



## NEWS

### Susanne von Caemmerer elected Fellow of the Royal Society



Congratulations to **Susanne von Caemmerer** (PS), who was elected a Fellow of the Royal Society in the UK this month. She was elected for her contributions to the understanding of the process of photosynthesis. You can read more about Susanne's scientific career and life here.

### ANU Vice-Chancellor's Awards for Excellence in Education



Congratulations to **Estee Tee** (Pogson group, PS), who received an award for Excellence in Tutoring or Demonstrating, in the recent 2017 Vice-Chancellor's awards for excellence in education.

### New dual PhD degree with Humboldt University of Berlin announced

Parasitologists from RSB, JCSMR and the Centre for Advanced Microscopy celebrated the announcement that the new dual PhD

program had been funded by the German Research Foundation, with cake and 'Angela Merkel' cookies (see main image, and left). The International Research Training Group is called 'Crossing



Angela Merkel cookies. (Image: Sharyn Wragg)



Parasitologists celebrating the new International Research Training Group, set up in conjunction with Humboldt University of Berlin, in Germany. From left: James Rosling (Kirk group, BSB), Christina Spry (Saliba group, BSB), Erick Tjhin (Saliba group, BSB), Giel van Dooren (BSB), Brendan McMorran (JCSMR), Kevin Saliba (BSB), Kieran Kirk (BSB and Dean, CMBE), Gaetan Burgio (JCSMR), Adelaide Dennis (Kirk group, BSB), Melanie Rug (CAM), Meryn Fraser (Maier group, BSB), Alex Maier (BSB), Melanie Ridgway (Maier group, BSB), Richa Harnal (Maier group, BSB), Esther Rajendran (Kirk and van Dooren groups, BSB), Vanessa Howieson (Saliba group, BSB), Mrinalini Pratap (Maier group, BSB), Linden Mueller-Wong (van Dooren group, BSB), Edwin Tjhin (van Dooren group, BSB), Mona Shahali (Maier group, BSB). (See: News Item). Image Sharyn Wragg.

Boundaries: Molecular Interactions in Malaria', and grew from a collaboration between **Alex Maier** (BSB) and Kai Matuschewski of Humboldt, after Alex spent some time in Berlin on a fellowship. More information here, and to apply for the program, click here.

### Putting food on the plate for 9.7 billion: challenges and solutions



John Evans (front, white shirt) sits on the panel of experts at the recent forum at the Crawford School. Image Natalia Bateman.

In this forum, internationally recognised researchers in the areas of plant science, development, agriculture and public policy discussed one of the most urgent and complex issues of the 21st century: the challenges and potential solutions needed to secure a future with food for everyone. Speakers **John Evans** (RSB and CoETP), Andy Borrell (University of Queensland and CoETP), Mellissa Wood (ACIAR), Jamie Pittock (Fenner School) and Quentin Grafton (Crawford School of Public Policy) spoke to an audience of around 200 people in the

Weston Theatre at the Crawford School Public Policy, followed by a question and answer session moderated by ABC broadcaster Lish Fejer.

It was a lively and exciting discussion with many interesting questions from the audience, that highlighted the importance of an interdisciplinary approach to this critical issue. The event was livestreamed through the Crawford's Facebook account. A recording of the event will be available soon in the CoE for Translational Photosynthesis website and YouTube channel. - **Natalia Bateman** (PS).

### The Unusual Suspects

**Denisse Leyton** (BSB) and **John Evans** (PS) were part of a panel of five ANU scientists who came together for The Unusual Suspects event, held in King O'Malley's pub. The event, organised by CPAS students Frank Karamaroudis and colleagues, promised that the scientists would answer any question they were asked.

### Congratulations

**Jacinta Watkins**, PhD student in the Pogson group (PS), has been awarded the Young Investigators Travel award from the International Carotenoid Society.

**Elizabeth Whitty** (PhD student, Callaghan group, BSB) won third prize in the poster section of the 2nd Australian Cancer &

## Group leader profile: Allen Rodrigo, (CBBU)



### Group research focus

Broadly, our research focuses on the development of computational and statistical methods in evolutionary biology. Right now, we are working on three projects. First, we are developing new methods of inferring phylogenies and evolutionary models by using next-generation sequences in more efficient ways. Our other two projects are relatively new: we are looking at evolutionary models of how microbial communities associate with hosts, and we are trying to understand whether the evolutionary relationships and dynamics of tumour cells allow us to predict the health outcome of patients diagnosed with cancer.

### How did you become a computational biologist?

When I was going through my PhD back in the '80s, there was no discipline called "computational biology" or "bioinformatics". There was already a tradition of applying mathematical and numerical methods in biology amongst biochemists, ecologists, evolutionary biologists, physiologists and taxonomists, and others. When computers became more commonplace, folks from a variety of disciplines – e.g., computer science, zoology, botany, linguistics – began to use computers to solve these problems. I have always had an interest in the intersection of mathematics, computing and evolutionary biology, so my PhD used all three to address a pretty dry taxonomic problem (revision of a family of helminth parasites found in turtles – fun fact, I won the student prize at the Australian Parasitology Society Conference in 1989 held on Magnetic Island, for my presentation of this work!). Mid-way through my PhD, PCR was invented (!), but I didn't get to do any wet lab work until my first postdoc at the University of Auckland in 1990. After that, I swore off lab-work (I have "bad hands"), and became a full-time computational biologist.

### What do you enjoy most about teaching?

As a quantitative biologist myself, I am an evangelist for biological numeracy. I teach mathematical and statistical stuff to biology students who are equation-averse. Consequently, I try to expose them to quite a few equations, so that they lose their fear of symbols. The thing I enjoy most about teaching is seeing the lights come on in people's eyes. The best part of teaching typically happens mid-way through a course, when students begin to understand that it's not all magic and gobbledygook.

This newsletter is archived at [biology.anu.edu.au/news-events/newsletter](http://biology.anu.edu.au/news-events/newsletter).  
Layout: Mel Norris  
Editing: Stefan Bröer & Mel Norris

Metabolism Meeting at the Victorian Comprehensive Cancer Centre in Melbourne this month. Her poster was entitled 'Exploiting tumour acidity for polymer based drug delivery'.

### Grants

**Michael Braby** (E&E) has been awarded a Citizen Science Grant from the Australian Government to set up Butterflies Australia: a national database of butterfly distributions. The database will be online, and citizen scientists will input their sightings via a web portal, with expert moderators verifying their records.

## IN THE MEDIA

**Mike Crisp** (E&E) published a monograph on the pea flower genus *Daviesia* recently that included two species named after the stars of the movie 'Twins' – Arnold Schwarzenegger and Danny DeVito. This attracted media attention from all over the world, including the *New Zealand Herald*, *Deutsche Welle*, the *Irish News*, *Mashable* and the *Huffington Post*. It also appeared on the ABC online, *The Australian*, and other outlets.

The story was also one of the top five Facebook stories from ANU, reaching more than 27,000 people, and was one of the top three videos on the ANU Channel.

**Robert Furbank** (PS) was interviewed on the ABC radio Science Show program by Robyn Williams about photosynthesis, the importance of the C4 photosynthesis discovery and the impact of the 'Apollo' projects in plant science research.

**John Evans** (PS) was interviewed in the ABC Canberra radio program *Afternoons* with Lish Fejer on the 17th of May about *Fascination of Plants* day and challenges and solutions of feeding 9.7 billion people.

**Michael Braby** (E&E) was interviewed by Adam Shirley on ABC radio Canberra this month about his new government grant to set up Butterflies Australia, a national database of butterfly distributions (see item in Grants section, above).

**Rod Peakall's** (E&E) work with collaborators at UWA to identify the chemicals orchids use to attract their amorous insect pollinators recently appeared in *Angewandte Chemie International*, and was reported in the *West Australian* and *Chemistry World*.

## NEW APPOINTMENTS

The Peakall group (E&E) welcomes

**Tobias Hayashi**, who has returned to



take up a PhD. Tobias will be working on greenhood orchids, with the goal to understand the mechanism(s) by which they attract fungus gnats for pollination.

**Sally Buck** has just started her PhD in the Whitney group, coming to us from the University of Western Australia. She returns after completing a summer scholarship in 2016/17 to study the directed evolution of Rubisco.



**Shagufta Iqbal** has recently arrived



from Pakistan to undertake PhD studies in the Callaghan group (BSB). Her research will involve biochemical and structural approaches to elucidate the

locations of drug binding sites on the efflux pump P-glycoprotein.

## PHDS SUBMITTED

**Marcin Falkowski** (Zeil group, E&E, co-supervisor Jan Hemmi, UWA) 'The spectral and temporal properties of fiddler crab photoreceptors in the context of predator avoidance'.

**David Kainer** (Foley group, E&E) 'Genome-wide analysis of essential oil yield variation in *Eucalyptus polybractea*'.

**Pernelyn Torreña** (Hardham group, PS) '*Phytophthora parasitica* and lupin (*Lupinus angustifolius*) interactions: changes in gene expression during infection and after phosphite treatment'.

## PHDS AWARDED

**Nur Abdul Bahar** (Atkin group, PS) 'Photosynthetic characterisation of tropical and temperate rainforest species'.

**Liam Bailey** (Langmore group, E&E) 'Between the devil and the deep blue sea: Consequences of extreme climatic events in the Eurasian oystercatcher (*Haematopus ostralegus*)'.

**Mozes Blom** (Moritz group, E&E) 'Phylogenomic analysis of biogeography

and speciation in a widespread genus of skinks'.

**Christina Carroll** (Fahrer group, BSB) 'The treatment of solid tumours with Complete Freund's Adjuvant'.

**Huon Clark** (Backwell group, E&E) 'Reproductive success in a fiddler crab, *Uca mjoebergi*'.

**Jonathan Henshaw** (Jennions group, E&E) 'Models of mating system evolution: gamete competition, hermaphroditism and sexual selection'.

**Heli Barron Pastor** (Gordon group, E&E) 'Gut microbiome in rats: effects of diet on community structure and host-microbiome interactions'.

**Robert Summers** (Martin group, BSB) 'The malaria parasite's chloroquine resistance transporter: and exploration of its interactions with drugs and its evolution as a drug transporter'.

**Laura Wedd** (Maleszka group, E&E) 'DNA methylation, epialleles and gene regulation: insights from the honey bee'.

**Renate Zelger** (Maier group, BSB) 'Malaria detection: from biomarker identification to application'.

## PAPERS ACCEPTED

van Aken O, Pogson BJ, Convergence of mitochondrial and chloroplastic ANAC017/PAP-dependent retrograde signalling pathways and suppression of programmed cell death, *Cell Death and Differentiation*.

Bose J, Munns R, Shabala S, Gilliam M, Pogson BJ, Tyerman SD, Chloroplast function and ion regulation in plants growing on saline soils: lessons from halophytes, *Journal of Experimental Botany*.

Bröer S, Bröer A, Amino acid homeostasis and signalling in mammalian cells and organisms, *Biochemical Journal*.

Cai S, Chen G, Wang Y, Huang Y, Marchant B, Wang Y, Yang Q, Dai F, Hills A, Franks PJ, Nevo E, Soltis D, Soltis P, Wolf PG, Xue D, Zhang G, Pogson BJ, Blatt MR, Chen Z-H, Evolutionary Conservation of ABA Signaling for Stomatal Closure in Ferns, *Plant Physiology*.

Cardillo M, Weston PH, Reynolds ZM, Olde PM, Mast AR, Lemmon E, Lemmon AR, Bromham L, The phylogeny and biogeography of *Hakea* (Proteaceae) reveals the role of biome shifts in a continental plant radiation, *Evolution*.  
Clark IA, Vissel B, The meteorology of cytokine storms, and the clinical

usefulness of this knowledge, *Seminars in Immunopathology*.

Corry B, Mechanisms of selective ion transport and salt rejection in carbon nanostructures, *MRS Bulletin*.

Cunningham S, Magrath RD, Functionally referential alarm calls in noisy miners communicate about predator behaviour, *Animal Behaviour*.

Heinsohn R, Zdenek CN, Cunningham RB, Endler J, Langmore NE, Tool-assisted drumming in a wild bird population, *Science Advances*.

Hall ML, Langmore NE, Editorial: Fitness costs and benefits of female song, *Frontiers in Ecology and Evolution*.

Hardham AR, Blackman LM, *Phytophthora cinnamomi* Pathogen Profile Update, *Molecular Plant Pathology*.

Kalyaanamoorthy S, Minh BQ, Wong TFK, von Haeseler A, Jermini LS, ModelFinder: Fast model selection for accurate phylogenetic estimates, *Nature Methods*.

Lin Y-P, Ding ZY, Gullan PJ, Cook LG, A newly recognised Australian endemic species of *Austrolecanium* Gullan & Hodgson 1998 (Hemiptera: Coccidae) from Queensland, *Zootaxa*.

Lin Y-P, Edwards RD, Kondo, T, Semple TL, Cook LG, Species delimitation in asexual insects of economic importance: The case of black scale (*Parasaissetia nigra*), a cosmopolitan parthenogenetic pest scale insect, *PLOS One*.

Liu Y, Hassan S, Kidd BN, Garg G, Mathesius U, Singh KB, Anderson J, Ethylene signaling is important for isoflavonoid mediated resistance to *Rhizoctonia solani* in *Medicago truncatula*. *Molecular Plant-Microbe Interactions*.

Marshall-Colon A, Long SP, Allen DK, Allen G, Beard DA, Benes B, von Caemmerer S, Christensen AJ, Cox DJ, Hart JC, Hirst PM, Kannan K, Katz DS, Lynch J, Millar AJ, Panneerselvam B, Price ND, Prusinkiewicz P, Raila D, Shekar RG, Shrivastava S, Shukla D, Srinivasan V, Stitt M, Turk MJ, Voit EO, Wang Y, Yin X, Zhu X, Crops in silico: Generating virtual crops using an integrative and multi-scale modeling platform, *Frontiers in Plant Science*.

Masle-Farquhar E, Bröer A, Yabas M, Enders A, Bröer S, ASCT2 (SLC1A5) deficient mice have normal B-cell development, proliferation and antibody production, *Frontiers in Immunology*.

Piggott MP, Hansen B, Soderquist T, Eldridge MDB, Taylor AC, Population monitoring of small and declining brush-tailed rock wallaby (*Petrogale penicillata*) colonies at the extreme of their range using faecal DNA sampling, *Australian Mammalogy*.

Pornsiriwong W, Estavillo GM, Chan KX, Tee EE, Ganguly D, Crisp PA, Phua SY, Zhao C, Qiu J, Park J, Yong MT, Nisar N, Yadav AK, Schwessinger B, Rathjen J, Cazzonelli CI, Wilson PB, Gilliam M, Chen Z-H, Pogson BJ, A chloroplast retrograde signal, 3'-phosphoadenosine 5'-phosphate, acts as a secondary messenger in abscisic acid signaling in stomatal closure and germination, *eLife*.

Ribi W, Zeil J Three-dimensional visualization of ocellar interneurons of the Orchid bee *Euglossa imperialis* using micro X-ray Computed Tomography, *Journal of Comparative Neurology*.

de Villiers M, Spry C, Macuamule CJ, Barnard L, Wells G, Saliba KJ, Strauss E, Antiplasmodial mode of action of pantothenamides: pantothenate kinase serves as a metabolic activator, not as a target, *ACS Infectious Diseases*.

### First year field trip to Botanic Gardens

Field trips are for first year undergraduates too! PhD students **Lauren Ashman** (Rowell group, E&E) (top pic) and

**Damien Esquerre** (Keogh group, E&E) demonstrated for one of the Biol 1003 groups at the Botanic Gardens. Images Jessica Ward-Jones.

