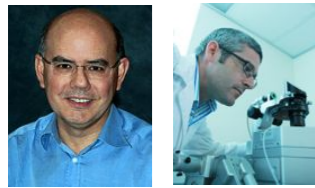


Ref: Walser P et al. 2012 *Cell* 150, 752–763.

Published something good lately? Let us know!

Regional Round Up

New South Wales



Anthony Kee and Will Hughes

In October, Dr Anthony Kee (Neuromuscular and Regenerative Medicine Unit, School of Medical Science, University of New South Wales) ended his term as NSW representative of ANZSCDB. We would like to thank Anthony for the great job as the NSW representative, in particular for organ-

ising the 2011 and 2012 Annual Cell and Developmental Biology meetings. Dr Will Hughes (Diabetes and Obesity Program, Garvan Institute) continues as the NSW representative and he has a wonderful program planned for next year's annual scientific meeting of the NSW chapter. In the last few years the calibre of International and National speakers has been outstanding and next year's meeting will be equally exciting. As in previous years, a number of talks chosen from submitted abstracts for students and postdocs.

The 13th Hunter meeting will be held in the Hunter Valley in March 2013 (19th-22nd). This is one of Australia's premier cell and developmental biology meetings. A number of NSW ANZSCDB members are involved in organising this meeting, including Sally Dunwoodie who is co-convenor and Will Hughes as an organiser of the pre-meeting Imaging Workshop.

Queensland

Annemiek Beverdam and Kelly Smith

The Queensland sector has furthered Cell and Developmental Biology with a number of events over the past six months. The ANZSCDB-sponsored Brisbane's Cell and Developmental Biology Meeting took place on the 4th October, 2012 at the Queensland Brain Institute at the University of Queensland. Over 125 registrants were in attendance and were honoured with an impressive list of speakers, including plenary speaker, Professor Robin Lovell-Badge (National Institute for Medical Research, UK), and two national invited speakers, Dr Quenten Schwarz (Centre for Cancer Biology, SA Pathology) and Dr Michael Samuels (Centre

for Cancer Biology, SA Pathology). In addition, the event showcased the impressive array of research in Cell and Developmental Biology going on in the area with the presentation of Postdoctoral and PhD talks and posters. Notable presentations were made by Dr. Grace Shin Lah (School of Biomedical Sciences - UQ) and Baptiste Coxam (Institute for Molecular Bioscience) who were the recipients of the best oral presentation for a postdoc and PhD student, respectively, and the runners-up were Dr. Tara Roberts (Queensland Institute for Medical Research) and Joshua Eeles (School of Biomedical Sciences - UQ), respectively. Our poster prizewinners were Dr. Conor O'Leary (Queensland Brain Insti-

tute) and Joanna Rakoczy (School of Biomedical Sciences - UQ) in the categories of postdoc and PhD student and runners up were Dr. Jatin Patel (The University of Queensland Centre for Clinical Research) and Elanor Wainwright (Institute for Molecular Bioscience).

More recently, the Early Career Researcher Poster Symposium took place at the Institute for Molecular Bioscience at the University of Queensland. The event provided an informal setting for Early Career Researchers to present and discuss their work with other budding cell and developmental biologists. Taking place on the 20th November, 2012, there were over 140 registered partici-



Early Career Researcher Poster Symposium, Institute for Molecular Bioscience, UQ

pants and even more attendees. Award winners included Dr Andrew Brooks (Institute for Molecular Bioscience, UQ) and Dr Makrina Totsika (School of Chemistry and Molecular Biosciences, UQ) as best and runner-up posters for postdoctoral researchers, respectively, and Gregory James (School of Biomedical Science, UQ) and Daniel Nielsen (Institute for Molecular Bioscience, UQ) as winner and runner-up of the best student poster prizes.

In addition to these events, we were also treated with a visit and lecture from Professor Konrad Bassler. Professor Bassler was invited to give this year's Toshiya Yamada lecture and presented some insights into his time working alongside Toshiya Yamada as well as some of his current work and the great clinical impact that fundamental developmental and cell biology can have.

This year celebrated the 15th year of the Brisbane Developmental Biology monthly seminar series. Organized by the Brisbane Developmental Biology Group, we were indulged by an impressive array of national and international speakers, including Dr James Briscoe (National Institute for Medical Research, London), Professor Stephen Jane (Monash University,



Toshiya Yamada lecture. From L-R: Linda Yamada, Prof Konrad Basler, Prof Brandon Wainwright (IMB, UQ) and Prof Perry Bartlett (QBI, UQ).

Melbourne) Professor Thomas Becker (Brain and Mind Research Institute, Sydney), Professor Richard Harvey (Victor Chang Cardiac Research Institute, Sydney), Dr Milos Tanurdzic (School of Biomedical Science, UQ, Queensland), Dr Massimo Hilliard (Queensland Brain Institute, Queensland), Dr Natasha Harvey (Center for Cancer Biology, Adelaide).

Two state members have received recognition. Professor Peter Koopman was recently elected as one of the 10 esteemed Council members of the Australian Academy of Science for 2013-2016. In addition, Michael Tallack was the recipient of Queensland's ASMR postdoctoral award.

Regional Round Up

Victoria



Julian Heng and Jeffrey Mann

On November 16th this year, the Victorian Chapter of the ANZSCDB held its annual Melbourne Cell and Developmental Biology meeting within the Clayton Campus of Monash University. The day-long event boasted an impressive speaker list comprising 8 postdoctoral and 8 PhD student researchers. This year's program again featured an extensive range of animal models (nematodes, drosophila, rodents, chick, zebrafish) for understanding growth, development and cancer. One strong, recurrent theme within this year's speaker programme was the importance of a developmental biologist's perspective for understanding disease. Studies of muscle development in zebrafish pro-

vided new potential targets for therapeutic intervention, while a different study on the neuronal colonisation during development for gut motility in mice offered unique insight into how obstructive bowel disorders in juveniles could potentially be treated with cell transplantation therapy.

Our speaker programme was augmented by the excellent presentations from our plenary speakers, Professors Christophe Marcelle (ARMI, Melbourne) and Jenny Stow (IMB, Brisbane). Professor Marcelle's presentation on myogenesis in the chick featured a powerful combination of cutting edge molecular techniques, timelapse confocal microscopy and novel computer modelling/visualisation techniques. Professor Stow's equally impressive presentation featured high resolution microscopy techniques to elucidate the distinct roles for cell sorting machinery to regulate cytokine

secretion. The audience was overwhelmed by the quality of their presentations, which together stand as a wonderful representation of the calibre of cell and developmental biology research within Australia.

While judging for the best presentations was made difficult by the excellent quality of all presentations on the day, this year's Merck/Roche student speaker prize went to Ms Micka Bertucci (Monash University), while the Leica postdoc speaker prize was awarded to Dr. Lincoln Stamp (Murdoch Childrens Research Institute). We would like to sincerely thank our sponsors for providing continued support for our meeting which is an important vehicle to showcase the strong and growing local talent in developmental biology in Melbourne.

Convenors 2011 Melbourne Cell and Developmental Biology meeting.

Regional Round Up

Western Australia

Evan Ingley and Archa Fox



This year saw continued support by the ANZSCDB at the annual Combined Biological Sciences Meeting (CBSM) held in Perth each August. This meeting is a great opportunity for young scientists in WA to get together and discuss all areas of biology, including cell and developmental biology. A key feature of the meeting is the opportunity for students and Early Career Researchers to present their work in the form of both orals and posters, and the donation of generous prizes to reward their efforts. This year ANZSCDB was delighted to present a Student Poster Presentation Award to Alison Louw, for her poster on RMND5 Proteins targeting the pro-

static tumour suppressor, NKX3.1 for proteasomal degradation. 2012 also saw many of the ANZSCDB WA members heading over east to Adelaide to attend ComBio2012. Members who spoke included Archa Fox, Aleksandra Filipovska and Evan Ingley.

We are all gearing up for ComBio in 2013, which will be held once again in Perth, and are looking towards continuing the strong presence of ANZSCDB members and organization in this meeting next year. Society member Professor George Yeoh has been elected Convenor of COMBIO 2013, which is a great boost for the Society and promises that COMBIO will continue to be as relevant for ANZSCDB as ever.

Regional Round Up

New Zealand

New Zealand has two new society representatives,



Dr Julia Horsfield (top) and Dr Megan Wilson (bottom). Julia is a developmental geneticist who was instrumental in establishing the Otago Zebrafish facility in 2007, allowing better access to this important development model for Otago researchers and undergraduate teaching laboratories. Julia is head of the Chromosome Structure and Development group, Department of Pathology, Otago University (<http://www.otago.ac.nz/csdg>). Megan is a developmental biologist who moved to the Department of Anatomy in 2011 to establish a new research group (<http://wilsonlab.otago.ac.nz/>). Her interests include understanding how genes become co-opted into novel developmental pathways and the role this has in producing diversity and complexity within animals

(evo devo) as well as studying gene regulatory mechanisms in mammalian developmental and reproductive biology. Megan makes use of both mouse and sea squirt developmental models (Ciona and Botryllodes).

Meeting highlights. Queenstown Molecular Biology meeting (<http://www.qmb.org.nz/>), an annual meeting held in Queenstown, featured a lineup of top researchers from both New Zealand and Australia, and this year included satellite meeting with focuses on non-coding RNA and Genetics. Dr Megan Wilson (Otago) won the 2012 Life technologies award for her work in developmental and evolutionarily biology. Take note of next years meeting to be held 25-30 August which features satellite meetings on epigenetics, heart and redox research.

Reproduction and Development cluster of the Department of Anatomy (Otago) held a successful symposium showcasing the research of our post-graduate students. We opened the meeting with an invited speaker, Assoc. Prof. Dagmar Wilhelm (Monash), who gave an exciting keynote lecture on ncRNAs and ovarian development.

Grant success. Several New Zealand developmental and cellular biologists were successful in the grant

rounds. Dr Lynnette Browfield (Otago) received a Marsden Fast start grant to study the role of asymmetric division in male germ-line specification in flowering plants. Dr Patricia Rosengrave (Otago) also receive a Marsden Fast Start grant for her project, How do males adjust their sperm quality in response to social cues? Dr Mark Vickers (Auckland) received funding for his project entitled "Nutritionally driven reproductive development: is the male in the driving seat?" Professor Stephen Roberston (Otago) received a HRC project grant; Defining the genetic predisposition to biliary atresia.

Update on Research centres Genetics Otago (<http://www.otago.ac.nz/genetics/>) has been successful confirmed as a one of 12 research centres at the University of Otago. Genetics Otago has more than 180 members across many disciplines including developmental, cellular, human disease.

National Research Centre for Growth and Development (NRCGD), one of seven New Zealand Centres of Research Excellence (CoRE) has been renamed Gravida (<http://www.gravida.org.nz>). Gravida brings together researchers from all corners of New Zealand to collaborate on studies investigating developmental plasticity and its implications for human health and livestock productivity.

After the devastating Christchurch earthquake, researchers at the University of Otago Christchurch campus recently began to move back into the medical research building after 21 months of strengthening work. Many researchers had to continue their work in other university laboratories and even a specially fitted out warehouse to keep their research programmes on track.

Merry Christmas from NZ

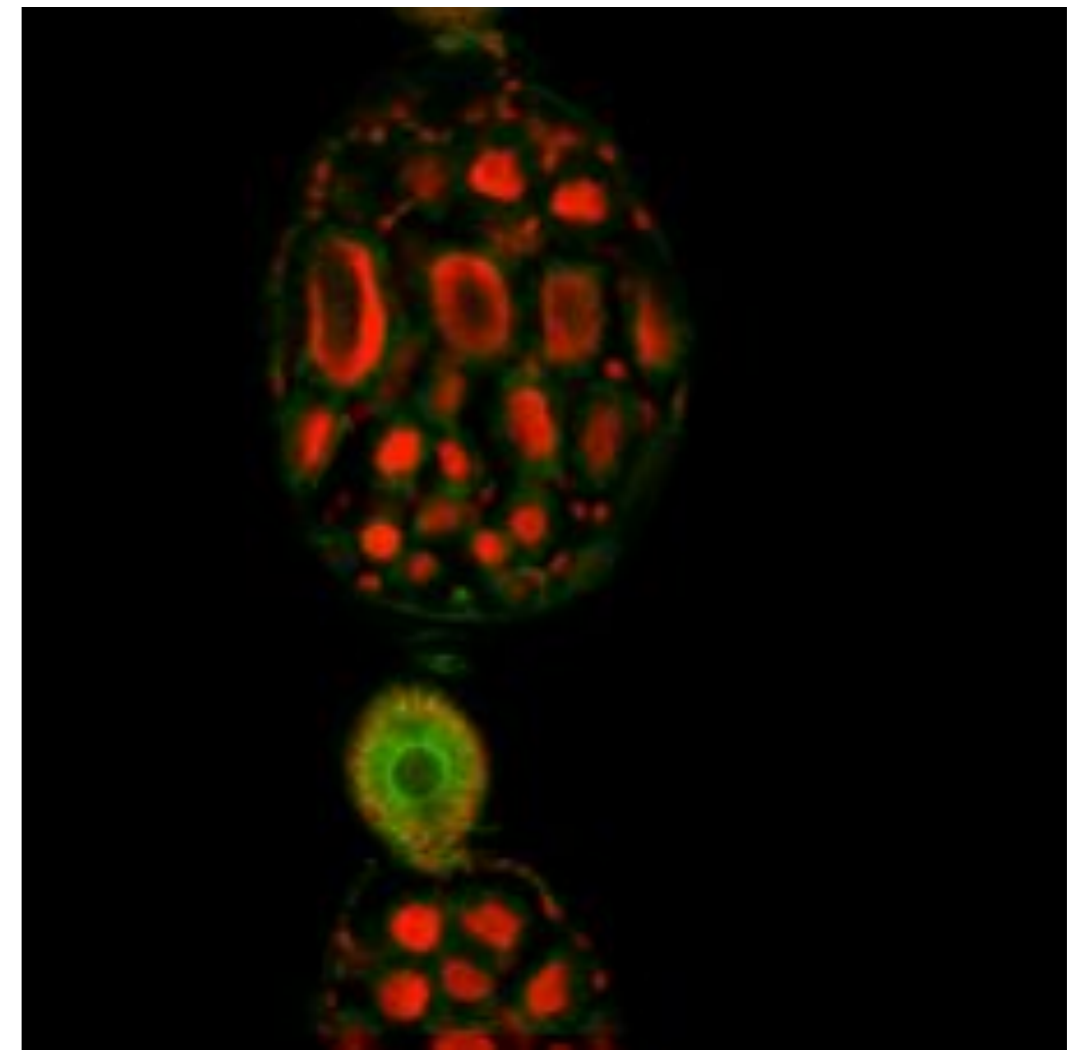


Image for Christmas – A honeybee ovariole stained for DAPI (red) and acetylated- α tubulin (green). Taken by Dr MJ Wilson.

The Woods Hole Embryology Course - a life-changing experience

Lucas Dent

In June and July 2012, after 18 months of focused PhD research I finally managed to extricate myself from my own experiments to spend six weeks expanding my understanding of developmental biology. I was fortunate to join 23 enthusiastic scientists to participate in the Embryology course at Marine Biological Laboratories (MBL), Woods Hole, Massachusetts, USA. The MBL Embryology course has been running for more than 110 years, and applications are open to everyone (from PhD students and post doctoral researchers to senior researchers). I decided to apply after reading through the course handbooks from previous years and being impressed with the breadth of techniques and concepts that are covered. The stated aims of the

course are to train scientists in the major paradigms, techniques and questions confronting developmental biologists, and this is indeed what the course achieves. However, I did not realise that I would also be leaving Wood's Hole with a suitcase full of souvenir t-shirts and memories of wonderful friends from all across the globe.

Education by total immersion
The application form for the Embryology course contained the following warnings, "MBL summer courses are extremely rigorous", and "There is little time for much else but course work". This only increased my excitement. I soon found that 'extremely rigorous' meant dedicating 16 hours a day, 6 days a week, for 6 weeks to learning experimental techniques and performing experiments with an enormous variety of model

organisms. In a typical day we would attend lectures from visiting faculty presenting their research, followed by discussion and questions with the speaker. The next 13 hours were given to learning experimental techniques, and conducting experiments with the enormous variety of model organisms that were available. The animals we used for experiments included both genetic (e.g. *Drosophila*, *C.elegans*, zebrafish, and mice), and experimental (eg. frogs, salamander, ascidians, chicks, sea urchins) model systems. The combination of long workdays and the sheer amount of information available for us to absorb, meant the course was both an intellectual and physical challenge. I have many happy memories of late night dissections, micro-injections, transplants, RNA extractions, and coffee-fuelled confocal sessions.



The Marine Biological Laboratory, Embryology Course participants; yellow (arrow shows Lucas Dent)

Many of us also enjoyed a number of beautiful sunrises over the atlantic ocean, usually from working all night, rather than rising early.

'Networking', another word for making friends

One of the most important things I learned from the other students attending the course is that 'networking' is really just another word for making new friends. There is no doubt that the six-week duration and immersive nature of this particular embryology course provides a unique opportunity to form lasting connections with researchers and other students. The faculty who teach the course are all outstanding scientists and developmental biologists. These researchers included scientists in my field of growth control and *Drosophila* developmental biology, such as Georg Halder, Nipam Patel, Ruth Lehmann, Stephen Small, and Matt Ronshaugen, as well as world-leading researchers in areas as diverse as limb development, neural crest migration and stem cell biology. Faculty members typically spent a whole week working closely with the students, providing instruction in the lab and joining us for meals and recreation. This meant there was an opportunity to get to know each faculty member personally during dinner, or activities like softball games and trips to the beach. My biggest surprise was the wonderful friendships I made with classmates during the course, which comprised participants from over 14 different countries - it was incredible how quickly we found common ground in our enthusiasm for biology. We came from China, Japan, England, India, Ireland, Argentina, Chile, Brazil, Peru, Mexico, South Africa, Canada and the United States. We played softball together, marched on the 4th of July, swam together at the beach in the day and night, and were mesmerised by the bio-luminescence and the beautiful landscape of Cape Cod. The diversity

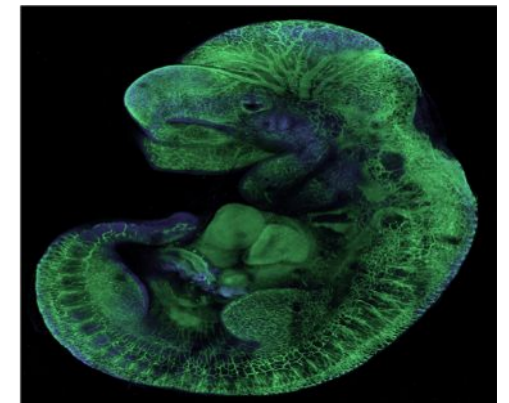
amongst us also allowed us to share our cultures. We shared our thoughts on ethics and science policy, we each cooked our national cuisine, we shared our modern and traditional songs, and we also shared our dancing. But above all else, I think we shared the tiredness that accumulates after hundreds of hours of experiments.

Many and varied inspirations

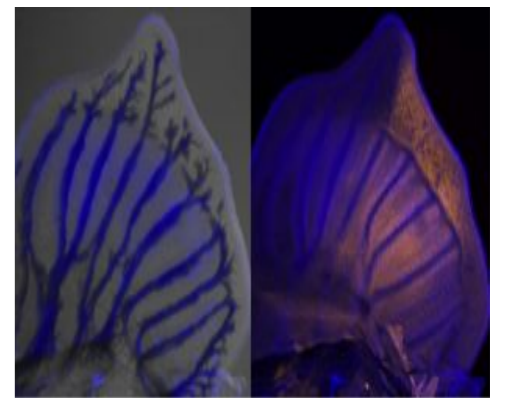
It was very energising to wake up every day and meet creative scientists who have been able to envision important new areas of research, and then pursue them. I was able to meet a number of courageous scientists who are developing new approaches to investigating biology. These included a number of scientists who are focused on establishing new model systems such as the course director, Alejandro Sanchez-Alvarado who has developed the regenerating flatworm 'planaria' as a model to understand stem cell biology. Alejandro has adapted an enormous range of techniques to this emerging model, including RNA interference, flow cytometry to study stem cell cycling, and in situ hybridisation. Similarly, Nipam Patel (former director of the Embryology course) spent three weeks with us, and talked about his lab's work developing genetic tools in crustaceans to discover the principles of animal segmentation.

A number of faculty also presented inspiring research that has only become possible with the availability of rapid, low cost sequencing, and new bioinformatics techniques for interpreting and manipulating sequence data. Some excellent examples of this were Bernard Degnan who has chosen a species of sea sponge to investigate the evolution of multicellular animals, and Mike Shapiro who has undertaken large-scale breeding and genome sequencing of pigeons to understand

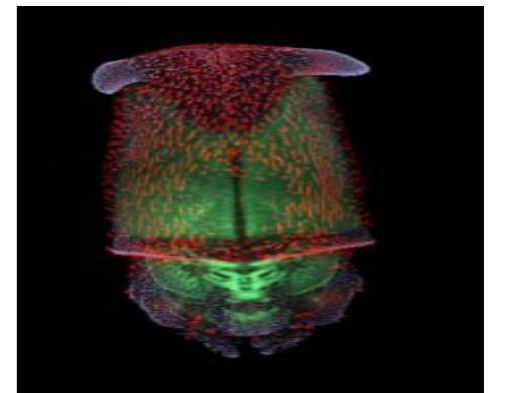
the rapid evolution of enormous phenotypic variations within a single species.



E10.5 Mouse showing vasculature stained in (Green), and Nuclei (Blue)



Butterfly imaginal disc showing nuclei (Blue) and Engrailed (marking posterior domain) (Orange)



Squid Embryo, showing Nuclei (Purple), Actin (Green) and Acetylated Tubulin (Red)

"Now get back to work!"

After 6 weeks of hard work at the Embryology course, I could not wait to start my own experiments again. Undoubtedly, I was motivated by the research presented at the course, and by the hard work of my colleagues. In addition to learning experimental techniques in all of the major animal models, I have returned to my work in *Drosophila* with new techniques and a far broader understanding of this animal's biology, and of its evolutionary relationship to other animals. The current directors of the Embryology course are Richard Behringer and Alejandro Sanchez-Alvarado. Richard and Alejandro were fantastic in this role, and helped to create the

encouraging and enthusiastic atmosphere that made this year's Embryology course such a joy.

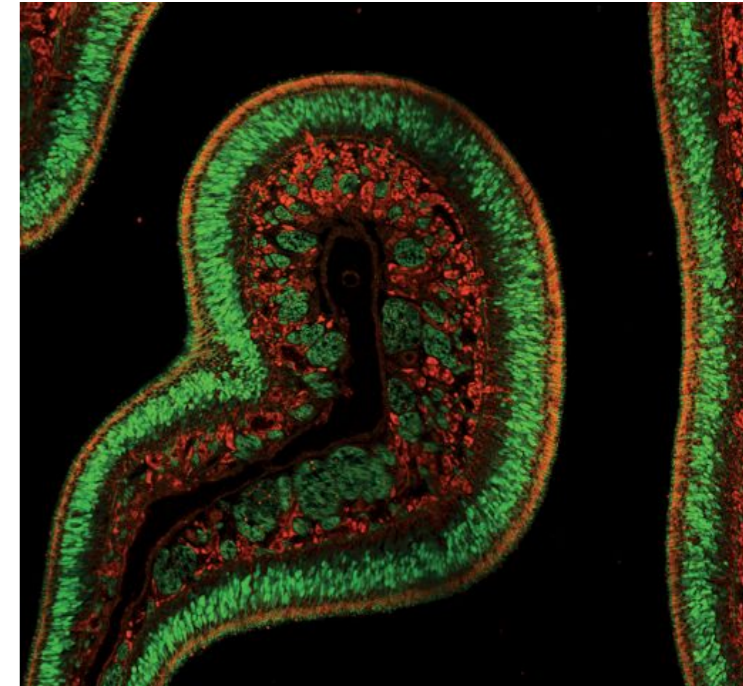
I fully recommend this experience to Australian and New Zealand researchers at any stage of their career, who want to be exposed to new ideas, to think about and experience different model systems, and who want to make connections with like-minded scientists around the world.

Course Website: <http://www.mblembryology.org/>
Online Applications Close February 1, 2013



Head grafts of GFP transgenic Hydra onto wild-type donors

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Your Committee Members



MIRANDA GROUNDS

University of Western Australia
Miranda has focussed on factors controlling the repair of damaged skeletal muscle and on potential treatments for muscle disease such as Duchenne's muscular dystrophy. Her research has pioneered many studies into factors controlling skeletal muscle regeneration with a particular emphasis on my-

ogenesis in post-natal skeletal in vivo, and ongoing interest in the role of extracellular matrix. Current research includes such things as in vivo role of IGF isoforms, inflammation and anti-cytokine therapies, all with applications to skeletal muscle wasting.
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CHRISTINA MITCHELL

Monash University
The research group led by Christina is currently pursuing the identification and characterization of novel proteins that regulate cell growth and differentiation. The team has two major fields of research; 1) characterizing several lipid phosphatases that terminate signals generated by the proto-oncogene

PI 3-kinase. 2) We have cloned and characterized a recently identified family of proteins, comprising on four and half LIM domains, which are predominately expressed in skeletal muscle.
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RICHARD HARVEY

Victor Chang Cardiac Research Institute
The molecular dissection of heart development is important not only for understanding congenital heart disease causation and approaches to amelioration, but also to adult heart adaptation, stem cell deployment and disease. The aim of the Developmental

and Stem Cell Biology Division at the institute is to understand how different genes work together individually and in networks to guide development of an animal and its organs and how pathways might be augmented, particularly in regeneration.
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PHIL CROSIER

University of Auckland, New Zealand
Phil's major research interest is in the regulation of cell growth and differentiation, and lineage commitment. In this research he uses the zebrafish model system to investigate the transcriptional regulation of stem cell function and development of the innate and adaptive immune systems. In this

work the zebrafish system is also being used to model insights into human disease and utilize these systems in chemical genetic screens.
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Your Committee Members



ALPHA YAP

Institute for Molecular Bioscience, University of Queensland
My laboratory studies on set of cell-to-cell interactions, those that occur when cells attach to one another. We focus on the cadherin family of cell adhesion receptors. These critically determine the ability of the cells to recognise one another and organise into

coherent tissues. The importance of these receptors is emphasised by the fact that loss of cadherin function promotes cancer progression in epithelial tissues - the commonest form of cancers.

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PETER KOOPMAN

Institute for Molecular Bioscience, University of Queensland
Our group focuses on genes controlling the formation of various organs in the developing embryo. Our main interest is striving to understand the events that determine whether an embryo develops as a male or a female. We also specialise in the identification and

characterization of other sex development genes using techniques such as microarray screening and transgenic mouse models and studying how these affect sex development. We are interested in how an embryonic cell type known as germ cells comes to develop as a sperm or egg.

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SHARAD KUMAR

The two major interests in our laboratory are: 1) programmed cell death and (2) regulation of protein stability and trafficking by ubiquitination. Apoptosis plays a fundamental role in cell and tissue homeostasis and is misregulation results in a variety of human diseases. We are studying the function and regulation of caspases

that act as effectors in apoptosis. We also study ubiquitin-protein ligating enzymes (Nedd4 like proteins) The Nedd4 family belong to the HECT class of E3's. We are also studying a group of proteins that regulates the function of the Nedd4 family of E3's.

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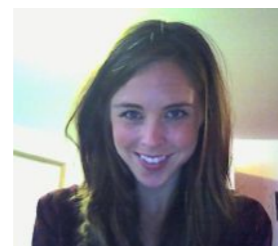


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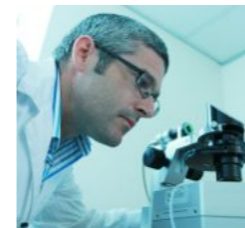
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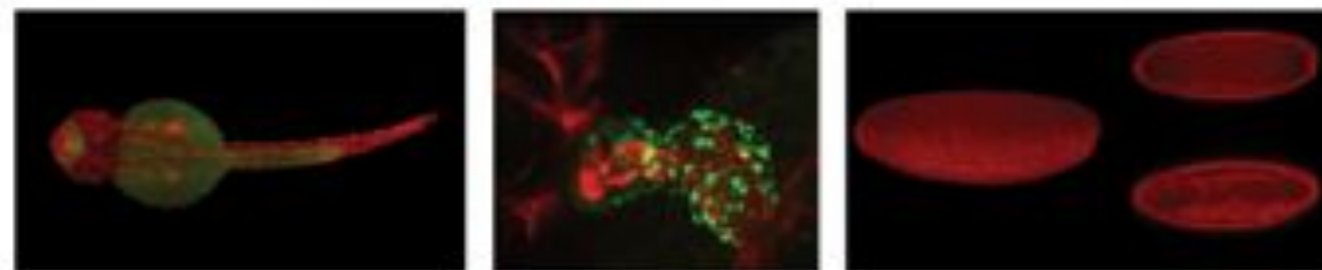
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