

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

Victoria

The University of Melbourne

LE0989341 Prof F Caruso; Prof K Hourigan; Prof GW Stevens; Prof T Sridhar; Prof SJ Kent; Mr A Fouras; A/Prof GG Qiao; A/Prof DE Dunstan; Dr GA Thouas; A/Prof SB Hooper; Dr AJ O'Connor; Dr AP Johnston; Dr BM Stadler; A/Prof RG Evans; Dr SL Gras; Dr KM Denton; Dr JT Pearson; Dr GK Such; Dr A Blencowe; Dr MJ Kitchen; Dr KK Siu

Approved Project Title **Advanced NanoBiomaterials Imaging Facility**

2009 : \$ 690,000

Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

Partner Organisations & Collaborating Organisations

The University of Melbourne

Monash University

Administering Organisation The University of Melbourne

Project Summary

The convergence of nanotechnology with biotechnology offers unprecedented opportunities to prepare nanomaterials with defined structure and function on the nanometre scale. However, the small length scales involved in nanomaterials present challenges in their characterisation, and in turn, their interaction with biological systems. The Advanced NanoBiomaterials Imaging Facility will provide state-of-the-art equipment for examining the properties of nanomaterials and their interaction with biosystems. The equipment will facilitate the development of new materials that are expected to underpin advances in drug delivery, diagnostics and implant devices, further strengthening Australia's strong reputation in these areas.

LE0989226 Prof WR Heath; A/Prof FR Carbone; Prof J McCluskey; Dr A Brooks; Prof DI Godfrey; Prof PC Doherty; Dr SJ Turner; Dr AW Purcell; Prof PA Gleeson; A/Prof IR van Driel; Prof J Rossjohn; Dr EL Hartland; Dr TC Beddoe

Approved Project Title **Multi-photon imaging for infection, immunity, and self recognition**

2009 : \$ 340,000

Primary RFCD 3202 IMMUNOLOGY

Partner Organisations & Collaborating Organisations

The University of Melbourne

Monash University

Administering Organisation The University of Melbourne

Project Summary

This proposal will address a gap in our imaging capabilities, allowing us to visualise the movement of immune cells and infectious agents such as bacteria and viruses within living tissues. This will immensely improve our capacity to understand interactions between the immune system, invading organisms and the rest of our body. The intravital imaging system will provide novel insights into how the immune system works, which will benefit the design of vaccines, the treatment of cancer, and our understanding of allergy. This state-of-the-art facility will also provide vital training in an emerging technology that will have application in many areas of biology.

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LE0989125 A/Prof SD Kolev; Dr IE Woodrow; A/Prof ID McKelvie; Dr BF Abrahams; A/Prof M Ashokkumar; Dr RA Caruso; A/Prof CS Cobbett; Dr PL Cook; Dr PS Donnelly; Dr MR Grace; Prof AA Hoffmann; Prof RA O'Hair; Prof CH Schiesser; Prof AG Wedd; A/Prof JM White; Dr U Wille; Dr SJ Williams; A/Prof CG Young; Dr S Yuen

Approved Project Title **Enhanced Capacity in Ultra-Trace Level Detection and Speciation of Compounds of Environmental, Biological and Materials Science Interest**

2009 : \$ 150,000

Primary RFCD 2504 ANALYTICAL CHEMISTRY

Partner Organisations & Collaborating Organisations

The University of Melbourne

Monash University

Administering Organisation The University of Melbourne

Project Summary

The proposed integrated facility will strongly support collaborative research in areas of high national priority. These are environmental sustainability, development of new materials and designing molecules of therapeutic value on the basis of better understanding the relevant biological processes. This support will lead to maximizing the outcomes of numerous projects already funded by the Australian Research Council which require accurate and highly sensitive analysis. This will improve the cost effectiveness of research funding and will further strengthen the outstanding reputation of Australia science worldwide.

LE0989390 Prof KA Nugent; A/Prof AG Peele; A/Prof PC Dastoor; A/Prof WM Skinner; Dr WP Gates; A/Prof AF Masters; Prof L Tilley; Dr PR Heraud; Prof PA Lay; Dr BC Cowie; Dr DJ Paterson

Approved Project Title **Versatile Scanning X-ray Microscopy Facility at the Australian Synchrotron**

2009 : \$ 500,000

Primary RFCD 2404 OPTICAL PHYSICS

Partner Organisations & Collaborating Organisations

The University of Melbourne

Monash University

La Trobe University

The University of Newcastle

The University of Sydney

University of South Australia

Australian Synchrotron

Administering Organisation The University of Melbourne

Project Summary

The challenges of the modern world means that the Australian community must continue to have access to state of the art research tools. An important component of international synchrotron sources is the very high resolution x-ray microscope. These microscopes are used to image samples of biological, material or environmental significance with extraordinary precision. This project will establish such a microscope at the Australian Synchrotron in Clayton, and nucleates an extensive nationwide collaboration that is devoted to the development of this and related techniques and their application to problems of national scientific, environmental and technological importance.

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LE0989384 Prof MG Pandy; Prof IM Mareels; Prof R Kotagiri; A/Prof RK Begg; Dr KM Crossley; Dr KE Webster; A/Prof JA Feller; Dr JW Fernandez
Approved Project Title **High-speed, three-dimensional, x-ray fluoroscopy for accurate measurement of human joint motion**
2009 : \$ 233,000
Primary RFCD 2915 BIOMEDICAL ENGINEERING

Partner Organisations & Collaborating Organisations

The University of Melbourne
Victoria University
La Trobe University
National ICT Australia

Administering Organisation The University of Melbourne

Project Summary

This proposal addresses one of the most difficult and long-standing problems in the field of biomechanics: How can human joint motion be measured accurately and non-invasively during common activities such as walking, stair ambulation and running? Low-dose, high-speed, three-dimensional, x-ray fluoroscopy provides an excellent solution to this problem and, in so doing, can play a pivotal role in healthcare, through clinical gait analysis and gait rehabilitation (diagnosis, prevention and treatment of movement disorders); in sports, through the development of personalized training programs for elite athletes; and in entertainment, through the creation of physics-based animations for the video/digital games industry.

LE0989197 Dr U Wille; Dr ML Coote; Prof CH Schiesser; Prof KP Ghiggino; Prof P Mulvaney; A/Prof SD Kolev; Prof JW White; Dr E Rizzardo
Approved Project Title **Reaction Kinetics Analysis Facility**
2009 : \$ 225,000
Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisations & Collaborating Organisations

The University of Melbourne
The Australian National University
CSIRO Molecular & Health Technologies

Administering Organisation The University of Melbourne

Project Summary

This proposal will establish a world-class resource to support major research efforts in a wide range of applications associated with the study of reaction mechanisms and intermediates in systems ranging from small molecules to complex polymers. This facility, which is unique in Australia and strongly builds on the broad expertise of the involved researchers at the participating institutions, will address an important need in the areas of physical-organic and physical chemistry by strengthening our capacity for cutting-edge research in reactive intermediate chemistry. The Facility will help to establish frontier technologies in the chemical sciences for building and transforming Australian industries in line with national research priorities.