

Summary of Linkage Projects Proposals for Funding to Commence in 2007

South Australia

The University of Adelaide

LP0776833 Prof AD Austin; Dr JT Jennings; Mr MF Purcell; Dr NA Schellhorn

Approved Project Title **Systematics and coevolution of insect herbivores on casuarinas: testing phylogenetic congruence for selection of plant biocontrol agents**

2007 : \$ 31,000

2008 : \$ 71,000

2009 : \$ 82,500

2010 : \$ 42,500

Primary RFCD 2705 ZOOLOGY

Collaborating/Partner Organisation(s)

USDA_ARS Australian Biological Control Laboratory

South Australian Museum

Administering Organisation The University of Adelaide

Project Summary

The casuarinas (sheoaks) are a significant component of the Australian floral landscape. Associated with them are many co-evolved insects, some of which may prove useful as biocontrol agents against Casuarina weeds. Using morphological taxonomy combined with a novel molecular approach, we will compare the co-evolution of psyllids, scale and gall insects, and weevils with that of the casuarinas. This project will have significant implications for conservation and regeneration of casuarinas in the Australian context and the selection of specific biocontrol agents against casuarinas as environmental weeds.

LP0776684 Dr BE Forbes; Prof JC Wallace; Dr C Owczarek; Dr E Maraskovsky

Approved Project Title **Development of novel therapies for the treatment of cancer**

2007 : \$ 35,898

2008 : \$ 73,655

2009 : \$ 37,757

Primary RFCD 3203 MEDICAL BIOCHEMISTRY AND CLINICAL CHEMISTRY

Collaborating/Partner Organisation(s)

CSL Limited

Administering Organisation The University of Adelaide

Project Summary

Both aging and obesity are significant risk factors for cancer and are becoming a burden on the health care budget. The proposed novel cancer therapy will improve current cancer treatments by enhancing their efficacy, thereby reducing the required dose and minimizing side effects. Such an outcome would not only benefit the well being of the individual but would achieve significant health care cost savings.

LP0776635 Dr BN Kaiser; Prof MA Tester; Dr JA Rafalski; Dr K Dhugga

Approved Project Title **Targeted approaches to improve nitrogen use efficiency in maize**

2007 : \$ 150,000

2008 : \$ 300,000

2009 : \$ 300,000

2010 : \$ 150,000

Primary RFCD 3002 CROP AND PASTURE PRODUCTION

Collaborating/Partner Organisation(s)

DuPont-Pioneer

Administering Organisation The University of Adelaide

Project Summary

Nitrogen is an essential input required for growing high yielding quality cereal crops such as maize and wheat. Unfortunately, excessive use of nitrogen fertilizers can lead to serious environmental costs including nitrogen pollution through leaching and the significant cost in non-renewable fossil fuels used in their production. Improving nitrogen use efficiency in crops such as maize will reduce fertilizer use while ensuring long-term sustainable production and harvestable yields. This collaboration with DuPont-Pioneer will focus on identifying nitrogen-linked traits in Maize that will be incorporated into new lines targeted at reducing grower dependence on nitrogen fertilizers.

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LP0776947 Prof TM Monro
Approved Project Title **Low power optical limiting for laser receiver protection**

2007 : \$ 45,000
2008 : \$ 112,500
2009 : \$ 112,500
2010 : \$ 45,000

Primary RFCD 2404 OPTICAL PHYSICS

Collaborating/Partner Organisation(s)

BAE Systems Australia

Administering Organisation The University of Adelaide

Project Summary

This project will place Australia as one of the leaders in the world in both science and technology of soft glass Photonic Band Gap Fibres, which is an enabling field of research with enormous number applications in Medicine, Defence, communication, etc. The project will develop a critical component (receiver protection) for laser range finders, which are widely being used in defence industries, therefore having national benefit in terms of safeguarding Australia. The project will also be an excellent vehicle for educating young physicists and engineers in Australia. This is of national importance in itself due to the current shortage of photonics physicists.

LP0776316 A/Prof GJ Nathan; Dr PA Kalt; Dr JJ Parham; Dr NL Smith

Approved Project Title **Assessment and Optimisation of Mixing and Aerodynamic Characteristics of Multi-Fuel Burners for Rotary Kilns**

2007 : \$ 50,000
2008 : \$ 95,000
2009 : \$ 90,000
2010 : \$ 45,000

Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

Collaborating/Partner Organisation(s)

FCT-Combustion

Administering Organisation The University of Adelaide

Project Summary

Cement kilns are increasingly being used to dispose of waste and low-grade biomass fuels. Being nominally greenhouse neutral, these fuels reduce greenhouse gas emissions by displacing fossil fuels. However, their use also presents significant technical challenges, one of which will be addressed by the proposed program. In building capacity of local industry to utilise these fuels in cement kilns, it will open the door to other opportunities in the future. It will also increase the export earnings of an Australian company who will commercialise these outcomes internationally.

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LP0776921 Dr DJ Peet; A/Prof ML Whitelaw; Dr S Klaus; Dr R Bilton

Approved Project Title **Characterisation of the oxygen-sensing asparaginyl hydroxylase, FIH-1, and hydroxylase-specific antagonists.**

2007 : \$ 40,000

2008 : \$ 80,000

2009 : \$ 80,000

2010 : \$ 40,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

APDI Dr R Bilton

Collaborating/Partner Organisation(s)

FibroGen Inc.

Administering Organisation The University of Adelaide

Project Summary

This research will provide fundamental information on how cells and whole organisms can sense and respond accordingly to oxygen deficiency. This information is fundamental for our understanding of embryo development and adult life in different environments, and central to the diagnosis and treatment of diseases such as stroke, cardiovascular disease, and cancer. This research will contribute to our basic knowledge of these processes, provide invaluable information about the specific genes and proteins involved, and provide direct information about the therapeutic potential of specific drugs or inhibitors designed to target this oxygen response in human disease.

LP0776825 Prof JC Wallace; Dr GK Shooter; Prof RS Norton

Approved Project Title **Interactions of Insulin-like Growth Factors and their Binding Proteins with Vitronectin: a structural basis for antagonist design and development**

2007 : \$ 50,804

2008 : \$ 101,256

2009 : \$ 50,452

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Collaborating/Partner Organisation(s)

Tissue Therapies Ltd

Administering Organisation The University of Adelaide

Project Summary

Tissue Therapies Ltd has shown that a patented combination of three biosynthetic molecules, VitroGroR, can promote tissue repair effectively. This project will use biophysical and biochemical techniques to investigate precisely how these molecules interact, and hence provide a rational basis for future developments and improvements of this exciting new therapeutic strategy.

Conversely, this information would also facilitate the development of antagonists to VitroGroR complexes would provide novel opportunities to treat diseases such as cancer and atherosclerosis that involve excessive production of its component molecules.