RESEARCH SCHOOL OF BIOLOGY

THE AUSTRALIAN NATIONAL UNIVERSITY

NEWSLETTER

ISSUE 8 | 8 OCTOBER 2009

NEWS

NEW APPOINTMENTS

The following people have been appointed as Administrators of the three new RSB Divisions:

Cathie Stewart-Moore (BSB)
Audra Johnstone (EEG)
Michelle Selman (PS)

Marie McNamara has been apponted to the role of Team Leader, Student Administration, and **Kathy Smith** has been appointed to the role of Team Leader, Student Technical Services. Appointments to the Senior Technical Officer positions should be finalised next week.

FAREWELL

Hannah Bender, PhD Student, Graves Lab (EEG) is finalising her thesis on Tassie Devil Facial Tumour Disease, then heading to Cornell University, College of Veterinary Medicine, Ithaca NY to do a three year residency in veterinary anatomic pathology.

FEEDING A HUNGRY WORLD: A GLOBAL DILEMMA

The 'green revolution' of the mid 20th century provided a quantum leap in crop productivity which led to linear increases in crop yields. More recent improvements are largely due to improvements in breeding techniques and refinement of water, fertiliser and pesticide application regimes. The rates of crop improvement are dwindling and are now unable to keep pace with the increasing global population. A second green revolution might be necessary to maintain food security, a cornerstone of global amity.

Last month, Murray Badger, Susanne von Caemmerer, John Evans, Dean Price and Spencer Whitney from RSB were involved in an Australian Government funded workshop hosted by ANU on applying photosynthesis research to improve crop yields. Much is known about the processes of photosynthetic carbon fixation, its limits and influences, yet this information has not been a driver for increasing crop productivity. This knowledge, together with new technologies (both genetic and otherwise) has the potential to improve yield and be applied in crops within the next decade. This funded workshop brought together international leaders in the fields of photosynthesis and crop breeding to draft a strategy to bring this to fruition.

EVOLUTION '09

The Biennial Meeting of the Australasian Evolution Society was held in the School last week. Award winners from the School were:

Best Student Poster; **Alexandra Livernois,** Graves lab (EEG) *Dosage compensation: a comparison between platypus and chicken.*

Outstanding Talk Prize; **David Moore,** Keogh Lab (EEG) *Positive Darwinian selection results in resistance to cardioactive toxins in true toads (Anura: Bufonidae)*

Outstanding Talk Prize; **Pamela Fallow,** Magrath Lab (EEG) *Eavesdropping on other species: interspecific understanding of urgency information in avian alarm calls.*

NOTICES

PLANT BIOLOGY SEMINAR SERIES

14 October, 1pm
Robertson Lecture Theatre
The peroxisomal protein Snowy Cotyledon 3 is required for chloroplast biogenesis in seedlings. **Veronica Albrecht**, Center of Excellence in Plant Energy Biology.

21 October, 1pm
Robertson Lecture Theatre
Engineering of Long-Chain Polyunsaturated Fatty Acids in Plant Oils. **James Petrie**, CSIRO PI.

View more Plant Biology Seminars and other RSB events here: http://biology.anu.edu.au/Events

RIDE TO WORK DAY

14 October

Free breakfast for cyclists in Union Court from 8- 9.30am.
Register as a member of Team ANU online to be in the running for prizes. Our team code is 141836.

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

CONGRATULATIONS

Phil Shearman (EEG) has been awarded the ANU JG Crawford Prize. This highly prestigious prize is awarded each year to those graduate students most deserving of recognition for the quality of their graduate work. There are two prizes awarded across the ANU each year.

Anton Wasson, Mathesius lab (PS), handed in his PhD thesis last week and started a new job at CSIRO Plant Industry the next day.

Adele Lehane, Kirk lab (BSB), handed in her PhD thesis last week, and is taking a short break before returning to the same lab.

WELCOME

Dr Nami Okubo will begin a postdoctoral year working with Eldon Ball and David Hayward (EEG), on the molecular control of coral development. She is supported by a prestigious Postdoctoral Fellowship from the Japan Society for the Promotion of Science and was working at the Seto Marine Biological Laboratory of Kyoto University.

Dr Nele Schmitz has arrived to work for one year with Marilyn Ball (PS) and Dr Catherine Lovelock, University of Queensland, on water transport in mangrove trees. Nele is a Post-doctoral researcher at the Vrije Universiteit Brussel (VUB) and the Royal Museum for Central Africa (RMCA). She is supported by a prestigious grant from the Research Foundation of Flanders.

Two overseas school visitors will undertake internships with Nijat Imin. **Mahmut Kare** is currently enrolled in a PhD in China and will be here for one year. **Marjan Yusefinejad,** from Shiraz, has just completed her PhD in Iran and is here to broaden her scientific experience during the next six months. Both will be working on root organogenesis. Welcome Mahmut and Marjan!

Dr Hope Klug (University of Helsinki) will be visiting the Jennions' lab until late October. Dr Klug is currently working on the evolution of parental care, the measurement of sexual selection and cannibalism in fish.

MALARIA CHLOROQUINE RESISTANCE TRANSPORTER

Editor: Stella Hurtley
This Week in Science Vol 325
25 September 2009

Malaria is one of the most deadly infectious diseases in the world today, and the emergence and spread of chloroquine-resistant parasites has been a disaster for world health. The Chloroquine Resistance Transporter (PfCRT) was originally identified because mutations in this protein confer chloroquine resistance in the human malaria parasite, *Plasmodium falciparum*.

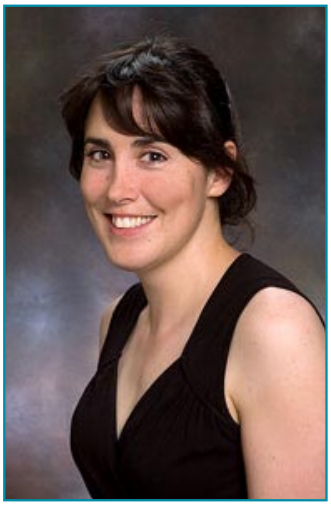
However, the mechanism by which they do so has been the subject of ongoing debate. Martin *et al.* (p. 1680) have now succeeded in expressing PfCRT at the surface of *Xenopus laevis* oocytes, establishing a robust and reproducible heterologous system for the study of this protein. The resistance-conferring form of the protein mediates the transport of chloroquine, whereas wild-type PfCRT does not. Thus, as suspected, chloroquine resistance in the malaria parasite indeed arises as a result of the transport of the drug via mutant PfCRT.

Journal article:
Chloroquine Transport via the Malaria Parasite's Chloroquine Resistance Transporter *Science* 25 September 2009: Vol. 325. no. 5948, pp. 1680 - 1682.

Related publications:
Discovery to help stem malaria's drug defiance. ANU Media Release.

Malaria drugs may get new lease of life. ABC Science.

Biologist probes parasite's progress The Australian.



Dr Rowena Martin (BSB)

PAPERS ACCEPTED

Bröer, A., Balkrishna S., Kottra G., Davis S., Oakley A., Bröer S. Sodium translocation by the iminoglycinuria associated imino transporter (SLC6A20) *Molecular Membrane Biology.*

Casey, T., Solomon, P.S., Bringans, S., Tan, K-C., Oliver, R.P., Lipscombe, R. Quantitative proteomic analysis of G-protein signalling in *Stagonospora nodorum* using Isobaric Tags for Relative and Absolute Quantification (iTRAQ). *Proteomics.*

Cote, I., Jennions, M.D. Overview: procedure of meta-analysis in a nutshell. *In:* J Koricheva & J Gurevitch (Eds) /Meta-analysis and Research Synthesis in Ecology and Evolution, Princeton University Press, Princeton.

Foret, S., Kucharski, R., Pittelkow, Y., Lockett, G.A., Maleszka, R. Epigenetic regulation of the honey bee transcriptome: unravelling the nature of methylated genes. *BMC Genomics.*

Furbank, R.T., von Caemmerer, S., Sheehy, J., Edwards, G. C_4 rice: a challenge for plant phenomics. *Functional Plant Biology.*

Gordon, K., Wee Tek, T., Collinge, D., Williams, A., Batterham, P. Genetics and Molecular Biology of the Major Crop Pest Genus *Helicoverpa. In:* Molecular Biology and Genetics of the Lepidoptera. Eds. Marian R. Goldsmith and Frantisek Marek, CRC press, USA.

Hietanen, M.A., Cloherty, S.L., Clifford, C. W. , Ibbotson, M.R. Differential changes in perceived contrast following contrast adaptation in humans. *Vis. Res.*

Ho, K., Deakin, J.E., Wright, M., Graves, J.A.M., Grutzner, F. Replication asynchrony and differential condensation of X chromosomes in female platypus (*Ornithorhynchus anatinus*). *Reproduction Fertility and Development.*

Jennions, M.D., Lortie, C., Koricheva, J. Meta-analysis and its effect on scientific practices. *In:* J Koricheva & J Gurevitch (Eds) /Meta-analysis and Research Synthesis in Ecology and Evolution, Princeton University Press, Princeton.

Leone, J.F., Kifley, A., Morgan, I.G., Wang, J.J., Cornell, E., Mitchell P., Rose, K.A. Prevalence of heterophoria and its association with refractive error in Australian school children, *British Journal of Ophthalmology.*

Morgan, I.G., Rose, K.A., In Myopia – Clinical Analysis to Animal Models (Eds. Beuerman R., Saw, S.M., Tan D, Wong T.T.) *Gene-environment interactions in the etiology of myopia.* World Scientific Press, Singapore.

Nagai, Y., Maddess, T., Taylor, R.L.R. Discrimination of complex form by simple oscillator networks. *Network: Computation in Neural Systems.*

Phillips, M.J., Gibb, G.C., Crimp, E.A., Penny, D. Tinamous and moa flock together: mitochondrial genome sequence analysis reveals independent losses of flight among ratites. *Systematic biology.*

Querubin, A.,Hie Rin Lee, Provis, Jan M., Bumsted O'Brien, K.M., Photoreceptor and ganglion cell topographies correlate with information convergence and high acuity regions in the adult pigeon (*Columba livia*) retina. *Journal of Comparative Neurology.*

Sanderson, C.E., Belov., K., Deakin, J.E. Physical mapping of immune genes in the tammar wallaby (*Macropus eugenii*). *Cyt and Genome Res.*

Siebke, K., Ball, M.C. Non-destructive measurement of chlorophyll b to a ratios and identification of photosynthetic pathways in grasses by reflectance spectroscopy. *Functional Plant Biology.*

Tan, J. K.H. and O'Neill, H.C. Investigation of murine spleen as a niche for hematopoiesis. *Transplantation.*

Valter, K., Kirk, D. K., and Stone, J. Optimising the structure and function of the adult P23H-3 retina by light management in the juvenile and adult. *Experimental Eye Research.*

Editing: Kiaran Kirk, Diane Whitehead & Sharyn Wragg. Design & layout: Sharyn Wragg. Banner image: The succulent *Kalanchoe daigremontiana*, by Jeff Wilson.