Australian National University

# Research School of Biology Newsletter

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ANU COLLEGE OF MEDICINE, BIOLOGY AND ENVIRONMENT

## NEWS

### New ANU-CSIRO Centre

A new joint initiative between ANU and CSIRO, the Centre for Biodiversity Analysis (CBA), has been formed to coordinate, develop and promote the rapidly expanding field of biodiversity science between the two institutions.

CBA will capitalize on the world-class strengths of ANU and CSIRO in ecology, evolution and systematics to exploit the vast new and emerging capabilities in genomics and bioinformatics. Innovative and collaborative approaches to genomics and spatial modeling in biodiversity discovery will be developed to understand species evolutionary responses to past environmental change. This information will be used to inform policy makers dealing with rapid environmental change on the protection of genetic and species diversity.

The CBA will also support training opportunities in genomics and bioinformatics across the participating institutions, including PhD and Honours research and the organisation of workshops led by prominent national and international scientists. One of the CBA's first activities will be to host a conference in biodiversity genomics in April 2013. For further information please contact the Director, Craig Moritz or CBA Coordinator, Claire Stephens.

Image credit: Mitzy Pepper

### Future Fellows

**Martijn van de Pol** (EEG) has recently been announced as one of ANU's new Future Fellows for his research entitled 'Animals' response to extreme climatic events'.

The Future Fellowships program is administered by the Australian Research Council and aims to promote the best research in areas of national importance by giving grants to the country's best and brightest mid-career researchers.

### Birds with Attitude

**Wes Keys** (EEG) has been working with staff at the Hancock library, providing material for their current display 'Birds with Attitude'. The display will be in the Hancock main foyer until the end of August and contains specimens on loan from the EEG museum.

### Vale Ralph Slatyer

**Emeritus Professor Ralph Slatyer**, former Director of RSBS (1984-1989), former Australian Ambassador to UNESCO (1978-81), and Australia's first Chief Scientist (1989-92) died on Thursday 26 July 2012. Graham Farquhar (PS) has prepared an obituary which is published on the RSB website. A memorial service for Ralph will be held on Friday 7 September at 11.00 am, in the hall of University House.

The School has recently established the Ralph Slatyer Medal for outstanding research in the field of Biology. The award will be made annually, with the recipient each year to be a person who has made an outstanding contribution to biological science and who is an Australian citizen, an Australian resident, or a person whose work has a significant Australian relevance.

## WELCOME

BSB welcomes **Graham Hicks** as the new divisional administrator. Graham has worked most recently as student administrator in the School of Culture History and Language, and has worked in other areas at ANU as an enrolment officer and purchasing officer.

**Susan Breen** has joined the Solomon lab (PS) from the University of Dundee for a three year postdoctoral position to study protein-protein interactions between fungal pathogen and wheat proteins. **Mirka Novakova** has also joined the Solomon lab for a three month training visit from the Institute of Chemical Technology in Prague, Czech Republic.

**Weixing Shan** is visiting the Hardham lab (PS) for three months from Northwest A & F University in Yangling, China.

**Kristal Cain** has arrived from Indiana University to take up a postdoc in the Langmore Lab (EEG).

**Jason Bragg** and **Dan Rosauer** join the Moritz Lab (EEG) as postdocs, **Sally Potter** joins as lab manager and **Claire Stephens** as centre coordinator.

**Nina Svedin** joins the Pryke lab (EEG) as a Research Officer, **David Hamilton** joins the lab as a school visitor and **Catherine Young** as a PhD Student. **Madeleine Yewers** will also join the Pryke lab to continue her PhD.

**O'mezie Ekwudu** has joined the Tscharke lab (BSB) from Anambra State University, in Uli, Nigeria to pursue his PhD. He will be working on the genomics and pathogenesis of a set of *vaccinia* viruses causing epizootics in rural communities living close to the forest in Brazil.

**Jessie Au** joins the Foley lab (EEG) as a research assistant and **Samantha Burn** joins the Gordon lab (EEG) as a PhD Student.

**Katherine-Lindsay Collins-Taylor** (Kate) has joined the Callaghan lab (BSB) for a one-year laboratory placement. Kate is from the University of Glasgow where she is undertaking a Masters of Medical Science (Genetics).

Three new members have joined the Borevitz lab (PS). **Tim Brown** comes from Salt Lake City and will be developing tools for capture, visualisation, and analysis of plant phenomics data across scales from growth chambers to landscapes. **Pip Wilson** returns to ANU after a postdoc at CSIRO and will be leading a project using genome-wide association in *Brachypodium distachyon* to map adaptive phenotypic plasticity in growth conditions that mimic Australian agricultural environments. **Jared Streich**, a grad student from Oregon State, will be working on population genomics and colonization of *Brachypodium*.

## FAREWELL

The Tscharke lab (BSB) said farewell to Research Assistant, **Natasha Noel**. Natasha has returned to Canada after nearly three years in the school.

**Sarojini Balkrishna** is leaving the Bröer lab (BSB) after a total of seven years with the lab. She will take up a position at the Juvenile Diabetes Foundation in Sydney and will submit her PhD thesis within the next few weeks.

After five years in the Price lab (PS) **Benjamin Rae** is leaving to take up a post-doctoral research position at the University of Oxford's Department of Earth Sciences where he will continue to work on the $CO_2$-concentrating mechanism.

## CONGRATULATIONS

**Peter Solomon** (PS) has been awarded a three year $180K grant by the Grains Research and Development Corporation entitled "Understanding the potential for mycotoxin production from necrotrophic fungi".

**Naomi Langmore** (EEG) and **Rob Heinsohn** (Fenner) have been awarded a Hermon Slade Grant of $78K for their work on palm cockatoos on Cape York.

## Lab Leader Profile
## Sarah Pryke, EEG

*Lab researching:* "We are broadly interested in the proximate mechanisms and the evolutionary consequences of animal behavior. We work mainly with tropical Australian finches but have also recently started working with tropical reptiles."

*Lab members:* Nina Svedin, research officer; Catherine Young and Madeleine Yewers, PhD students.

*Greatest achievement:* "Setting up a research programme on the amazing little Gouldian finch - a pretty unique species that has turned out to be a great model system for investigating all sorts of topical questions in evolutionary biology. 'Decoding' this system has been an incredibly challenging puzzle, which at least personally, has been very fulfilling."

*Next big thing:* "One thing I am looking at is the role mothers play in driving evolutionary change. Can they, and how do they, modify their offspring to best match the environment? Can they generate and direct evolutionary change?"

*Science inspiration:* "David Attenborough, as he is responsible for my early interest into the weird and wonderful behaviours of animals. Growing up we used to watch his documentaries whenever we were allowed to - and I was lucky enough to meet him as an undergrad and again two years ago. Even though he is in his 80s now, his distinctive narrative voice and his obvious love for any animal whether it has fur, feathers, fins or flippers is really contagious and continues to inspire."

**Dominique Roche** (Jennions lab, EEG) received a grant from the Ecological Society of Australia for $1.5K to examine how water motion affects escape responses in coral reef fishes.

**Laurence Wilson** (Fahrer lab, BSB) has been awarded an EMBL Australia PhD Symposium Travel Grant to attend the EMBL symposium "Overcoming Chaos - Networks in Life Sciences: From genomics and proteomics to systems biology" in Heidleberg, Germany.

**Uyen Nguyen** (Maier lab, BSB) was awarded an OzEMalAR Travel scholarship to visit the Institut Pasteur in Paris for three months.

**Michael Whitehead** (Peakall lab, EEG) has submitted his PhD thesis entitled "The evolutionary biology of pollination: studies in a genus of Australian sexually deceptive orchids".

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

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Contact Casey Hamilton to submit content or to be added to the newlsletter distribution list.

**Anesh Nair** (Verma lab, BSB) has submitted his PhD thesis entitled "Structure, function and genetic diversity of glucosyltransferase (GtrIV) of *Shigella flexneri*".

## PUBLICATIONS

Bromham, L., Lanfear, R., Cassey, P., Gibb, G., & Cardillo, M. Reconstructing past species assemblages reveals the changing patterns and drivers of extinction through time. *Proceedings of Royal Society London B.*

Busch, F.A., Sage, T.L., Cousins, A.B. & Sage, R.F. $C_3$ plants enhance rates of photosynthesis by reassimilating photorespired and respired $CO_2$. *Plant, Cell and Environment.*

Conlan, B., Colgrave, M., Gillon, A., Guarino, R., Craik, D. & Anderson, M. Insights into processing and cyclization events associated with biosynthesis of the cyclic peptide kalata B1. *Journal of Biological Chemistry.*

Corry, B., & Smith, N.M. The role of thermodynamics and kinetics in ligand binding to G-quadruplex DNA. *Chemical Communications.*

Deplazes, E., Louhivuori, M., Jayatilaka, D., Marrink, S.J. & Corry, B. Structural investigation of MscL gating using experimental data and coarse grained MD simulations. *PLoS Computational Biology.*

Evans, J.R. & von Caemmerer, S. Temperature response of carbon isotope discrimination and mesophyll conductance in tobacco. *Plant Cell & Environment.*

Fahrer, A.M. A proposal for a simple and inexpensive therapeutic cancer vaccine. *Immunology & Cell Biology.*

Hanna, E. & Cardillo, M. A comparison of current and reconstructed historic geographic range sizes as predictors of extinction risk in Australian mammals. *Biological Conservation.*

Harrison, M.T., Evans, J.R., & Moore, A.D. Using a mathematical framework to examine physiological changes in winter wheat after livestock grazing. 1. Model derivation and coefficient calibration. *Field Crops Research.*

Harrison, M.T., Evans, J.R. & Moore, A.D. Using a mathematical framework to examine physiological changes in winter wheat after livestock grazing 2. Model validation and effects of grazing management. *Field Crops Research.*

He, X., Wang, W., Qin, Q., Zhang, Z., Zhang, S., & Barron, A. A. Assessment of flight activity and homing ability in Asian and European honey bee species, *Apis cerana* and *Apis mellifera*, measured with radio frequency tags. *Apidologie.*

Hee, W.Y., Torreña, P.S., Blackman, L.M. & Hardham, A.R. *Phytophthora cinnamomi* in Australia. In: *Phytopthora A Global Perspective*. Ed: K. Lamour.

Hey, Y. & O'Neill, H.C. Murine spleen contains a diversity of myeloid and dendritic cells distinct in antigen presenting function. *Journal Cellular and Molecular Medicine.*

Holman, L. & Kokko, H. The consequences of polyandry for population viability, extinction risk and conservation. *Philosophical Transactions of the Royal Society of London B.*

Jia, H., Liggins J.R. & Chow, W. S. Acclimation of leaves to low light produces large grana: the origin of the predominant attractive force at work. *Philosophical Transactions of the Royal Society of London B.*

Ludowici, V., Zhang, W., Blackman, L.M. & Hardham, A.R. *Phytophthora nicotianae.* In: *Phytopthora A Global Perspective.* Ed: K. Lamour.

Moschen, I., Bröer, A., Galic, S., Lang, F., & Bröer, S. Significance of short chain fatty acid transport by members of the monocarboxylate transporter family (MCT). *Neurochemical Research.*

Niemand, J., Louw, A.I., Birkholtz, L., & Kirk, K. Polyamine uptake by the intraerythrocytic malaria parasite, *Plasmodium falciparum. International Journal of Parasitology.*

Pengelly, J.J.L., Tan, J., Furbank, R.T., & von Caemmerer, S. Antisense reduction of NADP-malic enzyme in *Flaveria bidentis* reduces flow of $CO_2$ through the $C_4$ cycle. *Plant Physiology.*

Pryke S. R., & Rollins L. A. Mothers adjust offspring sex to match the quality of the rearing environment. *Proceedings of the Royal Society of London B.*

Rae, B.D., Long, B.M., Badger, M.R. & Price, G.D. Structural determinants of the outer shell of ß-carboxysomes in *Synechococcus elongatus* PCC 7942: Roles for CcmK2, K3-K4, CcmO, and CcmL. *PLoS ONE.*

Rae, C., Fekete, A.D., Kashem, M.A., Nasrallah, F.A., & Bröer, S. Metabolism, compartmentation, transport and production of acetate in the cortical brain tissue slice. *Neurochemical Research.*

Richards, L., Schaefer, A., Richards, B & Corry, B. Quantifying barriers to monovalent anion transport in narrow non-polar pores. *Physical Chemistry Chemical Physics.*

Thanweer, F & Verma, N.K. Identification of critical residues of the serotype modifying O-acetyltransferase of *Shigella flexneri*. *BMC Biochemistry.*

Theodoratos, A., Wilson, L.O., Gosling, K.M. & Fahrer, A.M. Splice variants of the condensin II gene Ncaph2 include alternative reading frame translations of exon 1. *FEBS J.*

von Caemmerer, S., Quick, W.P. & Furbank, R.T. The Development of $C_4$ Rice: Current Progress and Future Challenges. *Science.*

Whitehead, M. R., & Peakall, R. Short term but not long term patch avoidance in an orchid-pollinating solitary wasp. *Behavioral Ecology.*

Whitehead, M. R., Phillips, R. D., & Peakall, R. Pollination: The Price of Attraction. *Current Biology.*

Zhang, M., Meng, Y., Wang, Q., Liu, D., Quan, J., Hardham, A.R. & Shan, W. PnPMA1, an atypical plasma membrane $H^+$-ATPase, is required for zoospore development in *Phytophthora parasitica*. *Fungal Biology.*