RESEARCH SCHOOL OF BIOLOGY

THE AUSTRALIAN NATIONAL UNIVERSITY

NEWSLETTER

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NEWS

BIOLOGY TEACHING AND LEARNING CENTRE

The newly-established Biology Teaching and Learning Centre administration office is open for business. Many thanks to the RSB Workshop staff who did a wonderful job of completing the renovations in record time and juggling several jobs at a time to complete the work.

The new Biology Teaching and Learning Centre's administration office is in Gould Wing, and will be the first point of call for all Biology coursework and research student enquiries. The Centre's Teaching lab support staff will work out of Birt and Gould Wings until the new purpose-built teaching building, currently under construction at the end of Linneaus Way, opens in 2011.

AUSTRALIA DAY HONOURS

Jenny Graves, EEG, was awarded an Order of Australia "For service to scientific research in the field of genetics, particularly of Australian marsupials and monotremes and their relevance to international understanding of human evolution." It's a fitting recognition of all the wonderful work that Jenny and her colleagues have done, and a great outcome for the School.

THE PETER BAUME AWARD

John Gibson was awarded The Peter Baume Award presented by the Chancellor, Kim Beazley, at the graduation ceremony on 10 December, 2009. This is the University's highest award for staff members whose contributions to the economic, cultural, scientific or social development of Australia or the international community have demonstrated distinguished service of the highest degree.

In his letter to Prof Gibson, the Vice-Chancellor said "this Award is in recognition of your distinguished contributions to science and research training and for your exceptional contributions to the University as an academic leader during the formation of the ANU College of Medicine, Biology and Environment".

Image credit: Success Photography

MINISTER CARR ANNOUNCES BIONIC EYE FUNDING

Michael Ibbotson, BSB, is part of a team that has received a large grant from the ARC for the development of a Bionic Eye. There are 12 Chief investigators from ANU, UNSW, UWS and Melbourne University as well as

Continued overleaf

NOTICES

STAFF DIRECTORY DETAILS AND EMAIL SIGNATURES

All staff are reminded to update their ANU directory and email signature details. If you haven't updated your listing in the ANU directory, recently it's probably out of date, or may even be absent.

It is the responsibilty of all staff to ensure their details are correct. To check, type your name into the ANU staff search page. If your name is absent, click on the "Directory Help" link, to log a job to DOI, by logging in with your u-number and HORUS password, and selecting the fields "ANU Website", then "Staff Directory", and fill in the fields. If your details are present but incorrect, click on the Is your personal entry correct? link, and follow the instructions to submit your correct details. These DOI requests are usually actioned in a few days.

There are new ANU style guides for the email signature block. This URL details the new format and provides instructions on how to change your signature.

PLANT BIOLOGY SEMINAR

Wednesday 24 February, 1pm
Plant Industry Lecture Theatre
Rhizosphere nematodes and plant distribution.
Dr Sofia Costa, Center for Functional Ecology, University of Coimbra, Portugal.

HAPPY HOUR

The RSB joint Happy Hour will be held on the ground floor of the Robertson Building on Friday, 19 February from 4.30pm. Beer and wine $2. Soft drinks $1 Nibbles free. ALL WELCOME.

This newsletter is distributed fortnightly by email and hard-copy, and is archived at http://biology.anu.edu.au/Newsletter. Contact Diane Whitehead to be added to the mailing list, and to submit material for future issues.

WELCOME

Welcome to this year's Hons cohort. There are some 60 students enrolled in the three Hons Programmes overseen by the Biology Teaching and Learning Centre. The students are distributed throughout labs in each of the three RSB Divisions, as well as JCSMR and CSIRO.

Dr Odhran O'Sullivan from the UK has arrived as a post doctoral fellow in Owen Atkin's lab, PS, working on leaf respiration in illuminated leaves. Also newly arrived in Owen's lab: **Mr Lasantha Weerasinghe**, who is here on an AusAid Leadership Award to undertake a PhD on the effects of nutrient gradients on leaf respiration in Australia tree species; **Ms Clarissa Negrini**, who is to undertake her PhD as part of an ARC Linkage grant with the Universities of Adelaide and Western Australia on nutrient use efficiency in crop plants; and **Associate Professor Patrick Meir**, Edinburgh, as a Visiting Fellow in the Atkin lab until mid April to discuss collaborative research dealing with impacts of global patterns in nutrient gradients on plant respiration rates.

Melanie Edwards recently commenced her PhD studies with the Graves lab. Her project is *Marsupial pouch young - microbial exposure, threat and protection.*

Melanie Wagner has recently joined Peter Solomon's lab, PS, as part of her Diploma studies at the University of Strasbourg. Melanie will be here until August and is looking at the necrosis-inducing proteins in fungal wheat pathogens.

Ms Emma McIntosh, Sydney University, will join the Nicotra lab, EEG, to work for the next six months as an Editorial Assistant on a new web site for methods and protocols in plant ecology and physiology, PrometheusWiki.

NICTA. The funding is to produce an implanted bionic eye in a human patient within the term of the grant (4 years). Michael's lab will receive $1M over the funding period as well as playing a role involved in several projects within the consortium that will draw on a further $2M. The research involves recording electrical responses in the eye and brain after implantation to develop the appropriate stimulus parameters for the device, as well as behavioural experiments with humans to establish the best way of pre-processing the visual information before it is sent to the stimulating device.

CONGRATULATIONS

Cambridge Philosophical Society have confirmed **Michael Jennions**, EEG, as a member of the Editorial Committee of Biological Reviews from January 2010.

Christina Spry, Saliba lab, BSB, has been awarded the ASBMB President's Award Fellowship. ASBMB fellowships are awarded to early career researchers in recognition of their work, with the top-ranked candidate being eligible to receive the President's Award. Christina will use the Fellowship to visit Erick Strauss' lab at Stellenbosch University in South Africa.

Ajay Narendra, EEG, won the ABC Science Up Close Photography competition.

PHD THESIS ACCEPTANCES AND SUBMISSIONS

Hardip Patel Hardip, EEG, submitted his PhD thesis in early January 2010. The title of his thesis was *Comparative Genomics: A case study of genome, chromosome and gene family evolution.*

Suzannah Hetherington, BSB, submitted her PhD thesis on 22 December. Suzannah is now job-hunting in Dublin, Ireland.

Katy Sommerville submitted her PhD thesis, *Hydraulic constraints on the morphology of* Acacia *phyllodes.* This is the first PhD thesis submitted in the new Plant Science Division.

Christina Spry, Saliba lab, BSB, and **Adele Lehane,** Kirk lab, BSB, have both had the good news that their PhD theses have been accepted without correction. Christina is currently working as a postdoc in the Saliba lab. Adele is heading to New York to take up a postdoc position at Columbia University in the US.

RSB TEACHING AWARDS

Congratulations to the following members of RSB for winning 2009 Joint College Awards for Excellence in Education:

Chris Fulton and **David Tscharke** both received Individual Awards for Teaching Excellence.

Adrienne Nicotra, Gonzalo Estavillo, Ulrike Mathesius, Marilyn Ball, Michael Djordjevic, Amy Davidson and **Elizabeth Beckmann** won the Award for a Program That Enhances Learning for the course BIOL2121 Genes to Environment

Biology won two of the four individual awards in CMBE/CPS and the only award for a program that enhances learning.

Professor **Masami Kusunoki,** Department of Physics, Meiji University, Japan, is taking a two month sabbatical with Tom Wydrzynski in PS. Professor Kusunoki is a theoretical physicist and is using RSB data on the 18-oxygen exchange kinetics to develop a manganese-based model of the active site in Photosysrtem II which splits water into molecular di-oxygen (O_2) and hydrogen ions. Understanding the mechanism for water splitting remains one of the major challenges in photosynthesis research.

FAREWELL

Brian McNamara has been a valued and enthusiastic member of the Electronics workshop for more than five years. Unfortunately (for Wayne Genner and David Barwick) Brian has left the School to support his wife while she gains experience as a Registrar at Calvary Hospital, and to look after their two young children.

WASP GENOME MAP COULD AID PEST CONTROL

Friday 15 January 2010
Source: ANU Media Release

A female *Nasonia vitripennis* stinging a host. Photo: Michael Clark/Courtesy of the Werren Laboratory

A new genetic map of parasitic wasp species could open up avenues for insect pest control and reduce reliance on chemical pesticides.

Three wasp species from the genus *Nasonia* have been genetically sequenced by an international team including researchers from The Australian National University. Their results have been published in the journal *Science*.

Nasonia wasps paralyse and then lay their young on or in the bodies of various insects, including agricultural pests like blowflies. The young wasps then eat the paralysed bug, helping to keep a lid on insect population levels.

Now researchers have identified some of the key factors that make *Nasonia vitripennis, N. giraulti* and *N. longicornis* wasps such effective pest controllers, including the gene that tells the wasps which insects to attack. They've also learned more about the wasps' digestive needs, potentially aiding in the process of large-scale rearing of the insects.

Dr Robert Kucharski and **Professor Ryszard Maleszka** from the Research School of Biology at ANU contributed work on genes coding for a DNA methylation toolkit and an important gene family encoding Yellow-like proteins.

"This is the first time that DNA methylation has been shown to work in a non-social insect," Professor Maleszka says. "This is where environmental factors alter gene activity without affecting the DNA. By understanding more about how methylation works in a relatively simple creature like *Nasonia* wasps, we can learn more about how it works in humans, where the process is turning out to be important in a range of conditions such as cancer, obesity and mental illness."

Professor Maleszka says that the new research shows that the *Nasonia* genome contains the surprisingly large number of 26 genes encoding Yellow-like proteins, which are believed to play important roles in development, immunity and other cellular processes. Yellow-like proteins also work in bees to determine caste.

"Some of the lessons we're learning from the *Nasonia* genome sequencing could help us utilise these kinds of wasps for controlling pest insects, but the information is also helping us learn more about fundamental genetic processes that wasps, humans and other life forms share."

The *Nasonia* wasp genome sequencing project was led by researchers at the University of Rochester and the Baylor College of Medicine in the US.

PAPERS ACCEPTED

Blackman, L.M., Arikawa, M., Yamada, S., Suzaki, T. and Hardham, A.R. Identification of a mastigoneme protein from *Phytophthora nicotianae*.

Brennan R., Burrows J., Bell M., Bromham L., Csurhes P., Lenarczyk A., Sverndal, J., Klintenstedt J., Pender M., Burrows S. Strains of Epstein-Barr virus infecting multiple sclerosis patients. *Multiple Sclerosis*.

Detto T., Jennions M.D., Backwell P.R.Y. When and why do territorial coalitions occur? Experimental evidence in a fiddler crab. *American Naturalist*.

Duan, G., Saint, R., Helliwell, C.A., Behm, C.A., Waterhouse, P.M., Gordon, K.H.J. Expression of *Caenorhabditis elegans* RNA-directed RNA polymerase in transgenic *Drosophila melanogaster* does not affect morphological development. *Transgenic Research.* Accepted: 19 January 2010.

Ezaz T., Sarre S., O'Meally D., Marshall Graves J.A., Georges A. Sex chromosome evolution in lizards: independent origins and rapid transitions. *Cytogenetic and Genome Research. In Press.*

Flowers T.J., Galal H.K., Bromham L. Evolution of halophytes: multiple origins of salt tolerance in land plants. *Functional Plant Biology.*

Foret S., Knack B., Houliston E., Momose T., Manuel M., Queinnec E., Hayward D.C., Ball E.E,. Miller D.J. New tricks with old genes: the genetic bases of novel cnidarian traits. *Trends in Genetics.*

Gardner J. L., Trueman J. W. H., Ebert D., Joseph L. ,Magrath, R. D. . Phylogeny and evolution of the Meliphagoidea, the largest radiation of Australasian songbirds. *Molecular Phylogenetics and Evolution.*

Gimeno, T.E., Sommerville, K., Valladares, F., Atkin, O.K. Homeostasis of respiration under drought and its important consequences for carbon balance in a drier climate: insights from two contrasting *Acacia* species. *Functional Plant Biology.*

Goodale E., Beauchamp G. Magrath R. D., Nieh J. C., Ruxton, G. D. Interspecific information flow influences animal community structure. *Trends in Evolution and Ecology.*

Gorsuch, P., Pandey, S., Atkin, O.K. Thermal de-acclimation: how permanent is the leaf phenotype when cold-acclimated plants experience warming? *Plant, Cell and Environment.*

Gunn B.F., Aradhya M., Salick J., Miller A.J., Yang Y., Liu L., Xian H. Genetic variation in walnuts (*Juglans regia* l. and *J. sigillata dode*, Iuglandaceae): species distinctions, human impacts, and the conservation of agrobiodiversity in Yunnan, China. *American Journal of Botany.*

Losciale, P., Chow, W.S. and Corelli-Grappadelli, L. Modulating the light environment with the peach 'asymmetric orchard': Effects on gas exchange performances, photoprotection and photoinhibition. *Journal of Experimental Botany.*

Linterman, M., Beaton, L., Yu, D., Ramiscal, R., Srivastava, M., Hogan, J., Verma, N.K., Smyth M., Rigby, R. and Vinuesa, C.G. IL-21 acts directly on B cells to regulate Bcl-6 expression and germinal center responses. *Journal of Experimental Medicine.*

Merkle, T., Wehner R. Desert ants use foraging distance to adapt the nest search to the uncertainty of the path integrator. *Behavioral Ecology.*

Milner R.N.C., Booksmythe I., Jennions M.D., Backwell P.R.Y. The battle of the sexes? Territory acquisition and defence in male and female fiddler crabs. *Animal Behaviour.*

Milner R.N.C., Detto T., Jennions M.D., Backwell P.R.Y. Experimental evidence for a seasonal shift in the strength of a female mating preference. *Behavioural Ecology.*

Moscoso, J., Korres, H., George, D. and Verma, N.K. Identification of active site residues in the *Shigella flexneri* glucosyltransferase GtrV. *Molecular Membrane Biology.*

Moutaftsi M., Tscharke D.C, Vaughan K., Koelle D.M., Stern L., Calvo-Calle M., et al. Uncovering the interplay between CD8, CD4 and antibody responses to complex pathogens. *Future Microbiology.*

PAPERS ACCEPTED *CONTINUED*

Murchison E.P., Tovar C., Hse A., Bender H.S., Kheradpour P., Rebbeck C.A., Obendort D., Conlan C., Bahlo M., Blizzard C.A., Pyecroft S., Kreiss A., Kellis M., Stark A., Harkins T.T., Marshall Graves J.A., Woods G.M., Hannon G.J., Papenfuss A.T. The tasmanian devil transcriptome reveals schwann cell origins of a clonally transmissible cancer', *Science.* 1 January 2010, Vol 327.

Narendra A, Reid S.F , Hemmi J.M. The twilight zone: ambient light levels trigger activity in primitive ants. *Proceedings of the Royal Society, B.*

Nicotra A.B., Davidson A. Adaptive plasticity in water use traits. *Functional Plant Biology.*

O'Meally D., Miller H, Patel H.P., Marshall Graves J.A., Ezaz T. The first cytogenetic map of the tuatara, *Sphenodon punctatus. Cytogenetic and Genome Research.*

Phillips, M.J., Bennett, T.H. and Lee, M.S.Y. Reply to Camens: how recently did modern monotremes diversify. *Proceedings of the National Academy of Sciences USA.*

Ramiscal, R., Tang, S., Korres, H. and Verma, N.K. Structural and functional divergence of the newly identified GtrIc from its Gtr family of conserved *Shigella flexneri* serotype-converting glucosyltransferases. *Molecular Membrane Biology.*

Rutar M., Provis J., Valter K. Brief exposure to damaging light causes focal recruitment of macrophages, and long-term destabilization of photoreceptors in the albino rat retina. *Current Eye Research.*

Rye, J.-Y., Song, J.-Y., Chung, Y., Park, Y.-M., Chow, W.S. and Park, Y.-I. Transcript accumulation of carotenoid biosynthesis genes in the cyanobacterium *Synechocystis* sp. PCC 6803 during the dark-to-light transition is mediated by photosynthetic electron transport. *Plant Biotechnology Reports.*

Sette A., Grey H., Oseroff C., Peters B., Moutaftsi M., Crotty S., Assarsson E., Greenbaum J., Kim Y., Kolla R., Tscharke D., Koelle D., Johnson R.P., Blum J., Head, S., Sidney, J. Definition of epitopes and antigens recognized by vaccinia specific immune responses: Their conservation in variola virus sequences, and use as a model system to study complex pathogens. *Vaccine.*

Tan J.K.H., O'Neill H.C. In vitro haematopoiesis of a novel dendritic-like cell present in murine spleen. *Current Stem Cell Research & Therapy.*

Tan, J.K.H., O'Neill, H.C. Spleen as a distinct site for dendritic cell haematopoiesis. *Dendritic Cells: Types, Life Cycles and Biological Functions.*

Tan, J.K.H., O'Neill H.C . Spleen As a Distinct Site For Dendritic Cell Haematopoiesis. *International Journal of Medical and Biological Frontiers.*

Tan, J.K.H., Periasamy, P., O'Neill, H.C. Delineation of precursors in murine spleen that develop in contact with splenic endothelium to give novel dendritic-like cells. *Blood.*

Thomas J.A., Welch J.J., Lanfear R., Bromham L. A generation time effect on the rate of molecular evolution invertebrates. *Molecular Biology and Evolution.*

van Schalkwyk D.A., Chan X.W., Misiano P., Gagliardi S., Farina C,. Saliba K.J. Inhibition of *Plasmodium falciparum* pH regulation by small molecule indole derivatives results in rapid parasite death. *Biochemical Pharmacology.*

Zhang, Y., Zhang, H., Du, M., Li, W., Luo, H., Chow, W.S. and Zhang W. (2010) Leaf wilting movement can protect water-stressed cotton (*Gosspyium hirsutum* L.) plants against photoinhibition of photosynthesis and maintain carbon assimilation in the field. *Journal of Plant Biology.*

Editing: Kiaran Kirk, Diane Whitehead & Sharyn Wragg. Design & layout: Sharyn Wragg. Banner: Nocturnal bulldog ant, Dr Ajay Narendra.