

Summary of Linkage Projects Proposals for Funding to Commence in 2007

Queensland

The University of Queensland

LP0776937 Prof RG Birch; Dr GM Graham; A/Prof BJ Carroll; Dr D Schliebs; Mr PW Collins

Approved Project Title **Understanding and avoiding transgene silencing in sugarcane**

2007 : \$ 136,702

2008 : \$ 268,105

2009 : \$ 313,260

2010 : \$ 181,857

Primary RFCD 3002 CROP AND PASTURE PRODUCTION

APA(I) Award(s): 2

Collaborating/Partner Organisation(s)

CSR Sugar Pty Ltd

Administering Organisation The University of Queensland

Project Summary

Sugarcane is one of the world's major crops for food (sugar) and fuel (ethanol, electricity co-generation). It is one of the most appealing target crops for metabolic engineering aimed at renewable biomaterials and biofuels. Australia has invested strongly to achieve scientific leadership in gene technologies in our major export crops including sugarcane. Field tests show that development of methods to avoid unstable expression or 'silencing' of introduced genes is now a critical requirement for practical application. The current project emerges from industry recognition of the need to understand and avoid transgene silencing. The methods developed using sugarcane are expected to have rapid applicability for wider benefits in agriculture.

LP0776636 Prof IT Cameron; Prof PM Sanderson; Prof KM Hango

Approved Project Title **A multiscale-multifunctional approach to advanced diagnosis and operator performance in complex process systems**

2007 : \$ 57,000

2008 : \$ 118,000

2009 : \$ 115,000

2010 : \$ 54,000

Primary RFCD 2906 CHEMICAL ENGINEERING

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

BlueScope Steel Ltd

BP Refinery (Bulwer Island) Pty Ltd

Administering Organisation The University of Queensland

Project Summary

Major process system failures and subsequent poor diagnosis continues to produce significant company disruption, environmental damage, injury and possible loss of life. The benefits of this work will be reduced impacts and risks. This work will provide a new integrated approach with structured tools and diagnostic designs for process industries. It should have direct impacts on company performance through improved diagnosis, more timely response and hence reduced likelihood of major accidents. It will help to improve overall risk management practice in the process industries with less impact on people, property and environment, thus improving operational performance. Local communities will be direct beneficiaries of these reduced risks.

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LP0776985 A/Prof SP Collin; Dr A Barnes; Dr MJ Porter; Dr RP Smullen

Approved Project Title **Alternate diets for a sustainable aquaculture industry: neuroethology of feeding in barramundi**

2007 : \$ 39,793

2008 : \$ 50,706

2009 : \$ 23,147

2010 : \$ 12,234

Primary RFCD 3007 FISHERIES SCIENCES

Collaborating/Partner Organisation(s)

Ridley Aqua Feed

Administering Organisation The University of Queensland

Project Summary

Our unique approach to identify the sensory requirements of farmed barramundi and develop new alternative feeds will 1. Improve barramundi production by increasing growth rates, 2. Enhance acceptance and ingestion of food pellets, thereby reducing leaching of nutrients vital to the fish and detrimental to the environment, 3. Help produce formulated diets that will offer the advantages of nutritional consistency, storage convenience, reduced feed waste and pollution and 4. Lower costs allowing for the successful and profitable production of barramundi and potentially other finfish.

LP0776963 A/Prof JJ Cooper-White; Dr LE Rodd; Dr JR Stokes

Approved Project Title **Disposable microfluidic diagnostics for new generation foods, beverages and oral care products**

2007 : \$ 40,000

2008 : \$ 80,000

2009 : \$ 80,000

2010 : \$ 40,000

Primary RFCD 2999 OTHER ENGINEERING AND TECHNOLOGY

Collaborating/Partner Organisation(s)

Unilever UK Central Resources Limited

Administering Organisation The University of Queensland

Project Summary

The outcomes of this project will lead to the establishment of a new paradigm in designing foods, beverages and oral care products that have tailored health and vitality benefits (e.g. reduced levels of fat, sugar and salt). In addition, these foods will contain beneficial additives (e.g. anti-oxidants, vitamins, minerals, phytonutrients) targeted to specific consumer groups according to their lifestyle, age, medical condition or requirement for nutritional/nourishment efficacy, thereby contributing to healthy ageing. It is foreseen that this novel approach to designing foods will be extended to products intended for consumers whose sensory perception is compromised by existing medical therapeutic practices (such as radiation therapy).

LP0776463 Prof S Crozier; Dr F Liu; Mr E Weber; Dr S Junge

Approved Project Title **Transceive Phased Arrays for Parallel Imaging in High Field Magnetic Resonance Microscopy.**

2007 : \$ 100,000

2008 : \$ 205,000

2009 : \$ 210,000

2010 : \$ 105,000

Primary RFCD 2915 BIOMEDICAL ENGINEERING

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Bruker BioSpin MRI GmbH

Administering Organisation The University of Queensland

Project Summary

This project will contribute to the development of a new generation of Magnetic Resonance Imaging systems that provide new and innovative features capable of significantly increasing the resolution and /or speed of imaging. The economic benefit of being a developer of this technology is clear and significant. These new systems will enhance the efficiency and power of clinical diagnostic testing. Specifically, the enabling of molecular imaging will enhance the study of many more disease states and rapid assessment of new in vivo therapeutic agents. The side-stream benefit to biomedical research and development in Australia is therefore substantial.

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LP0776294 Dr JM Fleming; Prof LE Worrall; Dr PL Cornwell; Dr TP Haines; Dr T Ownsworth; Miss MB Kendall; Prof LI Chenoweth

Approved Project Title **Determinants of successful community transition for individuals with acquired brain injury and their families**

2007 : \$ 19,769

2008 : \$ 39,539

2009 : \$ 33,994

2010 : \$ 14,225

Primary RFCD 3210 CLINICAL SCIENCES

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Disability Services Queensland

Acquired Brain Injury Outreach Service

Administering Organisation The University of Queensland

Project Summary

Transition home following acquired brain injury (ABI) is a critical phase in which individuals and families are vulnerable. Unsuccessful transitions are characterised by events such as financial crisis, family breakdown, loss of work, social isolation, and institutionalisation. ABI does not discriminate, but there is a higher rate in Indigenous, rural and remote communities and amongst younger people. The societal impact of ABI includes loss of income and livelihood, health and welfare dependence, and long-term accommodation support. Research into the determinants of successful transition will alleviate the personal, social and economic burden of ABI and inform policy and program priorities for appropriate Australian Government bodies.

LP0776417 Dr MR Gallagher; Dr JP Connor; Prof J Wiles; Dr CT Kennedy

Approved Project Title **Detecting and Understanding Dysfunctional Anomalies in Queensland Healthcare Databases**

2007 : \$ 20,083

2008 : \$ 41,369

2009 : \$ 43,280

2010 : \$ 21,995

Primary RFCD 2802 ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Collaborating/Partner Organisation(s)

Queensland Health (Clinical Practice Improvement Centre)

Administering Organisation The University of Queensland

Project Summary

Healthcare systems are large complex organizations that are required to function effectively and efficiently. As the main healthcare provider of the state, Queensland Health faces significant challenges in managing the complexity of its operations. This project will use visualization and data mining techniques to support Queensland Health in effective utilisation of its information and communications technology. Through the analysis, detection and prediction of anomalies in the system, the project will contribute to improvements in patient outcomes and efficiency of the Queensland healthcare system.

Summary of Linkage Projects Proposals for Funding to Commence in 2007

LP0776764 Prof PC Hayes; A/Prof E Jak; Prof AD Pelton

Approved Project Title **Fundamental experimental and modelling studies of slag/matte/metal/gas systems in support of sustainable copper smelting and converting technologies**

2007 : \$ 110,000

2008 : \$ 217,500

2009 : \$ 210,000

2010 : \$ 248,000

2011 : \$ 285,000

2012 : \$ 139,500

Primary RFGD 2913 METALLURGY

APA(I) Award(s): 3

Collaborating/Partner Organisation(s)

BHPBilliton (Olympic Dam Operations)

Xstrata Copper Mount Isa Mines

Xstrata Technology

Rio Tinto Technology

Administering Organisation The University of Queensland

Project Summary

Australia is in the midst of a sustained increase in demand for its mineral resources that is leading to expansion in production and major capital investments across the industry sector. Most of the primary production of copper metal in Australia takes place through the use of high temperature smelting technologies. New technologies and significant changes to existing smelting technologies are currently underway; driven by the need to improve both productivity and environmental performance. This research partnership will provide important fundamental information about the complex chemistries of these high temperature processes. This project will assist these process improvements and will provide competitive advantage to Australian industry.

LP0776270 Prof GA Jull; A/Prof RF Peterson; A/Prof VM O'Connor; Prof JM McMeeken; Ms FC Blackstock; Dr N Morris; Prof A Wright; Ms AL Jones; Dr D Rivett; Dr TP Haines

Approved Project Title **Innovations in Clinical Education for Physiotherapy Students**

2007 : \$ 112,000

2008 : \$ 274,500

2009 : \$ 267,500

2010 : \$ 105,000

Primary RFGD 3399 OTHER EDUCATION

Collaborating/Partner Organisation(s)

LAERDAL Pty Ltd

Physiotherapists Board of Queensland

Australian Physiotherapy Council

NSW Physiotherapists Registration Board

Queensland Health Skills Development Centre

Queensland Health

Australian Physiotherapy Association

John Hunter Hospital

St Vincents Health Education Centre

Department of Health, Western Australia

NSW Department of Health

Department of Human Services

Administering Organisation The University of Queensland

Project Summary

Australia has workforce shortages and an ageing population. Physiotherapists are key players in promoting and maintaining good health through their leadership in physical activity and rehabilitation to retain Australians in the workforce and to ensure quality of life for our ageing population. There is a national shortage of physiotherapists. Increasing numbers of physiotherapists are being trained, requiring new models of clinical training as there is no capacity in conventional training to cope with student numbers. This research will develop and evaluate new models of training incorporating standardised patients (actors) and simulators (mannequins) which increase education capacity. Models are transferable to other health professions.

Summary of Linkage Projects Proposals for Funding to Commence in 2007

LP0776272 Dr S Liu; Dr JR Smith; Dr R Yi; Prof C Gallois; Prof PW Liesch; Ms SK Daly

Approved Project Title **Through the eyes of the Chinese: Attitudes to and opinions of Australia and their influence on Sino-Australian business exchange**

2007 : \$ 19,830
2008 : \$ 39,642
2009 : \$ 39,991
2010 : \$ 20,179

Primary RFCD 3502 BUSINESS AND MANAGEMENT

Collaborating/Partner Organisation(s)

SD Consulting
Queensland Government
Commerce Queensland

Administering Organisation The University of Queensland

Project Summary

The outcomes of this research will have significant policy implications for the Australian government and business sectors in terms of improving intercultural understanding, facilitating bilateral trade, unlocking the potential of the Chinese market, as well as increasing economic efficiency. The capacity of Australian businesses to engage with China will be substantially improved by enhancing our knowledge base about the individual, social, and national factors that facilitate and inhibit engagement in Sino-Australian business relations and exchange. Findings from this research will also inform the international development in education and training, tourism and technology in Australia.

LP0776703 Dr KM Makar

Approved Project Title **Elaborating a model of learning to teach mathematical inquiry**

2007 : \$ 19,000
2008 : \$ 38,000
2009 : \$ 19,000

Primary RFCD 3303 PROFESSIONAL DEVELOPMENT OF TEACHERS

Collaborating/Partner Organisation(s)

Jindalee State School
Lowood State School

Administering Organisation The University of Queensland

Project Summary

Australia's pioneering workforce in scientific and technological innovation requires classrooms which promote creative and flexible thinking, curiosity and persistence, deep disciplinary knowledge, and facility with technology, particularly in mathematics. International comparisons indicate Australia's classrooms teach out-dated procedural knowledge in maths that neglects 21st century needs. Mathematical knowledge developed through inquiry of authentic problems can provide purpose and deeper understanding as well as to cultivate capacity to grapple with uncertainty and greater complexity. This project is a university-schools partnership committed to the same purpose: promote the teaching of mathematical inquiry.

Summary of Linkage Projects Proposals for Funding to Commence in 2007

LP0776879 Prof JM Najman; Mr RJ Kemp; Dr ML Legosz

Approved Project Title **Drug Use by a Community Sample of Young Amphetamine Users in South-East Queensland â A Longitudinal Study**

2007 : \$ 59,627

2008 : \$ 124,399

2009 : \$ 131,272

2010 : \$ 66,500

Primary RFCD 3212 PUBLIC HEALTH AND HEALTH SERVICES

Collaborating/Partner Organisation(s)

Queensland Health

Crime and Misconduct Commission

Administering Organisation The University of Queensland

Project Summary

Drug use can impact on the national well being in a multitude of ways. In 1998-1999 the fiscal cost of licit and illicit drug use was estimated to be \$34.4 billion, while drug-related crime is estimated to cost Australia \$1.96 billion annually. This study is valuable in its capacity to inform evidence-based policy and practice addressing amphetamine uptake and amphetamine use trajectories and harms. This has implications for developing strategies to enable young Australians to make healthy choices regarding amphetamine and other drug use, and for the broader economic and social benefits arising from healthy and productive individuals, families and communities.

LP0776555 Prof JT Rothwell; Dr PC Mills; Dr SE Cross; Prof CJ Phillips; Dr MR Latter

Approved Project Title **Development of a topical treatment to replace surgical mulesing in sheep**

2007 : \$ 30,000

2008 : \$ 75,000

2009 : \$ 90,000

2010 : \$ 45,000

Primary RFCD 3005 VETERINARY SCIENCES

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Pfizer Animal Health

Administering Organisation The University of Queensland

Project Summary

10,800 farms in Australia are sheep farms and a further 30,000 have sheep. Exports of wool earn over \$2 billion annually. The animal rights campaign to ban mulesing has forced the industry to outlaw mulesing by 2010. Mulesing is largely confined to Australian Merino sheep and requires Australian research. If practical alternatives are not found costs will rise compromising the economic viability of many sheep farms. Chemical use on the breech will increase causing environmental contamination. A simple topical alternative to mulesing will allow farmers to economically manage flies and satisfy welfare imperatives. This will support rural communities and sustain Australia's export income from wool.

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LP0776851 Dr SW Salisbury; Dr MC Lamanna; Dr Z Luo

Approved Project Title **Small vertebrates from the Albian-Cenomanian of Queensland - testing hypotheses of provincialism among Australia's mid-Cretaceous dinosaur faunas**

2007 : \$ 30,000

2008 : \$ 57,500

2009 : \$ 57,500

2010 : \$ 30,000

Primary RFCD 2707 ECOLOGY AND EVOLUTION

Collaborating/Partner Organisation(s)

Isisford Shire Council

Carnegie Museum of Natural History

Land Rover Australia

Administering Organisation The University of Queensland

Project Summary

This project will add to our knowledge of Australian dinosaurs and the world they inhabited. Dinosaurs are often the means through which many people, especially children, are introduced to science. This project has the potential to greatly enhance this attraction to science, using the results of research on Australian dinosaurs. It has direct links with a number of national and international museum exhibitions, and in western Queensland the results will be incorporated into a newly developed regional interpretive centre in Isisford. The enormous social and economic benefits linked to this initiative will open up numerous opportunities for local businesses, and increase the appreciation for science and exploration in outback areas.

LP0776336 Dr S Schmidt; Prof AJ Lowe; Dr PM Schenk; Prof C Critchley; Dr JD Nichols

Approved Project Title **Accelerated breeding for a changing environment: genomic and physiological profiling of newly generated polyploid trees**

2007 : \$ 75,000

2008 : \$ 160,000

2009 : \$ 180,000

2010 : \$ 95,000

Primary RFCD 2799 OTHER BIOLOGICAL SCIENCES

APA(I) Award(s): 2

Collaborating/Partner Organisation(s)

Bio Adapt International

Administering Organisation The University of Queensland

Project Summary

Global climate change threatens the health and productivity of forests and plantations. Because tree breeding is slow, elite trees cannot be adapted rapidly to new environments. A new procedure for accelerated tree breeding has been developed by the industry partner. The procedure, termed polyploidisation, increases DNA content and produces novel traits that can improve plant growth and resilience. Polyploidisation is a natural force in plant evolution and its routine application for tree breeding has much potential. Using diverse approaches, we will investigate how newly synthesised polyploid tree species perform under heat and drought stress.

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LP0776358 Dr DJ Trott; Dr RN Cobbold; Dr H Wetzstein; Dr J Chin

Approved Project Title **Of pets, vets and antimicrobials: fluoroquinolone use in dogs and resistance biology.**

2007 : \$ 58,527

2008 : \$ 110,713

2009 : \$ 90,699

2010 : \$ 38,513

Primary RFCD 3005 VETERINARY SCIENCES

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Bayer Australia Limited

NSW Department of Primary Industries

Administering Organisation The University of Queensland

Project Summary

Antimicrobial resistance is a current and growing threat relevant to human health, animal welfare, food production, and environmental preservation. This project will provide new insights into the basic science of antimicrobial resistance, through the generation of accurate data on the role of companion animal use of antibiotics on the development and control of resistance. Ultimate project goals are to produce recommendations that limit the generation of further resistance. Project outcomes have demonstrable relevance to human preventative health, which is recognised as a national research priority. The health and welfare of pets will also be improved, which has associated community benefits.