Summary of Linkage Projects Applications for Funding to Commence in 2006

Queensland

The University of Queensland

LP0669527 Dr DJ Batstone; Prof J Keller

Approved Project Title **Advanced Stability Sensor for Anaerobic Digestion Processes**

2006 : $41,000
2007 : $82,000
2008 : $41,000
Primary RFCD 2504 ANALYTICAL CHEMISTRY

Partner Organisation(s)
Gelita Australia Pty Ltd
Gold Coast City Council
Administering Institution The University of Queensland

Project Summary

Australia is firmly committed to energy reduction and production, where possible, renewable energy production. Anaerobic digestion is the only in-use wastewater treatment option that not only can have net zero energy consumption, but that actually produces energy. This energy is from renewable carbon sources is therefore a zero contributor to greenhouse gases. Australia has some of the strongest environmental limit laws in the world. While this is reasonable - given our sensitive environment -assisting industry in meeting those limits in a cost effective manner is a priority. Given sufficient process stability and transparency, anaerobic digestion is a low capital and operating cost option.

LP0669191 A/Prof BR Bhandari; Prof MJ Gidley; Prof AK Whittaker; Dr HC Deeth

Approved Project Title **The Molecular Mechanism of Protein Instability in Dairy Powder Systems**

2006 : $60,000
2007 : $114,500
2008 : $119,500
2009 : $65,000
Primary RFCD 2901 INDUSTRIAL BIOTECHNOLOGY AND FOOD SCIENCES
APA(I) Award(s): 2

Partner Organisation(s)
Dairy Ingredients Group Of Australia Ltd.
Administering Institution The University of Queensland

Project Summary

Dairy is the fourth largest rural industry sectors in Australia, directly involving more than 13,000 farms and a large number of dairy factories. Most of Australia's 10 billion litre milk flow is converted to powder form for exports, with an annual value exceeding $1billion. The anticipated improvements in the performance and shelf-life of the dried dairy powder systems to be investigated in this project have the potential to generate significant economic impacts in both the dairy production and processing sectors. This work will also benefit the wider scientific community in dairy- and food-related areas, particularly in relation to the novel multidisciplinary approach involving a combination of material science and protein chemistry.

LP0669647 Dr MJ Dieters; Dr GT Dale; Prof KE Basford

Approved Project Title **Site factors and genotype-site interaction affecting growth of eucalypt hybrids bred for commercial agro-forestry as a salinity management tool.**

2006 : $35,000
2007 : $67,500
2008 : $65,000
2009 : $32,500
Primary RFCD 3006 FORESTRY SCIENCES

Partner Organisation(s)
Saltgrow Pty Ltd
Administering Institution The University of Queensland

Project Summary

Preliminary results indicate that with appropriate site-genotype matching, commercial plantation forestry can be pushed well below the current limit (650-700mm/yr). Outcomes from this project will potentially facilitate doubling of Australia's forest plantations, eliminate the annual trade deficit of $2 billion in forest products; ensure the long term environmental and productive sustainability of our agricultural production systems; diversify and drought proof farm income through the introduction of perennial tree crops whose yield and harvest is independent of short term seasonal fluctuations; and re-invigorate the economy of rural Australia brought about by investment in new, inland forest and wood processing industries.

LP0669328 Dr SL Dole; Prof DM Clarke; Dr AH Wright

Approved Project Title **Learning essential knowledge by design: Promoting and connecting mathematics and science in the middle years of schooling.**

2006 : $20,000
2007 : $42,500
2008 : $45,000
2009 : $22,500
Primary RFCD 3302 CURRICULUM STUDIES
APA(I) Award(s): 1

Partner Organisation(s)
Redeemer Lutheran College
Bundamba State Secondary College
Bremer State High School
All Hallows School
Faith Lutheran College Redlands
St. Peter's Catholic Primary School
Kenmore State High School
Administering Institution The University of Queensland

Project Summary

In the international setting, Australia's scientific and technical competitiveness is under threat. In the US this similar threat has elicited responses that focus on new mathematics and science teachers and teacher professional learning. This project aligns with major national and state initiatives to develop curricula that promote essential learnings and standards without losing sight of current educational approaches such as middle years of schooling. The project will explore research-based, integrated pedagogies, content and assessment to provide Australian teachers with new ways of engaging students with the mathematics and science curricula.

LP0669628 A/Prof RA Hyde; Dr KK Yeang; Dr N Groenhout; Mr F Barram

Approved Project Title **Exploring synergies with innovative Green Technologies for Advanced Renovation: Redefining a Bioclimatic approach for multi residential and office buildings in warmer climates**

2006 : $35,517
2007 : $72,455
2008 : $74,984
2009 : $38,046
Primary RFCD 3101 ARCHITECTURE AND URBAN ENVIRONMENT

Partner Organisation(s)
T.R Hamzath Yeang Sdn.Bhd
Bassetts Consulting Engineers
Integrated Energy Services
Administering Institution The University of Queensland

Project Summary

Building energy consumption accounts for nearly 27% of all energy related greenhouse gas emissions. By 2010, emissions' from buildings is estimated to increase by 48% above 1990 levels. This projected trend is alarming given that Australia's obligation under the Kyoto Protocol is only 8% above 1990 levels. Renovation of existing buildings is necessary to achieve this target. Research will address this problem by providing principles, strategies and solutions demostrating improvement of environmental performance and cost benefits. The application of new principles will assist with transforming the building industry to meet Kyoto targets.

LP0669768 Dr GJ Marston; Dr J Moss

Approved Project Title **Disability, Welfare and Work**

2006 : $23,000
2007 : $45,500
2008 : $44,000
2009 : $21,500
Primary RFCD 3702 SOCIAL WORK

Partner Organisation(s)
ACE National
Administering Institution The University of Queensland

Project Summary

The proposed project will offer significant insights into the experiences of people with a disability in the context of welfare-to-work policies. The project will be able to gauge the extent to which the significant amount of public funds invested in the new welfare-to-work measures is effective. In 2002/03 the Australian Government invested over 300 million dollars in Open Employment assistance. The applied research into conceptual questions such as the correct model of disability, the relation of obligation to our understanding of citizenship and associated ethical issues will assist in maintaining Australia at the cutting edge of applied philosophical and sociological research.

LP0669104 Dr HA McGowan; Mr SK Marx; Dr BS Kamber

Approved Project Title **Water resource management of the Snowy Mountains Hydro-electric Scheme catchment and the Murray-Darling River system - a new perspective on system reliability from drought history reconstruction.**

2006 :	$49,500
2007 :	$94,500
2008 :	$82,170
2009 :	$37,170

Primary RFCD 2606 ATMOSPHERIC SCIENCES

APDI Mr SK Marx

Partner Organisation(s)

Snowy Hydro Limited

Administering Institution The University of Queensland

Project Summary

The Snowy Mountains Hydro-electric Scheme assists in underwriting the production of $3 billion of agricultural products in the Murray-Darling Basin each year by providing a reliable source of water west of the Great Dividing Range, while Hydro-electric generation from the Scheme is worth annually several hundred million dollars and provides 70% of the renewable energy supplied to the eastern mainland grid, thereby avoiding 5Mt of carbon dioxide emissions each year. This study will ensure the ongoing sustainable and efficient management of the Schemes water resources in response to predicted climate variability and most importantly, severe drought.

LP0669698 Prof LK Nielsen; Ms Y Fung; Dr RM Minchinton

Approved Project Title **Ex vivo production of neutrophils**

2006 :	$45,000
2007 :	$80,000
2008 :	$35,000

Primary RFCD 2901 INDUSTRIAL BIOTECHNOLOGY AND FOOD SCIENCES

Partner Organisation(s)

Australian Red Cross Blood Service

Administering Institution The University of Queensland

Project Summary

Relentless infections frequently occur in patients receiving intensive chemotherapy treatment. Chemotherapy is toxic to the bone marrow where blood cells are produced. A low white blood cell count and in particular a low neutrophil count is linked with infection in these patients. Unlike red cells and platelets, neutrophils are difficult to collect from blood donors and hence are not routinely available. In this project, we will develop a practical, cost efficient process for the production of neutrophils from cord blood. Transfusion of these neutrophils should reduce the chance of patients suffering serious infection, allow them to recover faster from their chemotherapy, and reduce the need for admission to intensive care.

LP0669663 Prof MS Roberts; Dr AV Zvyagin; Dr YG Anissimov; Dr R Govindarajan; Dr CJ Loy

Approved Project Title **Relationship between melanosome distribution and skin colour**

2006 :	$30,000
2007 :	$60,000
2008 :	$70,000
2009 :	$40,000

Primary RFCD 2499 OTHER PHYSICAL SCIENCES

Partner Organisation(s)

Johnson & Johnson Asia Pacific

Administering Institution The University of Queensland

Project Summary

This work seeks to examine how the colour of our skin is related to the distribution of melanosomes. This work may allow us to better understand how to develop novel therapies that may alter skin colour and provide protection from the sun (frontier technologies) but may also, in the longer term, lead to healthier approaches to skin management - especially for ageing skin.

LP0669667 Prof MS Roberts; Dr YG Anissimov; Dr R Govindarajan; Dr CJ Loy

Approved Project Title **Topical peptide delivery for cosmetic and therapeutic benefits**

2006 :	$40,000
2007 :	$81,500
2008 :	$84,500
2009 :	$43,000
Primary RFCD	3205 PHARMACOLOGY AND PHARMACEUTICAL SCIENCES

Partner Organisation(s)

Johnson & Johnson Asia Pacific

Administering Institution The University of Queensland

Project Summary

Milk is a major Australian agricultural commodity and is now used in a number of topical products for the management of various skin conditions including chafing in babies, eczema and ageing skin. Hence, this work hopes to contribute to promoting and maintaining good health of Australians.

In addition, there is considerable research being conducted on peptide development for a range of diseases and there may be a possibility of delivering these by the skin.

This work, in seeking to understand some of the fundamental determinants governing how exogenously applied peptides distribute in the skin, is also contributing to the development of Australian pharmaceutical and cosmetic industries.

LP0669641 Prof V Rudolph; Dr P Massarotto

Approved Project Title **The Effect of Fines Particles on Production and Permeability of cbm Reservoirs**

2006 :	$106,500
2007 :	$180,500
2008 :	$140,500
2009 :	$66,500
Primary RFCD	2906 CHEMICAL ENGINEERING
APA(I) Award(s):	2

Partner Organisation(s)

Santos Ltd
CH4 Gas Ltd

Administering Institution The University of Queensland

Project Summary

Coalbed methane (cbm) energy resources in Australia exceed $20b in value. One of the production issues with recovering cbm is fines that are created or exist in the coal, which block gas flow to the recovery wells and damage downstream equipment. Understanding how fines are created and migrate within gas wells and then overcoming this problem, the purpose of this research, could deliver additional gas production worth over $1.8billion and reduce maintenance costs related to cbm extraction by $25m per year.

LP0669687 Dr RS Wilson

Approved Project Title **Conserving native wildlife during urbanisation: the effectiveness of biodiversity-friendly urban design and construction practices**

2006 : $50,000
2007 : $90,000
2008 : $85,000
2009 : $45,000

Primary RFCD 3008 ENVIRONMENTAL SCIENCES

APA(I) Award(s): 1

Partner Organisation(s)
Brisbane City Council
Gold Coast City Council
Redland Shire Council
Environmental Protection Agency
Urban Development Institute of Australia

Administering Institution The University of Queensland

Project Summary

Urbanisation has many negative effects upon native wildlife and their habitats, but biodiversity-friendly urban design and construction practices may greatly reduce these impacts. This study will examine the effectiveness of such measures at sustaining wildlife at sites of urban development, and will therefore produce significant benefits for local residents and the broader Australian community. Healthy natural ecosystems in urban areas provide many services to the public, reduce the need for costly management, and improve the livelihood of residents living in greener environments. This study will enhance all these community benefits through a detailed examination of the effectiveness of biodiversity-friendly urban development measures.

LP0669659 Mr N Woods; Dr A Hewitt; Dr C O'Donnell; Dr RF Sadler; Prof MP Zalucki; Dr BW Cribb; Prof MR Moore; A/Prof BN Noller

Approved Project Title **Understanding the control of adult mosquitoes to reduce arbovirus transmission while minimising environmental and public health risk.**

2006 : $17,500
2007 : $32,500
2008 : $30,000
2009 : $15,000

Primary RFCD 3212 PUBLIC HEALTH AND HEALTH SERVICES

APA(I) Award(s): 1

Partner Organisation(s)
Pacific Biologics
Maroochy Shire Council
Logan City Council
Gold Coast City Council

Administering Institution The University of Queensland

Project Summary

Mosquitoes are capable of transmitting a wide range of debilitating diseases such as Ross River and Barmah Forest viruses, Murray Valley Encephalitis, Japanese Encephalitis, Dengue fever and Malaria. To prevent the transmission of these diseases local authorities expend considerable resources on the control of mosquitoes. This project will increase the understanding of chemical control measures on adult mosquitoes and this will lead to more effective mosquito control treatments and reduce the incidence of mosquito transmitted diseases. The project will also result in a reduction in the risk from the application of pesticide to public health and the environment.