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Research School of Biology Newsletter

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ANU COLLEGE OF MEDICINE, BIOLOGY AND ENVIRONMENT

NEWS

Macfarlane Burnet Medal awarded to Professor Graham Farquhar

Graham Farquhar (PS) is to receive the Australian Academy of Science's most prestigious award for research in biological science, the 2016 Macfarlane Burnet Medal and Lecture. The award commemorates the contributions to science by Sir Macfarlane Burnet, and is offered every two years. Graham Farquhar is the third member of RSB(S) to receive this award, following Bob Robertson (1975) and Jenny Graves (2006).

RSB Student Conference

Congratulations to all 91 students who presented at the 2014 RSB student conference. The short-format talks once again provided a highly engaging showcase of the diverse and high calibre research being undertaken within the School. Thanks go to **Erin Pugh, Gen Carey** and **Panit Thamsongsana** from the Biology Teaching and Learning Centre, the session chairs, the adjudicators and the academic network convenors (**Adrienne Nicotra, Stefan Broer/Naresh Verma,** and **Spencer Whitney**) for their role in ensuring that the event was a success.

Thanks also to **Don Lim** and **Sarah Shafik** (BSB), **Anna Harts** and **Nina McLean** (EEG), **Christina Delay** and **Eli Thynne** (PS) for organising the scientific program and the 'After Party'. The higher quality of the presentations this year made it particularly challenging to identify the award winners in each PhD program.

The winners of Hirota Naora award (each totalling $900) were **Tiffany Russell** (BSB), **Damien Esquerre** (EEG) and **Eli Thynne** (PS).

Runner-up prizes of $250 were awarded to **Sarah Shafik** (BSB), **Marta Vidal Garcia** (EEG) and **Thi Hoa Nguyen** (PS).

The record number of attendees helped ensure that the conference, and the After Party, were a great success. Many thanks go to the live music from "**Hallows Eve"** (made up of local band member **Jared Streich, Damien Esquerre, Steven Ellis, Baxter Massey,** and **Carly Conlan**) that helped keep the party going late.

Prize winners of the 2014 RSB Student conference and the academic representatives of the three graduate study fields (see under NEWS).

ARC grant success

RSB has done very well with regards to Discovery projects and DECRA fellowships. Congratulations to all successful applicants.

Discovery projects

Marilyn C Ball (PS); Catherine E; Oliveira Lovelock, Professor Rafael; *et al.,* Top-down rehydration: role of multiple water sources in mangrove function, DP150104437, $428.9K

Andrew Cockburn; Loeske Kruuk; Martijn van de Pol (all EEG). Can inbreeding avoidance cause the evolution of sex-biased dispersal? DP150100298, $515.42K

Michael Djordjevic (PS); Douglas Cook, Michael Udvardi, Rene Geurts, CEP peptides provide a new paradigm for improving N-fixation and root shape, DP150104250, $452K

Scott Keogh (EEG), Phenotypic diversity dynamics at a continental scale, DP150102403, $355K

Kiaran Kirk (BSB); **Giel van Dooren** (BSB); **Stefan Broer** (BSB); Ian Cockburn (JCSMR), A novel family of amino acid transporter in Apicomplexan parasites, DP150102883, $560K

Robert Magrath (EEG); Andrew Radford; Esteban Fernandez-Juricic, Not lost in translation: how to get information from other species' calls? DP150102632, $469.6K

Ulrike Mathesius (PS), The key to making root nodules - new tricks of old hormones, DP150102002, $417.4K

Rod Peakall (EEG); Eran Pichersky; **Celeste Linde** (EEG); Peter Weston, The biosynthesis and evolution of novel semiochemicals in orchids, DP150102762, $644.8K

John Rathjen (PS) Identification of pathogen receptors and signalling proteins from plants, DP150101695, $419.3K

Jochen Zeil (EEG); Wolfgang Stuerzl, Acquiring and using views for homing, DP150102699, $386.2K

RSB academics in externally hosted grants

Graham Farquhar (PS) (through the James Cook University) DP150100588.

Naomi Langmore, DP150101652 (through the University of Melbourne)

Sarah Pryke (EEG) DP150101044, (through the University of Melbourne)

Jochen Zeil and **Ajay Narendra** (EEG) (through Macquarie University), DP150101172

DECRA Fellowships

Steven Eichten (Borevitz Group, PS & EEG) Beyond Genes: how the extended genotype of plants facilitates adaption, DE150101206, $372.5K

Nicholas Matzke (hosted by Craig Moritz, EEG, Bayesian hierarchical model for biogeography, E150101773, $369.5K

Daniel Noble (hosted by Scott Keogh, EEG), Early environmental effects on phenotypic development and evolution, DE150101774, $372K

Lab Leader profile: Susan Howitt (BSB)

Group research focus

My research is now mostly in education, with a focus on understanding how students perceive research, how they learn about it and therefore how we can improve research-led education. I also maintain an interest in transporter structure and function through collaborations.

Teaching and research achievements

My recent project on identifying what students learn during research projects has been both a teaching and research achievement. One of the biggest hurdles for students is that they don't expect a research project to be so different from the lab components of their other courses. This is leading to research papers and changes in the way I teach.

What do you enjoy most about research?

I am enjoying learning a completely new discipline as I do more educational research and also enjoy how this better integrates my research and teaching. It has been interesting coming into a field as a complete outsider and having my own views (or perhaps prejudices!) challenged.

Who is your science hero?

My science heroes are Charles Darwin and Ernst Mayr because they thought broadly both within biology and about what it meant to be a scientist. They both had the ability and willingness to step back from prevailing views and identify and criticise underlying assumptions.

Ryan Phillips (hosted by Rod Peakall, EEG), Pollination by sexual deception and the evolution of specialisation $387 K

Benjamin Schwessinger (hosted by John Rathjen, PS) The evolution of stripe rust virulence DE150101897 $341K

Kara Youngentob (hosted by Bill Foley, EEG), More than pretty pictures? Ecological applications of aerial remote sensing DE150101870, $342.1K.

Academic promotions

Congratulations to the following who received promotions in the current round:

Level C to Level D

Naomi Langmore (EEG)
Anthony Millar (PS)
Ben Corry (BSB)

Level D to Level E1

Susan Howitt (BSB)
David Rowell (EEG)
Justin Borevitz (PS & EEG)
Dean Price (PS)
Michael Djordjevic (PS)
Pat Backwell (EEG)

New Investigator grant

Jonathan Tan (O'Neill Group, BSB) was awarded a New Investigator Project Grant from the NHMRC.

Postdoctoral fellowships

Will Feeney (Langmore Group, EEG) has been awarded an Endeavour Postdoctoral Fellowship to undertake research at the University of Cambridge for 6 months from January; and a University of Queensland Postdoctoral Fellowship, to commence in June. Will has submitted his thesis, and is waiting on corrections.

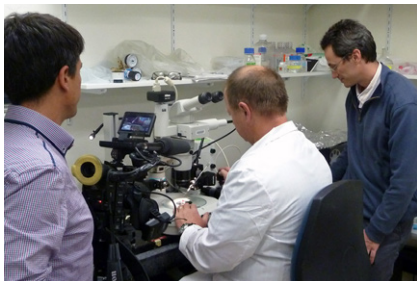
Student award

David Kainer (Foley Group, EEG) won the prize for Best Poster at the recent Annual Meeting of the Australasian Genomic Technology Association Meeting in Melbourne.

MEDIA

A paper by **Tamara Kayali Browne** (BTLC), entitled 'Is premenstrual dysphoric disorder really a disorder?', was reported in Australian newspapers including *The Sydney Morning Herald, The Age, The Canberra Times*, and news.com.au. Tamara was also interviewed on the topic for 666 ABC Radio Canberra.

A cameraman from the Franco-German TV network ARTE spent two days in RSB visiting the **Maleszka** and **Foret** Groups (EEG) to record honey bee footage for a major program on epigenetics. In the photo he is shown filming **Paul Helliwell** injecting embryos with a CRISPR construct that was designed to create white-eyed honey bees.



PHDs AWARDED

Bianca Dobson (Tscharke Group, BSB), 'Strain-specific genetic requirements for growth of vaccinia virus in culture'

Jennifer (Anne) Cochrane (Nicotra Group, EEG), 'Population variation in seed and seedling traits along a climate gradient: plant persistence in South West Western Australia under a changing climate'

Alison Farnsworth (Rowell Group, EEG), 'Genomics of *Helicoverpa armigera* insecticide resistance'

Abdul Gafur (Rowell Group, EEG), 'Taxonomic studies on the nematodes of the subfamily Radopholinae Allen & Sher, 1967'

Eliza Middleton (Zeil Group, EEG), 'Foraging, tandem recruitment and navigation in the Australian sugar ant, *Camponotus consobrinus*'.

Vincent Pujol (Jones Group, PS), 'Characterising a suppressor of stem-rust resistance genes effective against race Ug99 on wheat chromosome 7L'

Yik Chun (Michael) Wong (Tscharke Group, BSB), 'Investigating the differences between the MHC-1 antigen presentation of two commonly used vaccination virus strains'

Weiwei Zhang (Hardham Group, PS), 'Characterisation of regulated secretion in *Phyophthora.*'

NEW APPOINTMENTS

Ying-ying Hey (O'Neill Group, BSB) who recently submitted her PhD will take up a postdoctoral position to work with Helen O'Neill on extramedullary hematopoiesis in spleen.

WELCOME

The following have joined the Farquhar Group (PS):
Florian Busch, Postdoctoral Scientist, who is working on the large ANU/UWS/CSIRO led SIEF project which aims to quantify genetic and physiological variation in *Eucalyptus* in response to elevated CO_2, and within the CoETP,

 Continued from Page 1

with an emphasis on modelling photosynthesis;
Matthew Brookhouse, Postdoctoral Scientist, who will be continuing his involvement in the lab under the SIEF project with joint appointment with Fenner in his role as Convenor of ENVS1003: Introduction to environmental and social research;
Zoe Groeneveld, Technician, who is providing assistance to the SIEF project;
Yuan Wang, a mid-year Honours Student, who will be investigating leaf anatomical parameters associated with water use and stomatal response to vapour-pressure deficit to understand varietal differences in instantaneous and integrated water-use efficiency in cotton; and;
Lisabertha (Latu) Clark, Summer Student, who will be looking at the coordination between vein density (water supply) and stomatal density (water demand) in wheat grown in different CO_2 and light environments.

The following visitors have joined the Ecological Neuroscience Group (Zeil Group, EEG):
Willi Ribi, an insect neuroanatomist from the University of Liechtenstein;
Ladina Ribi, a graphics artist from Switzerland, who has visited previously;
Franziska Schmitt, a PhD student from the University of Wuerzburg, Germany,
Paul Ardin, a PhD student from the University of Edinburgh, UK; and
Wolfgang Roessler, an insect neuroethologist from the University of Wuerzburg.

FAREWELL

Sarah Roesler (Solomon Group, PS) is about to finish her 3 month visit and will be returning to Germany to complete her PhD.

Wenjie Wu, a PhD Student (Hardham Group, PS) is returning to China to finish writing her thesis before taking up a postdoctoral position in the Northwest A&F University with Dr Weixing Shan.

Sara Wood (Zeil Group, EEG) has handed in her Honours thesis on 'Visual and chemoreceptive adaptations for dim light in *Myrmecia* ants' and has taken up a position in law, combining law and biology in the emerging field of neurolaw. She will complete professional legal training with ANU Legal Workshop next year, and work at the Attorney General's office.

PAPERS ACCEPTED

Bromham, L, Hua, X, Lanfear, R, & Cowman, PF, Exploring the relationships between mutation rates, life history, genome size, environment and species richness in flowering plants. *American Naturalist*

Cardillo, M, Geographic range shifts do not erase the historic signal of speciation in mammals, *The American Naturalist*

Chooi, YH, Krill, C, Barrow, RA, Chen, S, Trengove, R, Oliver, RP, Solomon, PS, An *in planta*-expressed polyketide synthase produces (R)-mellein in the wheat pathogen *Parastagonospora nodorum, Applied and Environmental Microbiology*

Chooi, YH, Solomon, PS, A chemical ecogenomics approach to understand the roles of secondary metabolites in fungal cereal pathogens, *Frontiers in Microbiology*

Ens, BJ, van de Pol, M & Goss-Custard, J, The study of career decisions: Oystercatchers as social prisoners. *Advances in the Study of Behavior*

Feeney, WE, & Langmore, NE, Superb fairy-wrens, *Malurus cyaneus*, increase vigilance near their nest with the perceived risk of brood parasitism, *The Auk*

Feeney, WE, Welbergen, JA, & Langmore, NE, Advances in the study of coevolution between avian brood parasites and their hosts, *Annual Review of Ecology, Evolution and Systematics*

Haff, TM, Horn, AG, Leonard, ML, & RD Magrath, Conspicuous calling near cryptic nests: a review of hypotheses and a field study on white-browed scrubwrens. *Journal of Avian Biology*

Herfindal, I, van de Pol, M, Nielsen, JT, Sæther, BE & Møller, AP, Climatic conditions cause complex patterns of covariation between demographic traits in a long-lived raptor. *Journal of Animal Ecology*

Jiménez-Díaz, MB, Ebert, D, Salinas, Y, Lehane, AM, Dennis, ASM, Spillman, NJ, Kirk, K, *et al,* (+)-SJ733: A clinical candidate for malaria that acts through ATP4 to induce rapid host-mediated clearance of *Plasmodium. Proceedings of the National Academy of Sciences USA*

Li, J, Reichel, M, Li, Y, & Millar AA, The functional scope of plant microRNA-mediated silencing, *Trends in Plant Science*

Meijaard, E., Sheil, D. Cardillo, M, The limited value of high impact conservation science, *Nature*

Moya, A, Huisman, L, Forêt, S, Gattuso, J-P, Hayward, DC, Ball, EE, & Miller, DJ, Rapid acclimation of juvenile corals to CO_2-mediated acidification by up-regulation of HSP and Bcl-2 genes. *Molecular Ecology*

Nguyen, HT, Stanton, DE, Schmitz, N, Farquhar GD, & Ball, MC, Growth responses of the mangrove, *Avicennia marina*, to salinity: development and function of shoot hydraulic systems require saline conditions. *Annals of Botany*

Saslis-Lagoudakis, CH, Hua, X, Bui, E, Moray, C, & Bromham, L, Predicting species' tolerance to salinity and alkalinity using distribution data and geochemical modelling: a case study using Australian grasses. *Annals of Botany*

Shaw, RC, Feeney, WE, & Hauber, ME, Nest destruction elicits indiscriminate brood parasitism in a captive bird, *Ecology & Evolution*

Teng, R, Lehane, AM, Winterberg, M, Shafik, SH, Summers, RL, Martin, RE, van Schalkwyk, DA, Junankar, PR & Kirk, K, 1H NMR metabolite profiles of different strains of *Plasmodium falciparum, Bioscience Reports*

Vaidya, AB, Morrisey, JM, Zhang, Z, Spillman, NJ, Kirk, K, *et al*, Pyrazoleamide compounds are potent antimalarials that target Na^+ homeostasis in intraerythrocytic *Plasmodium falciparum, Nature Communications*

von Caemmerer S, Edwards, G, Koteyeva, N, & Cousins, A, Single cell C_4 photosynthesis in aquatic and terrestrial plants: a gas exchange perspective, *Aquatic Botany*

von Caemmerer, S & Evans, JR, Temperature responses of mesophyll conductance differ greatly between species, *Plant Cell & Environment.*

This monthly newsletter is archived at biology.anu.edu.au/newsletter
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