Queensland

The University of Queensland

LP0882517 Prof TJ Brailsford; Dr JT Alcock; Prof SF Gray; Mr BR Parmenter; Dr M Malakellis

Approved Project Title **The Management of Asymmetric Risk in a Modern Investment Portfolio**

2008 : $ 100,000
2009 : $ 90,000
2010 : $ 130,000
Primary RFCD 3403 ECONOMIC HISTORY AND HISTORY OF ECONOMIC THOUGHT

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Tactical Global Management Ltd
Administering Organisation The University of Queensland

Project Summary

Due to compulsory superannuation legislation, the future lifestyle of all Australians is dependent upon the successful management of investment funds. A large component of funds management is risk management. This project will generate practical management tools to enable portfolio managers to significantly enhance their risk-management strategies. A direct link between risk management and performance drives funds managers to carefully manage their risk exposure. Any developments that reduce the risk of a portfolio will ultimately enhance portfolio returns. Higher returns on superannuation investments will result in an improved future standard of living for all Australians.

LP0882371 Prof JJ Cooper-White; Prof GI Anderson; Dr T Eindorf; Prof P Ghosh; Dr S Gronthos; Dr A Zannettino

Approved Project Title **Intelligent scaffolds and methods for repair of osteochondral defects**

2008 : $ 109,851
2009 : $ 96,390
2010 : $ 102,613
Primary RFCD 2915 BIOMEDICAL ENGINEERING

Collaborating/Partner Organisation(s)

Mesoblast
Administering Organisation The University of Queensland

Project Summary

Osteoarthritis (OA) produces articulation of bone against bone resulting in extreme pain and disability. Of all musculoskeletal disorders, osteoarthritis has the greatest social and economic implications worldwide. By 2030, it is projected that 9.3% of the adult population will suffer from arthritis, significantly affecting their quality of life and overall productivity. A tissue engineered product capable of repairing osteochondral defects that does not require revision over time but becomes fully integrated with the host tissue will have significant benefits. It will improve patient activity and quality of life, and significantly reduce current health care costs associated with osteoarthritis sufferers.

LP0882095 A/Prof D Edwards; Dr SM Grimmond

Approved Project Title **Developing technology for the cost effective de novo sequencing and analysis of complex genomes**

2008 : $ 290,000
2009 : $ 270,000
2010 : $ 280,000

Primary RFCD 2702 GENETICS

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Bayer BioScience N.V.

Administering Organisation The University of Queensland

Project Summary

Applying the latest scientific advances supports society directly through promoting a knowledge based economy, as well as indirectly through securing agricultural productivity and improved biomedical applications. Establishing these methods places Australia at the forefront of genomics technology with direct applications for Australian biomedical and biotechnology industries. Maintaining agricultural production in an unreliable environment remains a national challenge, both for rural and urban communities. This sequencing technology will provide a detailed understanding of crop genome structure and lead to the development of crops that are better suited to the Australian climate, supporting a sustainable agricultural industry.

LP0882233 A/Prof JA Fuerst; Prof PN Shaw; Dr JN Hooper

Approved Project Title **Diversity of Salinispora actinobacteria producing pharmaceutically relevant natural products from Australian marine sponges**

2008 : $ 25,627
2009 : $ 25,627
2010 : $ 25,627

Primary RFCD 2703 MICROBIOLOGY

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Queensland Museum

Administering Organisation The University of Queensland

Project Summary

By investigating the distribution of marine microbial resources relevant to drug discovery, we will directly contribute to ARC's Research Priority I - An Environmentally Sustainable Australia Priority Goal and the Priority Goal 'Sustainable use of Australia's biodiversity'. We will determine sources of marine bacteria and their genes useful for discovery of new natural products for treatment of human diseases. We will do this by understanding where new strains of Salinispora bacteria may be isolated and how they are distributed in association with Australian marine sponge fauna, and by determining the distribution and chemical and genetic diversity of novel marine Salinispora bacteria.

LP0882618 Prof RG Gilbert

Approved Project Title **Controlled nutrient release for more efficient agricultural water use and reduced environmental insult**

2008 : $ 77,690
2009 : $ 80,329
2010 : $ 82,368

Primary RFCD 2505 MACROMOLECULAR CHEMISTRY

Collaborating/Partner Organisation(s)

CSBP Limited

Administering Organisation The University of Queensland

Project Summary

We will create a completely new type of coating for fertilizer granules. Clays that adsorb and slowly release phosphates and/or other nutrients will be exfoliated with cationic organic reagents to produce organoclay nanoparticles of greatly increased surface area. These will be polymerized with current and novel monomers to form nanocomposites, encasing the clay in a water-swellable matrix by polymerization; this will enable both slow water perfusion and strong binding to the granules. The polymer and nanoclay properties will be tuneable to release targeted nutrients at an optimal rate for uptake by crops, reducing nutrient seepage into the environment.

LP0882068 Prof PF Green; Dr GJ Ridley; Prof CB Ferguson; Dr PJ Coram

Approved Project Title **InformationTechnology (IT) Audit Methodologies in the Australian Public Sector: Addressing Mandatory Requirements of International Standards**

2008 : $ 47,647
2009 : $ 32,098
2010 : $ 25,827

Primary RFCD 3501 ACCOUNTING, AUDITING AND ACCOUNTABILITY

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

CPA Australia
Institute of Chartered Accountants in Australia
Tasmanian Audit Office

Administering Organisation The University of Queensland

Project Summary

The primary benefit occurs in relation to National Research Priority 3: Frontier Technologies for Building and Transforming Australian Industries, notably Priority Goal 'Smart Information Use', as it will enable more sophisticated and accurate assessments of current IT audit methodologies. In turn, these improvements will enable more effective IT audits by government audit offices in Australia, bringing reduced risk and increased efficiency to organisations subject to audit, as well as increasing conformance with the new accounting and auditing standards. Furthermore, all Australian citizens, (the indirect clients of public sector audit services), will benefit from well-managed program-delivery systems.

LP0882135 Dr NL Jimmieson; Dr SL Restubog; Dr G Sutton

Approved Project Title **Promoting high-performing multidisciplinary health care teams: An examination of the antecedents and consequences of psychological safety**

2008 : $ 80,000
2009 : $ 90,000
2010 : $ 48,000

Primary RFCD 3801 PSYCHOLOGY

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Queensland Health

Administering Organisation The University of Queensland

Project Summary

Australian health care services are faced with an increasing burden of complex disease and changing demographics which require identification of new models of care. By promoting effective teams, this research aims to empower both organisations and their employees to contribute to a process of continuous improvement that identifies best-practice solutions for all Australian hospitals. Overall, findings will help strengthen Australia's social and economic fabric by providing reliable and valid research evidence regarding ways to promote effective health care teams.

LP0882794 Prof GF King; Prof PF Alewood

Approved Project Title **Development of environmentally-friendly insecticides for the Australian livestock industry**

2008 : $ 149,987
2009 : $ 144,773
2010 : $ 144,868

Primary RFCD 3004 ANIMAL PRODUCTION

Collaborating/Partner Organisation(s)

Venomix Inc.

Administering Organisation The University of Queensland

Project Summary

Many insects and other arthropods are serious pests of Australian livestock. Australian farmers spend about $300 million per annum on insecticides and acaricides, while Australian consumers spend more than $100 million annually on insecticides for use on pets and around the home and garden. Unfortunately, many of these arthropod pests have developed resistance to chemical insecticides. This aim of this research program is to develop a new generation of environmentally-friendly natural products that can be used to control arthropod pests on farms and around the home and garden.

LP0882316 Dr JM Lanyon; Prof PK Pollett; Dr JR Ovenden; Mr D Broderick

Approved Project Title **Animal movement between populations deduced from family trees - a test case on dugongs in southern Queensland.**

2008 : $ 75,000
2009 : $ 75,000
2010 : $ 75,000

Primary RFCD 2702 GENETICS

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Queensland Department of Primary Industries and Fisheries
Sea World
Consolidated Rutile Ltd

Administering Organisation The University of Queensland

Project Summary

This project responds to a national research priority by developing new methodology that will assist with the management and protection marine and terrestrial biodiversity in Australia and worldwide. It aligns with the requirements of the Australian community and our industry partners by contributing to plans for the long-term use of ecosystem goods and services, ranging from fisheries to ecotourism. The outcomes will provide data on dugong movements between protected areas on the eastern Australian coast. This information is currently unattainable but is indispensable for the lasting security of this culturally and ecologically significant mammal.

LP0882340 Prof MF Lavin; Prof J de Jersey; Dr LW Guddat; Dr M Trabi; Mr A Baker

Approved Project Title **Pre-clinical evaluation of snake venom proteins with therapeutic potential**

2008 : $ 260,535
2009 : $ 250,699
2010 : $ 277,299

Primary RFCD 3205 PHARMACOLOGY AND PHARMACEUTICAL SCIENCES

APA(I) Award(s): 2

Collaborating/Partner Organisation(s)

QRxPharma Pty Ltd

Administering Organisation The University of Queensland

Project Summary

Australia harbors some of the most toxic snakes in the world. Their venoms contain a range of substances that are designed to rapidly immobilize and kill their prey. These include agents that lead to enhanced blood clotting; excess bleeding. We have isolated and characterized a large number of the components involved over the last several years. The aim here is to carry out pre-clinical trials in animal models to test the efficacy of three proteins as anti-bleeding agents and investigate several other novel components. The ultimate outcome will be the development of novel drugs that will have application in the treatment of human disorders.

LP0882681 Prof GM Lu; Dr S Qiao; Dr BC Peters; Dr MJ Kennedy; Ms Q Hu

Approved Project Title **Porous Silica-Based Nanocapsules for Targeted and Controlled Release of Biocides**

2008 : $ 182,038
2009 : $ 173,727
2010 : $ 172,416

Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

DPI&F

Administering Organisation The University of Queensland

Project Summary

The project will lead to significant advances in nanotechnology and agrichemical biocide applications. A highly efficient insect control technology will be developed, that will be cost-effective with the ability for targeted control and release of biocides. The encapsulation technology will reduce the total usage and costs of biocides thus benefit the environment in terms of reduced environment pollution and enhanced ecological safety.

LP0882090 Dr CA McAlpine; Dr JR Rhodes; Dr GS Baxter; Dr B Price; Dr AJ Bradley; Dr DH Lunney; Dr LM Seabrook

Approved Project Title **The conservation of widely distributed species: implications of differences between western and eastern koala populations**

2008 : $ 190,000
2009 : $ 129,902
2010 : $ 139,902

Primary RFCD 2707 ECOLOGY AND EVOLUTION

APA(I) Award(s): 2

APDI Dr LM Seabrook

Collaborating/Partner Organisation(s)

Australian Koala Foundation
South West Natural Resource Management Inc.
New South Wales Department of Environment and Climate Change

Administering Organisation The University of Queensland

Project Summary

Koalas are an iconic species in Australia, generating $2.5 billion in tourist income alone. This project will be a first to test cross-regional variations in koala-habitat relationships, with implications for conservation of other species occupying broad geographical ranges. It will also predict the effect of future climate change on western koala populations living at the margin of their ecological tolerances. It will provide regional natural resource management bodies and state conservation agencies with a sound ecological framework to conserve western koalas in the long term. Regional communities will benefit from involvement by incorporating new conservation knowledge into sub-catchment and property management planning.

LP0882320 Dr NA McMillan; Dr JR Morrison; Dr GR Leggatt; Dr W Gu

Approved Project Title **The Role of RNA interference in the induction of immune responses**

2008 : $ 108,875
2009 : $ 108,875

Primary RFCD 3202 IMMUNOLOGY

Collaborating/Partner Organisation(s)

Benitec Ltd

Administering Organisation The University of Queensland

Project Summary

Our work will allow us to understand a new means by which to alert the immune system to the presence of cancer cells using a new technology called RNA interference. This will hopefully lead to new investment in biotechnology products based on RNA interference, improved treatments for cancers and better health for Australians

LP0882939 Dr PJ Murray; Dr JB Gaughan; Prof J Billingsley

Approved Project Title **Individual animal management for grazing beef cattle.**

2008 : $ 201,441
2009 : $ 176,441
2010 : $ 186,441

Primary RFCD 3004 ANIMAL PRODUCTION

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Bengalla Pastoral Holdings Pty Ltd
RPM Rural Products

Administering Organisation The University of Queensland

Project Summary

This research will significantly improve the ability of the Australian beef pastoral industry to stay competitive in the world market whilst improving animal welfare standards for the industry. Labour shortages in rural and regional areas of Australia are a major problem to the grazing industry. This research will not only help address the shortfall in unskilled labour but will provide the tools for addressing many human and animal welfare issues associated with cattle handling.

LP0882549 Dr RS Pappu; Prof TB Cornwell; Dr K Doherty; Mr DA Cavalchini

Approved Project Title **Examining the impact of marketing communications on brand image, brand equity and behaviour outcomes**

2008 : $ 23,058
2009 : $ 33,000
Primary RFCD 3502 BUSINESS AND MANAGEMENT

Collaborating/Partner Organisation(s)

Australian Red Cross Blood Service
Administering Organisation The University of Queensland

Project Summary

The results would help charities in brand building activities through improved marketing communications. For example, the Australian Red Cross Blood Service (ARCBS) can understand how to improve their brand equity (e.g. improving loyalty, enhancing brand awareness levels, achieving higher perception of quality as well as enhancing brand image) in their donor markets. Increased commitment from the donors is likely to result in benefits such as more blood donations for this charity organisation. This would mean better services provided by ARCBS which would mean promoting and maintaining good health among the Australian public.

LP0882574 Prof V Rudolph; Dr P Massarotto; A/Prof SD Golding; Dr M Gasparon; Prof SK Bhatia

Approved Project Title **Flue Gas and CO2 Geosequestration in Surat and Bowen Basin Coals**

2008 : $ 247,327
2009 : $ 308,095
2010 : $ 229,799
Primary RFCD 2906 CHEMICAL ENGINEERING

APA(I) Award(s): 2

Collaborating/Partner Organisation(s)

Stanwell Corporation Limited
Institute of Geology, Geochemistry of Petroleum & Coal of University of Aachen
Origin Energy Ltd
Santos
Thiess Pty Ltd
Administering Organisation The University of Queensland

Project Summary

Climate change considerations require that CO2 emissions to atmosphere be severely reduced. This is best done in the short term by permanently storing the CO2 underground. Amongst the cheapest and safest options are to use coal seams, which then release valuable methane. The market value of this extra methane is ~$9billion and this reduces the cost of sequestration from ~$56 to $25/t CO2. Coal has a very strong affinity for CO2, so flue gas stream from power stations can be injected directly, eliminating the need for equipment to capture the CO2, providing savings of ~$500million for each large power station.

LP0882412 Prof TK Saha; Dr R Majumder; A/Prof ZY Dong

Approved Project Title **Optimum location of FACTS devices with advanced control scheme for improving the security of complex power grid**

2008 : $ 51,254
2009 : $ 51,254
2010 : $ 51,254
Primary RFCD 2909 ELECTRICAL AND ELECTRONIC ENGINEERING

APA(I) Award(s): 2

Collaborating/Partner Organisation(s)

Powerlink Queensland
Administering Organisation The University of Queensland

Project Summary

Prevention of blackouts is one of the highest priorities of the electricity industry. One of the fundamental reasons for the recent blackouts in long transmission network is inter-area oscillations. Queensland's long transmission network is a vital part of the Australian electricity grid and is vulnerable to inter-area oscillations. There is a need for a comprehensive approach to investigate the effect of inter-area oscillation that contributes to blackouts. Focussing the Queensland network, this project will provide a complete assessment tool for the optimum location of FACTS devices with modern and advanced control schemes in improving the security of complex interconnected power-grid.

LP0882479 A/Prof PA Strooper; Dr DA Carrington

Approved Project Title **Model-driven development and verification of railway interlocking control logic**

2008 : $ 60,346
2009 : $ 60,000
2010 : $ 58,000
Primary RFCD 2803 COMPUTER SOFTWARE

Collaborating/Partner Organisation(s)

Union Switch and Signal Pty Ltd
Administering Organisation The University of Queensland

Project Summary

Railway interlockings are an essential and safety-critical part of all rail infrastructure. The results of the proposed project are intended to reduce the cost of the development and improve the quality of railway interlockings control logic. This will contribute to safer and more cost-effective rail transport in Queensland, Australia and internationally. This project has the potential to improve both development and V&V capabilities for organisations that plan to use model-driven architecture (MDA) for safety-critical systems. While the industrial usage of MDA is currently in its infancy, forecasts predict that MDA will fundamentally change software development practice, especially in developed countries like Australia.

LP0882898 Prof SM Taylor; Dr TM Woodruff

Approved Project Title **Establishment of Therapeutically Relevant Animal Models and Markers for Crohn's Disease**

2008 : $ 110,590
2009 : $ 110,590
Primary RFCD 3005 VETERINARY SCIENCES

Collaborating/Partner Organisation(s)

Protagonist Pty Ltd
Administering Organisation The University of Queensland

Project Summary

Crohn's disease is a devastating life long disease, affecting 0.5% of the world population. There is urgent economic and social need to develop new and better drugs to treat the symptoms and underlying cause of this debilitating disease. Social benefits include the improved quality of life of sufferers that positively impacts society. Economic benefit includes income derived from commercialisation of research outcomes and the contribution this project makes to high value employment in the biotechnology sector.

LP0882187 Dr SM Tweedy; Prof Dr Y Vanlandewijck; Prof B Abernethy

Approved Project Title **Evaluating the impact of neuromusculoskeletal impairment on athletic performance**

2008 : $ 148,000
2009 : $ 160,000
2010 : $ 57,000
Primary RFCD 3214 HUMAN MOVEMENT AND SPORTS SCIENCE

Collaborating/Partner Organisation(s)

Australian Sports Commission
International Paralympic Committee
Australian Paralympic Committee
Administering Organisation The University of Queensland

Project Summary

Sufficient physical activity is required for good health. Competitive sport is a culturally significant physical activity in Australia and the prospect of participating in fair competition is known to drive participation. In Paralympic sport, fair competition is enabled by classification, which aims to minimise the impact of impairments on competition outcome. Unfortunately classification methods are not evidence-based, reducing confidence in the process and discouraging participation. This project will inform the development of the first evidence-based classification system, creating the possibility that, in the future, the prospect of truly fair competition may motivate sports participation among Australians, regardless of disability.

LP0882046 Prof A Whiteford; Dr MF Hilton; Dr G Waghorn; A/Prof JE Pirkis; Prof PA Scuffham

Approved Project Title **Mental-health intervention and non-urban detection screen project**

2008 : $ 214,280
2009 : $ 130,835
2010 : $ 61,453
2011 : $ 35,343
Primary RFCD 3402 APPLIED ECONOMICS

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Queensland Police Service
National Australia Bank
Rio Tinto trading as Technological Resources Pty Ltd
Department of Human Services, Victorian Government
Queensland Department of Education, the Arts and Training
Department of Child Safety, Queensland Government
Australia and New Zealand Banking Group Limited (ANZ)
BP Australia Pty Ltd
Administering Organisation The University of Queensland

Project Summary

If, as expected, there is a positive return-on-investment to employers for mental health screening and early intervention, employers will adopt these methodologies. This eases the burden on the public health system. Early intervention reduces hospitalisations and the psychiatric medications prescribed resulting in decreased MBS and PBS spending. Intervention for mental health decreases transitions into unemployment, sickness or disability benefit reducing the societal burden of mental health. Maintaining individuals in employment also increases tax revenue. Increase in employee's productivity serves to increase gross domestic product. The employees, their families, and community's quality of life will improve.

LP0882551 Prof AK Whittaker; Dr I Blakey; Dr H Liu; Dr PA Zimmerman

Approved Project Title **Double Exposure Photoresists for the 32 and 22 nm Lithographic Nodes**

2008 : $ 315,000
2009 : $ 192,500
2010 : $ 242,500
Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

SEMATECH

Administering Organisation The University of Queensland

Project Summary

The semiconductor industry is one of the largest world-wide, with annual revenue of $220B and employing over 1.5M people around the world. This project provides a unique opportunity for development within Australia of significant expertise in the field of double exposure lithography. The novel photoactive polymeric films to be developed are expected to support the next generation of microchips. A major outcome of this project will be establishment of Australia as a world-leader in this rapidly expanding field. Furthermore the technology can be applied broadly to many printing technologies.

LP0882016 Prof Z Yuan; Prof J Keller; Prof RE Melchers; A/Prof RM Stuetz; Dr PL Bond; Dr M Valix; Mr JR Witherspoon; Prof W Verstraete; Prof PA Vanrolleghem; Dr J Steyer; Dr HA Bustamante; Prof IH Suffet

Approved Project Title **Optimal management of corrosion and odour problems in sewer systems**

2008 : $1,325,357
2009 : $1,350,580
2010 : $1,059,309
2011 : $ 676,106
2012 : $ 245,451
Primary RFCD 2911 ENVIRONMENTAL ENGINEERING

APA(I) Award(s): 10

Collaborating/Partner Organisation(s)

Brisbane City Council (Brisbane Water is a business unit with BCC)
CH2M HILL
Gold Coast Water
SA Water
South East Water Limited
Sydney Water Corporation
United Water
Water Corporation

Administering Organisation The University of Queensland

Project Summary

Pollutants in wastewater undergo complex changes in sewers, leading to the production and release of odorous and corrosive compounds. Despite major efforts and expenditure by water utilities to mitigate these problems, odorous emissions from sewers are still commonly occurring in urban areas. Furthermore, the value of public assets is significantly diminished due to sewer corrosion, costing hundreds of millions of dollars a year in Australia alone. This project is a major joint effort by the Australian water industry and world-leading scientists to generate advanced knowledge and develop effective technologies for optimal odour and corrosion management in sewers, delivering large social, environmental and economic benefits.

LP0882957 Prof X Zhou; Prof JL Hunter; Prof Y Zhang; Dr S Sadiq; Dr EG Abal

Approved Project Title **Data Enhancement, Integration and Access Services for Smarter, Collaborative and Adaptive Whole-of Water Cycle Management**

2008 : $ 96,881
2009 : $ 76,881
2010 : $ 96,881

Primary RFCD 2801 INFORMATION SYSTEMS

APA(I) Award(s): 3

Collaborating/Partner Organisation(s)

South East Queensland Healthy Waterways Partnership

Administering Organisation The University of Queensland

Project Summary

The project provides a valuable opportunity to make significant impact on water resource management and create community partnerships that will go well beyond the lifetime of the project. The project is expected to contribute to improved water quality and healthier ecosystems. In turn, the scientifically rich research environment will benefit all involved. It will demonstrate the capability of the Australian researchers in addressing complex problems in data integration and quality. In particular there will be far reaching benefits of research training for associated PhD students and staff.

LP0882419 Dr J Zhu; Prof GM Lu

Approved Project Title **Development of a Novel One Step Process for Gas Conversion to Liquid**

2008 : $ 180,000
2009 : $ 160,000
2010 : $ 160,000

Primary RFCD 2906 CHEMICAL ENGINEERING

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Eden Energy Ltd

Administering Organisation The University of Queensland

Project Summary

Australia has a rich natural gas reserve, most of which is in remote locations. This project will lead to a new technology to use the remote gas that would be flared into the atmosphere, thus benefiting both Australian economy and green house gas reduction. It will also reduce the risk of relying on importing oil from Overseas thus contributing to Australia's energy security. In addition, while crude-based oil emits SOx, NOx and particulates etc into air, the liquid fuels from gas are pure and burns cleanly thus also contributing to air pollution control.