



Clinical Registries

AMREP has become home to the largest concentration of clinical registries in Australia. At present over 20 major registries are located on site, mainly within the Centre of Research Excellence in Patient Safety (CREPS). CREPS was established as an NHMRC Centre within the Monash University School of Public Health and Preventive Medicine (SPHPM) to provide national leadership and research into the measurement of quality of care.

Registries provide measurement and benchmarking of the outcomes of high significance clinical procedures. They are also used to monitor the safety of new drugs, devices and surgical procedures. New registries currently under development at AMREP include lung cancer, cardiac procedures, major transfusion and breast implants.

Clinical registries collect an identical minimum data set from patients treated at participating hospitals. Outcomes of treatment are also measured in a systematic way using identical definitions. The data is fed back to clinical teams to allow their performance to be measured against other units, nationally and internationally.

Some registries also collect details of treatment allowing the measurement of compliance with treatment guidelines and exploring variations in care which are still prevalent, even for common conditions such as prostate cancer.

Professor John McNeil, Head of SPHPM, says that one reason for the School's national role in registry development is its data centre. This provides a unique capacity to handle large clinical data sets involving thousands of patients with high security, which is matched by only one or two other units in Australia.

In addition, CREPS has become a leader in registry science, focusing on areas such as risk adjustment, registry governance and funding models. The unit worked closely with the National Commission for Safety and Quality of Healthcare to develop national guidelines for registries which have now been widely adopted throughout Australia.

The School's registry program has provided an excellent example of collaboration between Monash SPHPM and clinical units within The Alfred hospital. Professor McNeil says, "Registries rely on a combination of clinical and research skills. Several senior Alfred clinicians including Jeremy Millar (prostate cancer), Peter Cameron (trauma, burns) and Robert Stirling (lung cancer) work with the School's clinical epidemiologists, biostatisticians and data management staff to provide clinical leadership of each individual registry."

Professor Peter Cameron says, "The registries provide a great example of how specialised skills within the university and the hospital can produce a high profile national program. The registries will also provide the campus with a clinical research resource unique to the campus."



Emily Kelly of the SPHPM Clinical Informatics and Data Management Centre.



Registries managed include:

- Australian Society of Cardiac and Thoracic Surgeons (ASCTS) Database
- Australian Rheumatology Association Database (ARAD)
- Bosentan Patient Registry
- Haemostasis Registry
- Melbourne Interventional Group (MIG) Interventional Cardiology Registry
- REduction of Atherothrombosis for Continued Health (REACH) Registry
- Population-based prostate cancer clinical registry
- Surveillance of Australian workplace Based Respiratory Events (SABRE)
- Victorian Cardiac Arrest Registry
- Victoria Lung Cancer Registry
- Victorian Orthopaedic Trauma Outcomes Registry (VOTOR)
- Victorian State Trauma Outcomes Registry (VSTORM)

For more information, visit www.med.monash.edu.au/epidemiology/research/registries.html





The Healthy Lifestyle Research Centre at Baker IDI

In a bid to combat the epidemic of obesity and diabetes as well as subsequent development of heart and vascular disease, Baker IDI opened the Healthy Lifestyle Research Centre (on level 4 of the Alfred Centre) in May 2010.

The Healthy Lifestyle Research Centre's research program encompasses physical activity and nutrition underpinned by basic and clinical physiology. A principal aim is development of evidence-based, sustainable, interventions to combat obesity and its consequences.

Physical Activity Research

The physical activity program builds on a strong Baker IDI track record in research underpinning national and international exercise guidelines. More recently, time spent sitting has been identified as an independent risk factor for metabolic and vascular disease. The centre has a comprehensive program focused on sedentary behaviour reduction, including understanding mechanisms and development and evaluation of sustainable interventions to reduce sedentary time.

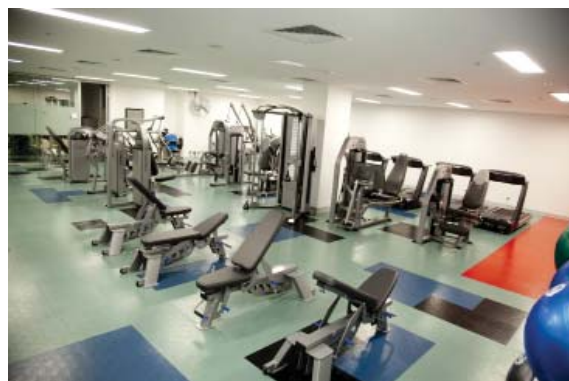
Nutrition Research

Diet and nutrition are important factors in the promotion and maintenance of good health throughout life. Their role as determinants of chronic non-communicable diseases is well established and consequently, they occupy a prominent position in prevention activities.

Lifestyle modification is the cornerstone of treating and preventing diseases of obesity. The nutrition program will examine and endeavour to optimise diets for people with obesity, cardiovascular disease, insulin resistance and Type 2 diabetes.

Access

Enquiries about accessing facilities at the Healthy Lifestyle Research Centre should be directed to Professor Bronwyn Kingwell (bronwyn.kingwell@bakeridi.edu.au).



Both aerobic and resistance exercise intervention research are conducted in the research gymnasium.



Dietary advice and support are central to research focused on sustainable weight loss.



Ian Potter Library

The Ian Potter Library provides a single integrated library and information service to staff and students of AMREP. Acting as the hub of the Alfred Health Library Service, the Ian Potter Library also supports the local library services at Caulfield Hospital and Sandringham Hospital.

The library organises its information resources to support patient care, educational training and research activities of the AMREP institutions. Supporting research is a major focus for the library, and keeping abreast of new research programs and developments is important. With representatives of all the AMREP institutions, the Library Advisory Committee advises on information services and resources required by research scientists and students. Key resources include access to full-text electronic journals, bibliographical databases in biomedicine, technical monographs, specialist reference texts and overseas document requests.

The trend towards replacing library print journal subscriptions with online-only journal subscriptions continued apace in 2010. Library subscriptions from publishers Elsevier, Nature, Springer and Wiley experienced a major change. At the same time, the library was able to generally expand access to the range of titles offered by these important scientific publishers. With online archival access to journal content locked-in, it is possible to consider disposing of back-runs of print journals when extra library shelving space is required. Full-text article downloads from library resources totalled 167,000 in 2010.

The library teamed up with research staff from National Information and Communications Technology Australia (NICTA) based at the University of Melbourne, and RMIT University's Department of Computer Science, to conduct a study titled 'Improving Tools for Searching Medical Literature'. The library asked for volunteers to participate in testing a variety of online search systems, which would gather data on the efficiency of database searching models.

The library provides a busy schedule of training classes for library users. The most popular training classes in 2010 were for EndNote and Medline. The library also provided classes for EMBASE, CINAHL, Cochrane Library and general library orientation. There were 151 training classes conducted, which provided training to 469 people.



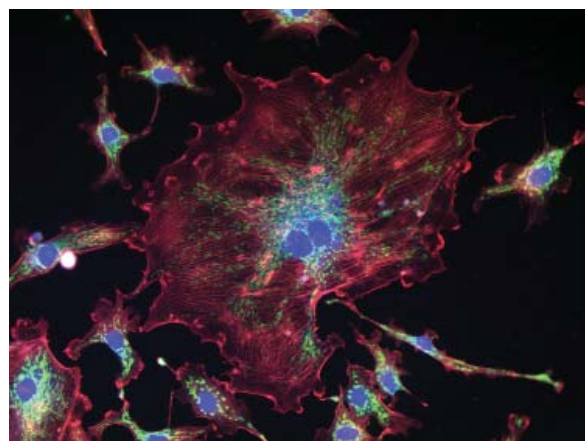
Monash Micro Imaging at AMREP (MMI@AMREP)

Monash Micro Imaging at AMREP manages core imaging resources within Baker IDI Heart and Diabetes Institute, Monash University Central Clinical School and the Burnet Cell Imaging Facility. Stephen Cody coordinates and facilitates microscopy developments, and is responsible for microscopy training and research support.

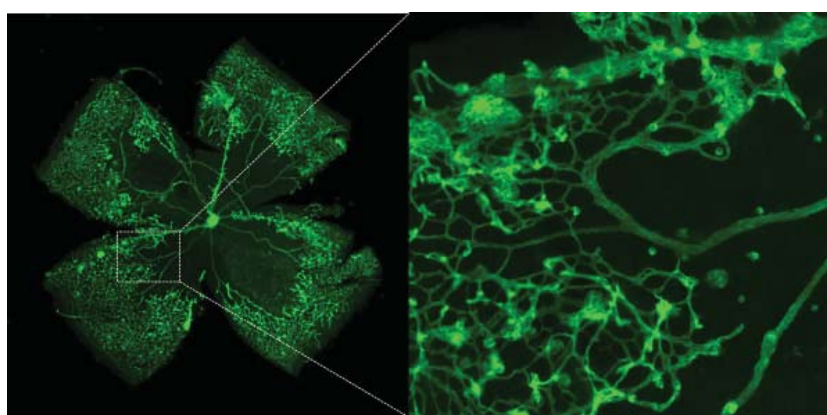
Currently, MMI@AMREP manages three confocal and several conventional fluorescence microscopes within PC2 laboratories. There is also a dedicated deconvolution microscope within a PC3 laboratory forming part of the Burnet Cell Imaging Facility. MMI@AMREP staff are available to help with experimental design, and techniques such as: live and fixed cell imaging, time-lapse, 3D, high resolution of large areas, fluorescence, brightfield, phase, DIC, ion imaging such as Ca²⁺ and pH.

Training on microscopes is conducted on request and is usually coupled with a discussion on the imaging requirements of the research project. This ensures that the training is targeted to the needs of the project, and that the experimental design is appropriate. Training seminars and workshops are also conducted to help broaden the understanding of imaging. MMI@AMREP staff are keen to assist when purchasing a new microscope, ensuring researchers order the right technology to suit their needs and have expertise in negotiating discounted pricing.

Contact Stephen Cody (stephen.cody@monash.edu) for microscopy related issues, including training, research support, instrument demonstrations and promotions, and new technology, or visit www.microimaging.monash.org



Bovine pulmonary artery endothelial cells stained with fluorescent dyes. Mitochondria are labelled in green, F-actin in red and nuclei in blue. Image by Stephen Cody, MMI.

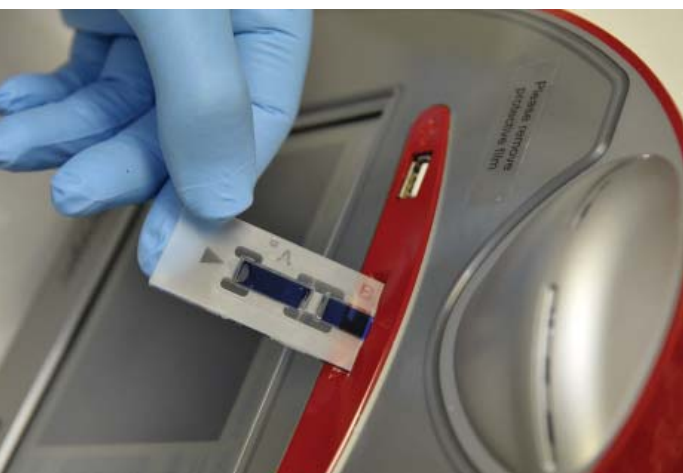


Oxygen-induced retinopathy. High resolution image of a whole mouse retina. The 'tiled' image on the left is 'stitched' together from a mosaic of high resolution images; an example of one tile is on the right. Image by Devy Deliyanti and Genevieve Tan, Department of Immunology, Monash University.

Burnet ImmunoMonitoring Facility

The Burnet ImmunoMonitoring Facility (IMF) is a certified NATA Research and Development (R&D) accredited facility. Under the direction of Associate Professor Rosemary Ffrench, the facility develops optimised and validated immunological assays for clinical trials and pre-clinical research compliant to ISO/AS17025. The development of vaccines and immunotherapies requires the sophisticated assessment of immune responses in both animals and in human clinical trials. Cell-mediated immunity is a key biomarker for most vaccines and immunotherapies and involves the activity of specialised cells including macrophages, dendritic cells, natural killer cells, antigen-specific cytotoxic T-lymphocytes, helper T-lymphocytes and the release of various cytokines in response to antigen stimulation.

The Burnet IMF aims to support both internal and external research in vaccine development by conducting and validating relevant immunological assays to Good Laboratory Practice standards. Increasingly, regulatory authorities request that assays showing markers of vaccine efficacy are robust and standardised. These assays are often difficult to complete and require a high level of operator skill and specialised equipment.



Analysis of the biological samples is performed using the following appropriately validated analytical techniques and processes: isolation and cryopreservation of mononuclear cells, plasma and serum; ELISpot assays; multiplex bead array systems; ELISA; neutralisation activity assays; phagocytic function and oxidative burst activity analysis.

Enquiries about the Burnet IMF should be directed to Associate Professor Rose Ffrench, Facility Director (ffrench@burnet.edu.au) or Kylie Goy, Facility Coordinator (kgoy@burnet.edu.au).



Dr Farhad Shafiei uses the Sequenom MassArray.

Omics (DNA and Blood Profiling)

The DNA and Blood Profiling Facility at Baker IDI has a systems biology theme integrating the genomics, epigenomics, metabolomics and proteomics laboratories with the bioinformatics group.

The facility contains state-of-the-art instruments, including the Illumina Genome Analyzer II (next generation sequencing) and iSCAN System (gene expression microarrays), the Sequenom MassArray for genotyping, as well as a number of specialised mass spectrometers for lipids profiling, peptide mass fingerprinting, biomolecule separation and protein profiling. The team also offers bioinformatics support for the relevant platforms and offers Sanger/capillary DNA sequencing as a regular service.

For more information on the platforms available and the services offered, contact Dr Farhad Shafiei (farhad.shafiei@bakeridi.edu.au), or visit www.bakeridi.edu.au/core_facilities/OMICS/

Mouse Metabolic Phenotyping

Devising new therapies to combat obesity is challenging due to the complex nature of metabolic disease, which involves the interaction between genetics and the environment. Mice provide an essential model for studying metabolic disorders since the whole mouse genome has been sequenced and candidate genes for coronary disease, cardiomyopathy, diabetes, obesity and other disorders of metabolism have been identified. Transgenic technology and gene targeting protocols have allowed researchers to create new mouse lines with specific phenotypes and well-defined DNA structural changes that enable diseases of metabolism to be better understood.



The Mouse Metabolic Phenotyping Facility at Baker IDI Heart and Diabetes Institute was established to provide services to scientists using mice to study obesity, diabetes, cardiovascular disease and other metabolic diseases. Using state-of-the-art tools and methods, the facility provides sophisticated, standardised, high quality metabolic and physiologic phenotyping services for rodent models of obesity, diabetes and related disorders. This service enables scientists to identify and study new mouse models of complex metabolic diseases. By manipulating candidate genes in mice, scientists will gain a better understanding of the genetic origins of obesity and related diseases, and the effects of different environmental factors.

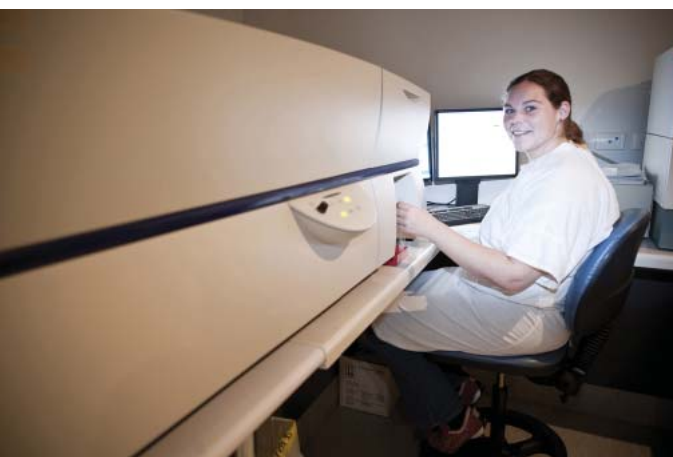
For more information, contact Professor Mark Febbraio (mark.february@bakeridi.edu.au) or Dr Clinton Bruce (clinton.bruce@bakeridi.edu.au).

Flow Cytometry

The AMREP Flow Cytometry Facility is a state-of-the-art, world class cell sorting and cell analysis laboratory, catering for the scientific research community based at AMREP and broader Melbourne. The facility is located in the Monash Department of Immunology, with some instruments located within the Burnet Institute.

The Flow Cytometry Facility offers comprehensive training and education, experimental design and protocol guidance specifically targeting effective data generation and interpretation. Services catering for both animal and human cell sorting in a PC2 environment are offered. The

facility can also handle infectious sample sorting (e.g. HIV, Hepatitis C) in a dedicated PC3 environment, which is unique to Melbourne. The facility offers two FACSAria high throughput sorting platforms and five flow cytometers: an LSR II, a FACSCanto II with a 96-well High Throughput Sampler and three FACSCalibur units.



For more information on the platforms available and the services offered, contact the Manager of the facility, Geza Paukovic (paukovic@burnet.edu.au) or Assistant Manager Michael Thomson (thomson@burnet.edu.au), or visit www.amrepflow.org.au

Dr Alexandra Ziegler utilises the LSR II, one of AMREP's most advanced cell analysers.