Australia & New Zealand

http://www.arabidopsis.org/portals/masc/countries/Australia.jsp
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Australia has a strong tradition in plant scientific research with most institutions across all states having some research involving Arabidopsis as a model system. Major areas of Arabidopsis research and functional genomics are Canberra, Melbourne and Perth. Funding for Arabidopsis in New Zealand is principally available through the Royal Society of New Zealand's Marsden Fund and the New Zealand Foundation for Research, Science and Technology. In addition to the projects being conducted at the universities, research programs are carried out at the Government-owned Crown Research Institutes, including Horticulture and Food Research Institute of New Zealand (HortResearch), and the New Zealand Institute for Crop & Food Research Limited (Crop & Food Research).

Key new developments during 2007 were:

Plant Phenomics (www.plantphenomics.org.au) Funding for the $50M Australian Plant Phenomics Facility (APPF) has now been secured. The APPF will be based across two nodes located at CSIRO / ANU in Canberra and UA at the WAITE campus in Adelaide. Construction of both APPF facilities will begin in May 2008 with full commissioning of stage one of the Arabidopsis screening module at the High Resolution Plant Phenomics Centre in Canberra (medium throughput growth and chlorophyll fluorescence screening with mathematical morphological analysis and phenomic database capability) occurring at the end of 2008. Throughput will increase with time until the full HTP Arabidopsis module is completed in Canberra at the end of 2009, by which time The Plant Accelerator automated glasshouse facility in Adelaide will also be commissioned. The NCRIS funded National Facility will be available to researchers at the marginal cost of running the facility and several international collaborations are being established and encouraged. For more info contact Bob Furbank (Robert.Furbank@csiro.au) or Mark Tester (mark.tester@acpfg.com.au).

SUBA (a SUBcellular location database for Arabidopsis proteins) brings together data from chimeric fluorescent fusion protein studies and mass spectrometry surveys of subcellular compartments with protein localisation information obtained from other literature references and bioinformatic prediction tools. The localisation data in SUBA encompasses 10 distinct subcellular locations, over 8000 non-redundant proteins and represents the proteins encoded in the transcripts responsible for over 50% of Arabidopsis ESTs. The SUBA database provides a powerful means by which to assess protein subcellularlocalisation in Arabidopsis (http://www.suba.bcs.uwa.edu.au)

Anno-J: Interactive web-based genome browsing in Arabidopsis for large datasets in functional genomics by Julian Tonti-Filippini and A. Harvey Millar (hmillar@cyllene.uwa.edu.au), The University of Western Australia. The rapid growth of new types of genome-aligned data at the DNA, RNA and protein levels requires a renaissance in web-based genome annotation browsers to provide useful data-mining tools for quickly exploring increasing complex data sets. Anno-J is a modern web-application for visualizing genome annotation data using Web 2.0 technologies for greatly enhanced style control, data syndication, data maintenance, user-interface and flexibility. Tracks are discrete plugins within Anno-J, allowing each to implement *ad hoc* functionality and controls. Scrolling along the genome in each track is accomplished by dragging and dropping the viewable area and continual scrolling is achieved via caches on either side of the visible range that are updated asynchronously as the user scrolls. Zooming allows rapid and fluid visualisation of the data over a four orders of magnitude from large chromosomal sections to single base resolution. Tracks have been created and tailored for short read deep sequencing data (eg from Illumina GA), genome tiling arrays, and proteogenomic mapping of peptide mass spectra. Co-visualisation of complex data sets from remote sources is a key strength of the AnnoJ architecture.

Major Research Institutions involved in Functional Genomics of Arabidopsis

- Australian Research Council (ARC) Centre of Excellence in Plant Energy Biology (www.plantenergy.uwa.edu.au/). The focus of the Centre is Arabidopsis functional genomics as it pertains to the roles of the chloroplast, mitochondria and peroxisome in energy metabolisms and plant development.
- CSIRO Plant Industry (www.pi.csiro.au). Major Programs on Genomics, micro RNAs and Plant Development. This program investigates several aspects of plant function and, importantly, is developing major facilities for Arabidopsis functional genomics work.

Major funding sources for Arabidopsis functional genomics in Australia

Funding is mainly available through the Australian Research Council's (ARC's) Discovery and Linkage Grant Schemes and its Centre of Excellence Scheme (www.arc.gov.au).

- Linkage Grants - supporting projects between academic institutions and industry
- Discovery Grants and Fellowships - supporting fundamental research
- Linkage-International - In the context of the International Arabidopsis Research Community, the Linkage-International Scheme is particularly relevant. It provides funding for movement of researchers at both senior and junior levels between Australian research institutions and centers of research excellence overseas. Two types of awards include (1) Fellowships, under international agreements for the reciprocal exchange of postdoctoral researchers, (2) Awards, to build links between research centres of excellence in Australia and overseas by funding extended collaborations.

Other major sources of funding for Plant Science are the Research Development Councils. The funding for these organizations is based to a substantial degree on Industry levies and therefore the research is targeted to particular industries. The largest is the Grains Research and Development Corporation of Australia (GRDC). A list of the RDCs is given at www.grdc.com.au/sites/rdcorp.htm .

Major funding sources for Arabidopsis functional genomics in New Zealand

- Royal Society of New Zealand Marsden Fund: (www.rsnz.org/funding/marsden_fund/)
- New Zealand Foundation for Research, Science and Technology: (www.frst.govt.nz/)