

Western Australia

The University of Western Australia

LP0882769 Prof D Andrich; Dr S Humphry

Approved Project Title **Maintaining a precise, invariant unit in state, national and international educational assessment**

2008 : \$ 120,000

2009 : \$ 120,000

2010 : \$ 150,000

Primary RFCD 3301 EDUCATION STUDIES

Collaborating/Partner Organisation(s)

Curriculum Council of Western Australia

Pearson Testing & Assessment Australia

Administering Organisation The University of Western Australia

Project Summary

School achievement testing is a high stakes activity for state and national governments, not just for school students. Significant educational policy decisions turn on comparisons of test results over time, and among states and nations. These decisions rest on assumptions about the validity and precision of national testing. In particular, current measurement systems assume that assessment scales have common units. Empirically, it is clear that many factors can compromise this assumption, making it rarely justified. This study will serve the national interest by building the theory and technology necessary to solve this problem.

LP0882350 Dr TD Colmer; Dr EJ Veneklaas; Dr K Shepherd; Dr G Barrett

Approved Project Title **Ecophysiology of stem succulent halophytes subject to changes in salinity and water availability: distinguishing natural dynamics from potential mine-related impacts**

2008 : \$ 104,286

2009 : \$ 104,286

2010 : \$ 104,286

Primary RFCD 2704 BOTANY

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Fortescue Metals Group Ltd

Department of Environment and Conservation (WA Herbarium)

Administering Organisation The University of Western Australia

Project Summary

This project contributes to the National Research Priority of an environmentally sustainable Australia. The project will underpin management strategies of vegetation in saline lakes/marshes; wetlands of national importance to biodiversity. Understanding the vegetation at the Fortescue Marshes will provide vital base-information for the future, and have flow-on benefits for improved strategies for revegetation of saline lands. Improvement of the publicly available Herbarium database on samphire species will also enable improved species identifications for conservation and/or rehabilitation efforts. The project will train a PhD student in an industry-relevant research area that is currently in high demand.

Summary of Linkage Projects Proposals for Funding to Commence in 2008

LP0882078 Prof JL Cordery; Dr LL Hughes
Approved Project Title **Managing work systems to promote employee engagement and business unit outcomes**

2008 : \$ 78,648
Primary RFCD 3502 BUSINESS AND MANAGEMENT
APDI Dr LL Hughes

Collaborating/Partner Organisation(s)

St George Bank Ltd

Administering Organisation The University of Western Australia

Project Summary

This project will lead to the identification of specific people management practices that can be implemented within business units in order to promote both positive business outcomes and improvements in employee psychological well-being through increased employee work engagement. Given that research has already demonstrated significant positive business and psychological benefits arising from work engagement, the results of the study have the potential to identify practical pathways towards generating significant economic, social and psychological benefits for employers and employees, at the level of the organisation, the community and, by extrapolation, the nation.

LP0882579 Dr PF Grierson; Dr CK Macfarlane; Mr S Vlahos; Dr L McCaw

Approved Project Title **Fire management of complex rehabilitated forests - quantifying and understanding spatial variability of forest structure and fuels**

2008 : \$ 160,000
2009 : \$ 170,000
2010 : \$ 135,000
Primary RFCD 3006 FORESTRY SCIENCES

Collaborating/Partner Organisation(s)

Worsley Alumina Pty Ltd

Department of Environment & Conservation, WA

Administering Organisation The University of Western Australia

Project Summary

Up to 5 million ha of forest is burnt by bushfire in Australia in severe fire years. The cost of fire suppression in 2002/3 in WA was in excess of 12 million dollars. Consequently, development and application of technologies and knowledge for enhancing fire management and reducing wildfire risk is of high priority and substantial economic, social and environmental benefit. The opportunity to conduct experimental fires across a complex landscape will enable calibration and development of technologies not previously possible. This research will define the way prescribed fire is used to integrate young rehabilitated forest into management of the broader landscape and develop more cost-effective tools for fire management.

LP0882875 Dr SM Heath; A/Prof JF Fletcher; Dr JH Hogben; Prof DV Bishop

Approved Project Title **Parents as Partners: Getting children off to a healthy start in literacy**

2008 : \$ 50,920
2009 : \$ 50,500
2010 : \$ 23,990
2011 : \$ 26,900
2012 : \$ 21,200
Primary RFCD 3801 PSYCHOLOGY

Collaborating/Partner Organisation(s)

Department of Education and Training Western Australia

Administering Organisation The University of Western Australia

Project Summary

Our nation is best served by children getting off to a healthy start in literacy. However, almost one in six children fails to do so. This group has reduced academic and vocational options, increased social, emotional and mental health problems, higher youth unemployment, and is significantly over-represented among offenders. The nation bears the costs of these problems through reduced productivity and expenditure on unemployment benefits, social programs, mental health services, and incarceration. This project targets both these sources of loss to the nation by utilising a hitherto untapped community resource: Training parents of preschoolers to develop critical pre-literacy skills in their children at home before they begin to fail.

Summary of Linkage Projects Proposals for Funding to Commence in 2008

LP0882884 Dr JM Hodgson; Prof KD Croft; Dr M Considine; Dr SC Tan
Approved Project Title Identification of Australian-bred apple and plum varieties with enhanced health attributes
2008 : \$ 45,200
2009 : \$ 65,000
2010 : \$ 45,000
Primary RFCD 3212 PUBLIC HEALTH AND HEALTH SERVICES

Collaborating/Partner Organisation(s)

Department of Agriculture and Food Western Australia

Administering Organisation The University of Western Australia

Project Summary

Improved prevention could save Australia \$4 billion annually in health care costs, mainly in the area of cardiovascular disease. A higher flavonoid intake has been estimated to reduce the risk of cardiovascular disease by about 20%. Apples are important sources of flavonoids in the diet. The proposed project involves collaboration between the Department of Agriculture and Food Western Australia and the University of Western Australia. The aim is to identify progeny of both the apple and plum breeding programs that have elite levels of flavonoids and to demonstrate health benefits of a high-flavonoid apple. This could lead to significant benefits to Australian horticulture and to population health.

LP0882519 Dr EF May; Dr M Kandil; Prof MA Trebble; A/Prof RD Trengove; Dr K Marsh
Approved Project Title Fundamental Data and Thermodynamic Modelling for Cryogenic LNG Fluids to Improve Process Design, Simulation and Operation
2008 : \$ 150,000
2009 : \$ 140,000
2010 : \$ 100,000
Primary RFCD 2906 CHEMICAL ENGINEERING

APA(I) Award(s): 2

Collaborating/Partner Organisation(s)

Chevron Australia Pty Ltd

Administering Organisation The University of Western Australia

Project Summary

This research will contribute to a more environmentally sustainable Australia because it will promote the use of natural gas as a fuel supply which produces significantly fewer greenhouse gases than oil or coal. This project will improve the ability of engineers to reliably simulate LNG production plants as well as test new processes and technologies with the potential to increase efficiency or revenue. Consequently, the level of over-engineering and, thus, the capital and operational costs of such plants will decrease. This in turn will promote the development of Australian gas reserves, particularly for those fields currently on the margins of economic viability.

LP0882537 Dr CA Musca; Prof L Faraone; Dr EP Smith; Dr D Lofgreen; Mr G Nancarrow
Approved Project Title Development of an advanced semiconductor characterisation capability for infrared focal plane array applications
2008 : \$ 194,178
2009 : \$ 177,350
Primary RFCD 2909 ELECTRICAL AND ELECTRONIC ENGINEERING

APA(I) Award(s): 2

Collaborating/Partner Organisation(s)

Raytheon Vision Systems

Raytheon Australia

Administering Organisation The University of Western Australia

Project Summary

Australian access to world leading technology in state-of-the-art infrared detectors is key to future advanced systems for defence surveillance and sensing, mineral exploration, biomedical instrumentation, precision agriculture, environmental monitoring and homeland security. This project will ensure that Australia contributes to an integral component required in the development of these technologies allowing early access to future systems. It will also enable Australia to play a leading role in setting the research directions for infrared materials that will place Australian research at the forefront in this area.

Summary of Linkage Projects Proposals for Funding to Commence in 2008

LP0882690 A/Prof JA Plummer; A/Prof EL Ghisalberti; Dr EL Barbour; A/Prof J Bohlmann

Approved Project Title **Elucidation of genetic and physiological factors controlling biosynthesis of sesquiterpenoids in sandalwood, Santalum spp.**

2008 : \$ 105,000

2009 : \$ 105,000

2010 : \$ 105,000

2011 : \$ 84,950

Primary RFCD 2708 BIOTECHNOLOGY

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Forest Products Commission

Administering Organisation The University of Western Australia

Project Summary

Plantation sandalwood removes pressure from natural populations and is a profitable long term investment. Australia is in a highly competitive position with regards to market supply but this cannot be taken for granted. This research seeks to understand the complex biology of sandalwood using the latest genomic and molecular technologies. This knowledge will be applied through directed, marker-assisted tree selection and improved plantation management. Ultimately we are developing a highly advanced production system with which Australia can lead Sandalwood production. Sandalwood plantations use a variety of native perennial hosts, increase biodiversity, help manage underground water resources and address carbon sequestration demands.

LP0882758 Prof SB Powles; Dr M Walsh; Mr T Ambe

Approved Project Title **Defining the evolutionary processes of resistance to the new mode of action herbicide, pyroxasulfone**

2008 : \$ 95,000

2009 : \$ 95,000

2010 : \$ 95,000

Primary RFCD 3002 CROP AND PASTURE PRODUCTION

Collaborating/Partner Organisation(s)

Kumiai Chemical Industry Co., Ltd.

Administering Organisation The University of Western Australia

Project Summary

The sustainability of the Australian grains industry is threatened by the continuing evolution and widespread expansion of herbicide resistant weed populations across the crop production regions. The resulting loss in herbicide efficacy is forcing producers away from the environmentally friendly practices of stubble retention and reduced tillage in an effort to control herbicide resistant weed populations. This research is aimed at conserving a novel mode of action herbicide with efficacy on resistant *Lolium rigidum* populations. The success of this project will inevitably lead the pesticide industry to adopt this approach for future product development.

LP0882914 Prof CL Raston; Dr R Jachuck

Approved Project Title **Application of process intensification on rotating surfaces (PIRS) in organic synthesis**

2008 : \$ 25,627

2009 : \$ 25,627

2010 : \$ 25,627

Primary RFCD 2503 ORGANIC CHEMISTRY

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

NanoDynamics Inc.

Administering Organisation The University of Western Australia

Project Summary

Process intensification technologies in the form of SDP and RTP are new to Australia and present many opportunities for carrying out the synthesis of organic compounds. They have remarkable versatility in being able to control chemical reactions with greater selectivity than using classical batch technology, at the same time allowing access to new compounds. Moreover, the technologies embrace the principles of green chemistry in minimising the generation of waste, while operating under continuous flow which is destined to be more attractive to industry. This is likely in the fine chemicals sector, and in drug discovery. The project will provide first-rate research training and promote Australian science.

Summary of Linkage Projects Proposals for Funding to Commence in 2008

LP0882775 Prof SM Smith; A/Prof EL Ghisalberti; Dr KW Dixon

Approved Project Title Investigation of the metabolism, molecular targets and environmental fate of the seed germination stimulant, butenolide

2008 : \$ 110,000

2009 : \$ 105,000

2010 : \$ 115,000

2011 : \$ 120,000

2012 : \$ 125,000

Primary RFCD 2503 ORGANIC CHEMISTRY

Collaborating/Partner Organisation(s)

Botanic Gardens and Parks Authority

Worsley Alumina Pty Ltd

Iluka Resources

Extension Hill/Mt Gibson Iron

Alcoa World Alumina

Administering Organisation The University of Western Australia

Project Summary

The potent germination stimulant, known as butenolide, is expected to provide substantial benefits for improving seed germination and seedling vigour of many plant species used in agriculture, land restoration and rehabilitation. Currently, little is known about the stability, persistence and distribution of the butenolide in natural environments and the mechanism of seed dormancy breaking. This study now provides a unique opportunity for Australian research to establish a world-leading position in understanding the processes that regulate seed dormancy, particularly in relation to post-mining land rehabilitation. The research findings will also have wider application in plant conservation, weed control and crop production.