

COLLABORATIONS

Central Nervous System Stability and Degeneration

Collaborations with Australian Universities

Provis J and Natoli R with Dr M Madigan, Save Sight Institute, University of Sydney. FGFR siRNA in primary cultures of primate cone photoreceptors.

Stone J and Valter K with Ms D van Driel, Save Sight Institute, University of Sydney. Distribution of mitochondria in mammalian retina.

Stone J and Valter K with Dr N Barnett, University of Queensland. Electrophysiological changes in the degenerative and ageing retina.

Stone J and Valter K with Prof. D-Y Yu, Lions Eye Institute, Perth. Oxygen levels in the degenerative P23H rat retina.

Marotte LR and Flett DL with Dr CA Leamey, University of Sydney. Development of thalamocortical synapses in the somatosensory cortex of the wallaby.

Marotte LR with Dr CA Leamey, University of Sydney. Genes regulating cortical collicular development in the wallaby.

Marotte LR with Prof. P Waite, University of NSW. Development of somatosensory system in the wallaby.

Collaborations with Other Institutions

Provis J with Prof. AE Hendrickson, University of Washington, USA. Mechanisms of primate foveal development.

Stone J and Valter K with Prof. S Bisti, at Università degli Studi Dell'Aquila, L'Aquila, Italy. Mechanisms of retinal neuroprotection.

Stone J and Valter K with Prof. LS Cervetto, at Università di Pisa, Italy. Mechanisms of retinal neuroprotection.

Stone J and Valter K with Prof. J Eells, at University of Wisconsin in Milwaukee, USA. Mechanisms of Near Infrared Light on retinal neuroprotection.

Comparative Genomics

Collaborations within ANU

Graves JAM with Prof. S Easteal, JCSMR. Bioinformatics of kangaroo genome sequence.

Graves JAM with Prof. S Wilson, JCSMR. Bioinformatics of kangaroo genome sequence.

Graves JAM and Gruetzner F with Dr D Rowell, BoZo. Translocation heterozygosity and meiotic chain formation in the platypus.

Graves JAM and Gruetzner F with Dr D Tremethick, JCSMR. Chromatin modification and X chromosome inactivation in meiosis.

Collaboration with Australian Universities

Graves JAM with Prof. DW Cooper, Macquarie University. ARC Centre for Kangaroo Genomics (CI and head of gene mapping node).

Graves JAM with Dr K Nicholas, Melbourne University. ARC Centre for Kangaroo Genomics (construction and use of EST libraries of tammar wallaby, mapping of milk genes in tammar).

Graves JAM with Prof. MB Renfree, Department of Zoology, Melbourne University. ARC Centre for Kangaroo Genomics (CI and head of function node).

Graves JAM with Dr K Zenger, University of Sydney. ARC Centre for Kangaroo Genomics (integration

of genetic and physical maps of the tammar wallaby).

Graves JAM with Dr A Ruvinsky, University of New England, Armidale. Co-editors on 'Mammalian Genomics' book.

Graves JAM and Ezaz T with Dr A Georges and Dr S Sarre, University of Canberra. Sex determination in dragon lizards.

Collaboration with other Institutions

Graves JAM and Deakin J with Dr K Belov, Australian Museum. Immunoglobulins and the major histocompatibility locus of marsupials and monotremes.

Graves JAM and Deakin J with Dr S Beck, Sanger Centre, Cambridge UK. Characterization of the major histocompatibility locus of the tammar wallaby.

Graves JAM and Deakin J with Dr R Miller, New Mexico, and the opossum MHC Consortium. Characterization of the major histocompatibility locus of the opossum.

Graves JAM, Koina E and Deakin J with Dr M Ross, Sanger Centre, Cambridge UK. Sequencing genes on the tammar X chromosome.

Graves JAM, Rapkins R and Hore T with Dr R Nicholls, Pittsburgh, USA. Evolution of the Prader Willi-Angelman Syndrome imprinted domain.

Graves JAM, Fong J, Wallis M, Patel V and Koina E with Prof. T Speed, WEHI. ARC Centre for Kangaroo Genomics (PI and head of bioinformatics node). Annotation and phylogenetic footprinting of genes cloned from the tammar wallaby.

Graves JAM with Dr A Sinclair, Royal Children's Hospital, Melbourne. Sex determination in vertebrates (co-authors of forthcoming book).

Graves JAM with Dr T Ashley, Yale, New Haven Connecticut, USA. Meiosis in marsupials and monotremes.

Graves JAM with Dr D Carvalho, Sanger Centre, Cambridge, UK. Genes on the Y chromosome in American marsupials.

Graves JAM with Prof. S Edwards, Harvard, Boston, USA. Sex chromosomes in birds and reptiles.

Graves JAM with Dr W Just, Ulm, Germany. Sex chromosomes in *Ellobius*, a species with no Y chromosome.

Graves JAM with Dr SJ O'Brien, National Cancer Institute, Frederick, USA. Comparative genetics and genomics.

Graves JAM with Dr RJW O'Neill, Connecticut, USA. Genome instability in marsupial species hybrids.

Graves JAM with Dr W Reik and Dr A Ferguson-Smith, Cambridge, UK. Genomic imprinting in marsupials.

Graves JAM with Dr P Waters, Stellenbosch, South Africa. Comparative painting and gene mapping of chromosomes of the Afrotheria.

Graves JAM and Delbridge M with Dr H Hameister, Ulm, Germany. Evolution of the mammal X chromosome.

Graves JAM and Gruetzner F with Dr MA Ferguson-Smith and Dr W Rens, Cambridge, UK. Comparative chromosome painting, evolution of marsupial and monotreme chromosomes.

Graves JAM and Koina E with Dr C Disteche, Seattle, USA. X chromosome inactivation in mouse and marsupials.

Graves JAM and Miethke P with Dr P Samollow, Southwestern University, Texas, USA. Gene mapping in the American marsupial *Monodelphis domestica*.

Graves JAM with Prof. W Warren,

Washington University School of Medicine, St. Louis, MO, USA. The construction of a physical map of the platypus.

Environmental Biology

Collaborations within ANU

Edwards EJ and Evans JR with Dr B Loveys, Ecosystem Dynamics Group. The influence of elevated CO₂ and nutrient regime on leaf temperature in a C₃-C₄ plant community.

Edwards EJ with Dr B Loveys and Ball M, Ecosystem Dynamics Group. The effect of nocturnal warming on plant carbon gain.

Edwards EJ and Evans JR with Bruhn D and Ball M, Ecosystem Dynamics Group. Temperature influence on plant respiration in the field.

Edwards EJ with Ball M and Bruhn D, Ecosystem Dynamics Group. Temperature control of plant metabolism.

Farquhar GD, Zhou YP and Stuart-Williams H with Prof. J Chappell, Research School of Earth Sciences. Examination of environmental influences of tree-ring isotopic composition – oxygen, carbon and hydrogen isotopes.

Hobbins MT and Farquhar GD with Roderick M, Ecosystems Dynamics Group, RSBS-ANU. Local-scale Pan Evaporation Physics and Long-Term, Large-Scale Evaporative Demand Trends.

Collaborations with Australian Universities

Cernusak L and Farquhar GD with Prof. JS Pate and DJ Arthur, University of Western Australia. Studies of isotope dynamics in lupins and eucalypts.

Cuntz M with V Haverd, University of Wollongong. Incorporating water and carbon isotopes in an ecosystem model.

Edwards EJ and Evans JR with Dr R Gleadow, Monash University, Effects of CO₂ and phosphorus on

cyanoglucoside production in clover.

Evans JR with Dr R Gleadow and Dr P Heraud, Monash University, IR spectroscopy of leaf tissue.

Evans JR with Prof. W Stock, Edith Cowan University, Perth. Nitrogen discrimination during plant growth.

Farquhar GD, Roderick M and Cuntz M with Prof. G Paltridge, University of Tasmania and Eugénie Crémer Ecole Normale Supérieure, France. Maximum Entropy Production and the Earth's Climate.

Farquhar GD and Wong SC with Dr C Lambrides, School of Land and Food Sciences, University of Queensland. Stable isotopes and water-use efficiency in sunflowers.

Masle J, Farquhar GD with Dr I Godwin and Dr C Lambrides, School of Land and Food Sciences, University of Queensland. Improving drought tolerance in canola.

Stuart-Williams H, Zhou Y-P and Farquhar GD with Dr K Grice, Curtin University of Technology. Examining the carbon and hydrogen isotopic composition of plant lipids, with a view to understanding better how the composition reflects environmental change.

Stuart-Williams H with Arafura-Timor Research Facility. Consultation on selection, installation and running of a stable isotope analysis facility.

Collaborations with other Institutions

Buckley TN with Prof. KA Mott, Utah State University and Prof. Steve Long, University of Illinois. Unifying Mechanistic and Dynamic Mathematical Models of Stomatal Behaviour and Photosynthesis.

Buckley TN with Prof. DW Roberts, Montana State University and Dr Niklaus Zimmermann, ETH Zürich. Modelling subalpine forest communities in a heterogeneous landscape in Wyoming, USA.

Buckley TN with Prof. DW Roberts, Montana State University.

Optimality-based analysis of tree allometry, sustainability of carbon gain, and limits to height growth.

Buckley TN with Dr A Cescatti, CEA, Trento, Italy. Testing model of optimal leaf and canopy nitrogen distributions.

Cuntz M with Dr P Ciais, Dr G Hoffmann, LSCE, CNRS/CEA-Saclay, Gif-sur-Yvette, France, Dr P Peylin, BioMCO, CNRS/INRA/UPMC, Grignon, France, Dr RJ Francey, Dr CE Allison, DAR, CSIRO, Melbourne, Dr PP Tans, CMDL, NOAA, Boulder, Colorado, Prof. JWC White, INSTAAR, University of Colorado. Using stable isotopes of atmospheric CO₂ to partition assimilation and respiration on continental scale.

Cuntz M with Dr G Hoffmann, Dr P Ciais, Dr P Friedlingstein, Prof. J Jouzel, LSCE, CNRS/CEA-Saclay, Gif-sur-Yvette, France, Dr C Weber, Dr E Maier-Reimer, K Six, MPI Meteorology, Hamburg, Germany, Prof. M Heimann M, MPI Biogeochemistry, Jena, Germany, Dr J Kaduk, University of Leicester. What drives the Dole effect? A paleo study on the link between marine sediment and Antarctic ice core records during the Pleistocene.

Cuntz M and Farquhar GD with Dr J Ogée, Ephyse, INRA, Bordeaux, Cestas, France, Dr P Peylin, Dr T Bariac, BioMCO, CNRS/INRA/UPMC, Grignon, France, Dr P Ciais, LSCE, CNRS/CEA-Saclay, Gif-sur-Yvette, France. Non-steady-state leaf water stable isotope enrichment; developing a unified model of the stable isotope enrichment of leaf water.

Cuntz M with Dr WJ Riley, LBL, Berkeley, California. Describing the stable isotopic composition of soil CO₂ and soil CO₂ efflux.

Cuntz M with Dr K Sturm, ANSTO. Improvement of mesoscale model of water isotopes.

Edwards EJ and Evans JR with Dr A Volder and Dr R Gifford, CSIRO Plant Industry Canberra. CRC GA Collaboration. The effect of warming, elevated CO₂ and cutting frequency

on soil and ecosystem respiration.

Evans JR with Dr H Poorter, Utrecht University, The Netherlands. Payback time of leaves with respect to their light environment.

Evans JR with Prof. T Vogelmann, University of Vermont, USA. Light absorption and CO₂ fixation profiles through leaves.

Farquhar GD with Dr MM Barbour and Dr A Walcroft, Landcare Research, New Zealand. Isotope discrimination in tree rings.

Farquhar GD with Dr MM Barbour, Landcare Research, New Zealand, Prof. J Ehleringer, Utah, and Dr JS Roden, Southern Oregon University. Stable isotopes of oxygen in water and organic matter of trees.

Farquhar GD, with Dr J Ghashgaie and Dr G Tcherkez, Univ. Paris-XI. Intra-molecular distribution of carbon isotopes.

Farquhar GD with Dr P Franks, James Cook University and Dr R Hill, University of Adelaide. Physiology of different stomatal structures. Relationships between stomatal structure and the regulation of leaf gas exchange to help accurately translate morphology of fossil and living leaves.

Farquhar GD and Keitel C with Dr MM Barbour, Maanaki Whenua – Landcare Research, New Zealand. Linking isotope composition of phloem sap to leaf and soil respired CO₂.

Farquhar GD and Keitel C with Dr A Gessler INRA, Centre de Recherche de Nancy, France. Carbon and oxygen isotopes in the phloem sap of trees.

Farquhar GD, Wong SC, Buckley TN with Prof. T Givnish, University of Wisconsin. Integrative Plant Technology: What determines optimal stomatal conductance and allocation to leaves vs roots, and what physiological and allocational factors determine maximum tree height.

Farquhar GD with Dr ML Roderick,

CRC for Greenhouse Accounting. Pan evaporation rate and diffuse light.

Farquhar GD, Stuart-Williams H, Keitel C, Cuntz M with Prof. A Henderson-Sellers, Dr D Stone, J Twining, Dr A Williams, Dr P Airey, ANSTO; Dr K McGuffie, University of Technology Sydney; Prof. D Griffith, University of Wollongong, Prof. M Adams, University of Western Australia; Dr R Leunig, Dr A Herczeg, Dr H Keith and Dr F Leaney, CSIRO Land and Water. Oxygen isotope composition of different water pools in the terrestrial environment.

Farquhar GD and Dr G Tcherkez, Univ. Paris-XI. Carbon isotopes and metabolism.

Farquhar GD and Wong SC with Dr JWH Yong, National Institute of Education Nanyang Technological University, Singapore. Cytokinin physiology.

Farquhar GD and Wong SC with Dr R Richards, Dr A Condon, Dr G Rebetzke, CSIRO Plant Industry. Isotope discrimination and wheat performance.

Farquhar GD and Wong SC with Prof. JE Ong and Dr WK Gong, Centre for Marine and Coastal Studies, University Sains Malaysia. Carbon and oxygen isotope discrimination of tropical mangrove communities.

Farquhar GD, Stuart-Williams HLeQ, Keitel C, Cuntz M with Dr D Yakir, Weizmann Institute, Israel, Dr G Hoffman, LSCE, CNRS/CEA-Saclay, Prof. L. Flanagan and Prof. T. Dawson, UC Berkeley, Prof. N. Buchman, ETH Lausanne, and Dr P Aggarawal. International Atomic Energy Agency (IAEA): Cooperative Research Project: IAEA Coordinated Network: ¹⁸O in the Terrestrial Environment.

Gilmore SR with Dr P McCarthy, Australian Biological Resource Study. Treatment of Rhizogoniaceae (Musi) for Flora of Australia.

Hobbins MT with Dr J A Ramirez, Colorado State University, Fort Collins, Colorado, USA. Large-scale, Long-term Trends in and Dynamics of Evaporative Demand across the

Conterminous United States and Australia.

Hobbins MT with Dr TC Brown, United States Forest Service Rocky Mountain Research Station, Fort Collins, Colorado, USA. Water Yields in the Conterminous United States under Climate Change.

Jost, R, Berkowitz O and Masle J with Dr MR Hajirezaei, Institutue for Plant Genetics and Crop Plant Research (IPK) Gatersleben Germany. Role of carbon metabolism genes in drought tolerance.

Keitel C and Farquhar GD with Dr A Gessler, INRA, Centre de Recherche de Nancy, France. Post photosynthetic carbon and oxygen isotope fractionation during the diurnal course and basipetal assimilate transport.

Kirschbaum MUF with Dr RM Gifford and Dr LB Guo, CSIRO Plant Industry. Study of soil carbon and nitrogen changes after deforestation of a mulga stand.

Kirschbaum MUF with Dr H Keith, Dr HA Cleugh, Dr R Leuning, CSIRO Land and Water. Detailed study of net ecosystem carbon exchange of a temperate eucalypt forest.

Kirschbaum MUF with Dr RC Dalal, Dr NC Mathers, Dr B Harms, Queensland Department of Natural Resources and Mines, Brisbane. Study of soil carbon and nitrogen changes after deforestation of a mulga stand.

Kirschbaum MUF with Dr B Schlamadinger, Joanneum Research Institute, Graz, Austria and others. Study of options for including biospheric carbon-management activities in a post-2012 international climate agreement.

Kirschbaum MUF with Dr AL Cowie, Forests New South Wales and others. Developing biospheric carbon-accounting options for a post 2012 commitment period under the Kyoto Protocol.

Kirschbaum MUF with Dr J Canadell, Global Carbon Project and others. Developing options for factoring out

human causes of biospheric carbon-stock changes for carbon accounting.

Kirschbaum MUF with Dr G Simioni, Forest Products Commission, Perth. Study of pine-forest growth in Western Australia.

Kriedemann P with I Goodwin, Senior Irrigation Scientist, Dept Primary Industries, Tatura Victoria. Regulated deficit irrigation and partial root zone drying in grape vines.

Masle J, Matthews P, Jost R and Berkowitz O with CIMMYT Mexico. Drought tolerance in wheat.

Masle J with Dr Upadhyaya and Dr P Ryan, CSIRO and Dr M Udvardi, Max Plank Institute for Molecular Plant Physiology, Germany. The molecular physiology of ammonium transport in rice.

Stuart-Williams H and P Brooks, Stable Isotope Laboratory, University of California, Berkeley. Oxygen isotope analysis by pyrolysis.

Ecosystem Dynamics

Collaborations within ANU

Ball MC and Siebke K with A Leigh and Dr AB Nicotra, Division of Botany and Zoology. Evolution of leaf shape.

Ball MC and Siebke K with S Prakash and Prof. T Caelli, NICTA and Research School of Information Sciences and Engineering. Development of infra-red thermal imaging techniques for assessment of leaf temperatures in plant canopies.

Barnes B with Dr D Gordon, School of Botany and Zoology. Coliform dynamics.

Barnes B and Roderick ML with Mr K Mokany, School of Botany and Zoology. Application of theoretical model to plant partitioning.

Davies ID with Dr C Broughton, School of Information Science and Technology. Supervision of an undergraduate project on Ecological simulation on distributed systems.

Davies ID with Dr G Cary, School of

Resources, Environment and Society. Fire model inter-comparison study.

Roxburgh SH with Dr BG Mackey, School of Resources, Environment and Society. Landscape-scale modelling of forest composition, fire regimes and carbon dynamics within Australian ecosystems.

Roxburgh SH with Mr K Mokany and Dr J Ash, Department of Botany and Zoology. The interaction between plant biodiversity and ecosystem processes.

Collaborations with Australian Universities

Ball MC with Dr B Atwell, Macquarie University. Effects of elevated CO₂ on hydraulic architecture of eucalypt seedlings.

Ball MC and Canny MJ with Prof. J Wolfe, University of New South Wales. Biophysics of freezing injury in evergreen tree seedlings.

Ball MC and Siebke K with Dr P Ralph, University of Technology, Prof. AWD Larkum, University of Sydney, and Prof. J Wolfe, University of New South Wales. Heat stress induced photo-bleaching in corals.

Ball MC with Dr CE Lovelock, University of Queensland. Effects of nutrients on structure and function of mangrove forests.

Barnes B with Dr H Sidhu, School of Physical, Environmental and Mathematical Sciences, University of NSW. Dynamical systems theory.

Roderick ML with Mr S Schymanski and Prof. M Sivapalan, Centre for Water Research, University of Western Australia. Optimality in the soil-vegetation-atmosphere system.

Collaborations with other Institutions

Ball MC, Bruhn D and Martin K with Dr CE Lovelock, University of Queensland, and Dr IC Feller, Smithsonian Institution, USA. Interactive effects of salinity and nutrients: linking physiological processes with patterns in mangrove

forest structure.

Ball MC with S Stuart, Dr B Choat and Prof. NM Holbrook, Harvard University, USA. Effects of salinity on freeze-induced embolism in mangroves.

Bruhn D with Dr OK Atkin, The University of York, UK. The component of the daily temperature regime to which plant respiration acclimates.

Bruhn D with Drs K Pilegaard, TN Mikkelsen, and A Ibrom, Risø National Laboratory, Denmark. Estimating ecosystem daytime respiration from eddy-flux data.

Davies ID with Drs GF Midgley and W Thuiller, National Botanical Institute Cape Town, South Africa. Long-term movement of Fynbos and succulent Karoo biomes of Southern Africa.

Davies ID with Drs GF Midgley, W Thuiller and Lee Hannah, Public Interest in Energy Research, USA. Effects of climate and land use change on the biota of California.

Davies ID with Dr S Lavorel, Centre d'Ecologie Fonctionnelle et Evolutive, CNRS, France. Vulnerability of Ecosystem Services to Land Use Change in Traditional Agricultural Landscapes (European VISTA project).

Davies ID with Drs J Gignoux and D Hill, École Normale Supérieure, Ecologie, and Institut Supérieur d'Informatique, de Modélisation et de leurs Applications, France. General spatialised ecological simulator.

Roderick ML and Farquhar GD with Dr L Rotstayn, CSIRO Marine and Atmospheric Research. Water availability & climate change.

Roderick ML and Hume I with Dr T McVicar, CSIRO Land and Water. Estimating pasture productivity using satellite imagery.

Roxburgh SH with Dr P Chesson, University of Arizona, Tucson, USA. Competition and coexistence in an Australian understorey forest community.

Schortemeyer M with Dr S

Schmidt, University of Queensland. Leaf nitrogen-photosynthesis relationships of woody vegetation along a rainfall gradient in Northern Australia.

Genomic Interactions

Collaborations with Australian Universities

Rolfe BG and Imin N with Prof. R J Rose, University of Newcastle. Molecular analysis of somatic embryogenesis.

Rolfe BG and Imin N with Dr BJ Carroll, University of Queensland. Investigation of function of Dem (defective embryo and meristems) proteins in *Medicago truncatula* and Tomato.

Djordjevic MA with Prof. P Gresshoff, University of Queensland. Analysis of sap from soybeans with aberrant root/shoot signalling controlling nodule meristem proliferation.

Djordjevic MA with Dr C Beveridge, University of Queensland. Analysis of sap from pea plants with aberrant root/shoot signalling controlling the proliferation of lateral shoot branching.

Djordjevic MA with Prof. C Parish and Prof. P Gresshoff, University of Queensland. Screening of biologically active molecules in angiogenesis.

Djordjevic MA Oakes M and Zhang K with Dr P Milburn, John Curtin School of Medical Research ANU. Fractionation of proteins and peptides from legume tissues.

Djordjevic MA with Dr S Djordjevic, Elizabeth McArthur Agricultural Institute and Dr S Cordwell, Australian Proteome Analysis Facility, Macquarie University. Proteomic analysis of cell surface proteins in *Mycoplasma*.

Van Noorden GE, Mathesius U, Rolfe BG with Prof. JJ Reid and Dr J Ross, University of Tasmania. Analysis of auxin in *Medicago truncatula* during nodulation.

Weiller GF and Wen J with Dr K

Nolan and Prof. RJ Rose, University of Newcastle. Analysis of the SERK1 gene sequence in *Medicago truncatula*.

Weiller GF and Goffard N with Prof. P Bhalla and Dr F Haerizadeh, University of Melbourne. Visualization of gene expression in *Glycine max*.

Weiller GF, Goffard N, Djordjevic MA with Prof. P Bhalla and Prof. M Singh, University of Melbourne. Comparative analysis of *Glycine max* gene expression using transcriptomics and proteomics.

Weiller GF, Goffard N with Prof. P Gresshoff and Dr M Kinkema, University of Queensland. Comparative analysis of *Lotus japonica* gene expression using transcriptomics and proteomics.

Collaborations with Other Institutions

Naora H with Prof. K Sorimachi, Dokkyo University, Medical School, Japan. Studies on *nbl* expression in surgically removed cancer tissues.

Rolfe BG and Chen H-C with Prof. W Dietz Bauer, Horticulture and Crop Science Ohio, USA. Quorum sensing mechanisms in *Sinorhizobium meliloti*

Rolfe BG, Holmes P and Djordjevic MA with Dr E Kondorosi and Prof. A Kondorosi, CNRS, Gif sur Yvette, France. Proteome analysis of developing nodule tissue in *Medicago*.

Rolfe BG Van Noorden GE and Mathesius U with Dr J Frugoli, Clemson University, USA, and Prof. D Cook, UCLA Davis, USA. The characterisation of a supernodulation mutant of the legume *Medicago truncatula*.

Rolfe BG and Mathesius U with Prof. W Dietz Bauer and Dr M Teplitski, Ohio State University, USA. Plant detection of quorum sensing compounds.

Weiller GF with Prof. M Udvardi, Max Planck Institute, Golm, Germany. Analysis of the expression of micro

RNAs and their target genes in *Medicago truncatula*.

Weiller GF with Prof. M Crespi M, CNRS, Gif sur Yvette France. Analysis of non-coding RNAs in *Medicago truncatula*.

Imin N and Rolfe BG with Dr M Udvardi, Max Planke Institute, Golm, Germany. Global analysis of transcription factors present during somatic embryogenesis of *Medicago truncatula*.

Buer CS and Djordjevic MA with Dr G Muday, Wake Forest University, Winston-Salem, NC, USA. Flavonoid effects on plant morphology.

Molecular Genetics and Evolution

Collaborations within ANU

Ball EE and Hayward DC with Dr J W Trueman, Botany and Zoology, Phylogenetics of developmentally important genes in insects.

Campbell HD with Dr KI Matthaei, JCSMR. Mouse gene targeting and transgenesis.

Campbell HD with Prof. IG Young, JCSMR. Human and mouse homologues of invertebrate genes.

Campbell HD with Dr CA Behm, School of Biochemistry and Molecular Biology, The Faculties. Molecular biology of *Caenorhabditis elegans* homologues of mammalian genes.

Campbell HD with Dr L Tierney, JCSMR. Ion channels.

Grasso LC, Hayward DC, Saint RB, and Ball EE with Mr J Maindonald and Mr P Maxwell (CBIS) EST and microarray studies on the development of the coral, *Acropora millepora*.

Saint RB with Prof. C Goodnow, JCSMR. Analysis of the *Drosophila* ortholog of the mouse autoimmune gene, roquin.

Collaborations with Australian Universities

Ball EE, Hayward DC, Grasso LC and Saint RB with Dr DJ Miller and associates, Comparative Genomics Centre, James Cook University, Townsville. Molecular control of coral development.

Campbell HD with Dr MF Crouch, TGR BioSciences, Adelaide. Studies on mammalian genes.

Saint RB with Assoc. Prof. RI Richards, School of Molecular and Biomedical Sciences, University of Adelaide. Studies of the *Drosophila* ortholog of the FOR/WWOX proto-oncogene.

Collaborations with Other Institutions

Ball EE and Hayward DC with Patel NH, University of California, Berkeley. Molecular control of grasshopper development.

Ball EE with GM Technau, Johannes Gutenberg University, Germany. Comparative development of glial cells in grasshopper and *Drosophila*.

Ball EE, Hayward DC, Grasso LC and Saint RB with CW Sensen, P Gordon, University of Calgary, U Technau, Sars Center, Bergen, S Rudd University of Turku and TW Holstein TU-Darmstadt, Finland. EST studies in *Acropora* and *Nematostella*.

Campbell HD with Dr A Cowin and Dr B Powell, Child Health Research Institute, North Adelaide and Prof. D Roop, Baylor College of Medicine, Houston, USA. Mammalian wound healing.

Campbell HD with Dr MF Crouch, TGR BioSciences, Adelaide. Studies on mammalian genes.

Campbell HD with Prof. MR Stallcup, Department of Pathology, University of Southern California, USA. Studies on the role of FLII in mammalian cells.

Campbell HD with Dr KI Matthaei, JCSMR and Dr H Scrable, University of Virginia, USA. Regulable mouse

transgenes.

Campbell HD with Prof. DF Becker, University of Nebraska, USA. Proline oxidase.

Clark-Walker GD with Dr A Schnauffer, Seattle Biomedical Research Institute, Seattle, USA. Characterization of a mutation in the gamma γ subunit of F₁-ATPase suppressing ρ^0 - lethality in *Trypanosoma brucei* and *Kluyveromyces lactis*.

Clark-Walker GD with Dr N Bonnefoy, CNRS, Gif-sur-Yvette, France. Investigation of mutations suppressing ρ^0 - lethality due to loss of the mitochondrial genome in *Schizosaccharomyces pombe*.

Hayward DC, Trueman JW and Ball EE with Dr MJ Bastiani, University of Utah and Whiting M, Brigham Young University. Evolution of RXR/USPs in insects.

Molecular Plant Physiology

Collaborations within ANU

Badger MR with Dr B Pogson, School of Biochemistry and Molecular Biology, ANU. The ARC Centre of Excellence in Plant Energy Biology.

Price GD with Dr S Howitt, School of Biochemistry and Molecular Biology, ANU. Targeted mutagenesis of proteins involved in active CO₂ uptake in cyanobacteria.

von Caemmerer S with Dr B Pogson, School of Biochemistry and Molecular Biology, ANU. Characterisation the physiology of *Arabidopsis* mutant alx8 using gas exchange and fluorescence imaging.

Collaborations with Australian Universities

Badger MR and Pogson BJ with Prof. J Whelan, Prof. S Smith, Prof. I Small and Prof. H Millar, University of Western Australia and Prof. DA Day, University of Sydney. The ARC Centre of Excellence in Plant Energy Biology.

Badger MR and Takahashi S with Assoc. Prof. P Ralph, University of Technology, Sydney. High temperature effects on the photoinhibition of photosynthesis in *Symbiodinium* species.

Ghannoum O and von Caemmerer S with Prof. JP Conroy, University of Western Sydney, Hawkesbury. Regulation of photosynthesis by phosphorus in Australian C₃ and C₄ grasses.

Whitney SM with Dr R McLilley, School of Biological Sciences, University of Wollongong. Characterisation of Rubisco in dinoflagellates.

Collaborations with Other Institutions

Price GD with Dr S Singh, CSIRO, Plant Industry and Dr N Verma, School of Biochemistry and Molecular Biology. Targeted changes in lipid composition in cyanobacteria.

Price GD with Dr D Desai, CSIRO-CMIT, Highett, Melbourne. Development of a cyanobacterial bioreactor.

Badger MR and Price GD with Dr TW Lane and Dr A Martino, SANDIA National Laboratories, USA. The structure and function of cyanobacterial carboxysome multi-protein complexes and their role in carbon sequestration in cyanobacteria.

Badger MR and Takahashi S with Prof. H Bauwe, University of Rostock, Germany. Photoinhibition processes in photorespiration mutants of *Arabidopsis thaliana*.

von Caemmerer S with RT Furbank, CSIRO Plant Industry, Canberra and Prof. K Izui and Dr T Furumoto, Kyoto University, Japan. Genetic manipulation of PEP-Carboxylase-Kinase in *Flaveria bidentis*.

von Caemmerer S with RT Furbank and A Condon, CSIRO Plant Industry, Canberra. Study of ear photosynthesis in different durum wheat genotypes.

von Caemmerer S with Dr C Raines, Dr T Lawson, Prof. N Baker and K Oxborough, University of Essex, UK. Response of stomata to light and CO₂ in transgenic tobacco with reduced SBPase activity.

Whitney SM, Kane HJ and Andrews TJ. Full partner laboratory of the European Union Framework 5 consortium undertaking Project MARISCO (Improving arable production systems by expressing marine algal Rubisco in crop plants, Contract No. QLK3-CT-2002-01945)

Whitney SM with Dr I Matsumura and D Greene, Department of Biochemistry, Emory School of Medicine, Georgia, USA. Directed evolution of Rubisco in *Escherichia coli*.

Photobioenergetics

Collaborations within ANU

Chow WS with Dr B Pogson, School of Biochemistry and Molecular Biology. Mechanisms of photoprotection in plants – a genomics and photophysical approach.

Fernandez-Velasco JG with Dr G Burgess and Dr K Lovegrove, Centre for Sustainable Energy Systems, Faculty of Engineering and Information Technology. Techno-economical analysis for the design and operation of a photobioreactor for large-scale hydrogen production by microalgal photosynthesis.

Hendrickson L and Chow WS with Dr B Förster and Dr B Pogson, School of Biochemistry and Molecular Biology. Photoprotection in capsicum.

Wydrzynski T with Dr R Pace, Department of Chemistry, and Prof. E Krausz, Research School of Chemistry. Spectroscopy of purified Photosystem II from higher plants and cyanobacteria.

Collaborations with Australian Universities

Wallace B with Prof. J Reimers, Department of Chemistry, University

of Sydney. Wavepacket propagation using time-sliced semiclassical initial value methods.

Wydrzynski T and Razeghifard R with Dr M Chen and Prof. AWD Larkum, School of Biological Sciences, University of Sydney. Spectroscopic Studies of Photosystem II in Chlorophyll d-Containing *Acaryochloris marina*.

Collaborations with Other Institutions

Anderson JM and Chow WS with Dr L. Hendrickson and Prof. G Öquist, Department of Plant Physiology, Umeå, Sweden. Investigations on light stress in photosynthesis.

Chow WS with Prof. C-H Lee, Department of Molecular Biology, Pusan National University, South Korea. Plant species with differing chilling sensitivities.

Chow WS with Dr H-Y Lee, School of Biological Sciences, Seoul National University, South Korea. Recovery of photosystem II from photoinactivation.

Chow WS with Prof. DJ Shi, Department of Photosynthesis, Institute of Botany, Chinese Academy of Sciences, China. Photosynthesis and growth of *Nostoc flagelliforme*.

Hillier W with Dr A Boussac, Department of Bioenergetics, CEA Saclay, France. Inorganic Ca and Sr mutants of *Thermosynechococcus elongatus*.

Hillier W with Prof. RJ Debus, Department of Biochemistry, University of California at Riverside, USA. Fourier Transform Infra Red measurements on mutants of Photosystem II.

Hillier W with Prof. S Furguson-Miller, Department of Chemistry and Biochemistry, Michigan State University, USA. Catalytic steps in the oxygen reduction mechanism of cytochrome c oxidase.

Hillier W with Dr J Messinger, Max-Planck Institute for Bioinorganic Chemistry, Mulheim, Germany.

Mass spectrometric measurement of oxygen.

Kim EH, Chow WS and Anderson JM with Prof. P Horton, Department of Molecular Biology and Biotechnology, University of Sheffield, England and Prof. S Jansson, Department of Plant Physiology, University of Umeå, Sweden. Structure/function relationship in *Arabidopsis* mutants lacking the main light-harvesting antenna of Photosystem II.

Kim EH, Chow WS and Anderson JM with Prof. P Horton, Department of Molecular Biology and Biotechnology, University of Sheffield, England. Entropy-assisted stacking of photosynthetic membranes.

Razeghifard R and Wydrzynski T with Prof. PL Dutton, Department of Biochemistry and Biophysics, University of Pennsylvania, USA. Design and synthesis of photoactive peptides based on photosynthetic reaction centres.

Wydrzynski T with Dr J Eaton-Rye, Department of Biochemistry, University of Otago, NZ. Analysis of Photosystem II in cyanobacterial mutants.

Wydrzynski T with Prof. GC Dismukes, Department of Chemistry, Princeton University, USA, and Prof. VV Klimov, Institute for Basic Biological Problems, Russian Academy of Sciences. The origin of oxygen on earth – the innovation and evolution of photosynthetic water oxidation.

Plant Cell Biology

Collaborations within ANU

Hardham AR with Dr U Mathesius, School of Biochemistry and Molecular Biology. The role of flavonoids in nodulation and resistance to disease.

Rouse DT with R Peakall, School of Botany and Zoology. Collection of pseudo-copulating orchid species.

Table S and Williamson RE with S Kalyanasundaram, Department

of Engineering. Modelling the mechanical properties of plant cell walls.

Collaborations with Australian Universities

Blackman LM and Collings DA with Assoc. Prof. RL Overall and C Faulkner, University of Sydney. Analysis of GGA proteins in plants.

Blackman LM with C Faulkner and Assoc. Prof. RL Overall, University of Sydney. Identification of plasmodesmata-associated proteins: a proteomics approach.

Blackman LM with Dr JDI Harper, Charles Sturt University, Assoc. Prof. RL Overall and Dr J Marc, University of Sydney. Characterisation of centrin in higher plants.

Blackman LM with E Johnson and Assoc. Prof. RL Overall, University of Sydney, and Dr RG White, Division of Plant Industry, CSIRO. Characterisation of the auxin influx carrier from maize.

Collings DA with Dr G Ash and Dr JDI Harper, Charles Sturt University. Characterisation of the organisation and dynamics of peroxisomes during cell division in *Allium* species and other plants.

Hardham AR and Blackman LM with Dr JDI Harper, Charles Sturt University. Centrin and Hsp90 in the Oomycetes.

Hardham AR and Robold A with Dr P Scott, University of Queensland. Development of ScFv recombinant antibodies directed towards the adhesive protein of *Phytophthora* zoospores.

Hardham AR and Skalamera D with Dr D Maclean, Dr A Drenth and Dr S Basnayake, University of Queensland. Isolation of avirulence and pathogenicity genes from *Phytophthora*.

John PCL with Prof. J Hamill, Monash University. Cell cycle control in the initiation of lateral root primordia.

Jones DA and Lim G with Dr B Carroll,

University of Queensland. Isolation of the tomato I-3 gene for resistance to the wilt pathogen *Fusarium oxysporum* pv. *lycopersici*.

Collaborations with Other Institutions

Collings DA and Rashbrooke MC with Prof. GO Wasteneys, E Kawamura and Dr T Shoji, University of British Columbia, Vancouver, BC, Canada. The microfilament and microtubule cytoskeleton in *Arabidopsis* root growth.

Gunning BES with Govindjee, Department of Plant Biology, University of Illinois, Urbana, USA and Prof. F Koenig, Department of Biology and Biochemistry, University of Bremen, Germany. Writing a book chapter on chloroplast history.

Hardham AR with Dr JDI Harper, Charles Sturt University and Dr K Lehtreck, University of Massachusetts Medical School, Worcester, MA, USA. Striated fibre assembling in the Stramenopiles.

John PCL with Prof. BG Forde, University of Lancaster, Lancaster UK. Hormonal and nutritional effects in the initiation of lateral root primordia.

John PCL with Prof. D Inzé, University of Gent, Belgium. Location and activity of plant cyclin dependent kinases.

John PCL with Prof. TI Baskin, University of Massachusetts, Amherst, USA. Modulation of meristem action by cell cycle transgenes.

Williamson RE with Prof. L Faye, University of Rouen, France. Changes in N-glycosylation in *Arabidopsis* mutants.

Williamson RE, Gebbie L and Howles PA with Dr CP Joshi, Michigan Technical University and Dr T Arioli, Bayer Cropscience. Functioning of CesA in vivo.

Visual Science

Collaborations within ANU

Hemmi JM with Prof. A Cockburn, Faculty of Science, Botany and Zoology. Plumage colouration in fairy wrens.

James AC with Prof. A Snyder, Centre for the Mind, RSPHysSE. Unconscious processes in human cognition.

James AC with Dr H Gardner, Department of Computer Science, FEIT. Neurofeedback and the Mind-Attention Interface.

Maddess T and James A with Dr K Pammer, Department of Psychology. Spatial integration in Visual Distress Syndrome.

Maddess T with Prof. T Lamb and Dr A Cameron, JCSMR. Component analysis of ERG waveforms.

Srinivasan MV, Lamont R and Snowball M with Dr C Brack, School of Resources, Environment and Society. Design and development of *Panotree*: an instrument for remote measurement of tree ranges and girths.

Zeil J and Hemmi JM with Dr P Backwell, Faculty of Science, Botany and Zoology. The meaning of colour in fiddler crabs.

Zeil J and Hemmi JM with Dr P Backwell, Faculty of Science, Botany and Zoology. Movement based signals in fiddler crabs.

Collaborations with Australian Universities

Hemmi JM with Dr A Griffin, Department of Psychology, Macquarie University. Image recognition in the tammar wallaby.

Ibbotson MR with Dr C Clifford, University of Sydney. Modelling cortical function.

Ibbotson MR with Prof. B Dreher, Dept of Anatomy and Histology, University of Sydney. Recording from various areas in the cat visual cortex.

Maddess T with Dr I Goldberg, University of New South Wales. A twelve year retrospective study of the use of contrast thresholds of spatial frequency doubling stimuli to predict glaucomatous.

Maddess T and Morgan I with Dr K Rose, University of Sydney. Axial length and corneal radius in the development of myopia.

Maleszka R with Dr B Oldroyd, University of Sydney. The genetics of social regulation of reproduction in honey bees

Morgan IG with Dr M Boelen, La Trobe University, Bendigo. The role of dopamine in the function of the retinal dark-light switch and the control of eye growth.

Morgan IG with Prof. N McBrien, University of Melbourne, Development of refractive errors in abnormal light-dark cycles.

Morgan IG with Dr K Rose. Prevalence of myopia in rural and urban areas of Vietnam.

Morgan IG with Dr K Rose and Prof. Paul Mitchell, University of Sydney. Sydney Myopia Study.

Morgan IG with Dr K Rose and Prof. Paul Mitchell, University of Sydney. Effects of mobile phone use on vision, eye health and hearing in older Australians.

Srinivasan MV with Prof. R Jarvis, Monash University, Dr R Kotagiri, University of Melbourne, and Dr S Venkatesh, Curtin University of Technology. Centre for Perceptive and Intelligent machines in Complex Environments.

Srinivasan MV with Prof. S Venkatesh, Prof. GA West, Dr T Tan and Dr MM Lazarescu, Curtin University of Technology. Surveillance systems for the transport industry. ARC Linkage Project.

Zeil J and Ball M, Ecosystem Dynamics with Assoc. Prof. J Marshall and others, University of Queensland. Prawns in Space (ARC Linkage Project).

Zeil J and Hemmi JM with Assoc. Prof. J Marshall, Dr S Kleinlogel and Dr M Vorobiev, University of Queensland. Spectral sensitivities of fiddler crab photoreceptors.

Zeil J with Dr M Vorobyev, University of Queensland. Spatial statistics of hyperspectral images.

Collaborations with Other Institutions

Barron A with Prof. A Mercer, University of Otago, NZ. Visualising neuromodulator receptor distributions in the honey bee brain.

Barron A with Prof. GE Robinson, University of Illinois, USA. Neuromodulation of reward directed behaviour.

Hemmi JM with Dr A Griffin, Department of Biology, McGill University, Montreal, Canada. Image recognition in the tammar wallaby.

Ibbotson MR with Dr M Mustari, Yerkes National Primate Centre, Emory University, Atlanta, USA. Motion processing in the awake behaving primate visual system.

James AC and Maddess T with Seeing Machines, Canberra. Application of multifocal pupillography in medical diagnostics.

James AC with Dr S Vanni, Brain Research Institute, Helsinki University of Technology, Finland. Multifocal fMRI mapping of human visual cortical areas.

Maddess T with Prof. I Hanazaki, Tokyo Denki University and Dr K Oura of Kokushikan University, Tokyo Japan. Hierarchical decomposition of infrared brain topography data.

Maddess T with Prof. Y Nagai and Prof. T Shimzu, Kokushikan University, Tokyo Japan. Binary and ternary textures containing higher order spatial correlations.

Maleszka R. with Prof. G Robinson, College of Medicine, University of Illinois at Urbana-Champaign, USA. The role of methylation in gene expression in the honey bee.

Morgan IG with Dr S-M Saw, Singapore Research Institute. The role of educational pressures and school structures in the development of myopia.

Morgan IG with Prof. D Tan and Dr W-H Chua. A randomised clinical trial of a preventative treatment for myopia based on imposed myopic defocus.

Srinivasan MV with Dr T Labhart, University of Zürich, Switzerland. Investigation of mechanisms of polarised-light navigation in the honeybee.

Srinivasan MV with Dr M Dacke, University of Lund, Sweden. Investigation of cognitive processes in honeybees.

Walcott B with Dr LC Moore and P Brink, Department of Physiology and Biophysics, Stony Brook University, Stony Brook, NY, USA. Water transport in the lacrimal gland.

Zeil J with Dr N Boedekker and Prof. M Egelhaaf, University of Bielefeld, Germany. Reconstruction of natural optic flow.

Zeil J with Prof. D Stavenga, University of Groningen, Netherlands. Optics of fiddler crab eyes.

Zeil J with Prof. J Zanker, Royal Holloway, England. Motion vision ecology.

Zeil J and Maleszka R with Prof. S Deeb, University of Washington, USA. The visual pigment genes of fiddler crabs.

Zhang SW and Srinivasan MV with Professor Dr J. Tautz at the Biozentrum of the Universitaet Wuerzburg, Germany. How do honeybees modulate their preference for a visual pattern with the time of day as well as the task at hand?

Zhang SW, Wang SP and Srinivasan MV with Professor K. Sato at the Tokyo Medical and Dental University, Tokyo, Japan. Optical Imaging experiments on the honeybee.

Zhang SW and Srinivasan MV with Prof. W Ribi, University of

Liechtenstein. Neuroanatomy of learning and memory in the honeybee.

Electron Microscopy Unit

Collaborations within ANU

Brink FJ, Visiting Fellow at Research School of Chemistry. Oxygen and fluorine ordering in metal oxy-fluorides, with Prof. R Withers.

Collaborations with Australian Universities

ANUEMU facilities are used by visitors to many departments of the ANU. In addition, they were used by staff and research students from Canberra Institute of Technology, Charles Sturt University, ADFA, James Cook University, University of Western Sydney, and the University of Melbourne.

Collaborations with Other Institutions

Brink FJ with Assoc. Prof. Saeed Asgary, Assoc. Prof. M Parirokh and Assoc. Prof. J Eghbal, Endodontic Department, Dental School, Shahid Beheshti University of Medical Sciences, Tehran, Iran and Kerman University of Medical Sciences, Kerman, Iran. EDXA analysis of dental materials.

Brink FJ with Assoc. Prof. Masoumeh S. Sadr Lahijani, Rafsanjan Dental School, Rafsanjan, Iran. SEM analysis of effects of antibacterial agents after root canal treatment.

Brink FJ with S Cordier and M Poulain, Institute de Chimie de Rennes, Université de Rennes, France. Oxygen and fluorine ordering in niobium oxyfluorides.

Stowe S with Prof. Nicholas Strausfeld, University of Arizona, USA and Dr David Rowell, School of Botany and Zoology. Onychorphan neuroanatomy and phylogeny.

Stowe S with Prof. D Stavenga, University of Groningen, Netherlands. Optically active microstructure of

lepidopteran cuticle.

Apart from the many visitors to other ANU departments who used the EMU facilities, they were used by Rebekah Ward, Cornell University, USA (freeze-substitution and cold stage SEM of *Epulopiscum*, an extremely large bacterium from Great Barrier Reef surgeonfish) and work was performed for Prof. Paul Callaghan and Dr Penny Hubbard, Victoria University of Wellington, New Zealand (freeze-fracture of surfactants).