Australian National University

Research School of Biology Newsletter

Issue 55 | 30 June 2014

ANU COLLEGE OF MEDICINE, BIOLOGY AND ENVIRONMENT

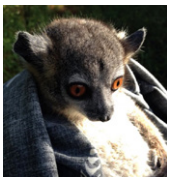
NEWS

Grants

Barry Pogson and **Arun Yadav** (PS) in collaboration with Gonzalo Estavillo (CSIRO) have been awarded $600k grant from the Grains Research and Development Corporation to undertake four year research project on 'The generation of wheat cultivars with improved drought tolerance'.

David Tscharke (BSB) and Lab members have been awarded $55k from the Discovery Translation Fund administered by ANU Connect Ventures for a project entitled 'A new viral vaccine platform'.

Bill Foley, Eleanor Stalenberg (EEG), and colleagues from the University of Hamburg have been awarded



$200k from the Deutsche Forschungsgemeinschaft (DFG) (German Research Foundation) to continue work on climate modelling of lemurs in Madagascar.

Amanda Edworthy and **Virginia Abernathy** (Langmore Lab, EEG) won Holsworth Wildlife Research Endowments ($7 and $5.5k respectively) from ANZ Trustees. Amanda also won a Stuart Leslie Research Award ($3k) from Birdlife Australia.

Susan Breen (Solomon Lab, PS) won a travel grant by the British Society of Plant Pathology to attend the MPMI Conference in Rhodes, Greece.

Awards

The ANU College of Medicine, Biology and Environment Best Oral Presentation Award ($500) went to **Christina Salmon** (Fahrer Lab, BSB) for her presentation 'Novel immunotherapy using Complete

Freund's Adjuvant'. The Runner-up Award ($250) was **Tiffany Russell,** (Tscharke Lab, BSB) with her presentation 'Herpes Simplex Virus Type I viral gene expression and latency'.

Publications and media

Carsten Külheim and **Bill Foley** (EEG) have collaborated with researchers in 30 institutions in 18 countries to sequence and analyse the genome of the Flooded Gum (*Eucalyptus grandis*). The paper has been published in the latest edition of *Nature* and was featured in the media. (See under PAPERS ACCEPTED.)

Wheat pathogen research in **Peter Solomon's** Lab (PS) was featured in an article entitled 'Viral silencing sheds light on disease resistance', in a supplement on cereal foliar fungal diseases in the latest Grains Research and Development Corporation (GRDC) GroundCover magazine.

A paper by **Daniel Stanton** (Ball Lab, PS) and colleagues entitled 'Epiphytes improve host plant water use by microenvironment modification, *Functional Ecology* was featured in *Science* 'In other journals'. (See under PAPERS ACCEPTED.)

Steve Shattuck (Zeil Lab, EEG) and Chris Schmidt have published a monumental treatise on the classification of a major ant subfamily, Ponerinae. Using molecular phylogenetics and morphological information they describe six new genera, providing keys, morphological diagnosis and species list to the world genera of Ponerinae. (See under PAPERS ACCEPTED.) Photo of *Brachyponera lutea* by Ajay Narendra.

Students from BIOL3132, coordinated by **Pat Backwell** (EEG) and tutored by **Tonya Haff** and **Sandra Binning**, have published a paper based on their field project in *Ethology* (see Beponis *et al*. in PAPERS ACCEPTED).

Appointments

Jenny Graves (EEG) has been appointed to Jury for L'Oreal Fellowships, 2014, and also to the Special Committee on Women in Science, Association of Academies and Societies of Science in Asia.

Matthew King (Combined Workshop) has been re-elected for a third term as the professional staff representative of the ANU Council. He welcomes people to approach him on any Council enquiry.

Events

The European Molecular Biology Laboratory (EMBL) Australia is bringing 60 first year PhD students to JCSMR and RSB for a two-week intensive training course, which spans bioinformatics, structural biology, genomics, biomedical imaging, stem cells, regenerative medicine and systems biology. This year's course will run from 30 June to 11 July and is being organised by a committee that includes **Ruth Arkell** (EEG) and members of JCSMR. Read more on RSB events.

The 2014 Gordon Research Conference 'CO_2 assimilation in plants: from genome to biome' took place from 8-13 June in New Hampshire, USA, and was attended by 21 RSB Plant Sciences researchers. The team contributed to the excellent scientific level with talks from **Graham Farquhar, Murray Badger, Spencer Whitney** and **Britta Förster** (PS), and a number of posters. Read more on RSB news.

PHDS AWARDED

Lucy Aplin (Cockburn Lab, EEG) 'Using social network analysis to map the spread of innovation and information through a wild population of birds'.

Lauren Du Fall (Solomon Lab, PS) 'Elucidating the mechanisms of necrotrophic effectors in the *Stagonospora nodorum*-wheat pathosystem'.

Pamela Fallow (Magrath Lab, EEG) 'Interspecific eavesdropping and alarm call identification by superb fairy-wrens (*Malurus cyaneus)*'.

Phataraporn Khumphai (Gordon Lab, EEG) 'A genetic analysis of *E. coli* using bioinformatic methods'.

Laurence Wilson (Fahrer Lab, BSB) 'Investigating the prevalence of an unusual form of alternative splicing'.

Sandra Binning (Backwell & Keogh Labs, EEG) 'The effects of biotic and abiotic factors on fish swimming performance'.

PHDS SUBMITTED

Veronica Briceno (Nicotra Lab, EEG) 'Elevation and microclimate affect vegetative and physiological traits in the alpine herb *Aciphylla glacialis* (Apiaceae)'.

WELCOME

Hesam Rohi Jahromi (Sam) has joined the BTLC Student Administration Team. Sam assists with counter inquiries, assignments, field trip bookings, and administration of postgraduate programs.

FAREWELL

James Davies (Jennions Lab, EEG) officially leaves at year end, but is on leave from mid-July after a decade working with crickets and fish (and endless generous assistance to those with bicycle-related issues).

PAPERS ACCEPTED

Avendaño-Vázquez, AO, Cordoba, E, Llamas, E, Pogson, BJ, *et al,* An uncharacterised apocarotenoid-derived signal generated in zeta-carotene desaturase mutants controls leaf development, chloroplast and nuclear gene expression in *Arabidopsis, Plant Cell*

Lab Leader profile: Adrienne Nicotra (EEG)

Lab research
Current research in the lab explores themes in plant evolutionary ecophysiology with a focus on the influence of phenotypic plasticity in response to water availability and temperature on plant response to climate change. We have projects running in the Alps and in arid and coastal NSW.

Greatest achievement
The question of how important phenotypic plasticity will be in determining response to climate change is one that's becoming common in a broad literature. I'm really pleased with how we are engaging with that discussion and trying to help clarify what plasticity is and what the potential and limits for plasticity to contribute to climate change response will be.

Next big thing
Great inroads are being made to understand the links between phenotypic responses to environment, genetic (or epigenetic) control thereof, and the evolution of these responses. It's going to be exciting to see how these continue to come together in the near future.

What other projects do you have?
I've been developing a new field course to be offered first in December 2015: *Field Studies in Functional Ecology.* This field course will be offered off site and will explore traditional ecophysiology content in both plants and animals and will be targeted at undergraduate students completing first year. There will be opportunities for RSB academics, post-docs and PhD students to get involved as faculty for short periods. Anyone interested please let me know.

Ayub, G, Zaragoza-Castells, J, Griffin, KL, & Atkin, OK, Leaf respiration in darkness and in the light under low, pre-industrial atmospheric CO_2, *Plant Science*

Beponis, LM, O'Dea, RE, Ohl, V-A, Ryan, MP, Backwell, PRY, Binning, SA & Haff TM. Cleaning up after a meal: The consequences of prey disposal for pit-building antlion larvae, *Ethology*

Brown TB, Cheng R, Sirault XR, Rungrat T, Murray, KD, Furbank, RT, Badger, M, Pogson, BJ, Borevitz, JO, *et al*, TraitCapture: genomic and environment modelling of plant phenomic data. *Current Opinion in Plant Biology*

Chooi, Y-H, Muria-Gonzalez, MJ, & Solomon, PS, A genome-wide survey of the secondary metabolite biosynthesis genes in the wheat pathogen *Parastagonospora nodorum, Mycology*

Browne, T, Is premenstrual dysphoric disorder really a disorder? *Journal of Bioethical Inquiry*

Corry, B, Lee S, & Ahern, CA, Pharmacological insights and quirks of bacterial sodium channels, *Handbook of Experimental Pharmacology*

Esquerré, D, Keogh, JS, & Schwanz, Direct effects of incubation temperature on morphology, thermoregulatory behaviour and locomotor performance in jacky dragons (*Amphibolurus muricatus*), *Journal of Thermal Biology*

Esquerré, D, Troncoso-Palacios, J, Garín, *et al*, The missing leopard lizard: a new species of the leopardinus clade (Reptilia: Squamata: Liolaemidae) from the Andes of the O'Higgins Region in Chile. *Zootaxa*

Estavillo, GM, Verhertbruggen, Y, Pogson, BJ, *et al*, Isolation of the plant cytosolic fraction for proteomic analysis. *Methods in Molecular Biology*

Gardner, JL, Amano, T, Backwell, PRY, *et al,* Temporal patterns of avian body size reflect linear size responses to broadscale environmental change over the last 50 years. *Journal of Avian Biology*

Henshaw, JM, Marshall, DJ, Jennions, MD & Kokko, H, Local gamete competition explains sex allocation and fertilization strategies in the sea. *American Naturalist.*

Hoegl, A, Darabi, H, Tran, E, Saliba, KJ et al, Stereochemical modification of geminal dialkyl substituents on pantothenamides alters antimicrobial activity, *Bioorganic & Medicinal Chemistry Letters*

Holman, L, Kahn, AT, & Backwell, PRY. Fiddlers on the roof: elevation muddles mate choice in fiddler crabs. *Behavioral Ecology*

Jia, H, Dwyer, SA, Fan, D-Y, Han Y, Badger, MR, von Caemmerer, S, & Chow, WS, A novel P700 redox kinetics probe for rapid, non-intrusive and whole-tissue determination of Photosystem II functionality and the stoichiometry of the two photosystems in vivo. *Physiologia Plantarum.*

Katris, NJ, van Dooren, GG, McMillan, *et al*, The apical complex provides a regulated gateway for secretion of invasion factors in *Toxoplasma, PLoS Pathogens*

Kokko, H, & Jennions, MD, The relationship between sexual selection and sexual conflict. In *Sexual conflict* (S Gavrilets and WR Rice, eds.) Cold Spring Harbor Press.

Kurdyukov, S, Mathesius, U, Nolan, KE, *et al*, The 2HA line of *Medicago truncatula* has characteristics of an epigenetic mutant that is weakly ethylene insensitive. *BMC Plant Biology*

Lim, HK & O'Neill, HC, Delineation of niches that support hematopoiesis. In *Adult stem cell niches.* Ed. S Wislet-Gendebien, Intech Publications

Ma, JZ, Russell, TA, Spelman, T, Tscharke, DC *et al*, Lytic gene expression is frequent in HSV-1 latent infection and correlates with the engagement of a cell-intrinsic transcriptional response, *PLoS Pathogens*

Martin, L & Corry, B, Locating the route of entry and binding sites of benzocaine and phenytoin in a bacterial voltage gated sodium channel, *PLoS Computational Biology*

Muria-Gonzalez, MJ, Chooi, Y-H, Breen, S, & Solomon, PS, The past, present and future of secondary metabolite research in the Dothideomycetes. *Molecular Plant Pathology*

Myburg, AA, Grattapaglia, D, Tuskan, GA, Külheim, C, Foley, W, *et al,* The genome of *Eucalyptus grandis, Nature* (see under NEWS)

Nisar, N, Cuttriss, AJ, Pogson, BJ, & Cazzonelli, CI. The promoter of the Arabidopsis PIN6 auxin transporter enabled strong expression in the vasculature of roots, leaves, floral stems and reproductive organs, *Plant Signaling & Behaviour*

Peso, M, Telford, L, & Backwell, PRY. Comparison shopping: detectability and mate preference in a fiddler crab, *Animal Behaviour*

Pogson, BJ, & Albrecht, V, An overview of chloroplast biogenesis and development. *In* Plastid Biology, Eds SM Theg & F-A Wollman, *Advances in Plant Biology,* Springer.

Saliba, KJ, & Spry, C, Exploiting the coenzyme A biosynthesis pathway for the identification of new antimalarial agents: the case for pantothenamides, *Biochemical Society Transactions*

Schmidt, CA, & Shattuck, SO, The higher classification of the ant subfamily Ponerinae (Hymenoptera: Formicidae), with a review of Ponerine ecology and behaviour, *Zootaxa* (see under NEWS).

Stanton, D *et al,* Epiphytes improve host plant water use by microenvironment modification, *Functional Ecology* (see under NEWS).

Van Norman, JM, Zhang, J, Cazzonelli, CI, Pogson, BJ, Chan KX, *et al*, Periodic root branching in *Arabidopsis* requires synthesis of an uncharacterized carotenoid derivative. *Proceedings of the National Academy of Science USA*

Vega-Trejo, R, O'Dea, R, Jennions, MD, & Head, ML, The effects of familiarity and mating experience on mate choice in mosquitofish, *Gambusia holbrooki. Behavioural Ecology.*

Walczewska-Szewc, K & Corry, B, Accounting for dye diffusion and orientation when relating FRET measurements to distances: three simple computational methods, *Physical Chemistry Chemical Physics*

Walling, CA, Morrissey, MB, Foerster, K, Kruuk, LEB, *et al*, A multivariate analysis of genetic constraints to life history evolution in red deer, *Genetics*

Warring, SD, Dou, ZC, Carruthers, VB, van Dooren, GG, *et al*, Characterisation of the chloroquine resistance transporter in *Toxoplasma gondii, Eukaryotic Cell*

Zabala, AO, Chooi, Y-H, Choi, MS, Lin H-C, & Tang Y, Fungal polyketide synthase product chain-length control by partnering thiohydrolase, *ACS Chemical Biology.*