

Summary of Discovery Projects Proposals for Funding to Commence in 2008

Queensland

Queensland University of Technology

DP0877587 Dr DC Berthelsen; A/Prof JM Nicholson; Dr S Walker; Dr SB Carrington

Approved Project Title **The transition to school for young children with developmental disabilities: The impact of interpersonal relationships on successful school adjustment**

2008 : \$ 88,000

2009 : \$ 97,000

2010 : \$ 83,000

2011 : \$ 41,000

Primary RFCD 3301 EDUCATION STUDIES

Administering Organisation Queensland University of Technology

Project Summary

Increasing numbers of young children with developmental disabilities are included in regular school settings. Children with developmental disabilities have additional support needs and are at high risk for poor school outcomes. Effective programs to support success in the transition to school have the potential to improve children's long-term social and behavioural adjustment. In this research, the focus on modifiable mediating factors for successful school transitions will inform inclusive educational policy and practice. Investment in optimising child outcomes in the early years has long-term social, community, and economic benefits.

DP0877964 Dr AL Blackler; Prof V Popovic; Dr DP Mahar

Approved Project Title **Facilitating intuitive interaction with complex devices for older users**

2008 : \$ 90,000

2009 : \$ 95,000

2010 : \$ 95,000

Primary RFCD 4104 DESIGN STUDIES

Administering Organisation Queensland University of Technology

Project Summary

Poorly designed interfaces impact more strongly on older people. Helping designers to make more intuitive interfaces for older community members has great potential for improving their lives and health, and thus benefiting the community generally. Making modern devices easier for older people to use will allow them to participate more fully in society and/or the workplace. This will also help to prevent them from becoming isolated and possibly depressed. This project will apply intuitive interaction to healthcare devices that older people use, which can save costly mistakes and even lives.

DP0880000 Dr J Brownlee; Em/Prof GM Boulton-Lewis; Dr JE Ailwood; Dr S Walker; A/Prof EM Johansson

Approved Project Title **Learning about social and moral values for active citizenship: Educational policy and practice in early education**

2008 : \$ 70,000

2009 : \$ 50,000

2010 : \$ 40,000

Primary RFCD 3303 PROFESSIONAL DEVELOPMENT OF TEACHERS

Administering Organisation Queensland University of Technology

Project Summary

It is economically sound to invest in quality early education programs to ensure productive engagement for individuals in society. In particular, the early years are considered to be a significant period for learning moral and social values necessary to ensure a tolerant and cohesive society. This study will provide an evidence base for how educational policy and practice, informed by teacher beliefs, do (or do not) support children's moral and social learning about active citizenship.

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DP0877450 Prof MD Courtney; Prof H Edwards; Prof AM Chang; Prof AW Parker

Approved Project Title Preventing hospital readmissions and loss of functional ability in high risk older adults: A randomised controlled trial

2008 : \$ 108,121

2009 : \$ 100,000

2010 : \$ 132,242

2011 : \$ 68,365

Primary RFCD 3212 PUBLIC HEALTH AND HEALTH SERVICES

Administering Organisation Queensland University of Technology

Project Summary

Older people have higher rates of hospital admission and readmission due to complications and falls. During hospitalisation, many older people experience functional decline which impacts on their future independence. Acute hospital services comprise the largest section of health expenditure in Australia, costing \$26,413 million/year. Prevention or delay of disease is known to produce more effective use of services. This study will compare the effectiveness of innovative strategies to prevent deconditioning, functional decline and hospital readmissions. Comparative analysis of these strategies will provide information with potential to reduce costs whilst improving functional status, psychosocial well-being and independence in older people

DP0878792 Dr SE Davies

Approved Project Title Containing H5N1: the role of the World Health Organisation (WHO) and East Asian states

2008 : \$ 98,986

2009 : \$ 78,986

2010 : \$ 88,986

2011 : \$ 88,986

Primary RFCD 3601 POLITICAL SCIENCE

APD Dr SE Davies

Administering Organisation Queensland University of Technology

Project Summary

International cooperation through the World Health Organisation (WHO) is seen as a primary defence mechanism for protecting countries from the spread of infectious diseases. By studying the efficacy of WHO's mechanisms for forging international cooperation, this project will provide new insight on the effectiveness of international measures for preventing the spread of infectious disease and the possibilities for improving those measures. A pandemic influenza would have a devastating impact on Australia. With the threat of H5N1 becoming a pandemic influenza, the possible failure of cooperation between states and WHO makes this study of crucial importance to the Australian government.

DP0880751 Prof CM Diezmann; Prof TJ Lowrie

Approved Project Title Improving Numeracy Outcomes and Mathematics Capability: Understanding Young Students' Interpretation of Graphics

2008 : \$ 80,000

2009 : \$ 80,000

2010 : \$ 80,000

2011 : \$ 60,000

Primary RFCD 3302 CURRICULUM STUDIES

Administering Organisation Queensland University of Technology

Project Summary

Informed participation in society and economic prosperity depends on a mathematically proficient populace ALL of whom are able to interpret common mathematical graphics and SOME of whom are able to interpret advanced graphics. The project benefits include (1) an INSTRUMENT to measure graphic knowledge, (2) THEORIES that explain how knowledge of graphics develops in young students and difficulties that they experience in interpreting graphics, (3) improved GLOBAL COMPETITIVENESS leadership by the CIs in cutting edge graphics research and publications, and (4) a HIGH QUALITY TRAINING ENVIRONMENT environment for two PhD students as part of the CIs' research team.

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DP0878685 Dr CA Doherty; Prof A Luke; Dr K Weir

Approved Project Title **The International Baccalaureate in Australian schools: a sociological case study**

2008 : \$ 70,000

2009 : \$ 90,000

2010 : \$ 70,000

Primary RFCD 3301 EDUCATION STUDIES

Administering Organisation Queensland University of Technology

Project Summary

The International Baccalaureate is being adopted by many Australian schools seeking an alternative to state curricula. In current debates over a national curriculum, there has been federal government and media support for the IB as a prototype for policy reform. This project will provide the first documentation on the spread of the IB, its target student/family cohorts, school implementation issues, student experiences and outcomes. It will evaluate its claims about the preparation of students for new economies, global citizenship and identity.

DP0877133 A/Prof T Flew; Prof PW Graham; Dr MN Gibson; Dr C Collis

Approved Project Title **Creative Suburbia: A Critical Evaluation of the Scope for Creative Cultural Development in Australia's Suburban and Peri Urban Communities**

2008 : \$ 108,000

2009 : \$ 65,000

2010 : \$ 160,000

Primary RFCD 4203 CULTURAL STUDIES

Administering Organisation Queensland University of Technology

Project Summary

Creative industries enterprises -are increasingly important to Australia in a global knowledge-based economy. They account for 5.5% of national income, and recent work has shown they are 50% bigger than first estimated. But much research and policy assumes that these enterprises only take place in inner urban environments. This project will examine the work patterns of creative enterprise workers in the outer suburbs of Brisbane and Melbourne, investigating how these enterprises work outside of inner city zones. Such work will enable a more empirically grounded understanding of creative enterprise dynamics, so that the creative and economic potential of these activities are better realised.

DP0877988 Prof GA George; Prof Z Upton; Dr TR Dargaville; Prof MA Brook

Approved Project Title **Composite biomaterials for modulation of dermal fibroblast function**

2008 : \$ 130,000

2009 : \$ 130,000

2010 : \$ 130,000

Primary RFCD 2915 BIOMEDICAL ENGINEERING

Administering Organisation Queensland University of Technology

Project Summary

The successful outcome of this research will revolutionize the way scars are treated for the large number of people who suffer burns and even minor trauma that leads to disfigurement. By using advanced chemical synthesis, biochemical analysis, cell biology and polymer materials science, an intelligent gel sheet will be devised that is able to control the formation of scar tissue and also reduce the effect of existing scars. This will produce improved quality of life for sufferers of severe scarring and have major economic benefits in reduced health costs.

Summary of Discovery Projects Proposals for Funding to Commence in 2008

DP0879793 Dr LA Gilmore; Dr MA Campbell; A/Prof IM Shochet; A/Prof CM Roberts

Approved Project Title **Investigating and promoting resilience in children with intellectual disabilities**

2008 : \$ 120,000

2009 : \$ 92,000

2010 : \$ 56,967

Primary RFCD 3212 PUBLIC HEALTH AND HEALTH SERVICES

Administering Organisation Queensland University of Technology

Project Summary

Disability is a significant risk factor that threatens health and well-being. For the estimated 4% of 0-14 year old children with diagnosed intellectual disabilities in Australia, early intervention is crucial for promoting resilience and preventing an accumulation of risk. By promoting resilience and thereby reducing the cost of lifelong support, evidence-based interventions produce huge social and economic benefits for the nation, as well as for individuals, families and communities.

DP0877802 Prof PW Graham; Prof C Luke; Dr CL Spurgeon; Dr K Weir; Dr E Ferrier

Approved Project Title **New media voices in the Australian values debate**

2008 : \$ 90,000

2009 : \$ 95,000

2010 : \$ 95,000

Primary RFCD 3301 EDUCATION STUDIES

Administering Organisation Queensland University of Technology

Project Summary

Long standing policy debates about Australian values have been reinvigorated in the context of a global war on terror. The Federal Government has identified Australian values as being central to the nation's security. Cultures are defined by their values, and media systems are the means by which they produce and propagate value systems. Safeguarding Australia means having coherent ways to teach identifiable, desirable, and relevant values. This project investigates Australian values in education by identifying which institutions and traditions most influence Australian youth and how these influences are played out in new media forums such as YouTube and MySpace.

DP0879596 Prof J Hartley; Prof G Turner; A/Prof A McKee; Dr SE Turnbull; Dr CL Healy; Dr JB Green

Approved Project Title **Australian television and popular memory: new approaches to the cultural history of the media in the project of nation-building.**

2008 : \$ 62,000

2009 : \$ 60,000

2010 : \$ 50,000

2011 : \$ 50,000

2012 : \$ 50,000

Primary RFCD 4001 JOURNALISM, COMMUNICATION AND MEDIA

Administering Organisation Queensland University of Technology

Project Summary

Despite its importance to our everyday lives since the 1950s, there is no history of television's role in Australian popular culture. This project will develop a series of collaborative histories that focus upon the popular experience of television and in particular its role in forming national culture. The research will not only involve conventional academic sources, but also those connected with 'the people': memories, memorabilia, personal collections as well as the full range of popular and ephemeral publications which support the popular engagement with the medium. The project is the first to examine television's historical role in our national life.

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DP0878365 A/Prof DW Hutmacher; Dr TJ Klein; Dr J Malda; Prof RL Sah

Approved Project Title **Engineering Articular Cartilage with Zonal Structure and Function**

2008 : \$ 203,933

2009 : \$ 190,000

2010 : \$ 170,000

Primary RFCD 2915 BIOMEDICAL ENGINEERING

APD Dr TJ Klein

Administering Organisation Queensland University of Technology

Project Summary

This project addresses the National Research Priority of Promoting and Maintaining Good Health and specifically the Priority Goal of Ageing well, ageing productively. Osteoarthritis, the most common cartilage-related disease, affects nearly 1.4 million Australians, resulting in 2 in 1000 Australians undergoing total joint replacement, annually. The incidence and impact of cartilage damage on the Australian health and economy is expected to increase with the ageing population. This work leads to the development of a novel cartilage engineering technology platform that addresses Frontier Technologies and will thus provide the foundation for translation of this technology to the international marketplace.

DP0878691 Dr MA Keane; Prof X Zhang

Approved Project Title **Governance, human capital and regional investment in China's new creative clusters**

2008 : \$ 57,000

2009 : \$ 56,000

2010 : \$ 59,000

Primary RFCD 4203 CULTURAL STUDIES

Administering Organisation Queensland University of Technology

Project Summary

This project will tell us much about China's bid to become more innovative, competitive and creative by harnessing foreign investment and human capital in the creative industries. It will show if foreign investment in designated creative clusters can trigger processes of sustainable development for regions and localities. It will show the benefits that foreign investors and businesses (including Australian companies) might obtain from participating in the cluster model, and the kinds of social and economic dividends that accrue to local actors and communities.

DP0879308 Dr JM Keith; Prof P Adams; Dr GF Weiller

Approved Project Title **Statistical methods for detection of non-coding RNAs in eukaryote genomes**

2008 : \$ 85,000

2009 : \$ 85,000

2010 : \$ 80,000

Primary RFCD 2702 GENETICS

Administering Organisation Queensland University of Technology

Project Summary

Understanding how eukaryotic cells work is a major goal of 21st century biology. A crucial step will be to catalogue the functional components of eukaryotic genomes. Australian researchers must be involved in this process at an early stage, in order to maximise commercial opportunities, attract quality researchers and position ourselves for further advances. This project will make major contributions to international efforts in this area, via the development of statistical methods for segmenting genomes, classification of those segments, and study of the resulting classes. In the long term, enhanced understanding of eukaryotic cells will lead to breakthroughs in biology, and to medical, pharmaceutical, agricultural and scientific advances.

Summary of Discovery Projects Proposals for Funding to Commence in 2008

DP0879015 Prof W Lane; Prof PE von Nessen; Dr AJ McCullagh; Mr TJ Smedinghoff
Approved Project Title **A new legal framework for identifying and reporting Australian data breaches**
2008 : \$ 104,000
2009 : \$ 93,000
2010 : \$ 72,000
Primary RFCD 3901 LAW
Administering Organisation Queensland University of Technology

Project Summary

A data breach reporting mechanism will provide security and economic benefits for Australia. One aim of such a mechanism is to enable law enforcement agencies to discover identity crime threats arising from data breaches. Enhanced reporting will lead to more information sharing which will lead to enhanced detection. The reporting mechanism will be built with the needs to Australian business at its heart to encourage reporting. In turn, this will enhance consumer confidence through enhanced governance regarding the handling of personal information. The research will cement Australia's reputation as an advanced technological jurisdiction that can incorporate the security requirements of technical development.

DP0878042 A/Prof GI Mackenzie; Dr D Indermaur; Prof RG Broadhurst; Prof CA Warner; Dr LD Roberts; Mr N Stobbs
Approved Project Title **Sentencing and public confidence: public perceptions and the role of the public in sentencing practice and policy**
2008 : \$ 185,000
2009 : \$ 220,000
2010 : \$ 137,000
Primary RFCD 3903 JUSTICE AND LEGAL STUDIES
Administering Organisation Queensland University of Technology

Project Summary

Public confidence is critical to the effective operation of the criminal justice system. This project will generate much needed current national data on public attitudes about sentencing. It examines avenues for the incorporation of public opinion into sentencing policy and processes, and provides accurate measures of the factors involved. The results will enable governments to respond to periodic crises in public confidence in constructive and informed ways, rather than act in response to law and order rhetoric, linked with harsh sentencing regimes, and costly and potentially unnecessary increases in incarceration rates.

DP0878011 Prof DL McElwain; Dr SW McCue; A/Prof IA Darby
Approved Project Title **A Mathematical Model of the Roles of Contraction and Oxygen in Human Wound Healing**
2008 : \$ 85,000
2009 : \$ 80,000
2010 : \$ 75,000
Primary RFCD 2399 OTHER MATHEMATICAL SCIENCES
Administering Organisation Queensland University of Technology

Project Summary

Slow or impaired wound healing and excessive scarring associated with burns are both painful and costly. Moreover, the debilitating effect of chronic wounds can be expected to increase with the continuing aging of the population and the current rise in incidence of Type 2 diabetes. This project brings together a multidisciplinary team to develop a mathematical model of human wound healing and to drive the modelling to generate important breakthroughs at the level of basic science with implications for both experimentalists and clinicians.

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DP0881045 A/Prof XS Miao; A/Prof Y Xiao; Prof RW Crawford

Approved Project Title **Bilayered and growth factor-loaded composite scaffolds for the guided bi-differentiation of bone marrow stem cells**

2008 : \$ 85,000

2009 : \$ 85,000

2010 : \$ 85,000

Primary RFCD 2915 BIOMEDICAL ENGINEERING

Administering Organisation Queensland University of Technology

Project Summary

The project will regenerate bone-cartilage (osteocondral) tissues using scaffolds, growth factors, and stem cells in order to repair osteochondral defects. The project will improve the quality of life for ~1.4 million Australians suffering from joint pain and disability due to damage or disease of cartilage and subchondral bone. The project will promote Australia research strength in biomaterials, tissue engineering, and drug delivery. The project will also create research opportunities for PhD students, who will be equipped with interdisciplinary skills.

DP0880346 Dr KI Momot; Prof JM Pope; Dr RM Wellard

Approved Project Title **Mobility of water in cartilage as a probe of molecular structure and function**

2008 : \$ 50,000

2009 : \$ 50,000

2010 : \$ 40,000

Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Administering Organisation Queensland University of Technology

Project Summary

Clinical diagnosis of early-stage osteoarthritis is difficult, and most patients are not diagnosed until a substantial degradation of cartilage has occurred as a result of the disease. This research will study the interaction between different components of articular cartilage and investigate, how this interaction can be exploited for the development of reliable and non-invasive techniques of cartilage imaging. Mobility of water molecules is a potent indicator of the microscopic structure of the cartilage scaffold. We will use this fundamental biophysical relationship to measure the internal architecture of collagen fibres; observe the changes effected by mechanical load; and distinguish between healthy and osteoarthritic cartilage.

DP0877624 Prof AN Pettitt; Dr G Ridall; A/Prof PA McCombe; Dr R Henderson; Dr JH Blok; Dr NP Friel

Approved Project Title **Novel Applied Bayesian Statistics for Monitoring Neuromuscular Diseases**

2008 : \$ 150,000

2009 : \$ 145,000

2010 : \$ 140,000

Primary RFCD 2302 STATISTICS

APD Dr G Ridall

Administering Organisation Queensland University of Technology

Project Summary

Neurological diseases such as motor neurone disease are caused by the progressive death of motor units serving a muscle. Currently there are no ways of quantifying and detecting change in the number of motor units serving a muscle which are non-invasive. Our research will provide an objective method for the progression of neuromuscular diseases to be monitored with minimal inconvenience to patients. This will allow clinical trials for possible effective treatments of neurological diseases such as motor neurone disease to be conducted with an objective measurement of disease progression.

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DP0877835 Prof S Sridharan
Approved Project Title **Robust speaker recognition with reduced utterance duration and intersession variability**
2008 : \$ 70,000
2009 : \$ 65,000
2010 : \$ 60,000
Primary RFCD 2802 ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING
Administering Organisation Queensland University of Technology

Project Summary

The development of robust and accurate speaker recognition systems will enable secure person authentication in over-the-phone financial transactions and benefit the community through the elimination of identity fraud incurred by customers and financial institutions. The technology will also assist in safeguarding Australia by enabling the implementation of suspect identification using voice and security measures for combating terrorism by using voice to locate and track terrorists. Our research at QUT Speech Research Lab is at the forefront of development in this field and will provide Australia with a technological advantage in the rapidly evolving global market for speaker recognition technology for person authentication applications.

DP0877992 Prof Z Upton; Prof GA George; Dr D Leavesley; Dr SC Rizzi; Prof JA Hubbell
Approved Project Title **Molecularly engineered cell-instructive hydrogels for enhanced tissue regeneration**
2008 : \$ 100,000
2009 : \$ 100,000
2010 : \$ 100,000
Primary RFCD 2708 BIOTECHNOLOGY
Administering Organisation Queensland University of Technology

Project Summary

The outcomes of this project will be relevant to range of wounds, including burns, bed-sores, and diabetic and venous ulcers. Clearly, innovation in wound healing is urgently required as the treatment of wounds represents a significant challenge at all levels of our society, in terms of cost (physical, emotional and financial) to patients, the economy and to the wider community. Despite this obvious and overwhelming need, research in wound healing is relatively under-developed and has yet to adopt modern biotechnology and biomaterials approaches. This project is therefore directed at generating cost-effective frontier wound dressing technologies that accelerate wound repair.

DP0877108 A/Prof H Zhu; Prof Dr EF Vansant; Prof Dr J Zhao; Prof Dr X Gao
Approved Project Title **Efficient One-Dimensional Photocatalysts from Titanate Nanofibres and Nanotubes**
2008 : \$ 115,000
2009 : \$ 114,000
2010 : \$ 109,000
Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)
Administering Organisation Queensland University of Technology

Project Summary

This project will deliver important fundamental knowledge for the development of high-value products of titania, and thus will contribute directly to the priority goal of transforming the existing titania industry through value adding and export on the international market. This research will lead to new industries and will create employment opportunities for Australians. It will also serve to train young scientists with a real appreciation of materials research and engineering, contributing to the overall competitiveness and productivity of Australian R&D. This project would lead to advances in important fields of clean energy, environment remediation and advanced materials processing in Australia.