

Summary of Linkage Infrastructure, Equipment and Facilities Proposals by State and Organisation

New South Wales

Macquarie University

LE100100229 A/Prof Simon C George, Prof Peter F Nelson, A/Prof Damian B Gore, A/Prof Joanne F Jamie, Dr Jochen J Brocks, Prof Brett A Neilan, Dr Gallage S Kannangara, Dr Ian Snape, Dr Herbert Volk, Dr Michael A Wilson

Approved Project Title **Time-of-flight mass spectrometer for analysis of complex mixtures in oils, ancient rocks, recent sediments, natural products and atmospheric aerosols**

2010 \$160,000.00

Primary FoR 0402 GEOCHEMISTRY

Partner/Collaborating Organisation(s)

Australian Antarctic Division (AAD), Commonwealth Scientific and Industrial Research Organisation (CSIRO) The Australian National University, The University of New South Wales, University of Western Sydney

Administering Organisation Macquarie University

Project Summary

Research benefits will be: 1. More effective remediation of petroleum spills through better understanding of degradation pathways, and ecotoxicological impact of spills. 2. Better understanding of the role of urban aerosols in human health impacts and climate change. 3. More effective development of finite petroleum resources by better understanding of processes altering crude oil in the sub-surface. 4. Identification of natural products from algae, cyanobacteria, plants and mushrooms as new sources of pharmaceutical agents. 5. Improved knowledge of early evolution of life on Earth, helping maintain Australian scientists as world leaders in this field. 6. Greater understanding of the source and migration of petroleum in frontier areas.

LE100100095 Prof William L Griffin, Prof Suzanne Y O'Reilly, Dr Norman J Pearson, Prof Simon P Turner, Dr Bruce F Schaefer, Dr Elena Belousova, Dr Nathan R Daczko, Dr Tracy A Rushmer, Prof Joel A Baker, Prof Geoffrey L Clarke, Dr Masahiko Honda, Dr Paul F Carr

Approved Project Title **Frontiers in integrated laser-sampled trace-element and isotopic geoanalysis**

2010 \$700,000.00

Primary FoR 0403 GEOLOGY

Partner/Collaborating Organisation(s)

Victoria University of Wellington
The Australian National University, The University of Sydney, University of Wollongong

Administering Organisation Macquarie University

Project Summary

Until around 2005 Australia was a leader in the coupling of laser-ablation microprobes (LAM) with inductively-coupled-plasma mass spectrometers (ICPMS) for geochemical research. However, international developments in femtosecond LAM, sector field instruments and novel instrument coupling possibilities have leap-frogged these achievements. The proposed innovative facility will allow us to regain the leading edge in this field, help maintain the high profile of Australian geoscience internationally, and to attract high-quality researchers and industry-related research funding. The research is relevant to the Deep Earth Resources National Priority and will include projects of direct relevance to mineral exploration and process technology.

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LE100100150 Prof Nicolle H Packer, Prof Phillip J Robinson, Prof Mark von Itzstein, Prof Robert C Baxter, Prof Patrick P Tam, Prof Kathryn N North, Prof Adam McCluskey, A/Prof Mark P Molloy, Prof Jürgen Götz, Dr Mark E Graham, Dr Sue M Firth, Dr Mark A Baker, Dr Geraldine M O'Neill, Dr Russell J Diefenbach, A/Prof Tracy M Bryan, Dr Rachael Z Murray, Dr Beric R Henderson, A/Prof Jennifer A Byrne, A/Prof Ann K Goodchild, A/Prof Paul A Haynes, Dr Megan Chircop, Prof Mark S Baker, Prof Roger R Reddel, Prof Jens Coorsen, Prof Antony Braithwaite

Approved Project Title

Beyond Proteomics: structure and function of protein modifications

2010 \$500,000.00

Primary FoR 0601 BIOCHEMISTRY AND CELL BIOLOGY

Partner/Collaborating Organisation(s)

Griffith University, The University of Newcastle, The University of Sydney, University of Western Sydney

Administering Organisation Macquarie University

Project Summary

The world's leading cancer therapeutics have come from the protein phosphorylation field, and glycomics has led to drugs that combat the flu and that stimulate red blood cell production in cancer patients. Thus there is a bright future for discovery of new medicines based on new knowledge in this area. Protein modifications are key to the understanding of disease mechanisms and for searching for new disease markers and new therapeutics. In the hands of local experts the instruments will enable identification of these modifications and provide improved understanding of biology, increase the national competitiveness of Australia's scientists, and provide advanced technology training to the next generation of scientists.

LE100100094 Dr Kira E Westaway, Dr Paul Hesse, A/Prof Damian B Gore, A/Prof Patricia C Fanning, Dr Kirstie A Fryirs, Dr Malcolm Choat, A/Prof Ian D Goodwin, Prof James Goff, Prof Charles G Skilbeck, Prof Michael J Morwood

Approved Project Title

Single-grain optically-stimulated luminescence and dosimetry instruments to service the Sydney metropolitan and greater New South Wales region

2010 \$110,000.00

Primary FoR 0403 GEOLOGY

Partner/Collaborating Organisation(s)

NSW Department of Environment, Climate Change and Water (DECCW)

The University of New England, The University of New South Wales, University of Technology, Sydney

Administering Organisation Macquarie University

Project Summary

This equipment will support projects that address significant environmental challenges in Australia, such as climate change and variability, coastal management and sustainable river and water management, and that assess the impacts and consequences of these challenges for populations living in environmentally sensitive areas. These projects will build on established collaborations in Australia, Antarctica and the south-west Pacific and encourage new collaborations with south-east Asian, Egyptian and Argentinean researchers, which will promote Australian research on a world stage. The use of this equipment will also pioneer new dating methodologies to further enhance Australia's place at the forefront of geochronology.