Vision: to be Australia’s leading centre for clinical research underpinned by excellence in basic research and public health.
It is my pleasure to introduce the Alfred Medical Research and Education Precinct (AMREP) Research Report for 2008. AMREP is a research and educational partnership between Alfred Health, Baker IDI Heart and Diabetes Institute, Burnet Institute, Monash University, La Trobe University and Deakin University. This report provides a comprehensive overview of the research programs undertaken across all institutions based at AMREP in 2008. Statistics on a selection of indicators of research performance, monitored since 1998, are also provided.

Seven years on from its establishment in 2002, AMREP has expanded enormously, largely as a result of the mergers of AMREP’s two medical research institutes with smaller institutes. In 2006, the Burnet Institute merged with the Austin Research Institute to become a new larger Burnet Institute, and, in 2008, the Baker Institute merged with the International Diabetes Institute to become Baker IDI Heart and Diabetes Institute. The additional staff of both enlarged institutes will be accommodated in Stage 2 of The Alfred Centre, which is currently under construction and due for completion in early 2010.

I would like to acknowledge the substantial contribution made by former Alfred Health Chief Executive Jennifer Williams to the advancement and support of research at AMREP and, in particular, her work (with Steve Wesselingh) in driving the planning of Stage 2 of The Alfred Centre.

I also wish to acknowledge the contribution of Peter McDonald, Acting Chief Executive, following Jennifer’s departure from Alfred Health in February 2009 until my recent appointment.

Andrew Way  
Chief Executive, Alfred Health  
Chair, AMREP Council
The AMREP Council has a major governance role in providing the infrastructure and environment in which research at AMREP can flourish.

The Council comprises two representatives from each of the four original AMREP partners and one from each of the newer partners (Deakin University and La Trobe University). Additional members are the Chief Medical Officer and Chief Nursing Officer, Alfred Health (representing the interface between research and clinical practice), and the chairs of the two campus ethics committees and the AMREP Scientific Advisory Committee.

Following are the major items of business considered by the AMREP Council from July 2008 to June 2009:

- Progress with construction of The Alfred Centre Stage 2
- Bio21 Research Directors Forum
- Redevelopment of AMREP Animal Services
- Proposal for a new AMREP lecture theatre
- Monash Health Sciences Cluster
- Facilities management at AMREP
- Merger of International Diabetes Institute with the Baker Heart Research Institute
- Centralised multi-site ethical review and Streamlined Ethical Review Process (SERP)
- Nucleus Network
- AMREP’s research performance
- Annual AMREP Research Report
- Alfred Health education strategy
- AMREP imaging consortium
- Code for Responsible Conduct of Research
- New NHMRC funding commencing in 2009
- Restructure of the Monash University Clinical School
- AMREP Global Health Forum
- Development of Critical Care Network
- Launch of new Burnet Institute logo
- Centre for Health Innovation agreement
- Campus wide internet outages
- Regular reports from The Alfred Human Research Ethics Committee, the AMREP Animal Ethics Committee, the AMREP Scientific Advisory Committee, AMREP operational working groups and Monash University Biosafety Committee (on dealings with genetically modified organisms).

Jennifer Williams, former Alfred Health Chief Executive, was Chair of the AMREP Council until February 2009 when she left to become Chief Executive of the Australian Red Cross Blood Service. Peter McDonald, Acting Chief Executive, chaired the Council from March to June 2009.

MEMBERSHIP (JULY 2009):

Andrew Way (Chair)
Representative, Alfred Health

Hilary Bolton
Representative, Baker IDI Heart and Diabetes Institute

Professor Mari Botti
Representative, Deakin University

Professor Brendan Crabb
Representative, Burnet Institute

Associate Professor Sharon Donovan
Chief Nursing Officer, Alfred Health

Professor Mark Cooper
Chair, AMREP Scientific Advisory Committee

Dr Lee Hamley
Chief Medical Officer, Alfred Health

Professor Geoff Head / Dr Raffi Gugasyan
Chair, AMREP Animal Ethics Committee

Professor Garry Jennings
Representative, Baker IDI Heart and Diabetes Institute

Professor John McNeil
Chair, The Alfred Human Research Ethics Committee

Professor Mark Hogarth
Representative, Burnet Institute

Professor Graeme Ryan
Representative, Alfred Health

Professor Karen Dodd
Representative, La Trobe University

Professor Napier Thomson / Professor Hatem Salem
Representative, Monash University

Professor Steve Wesselingh
Representative, Monash University

IN ATTENDANCE

Heather Gallichio (Secretary)
Manager, Alfred & Baker IDI Research Office

Gillian Holley
Manager, Monash University Central Clinical School

Bill O’Shea
Alfred Health Corporate Counsel

Geoff McDonald
Director, Capital and Infrastructure, Alfred Health

Ian Martin
General Manager, Infrastructure and Facilities Management, Baker IDI
Research Performance
AMREP’s research performance continued to show impressive growth in 2008. Total external research funding increased from $68 million in 2007 to $83 million. Of this, almost $39 million came from the NHMRC and the US National Institutes of Health. The number of masters and doctoral degree completions more than doubled from the level in 2007 to 194. Ninety-one of these were doctoral degree completions. The number of publications rose from 1028 to 1097. Impact factor analysis of published journal articles showed a substantial improvement in quality from the previous year.

AMREP researchers were awarded more than $40 million in total direct NHMRC grant funding commencing in 2009. Highlights were an Australia Fellowship awarded to Professor Mark Cooper (Baker IDI), $23.3 million of new Project Grant funding and $520,000 for H1N1 influenza research announced in July 2009.

AMREP World Health Day Global Health Forum
Global Health and Global Crises was the theme of the 3rd AMREP World Health Day Global Health Forum held on 7 April, 2009. More than 250 participants attended from South Africa, China, Indonesia, Fiji, New Zealand and Australia to consider how the global financial crisis and its subsequent economic impact will affect the future health and well-being of developing countries. There was also discussion of how the recent dramatic increase in world food prices is impacting on the state of nutrition and health in developing countries.

Keynote speakers included Susan Ivatts (Director of the Health and HIV Thematic Group, AusAID), Professor Dan Ncayiyana (a South African academic physician and editor of the South African Medical Journal), Dr Mark McGillivray (Chief Economist, AusAID and former Deputy-Director of the United Nations World Institute for Development Economics Research). The IGNITE group of Monash medical students also conducted a very successful display of photographs.

Establishment of an Australian and New Zealand Critical Care Network
An innovative collaboration between Monash University, The Alfred hospital and other key health service providers will bring together Australia’s leaders in critical care management and research. This alliance will tackle some of the key challenges faced by health professionals in the management of critically ill patients by undertaking research programs that improve both the management and outcomes of patients, and influence systems, policy and practice.

Addressing fundamental issues such as training clinical researchers, consolidating data systems and identifying gaps in research and clinical practice will be high on the group’s agenda as it forms a cohesive and dynamic network.

Australian Centre for Health Innovation
In 2008, the Australian Centre for Health Innovation (CHI) revisited its strategic plan, and engaged external consultants to review its business model and sustainability. As a result, the Board has been restructured to have a more commercial focus, which will ensure that CHI can continue to assist clinicians, health services and technology developers with innovations in health technology and simulation education.

Strong support from the Deans of Medicine and Health Sciences of Monash and La Trobe Universities is shown by their leadership of the newly formed Education and Research Advisory Committee. Simulation education is highly appreciated at all levels of clinical practice, and significant funding is being allocated under a new Federal initiative to expand clinical placement options and to support education for new graduates. CHI is now well positioned to take a strong role in developing and evaluating best practice models of simulation education.

Appointment of Director, National Trauma Research Institute
Professor Russell Gruen recently commenced as Director of the National Trauma Research Institute. He has also been appointed as Head of Trauma Quality Assurance at The Alfred and a Professor of Surgery and Public Health with Monash University. Professor Gruen is a general surgeon specialising in trauma care. He was Associate Professor of Surgery at the Royal Melbourne Hospital and the University of Melbourne from 2006.

Professor Gruen’s research expertise includes organisation and evaluation of systems of care, including trauma systems; audit and clinical governance; monitoring errors in trauma care; medical professionalism and evidence-based clinical practice and policy. He has been the lead investigator on research grants totalling over $6 million, including a Victorian Neurotrauma Initiative program grant, and holds an NHMRC Clinical Career Development Award. He has over 50 peer-reviewed publications, including articles in leading journals such as The Lancet, New England Journal of Medicine, JAMA and Annals of Surgery.

Alfred Week Research Poster Display and AMREP Research Prize
The Research Poster Display is an annual event held during Alfred Week. In 2008, 203 posters showcased research activities across AMREP. Prizes were awarded for the best posters in several categories. We gratefully acknowledge our prize sponsors as well as the contribution of the many AMREP staff who judged the posters.

The award ceremony featured an entertaining keynote address by Head of the School of Medicine at Auckland University, Professor Des Gorman, on the role of doctors in future health workforces.

Professor Gorman presented the 2008 AMREP Research Prize to Professor Jamie Cooper (Alfred Intensive Care Unit and National Trauma Research Institute). This annual prize is awarded to the AMREP first or senior author whose original research paper was published in the previous year in the journal with the highest impact factor. Professor Cooper’s article entitled ‘Saline or albumin for fluid resuscitation in patients with traumatic brain injury’ was published in the New England Journal of Medicine (impact factor: 52.589).

AMREP Honours Scholarships
The AMREP Honours Scholarships scheme was devised to attract outstanding Science and Biomedical Science students to undertake their Honours year at AMREP. Scholarships for study in 2009 were awarded to Li Let Tan and Maria Demaria who are both studying in the Monash Department of Immunology. Photographs of Li Let and Maria are on the inside back cover of this report.
AMREP’s Research Performance

Included in these composite data for 2008 are The Alfred hospital, Baker IDI Heart and Diabetes Institute, Burnet Institute and Monash University departments based at The Alfred campus.

1. External research funding

External research funding includes funds received from peer reviewed funding schemes (e.g. NHMRC, National Heart Foundation), other government grants (e.g. Department of Human Services), industry and university grants (e.g. Monash University funding schemes). Funds received from commercially sponsored clinical trials / contract research are not included.

Research funding received from external sources in 1998-2008.

2. Commercially sponsored clinical trials approved by The Alfred Human Research Ethics Committee

<table>
<thead>
<tr>
<th>Year</th>
<th>Approvals (number)</th>
<th>Income (millions)</th>
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<tbody>
<tr>
<td>1999</td>
<td>53</td>
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</tr>
<tr>
<td>2008</td>
<td>93</td>
<td>$18.383</td>
</tr>
</tbody>
</table>

Shown above is the number of commercially sponsored clinical trials approved by The Alfred Human Research Ethics Committee in 1999-2008. Also shown is the amount received for new and ongoing commercially sponsored clinical trials.

3. Publications

Publications include refereed journal articles, book chapters, books and electronic publications. Abstracts, conference proceedings and ‘in press’ articles are not included.


4. Higher degrees

Higher degrees include completed and passed masters and doctoral level degrees.

Number of completed and passed higher degrees in 1999-2008.
The Alfred Ethics Committee

The Ethics Committee reviewed 259 new ethics applications in 2008. Of these, 122 were health and social sciences applications and 137 were drugs and interventions applications. A further six applications were given cross-approval; that is, they had been approved by another human research ethics committee and, in line with the National Statement on Ethical Conduct in Human Research (2007) (National Statement) guidelines, did not require full Committee review.

In addition, 119 ‘low risk’ applications were considered by a sub-committee of the Ethics Committee, leaving the main Ethics Committee to consider higher risk projects. The National Statement allows institutions to establish alternative methods of ethical review for low risk research, provided the reviews are professional and competent.

The Committee continued to review a number of first-time-in-human (FTIH) applications. Reviews of high risk research involve in-depth scrutiny of the scientific aspects by the Research Review Committee and, in most cases, additional review by an external independent expert. For each such project, the Ethics Committee conducted an interview with the principal researcher about the scientific and ethical aspects of the research. Ten FTIH applications were reviewed over the period and all were approved. One study was stopped subsequently because of adverse effects.

Research Governance

Stricter requirements for progress reporting and a revised report form have resulted in the improved monitoring of research. In addition, completion of a ‘self-audit tool’ has helped researchers to reflect on their research conduct and to comply with guidelines for responsible research conduct. Twelve project audits across a range of departments showed a good standard of ethics compliance; most researchers were well prepared for audits, with study files in excellent order. The audits also demonstrated a comprehensive understanding of the Ethics Committee’s expectations.

General Ethical Issues

In 2008, the General Ethical Issues Sub-committee considered issues ranging from topics of general public interest, to matters of relevance to Alfred Health, to procedural issues relating to Ethics Committee review and research governance processes at Alfred Health.

- In consultation with the Victorian Managed Insurance Authority, revised patient information about injury compensation to clinical trial participants was developed. Alfred Health is trialling the resulting wording before it is considered for wider implementation in Victorian public hospitals.
- Lobbying is under way for a ‘no fault’ insurance scheme for major injury resulting from participation in clinical research, similar to that of the Transport Accident Commission.
- The General Ethical Issues Sub-committee contributed to the development of guidance, by the Offices of the Public Advocate and Health Services Commissioner, on the interaction of the Guardianship and Administration Act and the Health Records Act. These two sets of legislation come into play where research involves adult participants who lack the capacity to consent to participation in research.
- A detailed submission was made to the NHMRC on the draft Issues Paper Ethics and the exchange, sale of and profit from products derived from human tissue, with input from a number of hospital and external experts.
- Internal guidelines and processes were developed, revised or contributed to in the following areas:
  - The enrolment of research participants in concurrent clinical trials: patient recruitment is restricted to one interventional trial at a time, with some scope for exceptions.
  - Adverse event reporting: interim guidelines were developed to appropriately monitor the safety of clinical trials in a manageable and meaningful way, until revised guidelines are issued by the NHMRC’s Australian Health Ethics Committee.
  - Archiving of research records: the required period of data retention for non-interventional research projects was revised down from ‘indefinitely’ to seven years.
  - Access to, and governance of, databases/databanks/registries: departmental or custodian sign-off is an essential prerequisite for ethics approval.
  - Clinical photography: feedback was provided on draft organisational guidelines governing the use of clinical photography for research, educational and clinical purposes.
  - Patient privacy brochure What happens to information about me?: revisions were made in consultation with Health Information Services to more accurately portray the handling of patients’ health information in relation to Alfred Health’s research activities.
  - Hospital–industry conflicts-of-interest: Alfred Health’s policies were reviewed and endorsed.

- The General Ethical Issues Sub-committee continues with its ongoing program to develop and periodically review standard risk wording for participant information sheets.
- Guidance and information developed by the General Ethical Issues Sub-committee continues to be disseminated via the Ethics Committee Newsletter, The Alfred Research and Ethics Unit website, Alfred Health weekly information packs, reports and presentations to relevant groups.
COMMITTEE MEMBERSHIP

Ethics Committee
Professor John McNeil (Chair)
Roy Oliff (layman, Deputy Chair)
Dr Stephen Duffy (Chair, Health and Social Science Group)
Professor Mari Botti (nursing representative; Deputy Chair, Health and Social Science Group)
Marta Ago (lawyer)
Emily Bingle (laywoman – from March 2009)
Elizabeth Burns (laywoman – from March 2009)
Tracey Caulfield (laywoman)
Brad Crammond (member with knowledge of relevant research areas – from March 2009)
Fiona Ellis (lawyer)
Dr Judith Frayne (member with knowledge of professional care and treatment)
Peter Gallagher (layman)
Associate Professor Richard Gerraty (member with knowledge of relevant research areas)
Linda Hornsey (laywoman – from March 2009)
Reverend Scott Holmes (minister of religion – to June 2008)
Reverend Marilyn Hope (minister of religion)
Associate Professor David Hunt (member with knowledge of relevant research areas)
Dr Michael Hurley (member with knowledge of professional care and treatment)
Professor Colin Johnston (member with knowledge of relevant research areas)
Associate Professor Victor Kalff (member with knowledge of professional care and treatment)
Magda Karagiannakis (lawyer – to December 2008)
Andrew Kauler (layman)
Professor Paul Komesaroff (member with knowledge of relevant research areas – to December 2008)
Professor Henry Krum (member with knowledge of relevant research areas)
Maria McKenzie (member with knowledge of relevant research areas)
Stephen Moloney (lawyer)
Dr James Shaw (member with knowledge of relevant research areas)
Fran Westmore (laywoman – to February 2009)
Dr Fran Wise (Caulfield Hospital representative; member with knowledge of professional care and treatment)
Robyn Wright (nursing representative – to August 2008)
Rabbi Dr Gershon Zylberman (minister of religion)
Rowan Frew (Secretary)
Dr Angela Henjak (Assistant to Secretary – Drugs and Interventions Group)
Nicole Rosenow (Assistant to Secretary – Drugs and Interventions Group)
Kordula Dunscombe (Secretary – Health and Social Science Group)
Tracey Scheller (Secretary – Health and Social Science Group) (from May 2008)

General Ethical Issues Sub-committee
Professor John McNeil (Chair)
Professor Alison Street (Deputy Chair)
Dr Susannah Ahern (to December 2008)
Tracey Caulfield
Brad Crammond (from May 2008)
Professor Frank Dudley (from March 2009)
Reverend Marilyn Hope
Andrew Kauler
Peter Gallagher
Professor Paul Komesaroff
Dr Phoebe Mainland
Kathryn Marshall (Caulfield Hospital Representative – to May 2008)
Elizabeth Mullaly (Caulfield Hospital Representative – from May 2008)
Janine Roney (from June 2009)
Professor Jeffrey Rosenfeld (to December 2008)
Professor Graeme Ryan
Dr Tim Sutton
Professor John Wilson
Michelle Wright
Kordula Dunscombe (Secretary)
Rowan Frew (Ethics Manager)

Research Review Committee
Professor Colin Johnston (Chair)
Professor Henry Krum
Dr Sharon Avery (from September 2008)
Dr Catherine Cherry (from September 2008)
Dr Andrew Davies
Dr Judith Frayne
Associate Professor Richard Gerraty
Dr Andrew Haydon
Professor Jennifer Hoy (to June 2008)
Associate Professor Victor Kalff
Dr William Kemp (from September 2008)
Anne Mak
Dr David Mclroy (to June 2008)
Professor John McNeil
Dr James Shaw
Dr Alan Young
Rowan Frew (Secretary)
Dr Angela Henjak (Assistant to Secretary)
Nicole Rosenow (Assistant to Secretary)

Low Risk Sub-committee
Maria McKenzie (Chair)
Fran Westmore (to February 2009)
Dr Fran Wise (to January 2009)
Dr Phoebe Mainland (from January 2009)
Scott Presnell (from June 2009)
Nicole Rosenow (Secretary)
The AMREP Animal Ethics Committees (AEC) accept responsibility for the care and/or use of animals for scientific purposes for the Baker IDI Heart and Diabetes Institute, Burnet Institute, Monash University Central Clinical School, The Alfred, and onsite biotechnology companies.

The Bureau of Animal Welfare requires that all proposals to use live animals are assessed by a quorum of AEC members, meaning that at least one member from each of the following categories must be present: (A) veterinarian, (B) scientific, (C) animal welfare and (D) lay.

One hundred and three new experimental applications were processed in 2008 and a second committee was formed to deal with the increasing workload of applications from the precinct. Both Chairs meet regularly, and before every meeting, to ensure a consistent level of scrutiny is applied to all the applications. Many applicants, particularly those who are new to AMREP, are routinely interviewed by the AEC. The animals used during the year were principally mice and rats, but a small number of rabbits, ducks and dogs were also used. As a result of the implementation of a two committee system, Chairs now draw on the expertise of three lay people, three veterinarians and three animal welfare representatives. Scientific expertise comes from the AMREP research community.

In 2008, with the relocation of the Austin Research Institute to the precinct following its merger with the Burnet Institute, several new investigators were introduced into the system.

The AMREP Animal Ethics Committees adhere to the NHMRC Code of Practice for the Care and Use of Animals for Scientific Purposes and work closely with the Bureau of Animal Welfare to ensure compliance at the highest levels.

**Supporting Research**

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 library also provides frequent training classes for the use of electronic resources in its computer training room.

**Improving Access to Online Resources: Athens**

In 2008 the library signed up to the Athens system, which provides library users with remote authenticated access to institutional resources. The Athens system allows research staff and students access to key online resources from off-site locations, including when travelling overseas. The full capability of the system needs to be built up over time, and part of the process is registering the large number of potential staff and students on the Alfred campus. Athens will continue to be promoted in 2009.

**Education and Training: EndNote**

EndNote is a popular software product which assists researchers to keep track of journal and book citations, and helps format citations during the writing of journal articles, book chapters and thesis reports. The library added EndNote training to the range of information training classes in 2008. Demand for training has been high, with most classes booked out well in advance.

**Inter-library Support**

The Ian Potter Library continued to receive strong support from the Monash University Library and the La Trobe University Library in 2008. Both libraries support staffing as well as the purchase of books or journals for the collection. Many specialist texts were provided by the Monash University Library during the year to support research units based at AMREP. Monash and La Trobe students can electronically request materials from university campus libraries to be sent to the Ian Potter Library via a daily courier system.
NEW AMREP CORE FACILITIES

Mouse Metabolic Phenotyping Facility

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 recently 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 will enable scientists to identify and study new mouse models of complex metabolic diseases. By manipulating candidate genes in mice, scientists will gain a much better understanding of the genetic origins of obesity and related diseases, and the effects of different environmental factors.

Professor Mark Febbraio (email: markfebbraio@bakeridi.edu.au) or Dr Clinton Bruce (email: clintonbruce@bakeridi.edu.au) may be contacted for information on services.

Omics (DNA and Blood Profiling) Facility

With ever evolving new and emerging technologies in the fields of genomics, epigenomics, proteomics, metabolomics and lipidomics, the opportunities to develop comprehensive systematic identification of genes and biomarkers for the study of complex diseases have never held so much promise. The DNA and Blood Profiling Facility (Omics Facility) at Baker IDI integrates these research disciplines so that health problems can be examined from a multifaceted viewpoint. This systems biology approach combines the expertise of Baker IDI scientists and the latest in technological advances, thus enabling a more precise look at complex biological questions. The bioinformatics team is developing new computational tools to analyse data in a more comprehensive manner and is available to assist researchers with their questions.

The facility holds state-of-the-art instruments, including the Illumina Genome Analyzer II (next generation sequencing) with particular research interest in ChIP sequencing, and Illumina iSCAN (gene expression and microRNA arrays), as well as a number of specialised mass spectrometers for peptide mass fingerprinting, biomolecule separation and protein profiling.

Researchers are encouraged to take full advantage of the Omics Facility. For information on the platforms available, contact Facility Manager Dr Farhad Shafiei (farhad.shafiei@bakeridi.edu.au).

Monash Microimaging at AMREP (MMI@AMREP)

Monash Micro Imaging has established a node at AMREP to manage the core imaging resources of Baker IDI, the Burnet Institute and Monash University Central Clinical School. Stephen Cody has joined MMI to manage and develop the MMI@AMREP facility. Stephen coordinates and facilitates microscopy developments, and is responsible for microscopy training and research support. Training seminars and workshops are also conducted to help broaden understanding of imaging.

Currently MMI@AMREP manages three confocal and several conventional fluorescence microscopes within PC2 laboratories. There is also a dedicated deconvolution microscope within a PC3 facility if required. MMI@AMREP staff are available to assist with experimental design, and techniques such as live and fixed cell imaging, time-lapse, 3D, high resolution of large areas, fluorescence, brightfield, phase, DIC, and ion imaging such as Ca^{2+} and pH.

MMI@AMREP has an office in Baker IDI (lower ground floor) and a Monash office on floor six of the Burnet Tower. Contact Stephen Cody (stephen.cody@med.monash.edu.au) for further information.

Bovine pulmonary artery endothelial cell imaged in the MMI@AMREP facility.
Several of the projects within the Department of Cardiovascular Medicine translate the findings of biomedical research and development into clinical practice. Three studies undertaken during the past year illustrate different aspects of the translational process. Studies from Dr James Shaw and colleagues have demonstrated that the infusion of HDL (good) cholesterol can reduce inflammation in atherosclerotic plaque given several days prior to plaque removal by percutaneous atherectomy. These studies paved the way for future investigations of the effects of such therapy on clinical end-points.

Research by Professor Murray Esler and Dr Tony Walton have demonstrated that interrupting the sympathetic nervous supply of the kidneys in subjects with high blood pressure can be done safely through a percutaneous catheter, and appears to result in worthwhile gains in blood pressure reduction in subjects who are poorly controlled with medical therapy. These studies have been published in *The Lancet* and will form the basis for a definitive clinical trial to establish the place of this novel therapy.

A third example relates to the study within the department of an innovation developed by Professor David Kaye to make it possible to more safely undertake coronary angiography in subjects with renal failure. The research builds on Professor Kaye’s extensive experience with similar techniques in both clinical and experimental animal research, and uses a catheter based device to extract radio-opaque dye used in cardiac angiography before it has circulated through the body and potentially caused further kidney damage.

The accuracy and completeness of patient reported medication histories compared with those obtained by a pharmacist in a preadmission clinic

The aim of this study was to prospectively evaluate the accuracy and completeness of a patient-completed questionnaire (PAQ) completed by patients attending the preadmission clinic (PAC) compared with a pharmacist’s preadmission assessment.

The study was conducted over a three-week period in August 2007 with patients attending a preadmission surgical clinic. Consecutive patients had a preadmission assessment with the PAC pharmacist. Comparison was made regarding the accuracy of medication information between the PAQ and preadmission assessment by the PAC pharmacist. Of the 150 patients enrolled in the study, 33 (22.0%) had a PAQ that was totally correct. There was an average of 3.9 drug discrepancies per PAQ. The discrepancies were related to drug omitted (317), incorrect dose (24), dose omitted (110), frequency incorrect (24) or frequency omitted (63). The patient’s adverse drug reaction status was recorded correctly on the PAQ for 84.7% patients.

This study has shown that a PAQ used in the setting of a preadmission surgical assessment is not accurate in four out of five patients. This highlights the positive contribution of a pharmacist working in a PAC in ensuring that an accurate medication history is available.
Factors contributing to bleeding risk in patients receiving warfarin therapy

Investigators: J McNeil, P Cameron, M Dooley, R Wolfe, S Evans, E Maxwell, L Piterman, A Street, B Diug, J Lowthian

Warfarin is the mainstay of prophylaxis against stroke in atrial fibrillation and valve replacement. Warfarin’s narrow therapeutic window necessitates close monitoring of the International Normalised Ratio (INR) as numerous factors are recognised to increase or reduce its anticoagulation effect. Despite its efficacy, warfarin remains one of the most common drug-related causes of death and morbidity, with increased bleeding tendency as its major adverse effect.

The aim of this project is to reduce the amount of unnecessary bleeding due to warfarin, by identifying predisposing factors and potential system of care issues amongst patients with significantly elevated INR levels, and to develop a preliminary risk profile of patients being treated with warfarin who record elevated INR levels in the blood. We hypothesise that people with an elevated INR level will have a different profile than those who maintain an INR level within a therapeutic range.

Based in metropolitan Melbourne, this project is being conducted in collaboration with Melbourne Pathology, and consists of two phases. The pilot study was completed in 2007: 40 patients with INRs ≥ 6 and their primary treating doctors were interviewed. The current case control study comprises 450 patients: 150 cases and 300 controls. Patients are eligible if they are aged ≥ 18 years, reside in the community, provide informed consent and have been on warfarin for a minimum of six months. Additionally, cases have recently developed an INR ≥ 6.0, whilst controls have been well stabilised for a minimum of three months. Patient interviews investigate potential predisposing factors, including demographic and clinical characteristics, comorbidities, diet, medication and warfarin knowledge. Standardised measures evaluate cognition, mood, social support, functional independence, and adherence and medication complexity.

A major outcome of this study will be an improved ability to ‘risk-stratify’ patients given warfarin therapy into those at high and low risk of bleeding. Ultimately, it may reduce the significant burden of harm attributable to warfarin and improve the ratio of benefit to harm achieved with this agent. The project is funded by NHMRC Project Grant ID 436763.
The Department of Allergy, Immunology and Respiratory Medicine (AIRmed) has a unique and comprehensive spectrum of expertise in Australia across clinical and basic allergy, clinical immunology and advanced adult lung diseases. Specific disciplines include severe asthma, allergic diseases, non-HIV primary and acquired immune deficiencies, chronic obstructive pulmonary disease, interstitial lung diseases, sleep apnoea and sleep disordered breathing, cystic fibrosis (CF), bronchiectasis, pulmonary vascular disease and adult and paediatric lung transplantation. AIRmed emphasises integration of clinical services with extensive human and experimental research programs, linking senior clinician scientists, bench scientists, allied health professionals, primary care physicians and the community.

Clinically driven hypotheses in allergy and respiratory medicine direct the laboratory-based human research and subsequent translation into changes in current best practice for improved health outcomes. The clinical and academic base of AIRmed is located at The Alfred hospital, with experimental and clinical research laboratories located within the hospital and in the laboratories of Monash University at AMREP.

The department has a very active clinical and biomedical research focus with considerable success in NHMRC, ARC, Cooperative Research Centre and other competitive research funding. High international and national profiles of senior personnel are reflected in numerous peer-reviewed publications and speaking invitations.

AIRmed is committed to delivering outstanding best practice clinical care, outcome driven professional education and community outreach as well as translational research of international acclaim.

**DEPARTMENTAL HIGHLIGHTS**

- Academic promotions in the Department of Medicine, Monash University: Honorary-Professor Gregory Snell and Honorary Clinical Associate Professors Brenda Button, Bronwyn Levvey and Bruce Thompson
- Dr Glen Westall, Head of Paediatric Lung Transplant Program, was awarded the Norman Shumway Career Development Award from the International Society of Heart and Lung Transplantation, USA, and a research grant from the Sylvia and Charles Viertel Charitable Foundation for lung transplantation experimental research
- Professor Robyn O’Hehir was appointed co-editor and Associate Professor Jo Douglass was appointed associate editor of the international journal Clinical and Experimental Allergy
- Associate Professor Bruce Thompson won the 2008 Australian Lung Foundation John Read Prize for Physiological Research
- Associate Professor Brenda Button won the Australian Physiotherapy Association (Victorian branch) Achievement Award 2008 for her outstanding contribution to the advancement of physiotherapy treatment, education and research in CF
- AIRmed personnel were named chief investigators on six new NHMRC Project Grants and one new ARC Discovery Grant announced in 2008 for funding to commence in 2009
- Professor Robyn O’Hehir was appointed to the Advisory Committee of the World Health Organisation affiliated alliance Allergic Rhinitis and its Impact on Asthma (ARIA)

**AIRMED 1: LUNG TRANSPLANT SERVICE**

*Head: Professor Greg Snell*

The service is one of the largest in the world, performing 3% of all lung transplants worldwide and covering the southern Australian states and New Zealand. It has strong links to clinical programs in severe interstitial lung disease, pulmonary hypertension and severe chronic obstructive pulmonary disease, and includes a Paediatric Lung Transplant Service.

**Current Projects**

- Mechanisms and predictors of chronic allograft rejection with emphasis on airway remodelling and novel strategies for prevention and reversal
- Immunological and clinical evaluation of viral (cytomegalovirus) and chlamydia infections
- Human donor lung *ex vivo* resuscitation
- *Ex vivo* evaluation of humanised transgenic GAL knockout porcine lungs
- Randomised placebo-controlled drug trials of conventional and novel therapeutics in pulmonary hypertension and interstitial lung disease
- Investigation of bronchoscopic interventional treatment for emphysema by valve decompression airway stents and bronchial thermal ablation techniques
- Evaluation of emphysema using sound wave analysis

**AIRMED 2: CYSTIC FIBROSIS SERVICE**

*Head: Professor John Wilson*

The Alfred Cystic Fibrosis Service cares for the needs of over 280 patients. The service is actively engaged in clinical and basic research centred on stem cell therapies, host organism interaction, airway remodelling, nutritional needs, airway function and psychosocial issues.
Current Projects
- Stem cell sciences in advanced lung disease: potential role of stem cell therapy in CF
- Airway remodelling and growth factors in CF
- Advanced glycation end products in renal injury in CF
- Enhanced nutrition and anti-reflux therapy on clinical and physiological outcomes
- Nocturnal hypoxia and consequences for outcomes in CF
- Electronic health records to audit clinical outcomes
- Improved care models including palliative care

AIRMED 3: GENERAL RESPIRATORY AND SLEEP MEDICINE SERVICE
Head: Associate Professor Matthew Naughton
The General Respiratory Service cares for patients with general respiratory diseases including pneumonia, chronic obstructive pulmonary disease, acute and chronic respiratory failure, post-ICU recovery, tracheostomy care, interstitial lung diseases and lung cancer. The Sleep Service manages acute and chronic sleep related breathing disorders across a wide cross-section of pulmonary, cardiac and neurological conditions.

Current Projects
- Sleep disordered breathing in heart failure: a study of pathogenesis
- Non-invasive ventilation support (acute and chronic)
- Role of sleep disorders in motor vehicle collisions
- New management algorithms for sleep disordered breathing
- Premature lung disease in marijuana smokers
- Multicentre randomised controlled trials of sleep apnoea treatment in Type 2 diabetes
- Multicentre trial of bariatric surgery on obstructive sleep apnoea
- Impact of brain natriuretic peptide on the emergency management of dyspnoea
- Effect on actigraphy of anaesthetic functional class on recuperation following general anaesthetic
- Multicentre trial of obstructive sleep apnoea management on cardiovascular endpoints in high cardiovascular risk patients (SAVE Trial)

PHYSIOLOGY SERVICE
Head: Associate Professor Bruce Thompson
The Lung Function Laboratory underpins many of the AIRmed clinical and research programs. It takes a leading role in the evaluation of new diagnostic tests and the evaluation of lung function testing devices.

Current Projects
- Novel non-invasive measures of small airways disease in asthma, bronchiolitis obliterans syndrome and CF
- Delivery devices for bronchoprovocation studies
- Predicting lung function in a normal Australian population
- Ventilatory inhomogeneity in the periphery of the lung in premature lambs

LUNG HEALTH PROMOTION CENTRE
Manager: Adrienne James
This centre provides innovative education programs and resources for health professionals in all aspects of respiratory disease, but particularly asthma and the development of smoking cessation programs.

AIRMED 4: ALLERGY, ASTHMA AND CLINICAL IMMUNOLOGY SERVICE
Head: Associate Professor Jo Douglass
The service cares for patients with asthma, allergic diseases and primary and acquired immune deficiencies. It includes a node of the national Cooperative Research Centre for Asthma and Airways.

Current Projects
- Airways disease and lung function in the ageing population
- Needs-based education strategies for older people with asthma
- Transition to adult care in adolescents with primary immunodeficiency disorders
- Novel strategies for immunomodulation including nanoparticles
- Drug allergy: clinical and laboratory studies
- Immunological and molecular characterisation of peanut allergens
- Clinical and immunological mechanisms of subcutaneous injection and sublingual allergen immunotherapy
- Trials of dietary intervention in chronic idiopathic urticaria

POSTGRADUATE STUDENTS
10 PhD Students

PUBLICATIONS
65 Journal Articles
4 Book Chapters

Associate Professor Jo Douglass (centre) and Dianne Goeman developed a DVD of a model asthma consultation for use in an educational intervention for GPs, which was successful in improving the delivery of asthma care to people over 55 years of age.
The Department of Anaesthesia and Perioperative Medicine provides anaesthesia, perioperative care, pain management, resuscitation and referral services for Alfred Health. The department is amongst the largest in Australia, with 27 fulltime and over 50 visiting specialist anaesthetists, as well as 40 registrars in training. Each registrar must complete a research project as part of their specialist qualifications, and in 2008, eight projects were completed.

The research unit focuses on patient safety, quality of care, improving pain relief and avoiding serious complications after surgery. The research unit is led by Professor Paul Myles, and funded through a number of large NHMRC grants. Staff members include Senior Lecturers Dr David McIlroy and Dr James Tomlinson, Research Manager Sophie Wallace, Research Assistants Margaret Quayle, Kathryn Fraser, Andrea Ditoro and Secretary Kate Graham.

**DEPARTMENTAL HIGHLIGHTS**

Dr David McIlroy won the prestigious Gilbert Brown Prize at the 2009 Australian and New Zealand College of Anaesthetists (ANZCA) annual scientific meeting for the best research from a fellow qualified within eight years. Professor Paul Myles was awarded the Douglas Joseph Professorship by ANZCA for his research into cancer recurrence after major surgery.

Invited international presentations included:
- Professor Paul Myles was the invited plenary lecturer at the Association of Anaesthetists of Great Britain and Ireland annual scientific meeting, and was also an invited speaker at scientific meetings in South Africa, USA, New Zealand, Canada and Portugal.
- Dr Alex Konstantatos (Sir Run Run Shaw Hospital, China)
- Dr Premilla Chinnappa (13th Ottawa Conference on Clinical Competence and the 6th Australasian Conference on Quality and Safety on Health Care).

Dr Rishi Mehra won the Tony Charlton Poster Prize for Research in the Field of Cardiac Surgery during Alfred Week.

**CURRENT PROJECTS**

The unit currently coordinates four multicentre international trials, and participates in a further six trials consisting of randomised clinical trials to audits. The larger trials include:

**ENIGMA-II Trial** [www.enigma2.org.au](http://www.enigma2.org.au)
Professor Paul Myles
One of the department’s largest research initiatives is to investigate the safety of nitrous oxide in 7,000 patients with risk factors for coronary artery disease undergoing major surgery. It is hypothesised that avoidance of nitrous oxide will reduce the incidence of cardiac complications or death when compared with otherwise identically managed surgical patients. This study received a $2.8 million NHMRC Project Grant, and is coordinated by the department and the ANZCA Trials Group. The rationale for the study protocol has been accepted for publication in the *American Heart Journal*. This international, multicentre trial has collaborators in Australia, New Zealand, Hong Kong, Canada, USA, India, Saudi Arabia, UK, Malaysia, Switzerland and Singapore.

**The ATACAS Trial** [www.atacas.org.au](http://www.atacas.org.au)
Professor Paul Myles
The Aspirin and Tranexamic Acid for Coronary Artery Surgery (ATACAS) Trial is a large multicentre randomised, controlled trial investigating whether aspirin or tranexamic acid, or both, should be used in people having coronary bypass surgery. This NHMRC and ANZCA funded trial is jointly coordinated by the department and the ANZCA Trials Group, and aims to enrol 4,600 patients. The protocol has been peer reviewed and was published in the *American Heart Journal* in 2008. Collaborating sites include hospitals in Australia, UK, India and Canada.

**Endothelial Function Study**
Dr David McIlroy
Endothelial dysfunction is a recognised predictor of intermediate-term adverse cardiac outcomes in a non-surgical population. This prospective study of 160 patients will investigate the utility of endothelial dysfunction for predicting adverse perioperative cardiac events in high-risk elective surgery, both alone and in addition to currently used risk stratification models. Endothelial dysfunction is measured by brachial artery flow-mediated dilatation, impedance plethysmography and EndoPAT (a newer automated device). The study has received an ANZCA research grant. Recruitment is occurring at The Alfred and Prince of Wales Hospital, Hong Kong.

**Paracetomol Trial**
Dr Alex Konstantatos
This double-blind randomised, controlled trial conducted at The Alfred during 2006 and 2007 aimed to evaluate the effectiveness of intravenous paracetamol in day surgical patients. A total of 145 patients undergoing a variety of surgical procedures were recruited. Analysis of the results showed that injectable paracetamol use did not produce better pain ratings, or make for more rapid discharge from the recovery area or from hospital. The trial is currently awaiting publication.

**POSTGRADUATE STUDENTS**
- 3 Masters Students
- 1 PhD Student

**PUBLICATIONS**
- 15 Journal Articles
ANATOMICAL PATHOLOGY
Head: Professor Catriona McLean BSc, MBBS, FRCPA, MD

RESEARCH ACTIVITIES

HIV neuropathogenesis
Dr Katherine Thompson
This research examines the timing and type of brain cells infected by HIV and the events that lead to the establishment of the virus in the brain.

Progressive multifocal leucoencephalopathy neuropathogenesis
Dr Tanja Jankovic-Karasoulos
The frequency and genotype of PML infection in disease and in latent states in the brain and the kidney are examined.

Humoral rejection in cardiac transplantation
Julianne Bayliss, PhD student
This research supports the involvement of vascular endothelial growth factor (VEGF) as an important mediator of lymphocyte recruitment and extravasation during ACR. The involvement of VEGF in acute humoral rejection as a marker of endothelial activation is also demonstrated. Julianne’s study extrapolates the mechanisms through which VEGF may contribute to the development of cardiac vasculopathy through perpetuation of the immune response and the promotion of collagen and fibrin deposition by cardiac myofibroblasts.

Breast cancer sub-typing and epidemiology
Professor Catriona McLean
Collaborating partner: Cancer Council Victoria. This multinational study (with Cambridge University) highlights the relationship of various subtypes of breast cancers with diet, environmental factors and a new prognostic marker in breast cancer.

Neurotrauma brain bank
Dr Tony Frugier (NTRI), Professor Catriona McLean
Collaborating partner: NTRI. This study investigates the acute inflammatory response in the two weeks following human brain trauma, including cytokine RNA expression and morphologic change.

Psychosis in frontal lobe dementia
Professor Catriona McLean
Collaborating partners: Australian Brain Bank Network and Dr Dennis Velakoulis, Neuropsychiatry Department, Royal Melbourne Hospital. This study highlighted the frequent presentation of young frontal lobe dementia patients with an initial schizophreniaform illness.

Muscular dystrophy in children
Colleen D’Arcy
Collaborating partners: Murdoch Childrens Research Institute and State Neuropathology Service. This study was part of a BMedSc project highlighting the potential for misclassification of cases of dystrophy identified as juvenile polymyositis.

Pulmonary veno-occlusive disease
Susan Haarchand
Collaborating partner: Department of Allergy, Immunology and Respiratory Medicine. This study was part of a BMedSc project highlighting that failure of Bosentan treatment in pulmonary hypertension may be related to pulmonary venoocclusive disease as a missed diagnosis.

Neuroimaging (using novel binders) of neurodegenerative diseases
Professor Catriona McLean
Collaborating partner: National Neuroscience Foundation. This research highlights novel binders and their utility in the neuroimaging diagnosis of Alzheimer’s disease.

TDP-43 in motor neurone disease
Professor Catriona McLean
Collaborating partner: University of Melbourne. The study highlights a possible novel cerebrospinal fluid marker of disease.

MAJOR ACHIEVEMENTS

Professor Catriona McLean
• Australian Medical Association Victoria Crawford Mollison Prize for ‘outstanding contribution to Pathology including service pathology, research and registrar training’
• Noel Callahan Award, Cork, Ireland
• Alfred Week Research Poster Display 2008: two WTMS clinical poster prizes
• Two NHMRC Project Grants commencing in 2008

Dr Katherine Thompson
• Travel grant to present at the conference ‘Infectious diseases of the nervous system: pathogenesis and worldwide impact’ at the Pasteur Institute, Paris

Dr Julianne Bayliss
• Finalist 2008 Cardiac Society of Australia and New Zealand Ralph Reader Prize (Clinical Science)
• Finalist 2008 Transplantation Society of Australia and New Zealand (TSANZ) President’s Prize
• Finalist 2008 Alfred Postgraduate Research Symposium
• 2008 TSANZ/AMGEN Young Investigator Award

PUBLICATIONS
12 Journal Articles
AUSTRALIAN CENTRE FOR BLOOD DISEASES
Head: Professor Hatem Salem MD, FRACP

The Australian Centre for Blood Diseases (ACBD) is a leading national and international centre with recognised research, treatment, and educational programs for blood diseases. ACBD is affiliated with Monash University, Alfred Health, Eastern Health and Southern Health, and is organised into three integrated divisions:

- Clinical and Diagnostic Haematology/Oncology
- Clinical and Basic Research Programs
- Teaching and Education

The objectives of ACBD are to:
- provide leadership in the advancement of knowledge of blood diseases
- establish an information resource for medical practitioners and the general public
- apply and commercialise discoveries that arise from basic research in blood
- act as an advisory body to State and Federal Governments
- raise the centre's national and international profile by attracting leading clinicians and researchers

SERPIN BIOLOGY UNIT
Head: Associate Professor Paul Coughlin

The prevention and treatment of blood clots is a delicate act: too much anti-platelet or anti-coagulant therapy can lead to unwanted bleeding, which can have catastrophic consequences (such as haemorrhagic stroke), while fibrinolysis therapy can cause brain damage. The unit examines alternative ways of treating and preventing blood clots by focusing on the serpin (serine protease inhibitor) superfamily of proteins. The laboratory also examines the role serpins play in diseases such as lymphoma.

Current Projects
- Centerin: a serpin expressed in lymphoma (P Coughlin and A Horvath)
- Antiplasmin: a key regulator of clot dissolution (P Coughlin and A Horvath)

THROMBOSIS RESEARCH UNIT
Head: Professor Shaun Jackson

Platelets are small, specialised blood cells that work to stop bleeding following a vascular injury (haemostasis). Haemostasis is initiated by adhesion of platelets to damaged vessel walls, culminating in the formation of a platelet plug. Ironically, when triggered within diseased blood vessels, this normally protective haemostasis becomes exaggerated and results in an abnormal platelet plug that blocks blood flow through the vessel (arterial thrombosis). Thus, platelets represent a key ingredient in the development of blood clots (thrombosis) that lead to devastating diseases such as heart attacks and strokes.

The unit aims to further our understanding of the basic principles surrounding normal haemostasis, with the ultimate goal to discover a ‘magic bullet’ that selectively targets pathological thrombosis without compromising haemostasis. The laboratory has also expanded its research to acknowledge the broadening role of platelets in various pathological processes and disease states. The Thrombosis Research Unit has recently identified a new contractile method used by platelets to stabilise blood clots, a process which holds potential to be manipulated therapeutically to assist in removing unwanted blood clots in patients with cardiovascular disease.

Current Projects
- Novel insights into platelet function and thrombus formation
  - Identification of a novel thrombus contraction process (S Schoenwaelder and S Jackson)
  - Platelet apoptosis (S Schoenwaelder and S Jackson)
  - Platelets and diabetes (S Jackson and A Calkin)
  - A role for platelets in inflammation (Y Yuan and S Jackson)
- Biochemical and physical factors regulating platelet function
  - PI 3-kinase – a new target for antithrombotic therapy (S Jackson and S Schoenwaelder)
  - A role for Dok2 proteins in regulating haemostasis and thrombosis (S Hughan)
  - The effects of disturbed blood flow on blood clot formation (W Nesbitt and S Jackson)
- Platelet receptors and their roles in haemostasis and thrombosis
  - The von Willebrand factor receptor GPIb/V/IX (S Cranmer and S Jackson)
  - Thrombin and the protease activated receptors (J Hamilton)
THE FIBRINOLOGY AND GENE REGULATION UNIT

Head: Associate Professor Robert Medcalf

The removal of blood clots from the circulation and the turnover of extracellular matrix proteins are facilitated by specialised enzymes. One of the most important enzymes in this setting is plasmin, which is the end product of the fibrinolytic system. Plasmin performs many functions, but it is generally accepted that its primary role is to degrade fibrin, the structural scaffold of a blood clot.

The main interests of the unit are in the molecular and cellular biology of this enzyme system, particularly in gene regulation at the transcriptional and post-transcriptional levels, in various cell types. Efforts are also devoted towards understanding the biology and pathophysiology of the plasminogen activator system in the central nervous system, mainly in relation to ischaemic stroke and neurotrauma, and modulation of the blood brain barrier.

Current Projects
- Regulation of tissue-type plasminogen activator (t-PA) gene expression
  in vitro (R Medcalf)
- t-PA gene regulation
  in vivo (R Medcalf)
- The role of t-PA in the central nervous system (R Medcalf, A Samson and M Sashindranath)
- Regulation of the plasminogen activator inhibitor type 2 (PAI-2) gene
  (S Stasinopoulos)
- Post-transcriptional regulation of PAI-2 gene expression

MALIGNANT HAEMATOLOGY & STEM CELL TRANSPLANTATION

Head: Associate Professor Andrew Spencer

A diverse range of translational and clinical research activities exploring improved therapeutic approaches to a variety of blood cancers continued.

Myeloma Research Group
- Epigenetic targeting of haematological malignancies (A Spencer)
- Small molecule development program (A Spencer)
- Cell adhesion mediated drug resistance (A Spencer)
- Tissue array as a predictive tool in multiple myeloma drug response
  (A Spencer)

Immunotherapy Research Group
- Generation of cytomegalovirus (CMV)-specific T cells for prevention of CMV
disease following stem cell transplantation (SCT)
- Generation of minor histocompatibility antigen specific-T cells for use in immunotherapy as a potential treatment for leukaemia patients
- Role of natural killer cells and HLA-E in the recovery of patients after SCT
- The expression of the calcitonin receptor on leukaemia cells and its role in
  the disease process
- Modulation of immune function by anti-fungal drugs

Stem Cell Transplantation Research Group
- Late effects clinic
- Immune reconstitution following novel reduced intensity conditioned SCT
- Longitudinal audit of invasive fungal infections in SCT and acute leukaemia
  induction

Clinical Trials Program
- Clinical trial activities remained high during 2008, particularly with an
  increasing proportion of Phase 1 and first time in human studies being
  undertaken. 2008 also saw the final analysis of the multicentre ALLG MM6
  trial, coordinated by Nola Kennedy, and its acceptance for publication in the
  Journal of Clinical Oncology.

EASTERN CLINICAL RESEARCH UNIT (ECRU)

Clinical Research Trials Division

The Eastern Clinical Research Unit (ECRU) is an initiative of the Monash University Department of Medicine and is based at Box Hill Hospital, Maroondah Hospital and The Alfred. ECRU has been involved in clinical trials since 1996 and has consolidated its position as the premier clinical research facility in Australia. ECRU employs over 50 medical and nursing staff who are involved in the management of over 150 clinical trials in both medical and surgical specialties. ECRU is now the largest multidisciplinary clinical trial unit in Australia, having particularly distinguished itself in its ability to recruit, collect statistical data and retain trial participants.

ECRU Biotechnology Research Division

ECRU Biotechnology (ECRU Biotech), headed by Dr Anthony Dear, aims to expand the capabilities of ECRU beyond clinical research to a better understanding of the activity of existing pharmaceuticals and the development of new and better treatments. Active contributors to ECRU Biotech include members of several disciplines from the clinical activity at ECRU, including endocrinology, neurology and oncology.

Selected ECRU Biotechnology Collaborative Research Projects
- Assessment of novel small molecule treatments in
  in vivo models of abdominal aortic aneurysm, atherosclerosis and neointimal hyperplasia
  (Associate Professor Robert Widdop, Department of Pharmacology, Monash University)
- Effects of irinotecan on vascular endothelial peptide expression in
  in vitro and in vivo models of vascular disease (Dr Lotte Knudsen, Novo Nordisk A/S, Denmark)
- Effects of novel histone deacetylase (HDAC) inhibitors in models of
  abdominal aortic aneurysm (Professor Alan Daugherty, Department of Medicine and Physiology, University of Kentucky, USA)
- Synthesis of novel HDAC inhibitors for assessment in
  in vivo models of metastatic cancer and vascular disease (Associate Professor Patrick
  Permutter, Department of Chemistry, Monash University)
- In vivo characterisation of novel HDAC inhibitors in breast carcinoma
  (Associate Professor Robin Anderson, Peter MacCallum Cancer Centre, Australia)
- Assessment of novel HDAC inhibitors in the treatment of lymphoma
  (Associate Professor Ricky Johnstone, Peter MacCallum Cancer Centre, Australia)
- Effects of novel HDAC inhibitors on latent HIV expression (Dr David Rhodes,
  AVEXA Pty Ltd)
- Effects of novel HDAC inhibitors on HIV latency (Professor Sharon Lewin,
  Department of Infectious Diseases, The Alfred)
- Effects of novel HDAC inhibitors and azacitidine in the myelodysplastic
  syndrome (Associate Professor Joe McKendrick, Department of Oncology,
  Box Hill Hospital)
- Effects of novel HDAC inhibitors in myelodysplastic syndrome (Professor
  Giuseppe Leone and Dr Maria Teresa Voso, Catholic University, Italy)
- Effects of novel HDAC inhibitors alone and in combination with azacitidine
  in in vitro models of myelodysplasia (Dr Kevin Lynch, Celgene Corporation)
- Effects of thiazolidinediones on severity of acute thromboembolic
  cerebrovascular accident (Professor Christopher Bladin, Department of
  Neurology, Box Hill Hospital)

POSTGRADUATE STUDENTS
5 PhD Students

PUBLICATIONS
37 Journal Articles
AUSTRALIAN CENTRE FOR HEALTH INNOVATION

General Manager: Cathie Steele BSc, BAppSc, MPhty, MBus, AFACHSE
Director of Research: Professor Peter Cameron MBBS, MD, FACEM

The Australian Centre for Health Innovation (CHI) provides health technology evaluation, innovation and simulation education services that enhance patient safety and quality of care.

PROGRAM ACTIVITIES
In 2008, CHI partnered with health services and industry organisations to support research and conduct projects across a wide range of technology developments. CHI plays a key role in providing health services with access to innovative technology and education services. Over 5,000 clinicians, managers and technology developers from across Australia used CHI services in 2008.

KEY FINDINGS
Voice activated real time location services
Finding information, people and equipment can take up to 30% of nursing time in a hospital. CHI worked with CISCO and Regni to develop a voice-activated, real time location service. Using this technology, a nurse can use a normal WiFi phone to ring and ask the system for the location of any tagged or WiFi asset. This has the potential to save significant time, and free up nurses for patient care.

Development of a GS1 barcode translation system for pathology services
Current Australian pathology systems are unable to read GS1 barcodes. Scientists currently hand transcribe barcodes for these products. The barcode translation system allows GS1 codes to be read using a standard barcode reader. Clinical trials are under way.

Technology for clinical networks
A two day workshop on the application of technology to support integrated clinical care was held for the Cancer, Stroke, Maternity and Newborn, Emergency, and Renal networks in Victoria. Technology to support virtual meetings for multidisciplinary care is now being used across several regions in Victoria.

Simulation education
CHI staff developed and ran new courses on:
- The management of delayed reactions to contrast media, for radiology staff
- Crisis resource management for paediatric intensive care
- Crisis resource management for adult intensive care

CURRENT PROJECTS
- Best practice in wireless systems for surgical services
- The impact of rapid roaming user sessions on nursing workforce satisfaction and efficiency in aged care

PUBLICATIONS
1 Journal Article
2 Book Chapters
Baker IDI Heart and Diabetes Institute is an international leader in research on obesity, diabetes and heart disease, with work extending from the laboratory to wide-scale community studies. Created in 2008 from the merger of the Baker Heart Research Institute with the International Diabetes Institute, Baker IDI has five broad research themes, each of which supports groups of scientists who work in the community as well as researchers who work in a laboratory setting.

Population Studies and Profiling
This team works at understanding the prevalence of disease and disease risk in the population and improving health of the community. The focus is on prevention and education, as well as development of better profiling tools.

Metabolism and Obesity
The team explores the complex relationship between physical activity, weight regulation and the genetic and environmental underpinnings of metabolism to address the causes and complications of metabolic disorders and obesity.

Diabetic Complications
Diabetes is a chronic, insidious disease that is on the rise in the community. Among its many debilitating complications are heart and vascular disease, kidney and eye disease. This team focuses on understanding which people are most at risk of the complications of diabetes and discovering ways to mitigate the effects of the disease.

Vascular and Hypertension
This team brings together studies on high blood pressure, kidney disease, the neurobiology of the relationship between depression and heart disease as well as research into the damage to arteries caused by atherosclerosis, and the damage caused by heart attack.

Cardiology and Therapeutics
Heart failure and how better to treat atrial fibrillation are among the research areas for this team. Both are increasing the health burden of communities. The focus is on taking laboratory findings and translating them into better drugs, surgical and therapeutic devices for people suffering from heart disease.

Baker IDI also provides a one-stop shop of complete patient care, diagnosis and advice at its diabetes and heart clinics.

The following provides an overview of some of the health problems we are aiming to address. More information can be found on our website: www.bakeridi.edu.au

DIABETES AND OBESITY

Obesity is a serious and complex health problem, with Type 2 diabetes and cardiovascular disease amongst its major complications. In 2005, 3.2 million Australians were obese, and there were 379,000 new cases of cardiovascular disease and 102,000 new cases of Type 2 diabetes caused by obesity.

The health and economic burden for Australia is alarming: the total financial cost of obesity was estimated at $3.7 billion in 2005. It is projected that obesity rates in Australia will double by 2025 – translating to 7.2 million obese Australians. In turn, diabetes rates are set to double. The increased rates of obesity and diabetes will heavily impact cardiovascular disease in the community. Conservatively, between 2025 and 2050, obesity will contribute to 900,000 preventable hospitalisations for cardiovascular disease and 240,000, mainly premature, deaths.

The complications of diabetes include kidney, eye and vascular disease. It is a major factor in cardiovascular disease and the most common cause of kidney failure in the Western world. The only way to reduce the current disease burden of obesity and ensure that these projections are not realised is to understand it as a complex disease while investigating its molecular, cellular and physiological precursors and implications. The development of sound preventive strategies that are informed and evaluated by research is imperative. Reflecting this need, investigations into diabetes and metabolic conditions make up about 30 per cent of our research effort.

Current research projects include:
- The development of drugs to increase the activity of antioxidant enzymes to reduce the effects of diabetes
- The identification of a master molecular controller, responsible for turning genes ‘on’ and ‘off’, and how this master switch underpins diabetic and metabolic disease
- How health and disease in one generation modifies genes and affects the next, predisposing infants to diabetes and obesity
- Community-based research understanding the incidence of symptomless kidney disease in Type 2 diabetes patients

The following provides an overview of some of the health problems we are aiming to address. More information can be found on our website: www.bakeridi.edu.au
• The comparison of advanced glycation end products (AGEs), formed when sugars in the blood attach to proteins in the body, measurements and markers of inflammation and oxidative stress in diabetic patients to predict the development of cardiovascular disease
• The development of a new drug with the ability to reverse the detrimental effects of AGEs in the body, responsible for many of the diseases caused by diabetes
• The way key regulatory molecules that control cell differentiation are activated
• The role of the anti-proliferative protein CDK1 in diabetic complications
• The effectiveness of drug treatments in diabetic atherosclerosis, as well as the effectiveness of dietary interventions in the prevention of this condition
• The complexity of the metabolic changes that precede diabetes and the development of medications to mimic the effects of exercise in the body
• The importance of breaking up sedentary activity as a way of lowering blood glucose levels and the development of Type 2 diabetes
• Tracking the progress of diabetes with AusDiab, the nation’s largest longitudinal study into the disease

HEART FAILURE
Despite the alarming increase in its prevalence, heart failure is commonly misunderstood as ‘heart attack’. In fact, heart failure is a debilitating, progressive condition that often begins as a response to injury of the heart muscle, for example after a heart attack. Heart failure has devastating consequences for patients, representing a host of secondary conditions that result from the failing heart’s inability to adequately pump blood around the body. As more people survive heart attacks, the incidence of heart failure is rising. The quality of life for a person with heart failure is dramatically reduced – normal daily activities like walking to the letterbox or making a bed can be an unpleasant, difficult and exhausting experience. In many cases heart failure leads to a slow death.

Understanding why the heart fails and who is at risk of the progression of this disease is crucial given the rates of cardiovascular disease. It is currently estimated that heart failure affects 300,000 Australians, with up to 30,000 new cases developing each year. It represents one of the biggest causes of hospital bed stays.

Baker IDI’s research into heart failure is centred on understanding the processes of heart failure in order to identify those who might be at risk of the condition and to halt its progression in those already suffering. In extreme cases, heart failure patients require a heart transplant to survive. Investigations by Baker IDI scientists range from efforts to improve the health of those who must undergo heart surgery to work on the cellular, molecular and genetic underpinnings of the progression from initial heart muscle damage to the condition of heart failure. The ultimate objective is to not only treat heart failure better, but to cure it.

Research projects under way include:
• Studies of cardiac hypertrophy – why it is beneficial to athletes but a harmful development in heart failure?
• Investigations into the effects of diabetes on the heart muscle and how diabetes contributes to heart disease
• Studies of the effects of relaxin on fibrotic heart tissue and how it might improve the ability of a failing heart to pump blood
• Better cardiac surgical techniques, including a novel, non-surgical method for mitral valve repair
• The design of therapies to regenerate hearts that have failed and how the muscle can be rebuilt to make it function better
• The study of mechanisms whereby the heart responds to stimulation and how these processes contribute to heart disease
• Ways to eliminate the risk of rupture of the ventricular wall, a serious complication of heart attack that almost always leads to sudden death

Research focuses on why it occurs and which drug treatments might prevent it

Baker IDI has made internationally renowned contributions to the understanding of heart failure and the treatment of those living with it. Under Baker IDI’s Population Studies and Profiling programs, researchers track and map areas in Australia where heart failure is most concentrated and conduct analyses of the availability of health care services.

ACUTE CORONARY SYNDROME
Acute coronary syndrome, commonly known as heart attack, is an umbrella term referring to a set of signs and symptoms that suggest a reduced blood supply to the heart. The most common cause is the development of atherosclerosis: the accumulation of plaques (fatty deposits) in the blood vessels. It is the rupture or erosion of these plaques that can lead to heart attack, stroke and sudden death. Atherosclerosis is the underlying cause of most cardiovascular disease, and understanding the development and nature of these plaques, and who is at greatest risk of their rupture, is a major research concern across the institute. Advances in this area will have a profound effect on reducing the death and disability caused by cardiovascular disease, as there is currently no way of determining which plaques may cause a heart attack.

The direct cost of coronary heart disease in Australia is the largest of any single cardiovascular condition, costing more than $1.7 billion. Stroke is the second largest, at more than $1 billion. Coronary heart disease is the single most common cause of death in Australia and generally manifests as angina, heart attack or sudden death.

Baker IDI focuses on the investigation of cells that play an important role in plaque development, the study of nutritional approaches that might prevent atherosclerosis, and the prevention and reversal of cholesterol accumulation in blood vessels. A new class of ‘intelligent’ drugs is being designed to prevent clotting, or dissolve clots that have caused a heart attack or stroke, without the excessive bleeding complications caused by currently available drugs. Researchers also work towards the identification of biomarkers which, when added to existing knowledge of family history and lifestyle risk, will help predict coronary plaque rupture.

The effects of stress and psychological illness on heart disease are also an important research focus. Depression is known to be a major cause of heart disease and sudden death and as an isolated risk factor is equal to the risk posed by high blood pressure or high cholesterol. Baker IDI researchers measured neurotransmitters in people newly diagnosed with depressive illness and found that in about 40 per cent the sympathetic nervous system was permanently switched on, placing the heart under unrelied pressure. These findings have direct implications for future treatment of sufferers of depression.

Research projects under way include:
• Baker IDI scientists have shown that regulatory T cells are important in controlling the development of atherosclerosis. This has significant implications for the treatment of atherosclerosis and has the potential to be used in conjunction with other therapies to prevent the development of life-threatening lesions.
• The effects of ACE inhibitors in the treatment of Marfan syndrome. Standard treatment to date has been beta blocker therapy, which has many side effects.
• Baker IDI research has revealed that selectin is a significant contributor to heart disease in its own right, and is not merely an active biomarker. As such, drug treatments for disease indicated by its presence can focus on switching off the effects of this protein.
• The development of better-targeted treatments for blood pressure regulation through ongoing studies of the renin-angiotensin system
• The development of a drug therapy to halt the formation of atherosclerotic plaques by preventing changes in proteoglycans in blood vessel walls
• New surgical treatments for atrial fibrillation, an increasingly common condition where the chambers of the heart beat out of synchrony
• Understanding the pathway within the body responsible for removing cholesterol from the blood vessel wall (reverse cholesterol transport). Research focuses on the balance between the delivery of cholesterol to the blood and its removal.
• Neural control of the cardiovascular system during the onset of obesity and other metabolic disorders, and the mechanisms that cause cardiovascular diseases through environmental factors influencing the central nervous system
• Investigation of the relationship between different forms of stress and heart disease, including the link between panic disorder and cardiovascular disease, and the effects of two different types of treatment on heart risk: cognitive behavioural therapy and selective serotonin reuptake inhibitor medication.

FUTURE DIRECTIONS
New research initiatives planned for Baker IDI will enhance diabetes and heart disease research and management. State-of-the-art facilities being established include:

Metabolomics
Devising new therapies to combat obesity is challenging due to the complex nature of metabolic disease. To develop treatments for metabolic disorders such as obesity, therapies must first be tested in isolated cell systems before progressing to clinical trials. The knowledge gained through research conducted in the planned new facility will allow researchers to devise more effective prevention and treatments. Once the gene functions and defects implicated in particular diseases are identified, researchers can develop ways to screen people for risk factors and design remedies that target the causes and complications of the disease.

DNA and Blood Profiling
This new facility is a step towards enabling our researchers to personalise medicine. By more effectively understanding the genetic underpinnings of disease, clinicians will be able to diagnose, treat and care for their patients in a holistic manner. The central idea behind the new facility is to integrate existing research disciplines so that health problems are understood and resolved in a way that takes into account individual responses to risk factors.

Clinical Metabolism (The Healthy Lifestyle Research Centre)
Diet, exercise and genetics all play important roles in body weight regulation. However, it is important to understand the specific underlying causes of obesity, which remain unclear. The Healthy Lifestyle Centre will examine how genetic and environmental factors combine to influence body weight. This unique new facility will improve understanding about the effects of physical activity and nutrition for the prevention, management and treatment of obesity and its complications, including diabetes and cardiovascular disease.

Medicinal Chemistry
This new facility will promote and enhance existing Baker IDI research projects by providing scientists with the tools they need to further examine the therapeutic potential of particular compounds. Medicinal chemistry is the science of providing small, technically accessible, synthetic molecules. These molecules can be used to induce a change to the human system or better facilitate scientific observations.

The Centre for Indigenous Vascular and Diabetes Research (Baker IDI@Alice)
This important group at Baker IDI is a sign of the institute’s commitment to addressing the health inequalities of disease between indigenous and non-indigenous Australians. In indigenous communities, mortality rates from disease are three times the rate of the rest of the population. Baker IDI has plans for significant expansion of its research and prevention work in Central Australia.

INTERNATIONAL PROJECTS
By providing an extension of its Australian research to vulnerable societies around the world, Baker IDI improves the understanding of health and disease around the globe and provides a powerful presence in countries that can benefit from its research expertise. Part of Baker IDI’s mission is to reduce premature ill health and mortality from diabetes and heart disease wherever it occurs; increasingly it is a major threat to the future of many developing nations. There is a great disparity in health outcomes between Western and developing communities. Poverty is one of the strongest indicators of poor health and it is this inequality that must be addressed. Some projects now under way include:

Mauritius: A surveillance program in Mauritius is in the final stages of planning prior to its launch. The plan is to follow up on over 10,000 people surveyed by Baker IDI between 1986 and 1997 to determine their medical status now and, in the case of mortality, the cause of death. This is likely to be one of the most important studies of its kind documenting premature ill health and mortality in this multi-ethnic society, as it reflects our global population.

GIAN study: The GIANT study (General practice Implementation in Asia of Normoglycaemic Targets) is a randomised controlled trial investigating whether education of local GPs about diabetes guidelines from the International Diabetes Federation – Western Pacific Region (Type 2 diabetes practical targets and treatments) leads to improvement in blood glucose control amongst patients. The study has enrolled 10 GPs in each of 10 countries, and each GP has enrolled four patients with Type 2 diabetes (400 patients in total). Half of the GPs have received training about the guidelines and half have not. Over a 12-month period, the study will determine if there are any differences in control of diabetes between the two groups of patients. This study is funded by GlaxoSmithKline. The countries involved in this trial are Korea, Taiwan, Malaysia, Singapore, Thailand, Philippines, Hong Kong, China, Vietnam and Indonesia.

Heart of Soweto: This landmark study is a collaboration between Baker IDI, University of Queensland and University of Witwatersrand, South Africa. The project charts the emergence of heart disease in the most populous residential area in South Africa. The first findings were published in The Lancet. The overall challenge is how to increase scarce health resources to people in developing countries who present with advanced heart disease for the first time.

Rishi Valley, India: The Rishi Valley study is a collaborative project between Baker IDI, Monash University and the Rishi Valley Rural Health Centre. Although the most common causes of disease burden in countries such as India include malnutrition and infectious disease, vascular disease is being increasingly recognised as an emerging epidemic. In urban Indian populations, changes in lifestyle exposures (resembling those seen in developed nations) may underlie this phenomenon. Even less is known about the burden of vascular disease in those living in rural communities. The aim of this study is to obtain important baseline data on the extent of vascular disease (heart disease and stroke) and its risk factors in a typical rural Indian community.

Surveillance and Monitoring Function of the National Non-Communicable Disease (NCD) Program of Vietnam: Baker IDI collaborates with Monash University and relies on the Ministry of Health, Menzies Research Institute and World Health Organization. In developing nations, the burden of cardiovascular disease, stroke, diabetes and cancer is taking over from the traditional problems of infectious diseases, maternal and child illness and death, and disorders due to under-nutrition and deficiency disease. The burden of the NCD epidemic in Vietnam is accelerating in synchrony with economic development. This study aims to establish a sustainable system for NCD surveillance.

POSTGRADUATE STUDENTS
4 Masters Students
1 Other Doctoral Student
58 PhD Students

PUBLICATIONS
311 Journal Articles
17 Book Chapters
In 2008, the Burnet Institute’s core mission of addressing the health needs of Australia and the world’s most disadvantaged populations through a combination of research and public health programs was reinforced. The most momentous achievement of the past year was the commencement of the new building at AMREP, which will complete the merger with the Austin Research Institute.

Another major event was the restructure of the institute’s operations into four Centres of Excellence. These centres consolidate major areas of activity and provide a strong leadership framework to better realise synergies and ways to build capacity. An important part of the restructure was the recognition of four major themes that cut across the specific disciplines of the centres: infectious disease; disease prevention; business development (vaccines, diagnostics and immuno-therapeutics); education and capacity.

In a stellar year for publications, the institute published 118 peer-reviewed papers including publications in some of the world’s best scientific journals such as Nature, New England Journal of Medicine and The Lancet. It was also a record year for competitive grants, especially from NHMRC where five Research Fellowships were awarded. There was a continued increase in student enrolments in Burnet’s 12 postgraduate courses, with a steadily higher proportion of international students, reaching 33% in 2008.

**CENTRE FOR VIROLOGY**

The mission of the Centre for Virology is to achieve innovative solutions for viral diseases of global importance. Strong emphasis is placed on understanding how viruses manipulate their host cells in order to infect them. Burnet’s research in this area is vital in understanding how viruses infect cells causing disease and in developing strategies to block infection.

**Highlights**

Associate Professor Paul Gorry was a recipient of the Victorian Young Tall Poppy Science Award for 2008, in recognition of excellence in academic achievement in medical research and promotion of science. Paul heads the HIV Molecular Pathogenesis Laboratory.

In a study by PhD candidate Jasmina Sterjovski, the three-dimensional structures of functionally diverse HIV-1 gp120 proteins were elucidated by homology modelling. The results revealed novel structural changes that enhance the interaction between the virus and the cell.

Post doctoral fellow Dr Martin Jakobsen and research assistant Anne Ellett characterise adaptive changes in the clade C HIV-1 gp120 region that occur during disease progression. These studies will be critical for development of targeted vaccines and drug therapies for clade C HIV-1, which predominates in Africa and Asia and is the most common HIV-1 subtype worldwide.

PhD candidate Michael Roche characterises mechanisms involved in HIV-1 resistance to maraviroc, a new HIV-1 drug, which acts by preventing HIV-1 binding to cells. This work will be important for development of new laboratory tests for HIV resistance to maraviroc.

A study by PhD candidate Lachlan Gray characterises mechanisms involved in HIV-1 neurotropism, in a collaborative effort with Dr Melissa Churchill’s HIV Neuropathogenesis Laboratory. Brain derived HIV-1 strains were shown to undergo adaptive changes to increase the efficiency in the way they use CCR5 for entry into cells, which may increase their ability to replicate in brain microglial cells.

Antiviral drugs are becoming increasingly available in resource constrained countries to treat HIV-infected individuals with a low number of CD4+ T-cells (indicating a failing immune system). However, access to drugs is limited by the need for sophisticated laboratory testing for CD4+ T-cells, typically by flow cytometry. The Burnet Institute was awarded a grant by the CD4 Initiative, funded by the Bill and Melinda Gates Foundation, for the development of a rapid point-of-care CD4+ T-cell test, specifically designed for field use in remote settings. This continues a longstanding collaboration with Alan Landay (Rush University Medical Centre, Chicago) and Tom Denny (Duke University, North Carolina).

Suzanne Crowe, David Anderson and senior scientist Mary Garcia lead a team with expertise in diagnostic test development. The proof-of-concept studies for a novel, rapid detection method for CD4+ T-cells, and the subsequent conversion of the technology into a prototype field test for point-of-care use, were successfully completed. The CD4 rapid test is simple and takes 30 minutes, using a small volume of blood from a finger prick to give a visual readout without the need for instrumentation. The test result indicates whether the patient should commence treatment.

**Snapshots**

**Crowe/Jaworowski Laboratory (HIV Pathogenesis)**

Gregor Lichtfuss joined the laboratory as a PhD student in 2008, coming from the Robert Koch-Institut, Berlin. He has started work on an exciting project investigating mechanisms underlying the intense immune activation that is characteristic of HIV infection. His research focuses on the impact of HIV infection on signalling processes in human blood cells. This signalling is a way of communication between the immune cells in blood and is crucial for coordinating the body’s defence against pathogens.
Drummer/Poumbourios Laboratory (Viral Fusion)
High viral mutation rates challenge the development of HCV and HIV vaccines and antivirals. Studies of the HCV and HIV glycoproteins have revealed important sequences that are not subject to rapid change. The laboratory has produced a new HCV vaccine candidate based on a conserved component of glycoprotein E2. Together with CSL, it was demonstrated that this vaccine elicits a more effective antiviral immune response compared to previously available vaccines. A new target in the HIV fusion glycoprotein gp41 has been identified, with funding obtained from Australian Centre for HIV and Hepatitis Virology Research (ACH2) and NHMRC to exploit this target in the development of antivirals.

Gowans Laboratory (Hepatitis C – Molecular Biology)
Eric Gowans was a Senior Research Fellow at the Burnet Institute from 2002 to 2008, during which time he established a productive HCV research laboratory. Interests of the Gowans Laboratory include studies of HCV replication and approaches to develop novel antiviral agents (in collaboration with colleagues at Aveza Ltd), studies into the mechanism of HCV persistence with particular emphasis on regulatory T cells (with Dr Shuo Li) and HCV immunotherapy and vaccine development (with Associate Professor Bruce Loveland). Although Eric is now the Executive Director of the Women’s and Children’s Health Research Institute in Adelaide, he remains a co-laboratory head.

Tachedjian Laboratory (Molecular Interactions)
The aim of the Tachedjian Laboratory is to understand how HIV reproduces in the cell, including the role of host cell factors in HIV-1 replication, and to study drug resistance mutations in HIV. The lab is also involved in the preclinical development of microbiotics to prevent the sexual transmission of HIV. In 2008, Dr Jenny Anderson was recruited from the United States to continue her studies in understanding how APOBEC3G, a host cell protein, blocks HIV replication. Jenny has received NHMRC funding for this project, and will be using deconvolution microscopy to visualise whether APOBEC3G confers defects in virus trafficking to the cell nucleus.

Mak Laboratory (HIV Assembly)
Proteins are often thought to be the prime regulator of biological systems, but it is now appreciated that RNA has a much greater role in the regulation of biological processes than previously thought. It is generally accepted that stable RNA structures can be an important determinant in biological activity. Using HIV as a probe, the Mak Laboratory has provided direct evidence that structurally-poor RNA domains are also utilised by viruses to regulate biological processes. This study provides paradigm shift evidence to reveal the broad spectrum of mechanisms used by biological systems to govern the dynamic RNA-based regulation network in cells.

Churchill/Wesselingh Laboratory (HIV Neuropathogenesis)
Dr Melissa Churchill Heads the HIV Neuropathogenesis Laboratory. One of her major research interests is understanding the importance of astrocytes in the development of HIV-associated dementia, a complication of AIDS. Until now, astrocytes were thought to be rarely infected with HIV-1. In a study accepted for publication in Annals of Neurology, Melissa developed highly sensitive new techniques to show that astrocytes in brain tissue can be extensively infected with HIV, and that astrocyte infection has an important role in the development of brain disease.

Cherry Laboratory (HIV Neuropathy and Toxicity)
The Cherry Laboratory aims to find ways of predicting HIV treatment toxicities, before patients develop irreversible problems like neuropathy. The lab has developed a ligation-mediated PCR assay to quantify apoptosis, and has shown that patients with toxicity have higher results in blood than those without. With ACH2 funding, David Hooker is working to merge ligation-mediated PCR with real-time PCR to provide a rapid-throughput assay more suitable for clinical use. The laboratory also plans a prospective study of Australian HIV patients using modern therapies to confirm the assay’s utility for predicting side effects to improve safety of HIV treatments.

Crowe Laboratory (Clinical Research Laboratory, World Health Organisation Regional HIV Drug Resistance Laboratory)
The development of resistance to anti-HIV drugs poses a serious threat to effective HIV treatment. The WHO Regional HIV Drug Resistance Laboratory for the Asia and Pacific regions, supervised by Dr Anna Hearps, is responsible for providing technical and logistical support for resistance testing within the region. As part of this role, the laboratory has developed a low-cost resistance test and optimised its use with dried blood spots to enable resistance testing to be performed within remote areas of resource-constrained countries.

CENTRE FOR IMMUNOLOGY
The Centre for Immunology brings together outstanding research groups with a wide spectrum of skills applicable to the understanding of the immune system and its manipulation to treat disease. Key questions are: why does the immune system attack normal cells that it should ignore, for example in diseases such as rheumatoid arthritis and lupus, but in cancer, ignores the cancerous cells it should eliminate? How is it that infectious agents avoid immune destruction? Answering these questions will lead to a greater understanding of the immune system and the development of new treatments for major diseases.

The Centre for Immunology has a unique combination of researchers in Australian immunology: structural biologists and protein chemists, bio-organic chemists, cellular immunologists and molecular biologists. Centre laboratories have outstanding track records in translating basic research into new treatments. Commercialisation in the centre continues with pre-clinical development of a new intranasal vaccine for respiratory viruses and an injectable cancer vaccine.

Highlights
Establishment of Immunological Monitoring Facility
In a major initiative, Associate Professor Rosemary Ffrench and Associate Professor Bruce Loveland have established a central Immunological Monitoring Facility (IMF) which will produce high quality data on the immunogenicity of therapies to Good Laboratory Practice (GLP) standard.

IMF will support the future development of vaccines in influenza, respiratory syncytial virus and cancer, as well as therapeutic monoclonal antibody programs and involvement in the Cooperative Research Centre for Biomarker Translation. The facility has been carefully developed, with highly skilled staff, validated immunoassay protocols and dedicated equipment to undertake tests which assess the immune responses in small animal studies and early phase human clinical trials. The facility is available to the broader research and development community in collaborative partnerships, and 2008 saw the completion of the first phase 1 clinical trial.

IMF is expanding the range of assays that can be performed to GLP standard and is being evaluated for National Association of Testing Authorities (NATA) accreditation.

New vaccine strategies for cancer therapy
Geoff Pietersz and Vasso Apostolopoulos demonstrated the superior immunogenicity of an immune stimulant based on a carbohydrate modification of a breast cancer target. Development of a breast cancer vaccine has been in progress for many years and the selective stimulation of immune cells using a modified sugar attached to the cancer specific molecule, MUC1, has been shown to be effective in clinical testing on ovarian cancer patients. This has improved capacity to stimulate immune cells and showed superior immunogenicity in preclinical studies.
This is an excellent example of a combination of immunology, chemistry and structural biology, funded by NHMRC and will also be a commercial partnership with 4G Vaccines. The improved stimulation will provide a next generation of potential immunotherapy-based approaches to the treatment of cancer.

Snapshots

Apostolopolous Laboratory (Immunology and Cancer Vaccine)
Research has shown that the function of dendritic cells (DC) is dependent on their developmental stage, and may form the basis of improved DC-based immunotherapy protocols. In a study focused on multiple sclerosis, a number of mutant peptide antigens were designed and shown to alter DC-driven immune response, resulting in the suppression of MS in mice.

French Laboratory (Viral Immunology)
A major HCV clinical trial showed clear differences in the nature of the immune response in individuals who could clear the infection compared to those who experienced chronic infection. Importantly, the lab showed that early treatment for HCV infection with interferon restored effective immune responses, indicating that early therapy may aid in the prevention of subsequent re-infection with HCV.

Gerondakis Laboratory (Intracellular Signalling and Gene Expression)
This laboratory has shown that survival of B-cells stimulated through Toll-like receptors is achieved by the NF-κB pathway controlling several mechanisms that collectively neutralise and degrade Bim, a cellular protein which promotes cell death when activated by stress signals such as microbial products. These findings provide new insight into the mechanisms that limit microbial pathogenesis arising from cell death during infections.

Hogarth Laboratory (Helen Macpherson Smith Trust Inflammatory Diseases)
The lab has analysed 34,000 genes in the mouse and identified 18 that are altered during rheumatoid arthritis development in an animal model, with one candidate target identified for generation of future treatments. A key new subset of T-cells (Th17) that drives inflammatory disease is being elucidated. Microbes have evolved ways of avoiding immunity and the lab has used X-ray crystallography to discover how the golden staph hijacks immunity by binding and inactivating IgA.

Jackson Laboratory (Immunoreceptor)
The lab has made the remarkable observation that PECAM (platelet/endothelial cell adhesion molecule), which normally regulates immune, works against the immune system in salmonella infections. Mice lacking PECAM are better able to resist infection. Understanding the mechanism of this resistance may improve control of salmonella infection in humans.

Pietersz Laboratory (Bio-Organic and Medicinal Chemistry)
A number of novel ligands that bind to dendritic cells have been developed based on dendrimer modified antigens. In addition, these vaccines also incorporate synthetic danger signals to efficiently activate dendritic cells to prime naïve T-cells. Similar approaches are used to deliver genetic material to develop DNA vaccines and gene therapy strategies for the treatment of cancer.

Power Laboratory (Kidney)
Renin is the most important controller of blood pressure. The lab has shown that its secretion is controlled, in part, by fatty acid metabolism in the kidney suggesting a new link between obesity, diabetes and blood pressure. The lab also works to understand how leaks occur in the kidney. Recent research has shown that abnormalities in lysosomal function can lead to loss of proteins that can damage the kidney, leading to kidney failure and need for dialysis.

Ramsland Laboratory (Structural Immunology)
Recent studies have shed new light on the understanding of carbohydrate recognition by antibodies. Dr Ramsland’s group, with collaborators, determined the structural basis of antibody interactions with a carbohydrate present on pig cells, but not human cells, Galα(1,3)Gal. Automated docking studies with a panel of antibodies and Galα(1,3)Gal carbohydrates determined the major binding mode was end-on insertion where the terminal sugar unit anchors the entire carbohydrate.

Xing Laboratory (Cancer Immunotherapy)
The lab has generated a specific antibody to a proto-oncogene PIM-1, which reacted strongly with prostate cancer. For the first time, it was demonstrated that this antibody induces cancer cell death. It also substantially inhibits growth of human prostate cancer cells in an animal model. This is an exciting step towards the development of new treatment for those with prostate cancer.

CENTRE FOR POPULATION HEALTH

The Centre for Population Health (CPH) strives to improve the health of the community by conducting high quality, innovative research that addresses the major public health problems associated with infectious diseases and drugs and related behaviours. CPH’s areas of specific interest are HIV, hepatitis C, sexually transmitted infections, malaria, tuberculosis, and drug and alcohol misuse. All are serious health concerns in Australia and the Asia and Pacific regions predominantly affecting highly vulnerable populations.

CPH implements novel, multidisciplinary scientific programs that use epidemiology, laboratory science, clinical and social research, and public health principles to address major health problems in the region. Working with highly vulnerable populations, CPH undertakes a broad spectrum of work, ranging from research that helps to better understand the priority diseases and their transmission and ecology, to discovery science with potential for longer term benefits such as therapeutics and vaccines, to health systems oriented research that directly influences health policy.

Highlights

Groundbreaking work on drug-resistant tuberculosis
In an international collaboration set in Uzbekistan, Dr Helen Cox of Burnet’s International Health Research Group and her colleagues followed 87 patients infected with multidrug-resistant tuberculosis, using drug sensitivity testing and molecular typing. During the course of treatment, 18 patients developed resistance to ofloxacin, a marker for the extensively drug resistant strains. The group demonstrated that in 13 patients the molecular type remained constant and the strains had amplified resistance during treatment; one patient had an initial dual infection with a sensitive and a resistant strain. Alarmingly, four patients were shown to have been exogenously reinfected while on treatment with strains similar to those isolated from other patients staying in the hospital. Findings were published in New England Journal of Medicine and have major practical implications for the treatment of drug-resistant TB in hospital settings.

The networks study – an innovative multidisciplinary investigation of the hepatitis C virus
Since 2005, Associate Professor Margaret Hellard and Dr Campbell Aitken have collaborated with scientists from the Victorian Infectious Diseases Reference Laboratory and Department of Immunology, University of Melbourne, on a major multidisciplinary HCV study. The networks study focused on HCV transmission within social networks which include several hundred injecting drug users, the population most at risk of HCV. People who were infected with HCV, then cleared their infection, were found to be significantly more likely to be re-infected with the virus than those who had never contracted the disease. These findings suggest that clearance of an HCV infection does not confer immunity against future infection and makes subsequent infection more likely, with obvious implications for vaccine development.
A novel protein export machine in malaria parasites

Malaria is one of the most devastating infectious diseases of humankind and is caused by massive infection and destruction of the body’s blood cells by Plasmodium species parasites. Research is focused on trying to understand how Plasmodium parasites recognise and infect blood cells, and how they are able to grow and avoid the human immune system. In a recent breakthrough study, novel parasite protein machines that export parasite proteins into their red blood cell hosts were identified. The exported proteins are essential for parasite survival, and researchers aim to discover drugs that can block the export machines.

HIV prevalence study – Suck it and See

Suck it and See is an innovative new study that aims to estimate the prevalence of HIV and the extent of unrecognised infections among gay men in Melbourne. 746 men were recruited through community-based sites including bars, clubs, sex-on-premises venues and sexual health clinics. Participants completed a short behavioural survey and provided an oral fluid specimen for HIV antibody testing. As the first of its kind in Australia, this study will be the pilot for a nation-wide system conducted periodically and will inform ongoing epidemiological initiatives.

New study addresses health outcomes for injecting drug users

In 2008, the Melbourne Injecting Drug User Cohort Study (MIX) commenced as a longitudinal study of the health and social outcomes associated with injecting drug users. MIX will provide new data on the typical trajectories of injecting drug use in Australia and determine risk and protective factors for users for outcomes in the health, social and psychological domains.

Sexual health and young people

CPH continued its work related to sexual health and young people. Staff again attended the Melbourne Big Day Out music festival in January, recruiting over 2000 young people to complete a short behavioural survey. Participants then received twelve sexual health promotion text messages on their mobile phones over the subsequent four months. The results were very encouraging – there was a significant improvement in sexual health knowledge and uptake of sexual health testing after receiving the messages.

Justice health research

CPH commenced a study investigating the post-prison release experiences of offenders with a history of injecting drug use. This study will interview participants at one month, three months and six months post-release and examine personal, behavioural and service-related outcomes during this particularly vulnerable period in their lives – a period often characterised by substantially increased risks of mortality and morbidity.

Development of innovative surveillance systems

CPH worked on the development of several innovative surveillance systems to improve understanding of HIV, hepatitis C, chlamydia and syphilis transmission. These included an HIV/STI sentinel surveillance system for Victoria and the Australian Collaboration for Chlamydia Enhanced Sentinel Surveillance (ACCESS). Working with the National Centre in HIV Epidemiology and Clinical Research, the National Reference Laboratory and the National Perinatal Statistics Unit, six separate chlamydia sentinel surveillance networks will be established, each providing unique information on testing uptake and prevalence of chlamydia infection in a range of priority populations: young heterosexuals, men who have sex with men, Indigenous Australians, pregnant women and sex workers.

Malaria genomics for better interventions

A major obstacle to broadly effective malaria vaccines is the extraordinary genetic diversity of the malaria parasite, Plasmodium falciparum. Dr Alyssa Barry and colleagues investigate the distribution and evolution of diversity of P. falciparum surface antigens, including leading vaccine candidates. Patterns of antibody acquisition to the highly variable parasite antigen PIEMP1 are being defined to understand how natural immunity develops. This is a collaboration with the Papua New Guinea Institute of Medical Research, Queensland Institute of Medical Research and University of California, Irvine.

CENTRE FOR INTERNATIONAL HEALTH

The Centre for International Health (CIH) is committed to improving the health of communities in low-income countries through strengthening primary health care and the control of high-burden health problems. CIH aims to both support evidence-informed health programs and to more broadly influence international health policies and initiatives within the developing world.

CIH has a strong commitment to comprehensive harm reduction and has expanded its traditional focus on injecting drug use to a broader drugs and society approach that includes research on the impact of amphetamine-type stimulants (ATS), marijuana, and alcohol on behaviours that heighten the risk of sexually transmitted infections. CIH also continues to work closely with law enforcement officials in a number of countries, including Malaysia, Indonesia and China, to enable drug users to access prevention and treatment services.

CIH reached an important milestone in 2008 when our first ‘country program’ in the Lao PDR – celebrated its 10th anniversary.

Country Programs

Indonesia

A review of Burnet’s Indonesia Country Program resulted in a more focused strategic plan. Burnet staff have been active in several national networks, including HIV counselling and gay, transgender and other men who have sex with men. Burnet’s counselling training was acknowledged at the national level as a model of good practice. The Levi Strauss Foundation continues to support capacity building for local responses to HIV among drug users in Bekasi, West Java. In association with GRM, CIH commenced support of the third phase of Australian assistance to the Indonesian response to HIV and AIDS through the HIV Cooperation Program for Indonesia (2008–2012). CIH’s program of capacity building in HIV prevention and care continues in NTB province. AusAID commissioned Burnet to assess methods to ‘mainstream’ HIV in all development programs.

Lao People's Democratic Republic

In 2008, the Lao program developed a wide-ranging portfolio of new activities. The mining company LXML funded a maternal and child health and nutrition project in the surrounding district. Burnet is a sub-recipient in a new Global Fund grant to promote safer sex among men who have sex with men in three provinces. CIH successfully tendered for a two-year HIV prevention project, funded by the Asian Development Bank (ADB), in communities along a newly constructed highway in the north. Local staff engaged in a range of consultancies for development partners, including ADB, World Vision and Lux-Development.

Mozambique

The fifth year of CIH’s program witnessed significant achievements, including increasing proficiency of the Manica core team as trainers and mentors, strengthened capacity of CIH partner MONASO Manica, and increasing institutional and technical capacity of NGOs in Manica and Sofala provinces.
In October, CIH Youth Ambassador, Collingwood footballer Heritier O’Brien visited Manica and has become a strong advocate for Burnet’s HIV work in Mozambique.

Myanmar
The devastating natural disaster of Cyclone Nargis left over 130,000 people dead or missing, and directly affected another 2 million people. In response to Nargis, the CIH team in Myanmar grew to 58 full-time staff in order to deliver services through the Local Resource Centre and the Integrated Psychosocial Sexual Reproductive Health project (with Marie Stopes International). In the midst of these diverse public health and emergency activities, the Burnet Institute program in Myanmar continued its focus on strengthening the capacity of local partners to build community responses to HIV.

Papua New Guinea
AusAID extended Burnet’s contract to manage the Tingim Laip program, which supports community-based responses to HIV in 35 sites. The East New Britain Sexual Health Improvement Project became fully operational with STI training for health workers and the development of community-based ‘street takers’ who promote prevention, including condoms. There was a successful second measles supplementary immunisation activity, with social mobilisation from Burnet.

China (Tibet), Sri Lanka and Vietnam
• In Tibet, a two year Cooperation Agreement was endorsed and new support received from the Canada Fund to implement the Duilong Dechen Community HIV Prevention Project. CIH continued to manage the China Australia HIV and Health Facility and, with the Australian Red Cross, jointly implemented the Tibet Health Sector Support Program.
• In this fifth year of the Sri Lanka project to improve the health and well-being of elders in tea estates, there was a focus on advocacy, disseminating lessons learned and building sustainability of activities.
• With a Planet Wheeler Grant, CIH supported the Vietnam Community Mobilisation Centre for HIV/AIDS Control to implement harm reduction activities in Hanoi, including peer education, outreach, and a drop-in centre.

Other highlights
In 2008, AusAID established four new ‘knowledge hubs’. The Women’s and Children’s Health (WCH) Knowledge Hub (Compass) is a partnership between CIH, the Menzies School of Health Research and the Centre for International Child Health at the University of Melbourne. The purpose of Compass is to establish a central knowledge point for those who work to improve WCH, advocating for greater investment, facilitating partnerships, and influencing policy and practice, with a focus on contributing to equitable progress towards the United Nations’ Millennium Development Goals 4 and 5. Research included studies related to Drugs and Society in Asia and the Pacific, such as the AusAID-funded Illicit Drugs Initiative – research and capacity building on ATS in Lao PDR, Cambodia and Thailand.

The Pacific Drug and Alcohol Research Network (ten countries) is in its fourth year, supported by AusAID, UNODC and WHO. Burnet and the Fiji School of Medicine, and with AusAID funding, conducts situation assessments of STI/HIV risks associated with drugs and alcohol in 16 Pacific countries.

CIH contributed to a range of activities commissioned by a number of international partners. For example, a study of HIV epidemiology and surveillance in Pacific countries was commissioned by UNAIDS for the Commission on AIDS in the Pacific. Other activities included the development of the Pacific Regional HIV Strategic Implementation Plan (SPC), evaluation of the national needle and syringe program in Malaysia (WHO), technical direction of the Central Asia Regional HIV/AIDS Program (DFID), development of a national strategy on HIV prevention in mothers and children for Sri Lanka (World Bank), development of an advocacy tool around HIV and men who have sex with men in South East Asia (RTI/USAID), capacity building in essential drugs management in the Pacific (WHO), review of Uzbekistan’s harm reduction program (World Vision), and HIV prevention in prisons in China (UNODC).

POSTGRADUATE STUDENTS
7 Masters Students
54 PhD Students

PUBLICATIONS
115 Journal Articles
3 Book Chapters
The Burns Unit at The Alfred provides a state-wide service for adult, burn-injured patients. In addition to providing clinical care for all major burns patients in Victoria, the unit engages in clinical, epidemiological and basic science research designed to improve multidisciplinary care for burns patients, and inform prevention and education programs.

ACHIEVEMENTS

Funding has been secured for the establishment of a Bi-National (ANZ) Burns Registry. The registry was established in 2003 by The Alfred Burns Unit, which administered the registry until 2008 when funding enabled outsourcing for further development and ongoing management by the Department of Epidemiology and Preventive Medicine, Monash University. The Alfred Burns Unit has ongoing involvement with the registry via the steering and reference committees, as well as various subcommittees. The registry will form the basis for national benchmarking and quality activities in the area of burn care in Australia and New Zealand, and facilitate multicentre research projects.

Funding has been obtained to re-establish the Skin Tissue Culture Laboratory located in the AMREP laboratories. The laboratory is headed by Dr Shiva Akbarzadeh. The focus of this laboratory’s work will be on keratinocyte culture and the development of systems for delivery of cultured keratinocytes. Initial projects are established in collaboration with the Epithelial Stem Cell Laboratory at Peter MacCallum Cancer Centre. These include projects on optimising adult keratinocyte growth in vitro and identification of adult keratinocyte stem cell populations.

DEPARTMENTAL HIGHLIGHTS

- Yvonne Singer (Clinical Care Coordinator) was awarded a Churchill Fellowship in 2007 and in 2008 travelled to the USA, where she visited trauma and burns data bank centres, reviewed prevention programs, and benchmarked clinical practices at two major burns centres
- The Alfred Burns Unit organised and hosted the Australian and New Zealand Burns Association (ANZBA) Annual Scientific Congress
- Dr Edwina Moore (Monash Department of Surgery) was equal winner of the DS Rosengarten Surgical Trainee Research Prize with her presentation entitled ‘Candida and burns: risk factors and outcomes’

RESEARCH PROJECTS

- Virtual reality as an adjunct for procedural burn pain management
- Epidemiology of burns injuries in Victoria and Australia
- Alcohol and burn injury
- Intravenous lignocaine in the management of burn procedural pain
- Review of the use of Biobrane skin substitute in the management of burn wounds
- Splinting regimes in axillary burns (Alison Kolmus – Master of Physiotherapy)
- Outcomes in burn injured patients (Jason Wasiak – PhD)
- Prehospital management of burns patients in the state trauma system

COLLABORATIONS

- Epithelial Stem Cell Laboratory, Peter MacCallum Cancer Centre
- Monash Institute of Medical Research – cytokines in burn injury
- Monash Department of Epidemiology and Preventive Medicine – outcomes research and registry
- Victorian Burns Prevention Partnership (VBPP): Royal Children’s Hospital, The Alfred, Metropolitan Fire Brigade (MFB) and Country Fire Authority – evidence-based burns prevention programs
- MFB and MUARC (Monash University Accident Research Centre) – alcohol as a contributing factor in burn injury

POSTGRADUATE STUDENTS

1 Masters Student
1 PhD Student

PUBLICATIONS

3 Journal Articles
1 Cochrane Systematic Review

Dr Shiva Akbarzadeh heads the Skin Tissue Culture Laboratory, which is focused on basic research into keratinocyte cell biology and its application in skin regeneration and grafting.
RESEARCH AREAS

Metabolic Therapy
The department studies the effect of metabolic supplements and antioxidants such as coenzyme Q10, omega-3 fatty acids, selenium and orotic acid in the treatment of heart disease and preparation for major surgery including cardiac and orthopaedic surgery.

We have just analysed a three year study of perioperative metabolic supplementation in Alfred Hospital cardiac surgery patients using coenzyme Q10, lipoic acid, fish oils and magnesium orotate. The results showed a 50% reduction in the incidence of atrial fibrillation, a 33% reduction in troponin I release (indicating less cardiac damage) and a 1.3 day shortening in hospital length of stay.

These clinical benefits translated into an average cost saving per patient of $3,200. We are now giving metabolic supplementation to all Alfred cardiac surgery patients (funded by a vitamin and mineral company) and will review the outcomes after one year.

Measurement of Oxidative Stress and Antioxidant Capacity
We have acquired an automated analysis instrument that can rapidly measure oxidative stress and antioxidant capacity on finger prick blood samples and are beginning to correlate these measures with disease severity and response to metabolic therapy. We are in the process of establishing an oxidative stress laboratory where these assays can be made readily available to clinicians and researchers.

Mechanical Support of the Circulation
The department has a longstanding interest in assisting with the development of mechanical circulatory support devices and evaluating these in animal studies and clinical trials. In collaboration with the University of New South Wales we are currently evaluating the performance of the Ventrassist heart assist device in greyhound dogs and developing a feedback control system to regulate pump output to the demands of the body in exercise and at rest. We are also studying the effect of non pulsatile flow on vascular function in Ventrassist implant patients.

Transplantation
The department has recently studied optimal methods of preserving hearts from DCD (donation after cardiac death) donors. If these hearts can be resuscitated adequately, this would represent a whole new class of heart transplant donors. We are negotiating with a Texas based company and will be pursuing these studies in 2009.

Rib Plating for Chest Trauma
Dr Silvana Marasco and associates have been studying the use of absorbable plates to repair fractured ribs. These devices have the potential to reduce pain and accelerate recovery after major trauma.

MAJOR FINDINGS
We have demonstrated that metabolic preparation for cardiac surgery can reduce troponin release, halve the incidence of atrial fibrillation and reduce hospital stay by one day.

STAFF ACHIEVEMENTS
The Cardiac Surgical Research Unit has been designated, along with its partner, Swinburne University, as one of three Foundation Centres of the National Institute of Complementary Medicine. This Centre, headed jointly by Professor Franklin Rosenfeldt and Dr Lesley Braun, provides advice and expertise in complementary medicine to cardiac patients and health professionals as part of a Cardiac Wellness Program.

The Cardiac Surgical Research Unit has established an oxidative stress laboratory headed by Dr Ruchong Ou.

CURRENT PROJECTS
- Metabolic therapy for cardiac and orthopaedic surgery (Franklin Rosenfeldt, Lesley Braun, Ruchong Ou, Catherine Reardon)
- VentrAssist artificial heart and the peripheral effects of non-pulsatile flow (Juliana Van Der Merwe, Franklin Rosenfeldt, Robert Salamonsen, David Kaye)
- Feedback control for cardiac assist devices

POSTGRADUATE STUDENTS
- 2 Masters Students
- 2 PhD Students

PUBLICATIONS
- 23 Journal Articles
Research studies conducted within the Department of Cardiovascular Medicine range from identification of the best strategies for reducing the risk of cardiovascular disease through to the evaluation of the latest technological advances. Some studies involve research into basic mechanisms, whilst others investigate practical therapeutics. Studies within the department commonly rely on collaborations with other Alfred departments or AMREP partners, most notably the Baker IDI Heart and Diabetes Institute. In addition to investigator-led studies, the department participates in a number of multicentre trials. In 2008, a number of major findings from the department were published in *Circulation Research, Journal of American College of Cardiology, Journal of Cardiac Failure* and *Circulation*.

**CORONARY ARTERY DISEASE**

Research includes an investigator-led single centre study into whether the early administration of deferrioxamine can reduce the size of a heart attack. Deferrioxamine binds iron and is postulated to limit the size of a heart attack through limiting the damage done by oxidation products. This is the first large single centre study on infarct size to be conducted within the department and is led by Dr Stephen Duffy. Other studies involve the investigation of the pattern of blood flow in diseased and disease free coronary arteries using the new methodologies of wave intensity measurement. These studies build on previous extensive experience on the biomechanical properties of arteries (Professor Anthony Dart and Professor Bronwyn Kingwell). The department is a major contributor to the Melbourne Intervention Group register of outcomes following angioplasty.

**HEART FAILURE AND TRANSPLANTATION**

Research includes studies to try to limit cardiac fibrosis in transplant patients. Other studies examine the phenomenon of heart failure with preserved systolic pump function which is widely prevalent but ill understood. Research in heart failure within the department is coordinated by Professor David Kaye. A number of studies involve the evaluation of devices to treat heart failure, hypertension and valvular heart disease. These include the implantation of a device to measure the early onset of heart failure, a percutaneous technique to reduce inappropriate nerve activity to the kidney, which is a cause for high blood pressure, and a new technique to replace diseased aortic valves without an operation. These studies are led within the department by Dr Tony Walton. In addition, a device developed by Professor Kaye to reduce the damage done by contrast dye in patients with impaired kidney function who are undergoing an operation. These studies are led within the department commonly rely on collaborations with other Alfred departments or AMREP partners, most notably the Baker IDI Heart and Diabetes Institute. In addition to investigator-led studies, the department participates in a number of multicentre trials. In 2008, a number of major findings from the department were published in *Circulation Research, Journal of American College of Cardiology, Journal of Cardiac Failure* and *Circulation*.

**NON-INVASIVE CARDIOVASCULAR IMAGING**

Non-invasive cardiovascular imaging has expanded from echocardiography to cardiac magnetic resonance imaging (CMRI), and, in conjunction with the Department of Radiology, the use of computed tomography (CT) coronary angiography. Studies in CMRI, led by Dr Andrew Taylor, have particularly focused on ways of assessing scar damage within the heart in patients with heart failure and after a heart attack. These studies will help not only to explain the presence of heart failure in some patients, but also guide the appropriate use of therapeutic strategies, such as biventricular pacing and automatic implantable cardiac defibrillators.

**METABOLIC BASIS FOR BLOOD VESSEL DISEASE**

A number of studies, particularly in conjunction with colleagues at Baker IDI, probe the metabolic basis for blood vessel disease, predominantly in relation to glucose and lipids. Several studies concentrate on the functions of high-density lipoprotein (HDL), the ‘good’ cholesterol. A major study led by Dr James Shaw was completed during the year, demonstrating that a single infusion of HDL cholesterol could favourably modify properties of atheroma. This may open the way for such therapeutic measures to be used in the treatment of unstable coronary syndrome. Other studies, led by Professor Kingwell and Dr Duffy, demonstrated major effects of HDL on other metabolic processes such as inflammation and also a role for HDL in glucose metabolism. Several studies that commenced relate to obesity and lipid disorders. These include investigating the effects of obesity and its treatment on endothelial progenitor cells (Professor Jaye Chin-Dusting, Professor Dart), a major mechanism of vascular repair and a novel dietary treatment for elevated cholesterol (Dr Michael Skilton).

**ATRIAL FIBRILLATION**

Studies in the field of arrhythmias are concentrated on atrial fibrillation, which continues to grow as a clinical problem. Within this field, the department has a particular emphasis on the relationship between atrial fibrillation and heart failure, and whether restoration of normal rhythm would result in less morbidity from cardiac disease. The introduction of advanced mapping techniques into the department has made possible studies dependent on the ability to undertake (pulmonary vein isolation) ablation therapy for atrial fibrillation. Research in this area is led by Dr Peter Kistler.

**BRAIN–HEART INTERACTION**

A number of studies investigate the antecedents of cardiovascular disease, particularly the brain–heart interaction, and are led by Professor Murray Esler. Considerable attention in recent years has been given to the links between illnesses such as depression and panic attacks and cardiac, particularly coronary, events. Researchers seek to unravel some of the mechanisms by which these occur, with a particular focus on the role of the sympathetic nervous system.
CURRENT STUDIES

- High sensitivity C-reactive protein and its association with vascular events in HIV-positive patients (A Dart)
- Soluble P-selectin levels in peripheral arterial occlusive disease (K Woolard, J Chio-Dusting, A Dart)
- Cardiovascular disease and its genetic correlation with pseudoxanthoma elasticum (A Dart)
- Metabolic regulation of ABCA1 expression in patients with Type 2 diabetes and athletes (B Kingwell)
- In vivo microdialysis studies of metabolite and neurotransmitter overflow from the adipose tissue and skeletal (M Eiser)
- Clinical follow up of patients undergoing percutaneous revascularisation at Melbourne hospitals (S Duffy)
- Does systemic arterial compliance predict blood pressure responses in patients undergoing percutaneous coronary intervention (J Shaw)
- Effect of fitness on chronic low-grade activation of the immune system and insulin sensitivity in physically fit and healthy sedentary individuals (B Kingwell)
- Effects of polymorphisms in antioxidant genes on the clinical presentation (stable versus unstable coronary syndrome) in a group of patients undergoing coronary angiography (S Duffy)
- A novel mechanism mediating anti-atherosclerotic and metabolic actions of HDL cholesterol (B Kingwell)
- A randomised dose ranging study of hexadecasaccharide including active control in patients with unstable angina or non-ST-segment elevation myocardial infarction scheduled to undergo percutaneous coronary intervention (SHINE) (J Shaw)
- Sex dimorphism in matrix metalloproteinase (MMP) activity in peripheral white blood cells from healthy controls and patients with acute myocardial infarction (A Dart)
- Growth factor secretion by the normal and failing human heart (D Kaye)
- Identifying predictors of progressive mitral regurgitation in heart failure (D Kaye, J Mariani)
- Future revascularisation evaluation in patients with diabetes mellitus: optimal management of multivessel disease (A Dart)
- Heart transplant myocardial fibrosis study: effect of spironolactone on myocardial fibrosis and myocardial function in patients with left ventricular diastolic dysfunction after heart transplantation (A Leet)
- A clinical trial comparing cangrelor to clopidogrel in subjects who require percutaneous coronary intervention (S Duffy)
- Endothelial progenitor cell number and function in congenital vascular malformation (A Dart)
- Mechanisms of the disorders of circulatory control which may cause syncope (M Eiser)
- Sympathetic nervous system activation in renal failure: its contribution to pathogenesis and progression (G Lambert)
- Examining cognitive function in patients with the postural orthostatic tachycardia syndrome (G Lambert)

IMPROVE IT (IMProved Reduction of Outcomes: Vytorin Efficacy International Trial) (J Shaw)
- Role of endothelial progenitor cells in metabolic syndrome and weight loss (A Dart)
- Do high dose tirofiban and ReoPro have similar effects on platelet function and recovery of left ventricular function in patients with acute myocardial infarction? (J Shaw)
- Sympathetic function in the heart, brain and kidney of patients with POTS (M Eiser)
- ACE inhibition: a potential new therapy for peripheral arterial disease (B Kingwell)
- Novel therapies for the treatment of Type 2 diabetes (B Kingwell)
- Mechanisms of sympathetic overactivity in the metabolic syndrome: effects of reversing insulin resistance by drug treatment (N Stramzicky)
- The use of single chain antibodies for the detection of monocye activation in patients with stable and acute coronary syndromes (K Peter)
- A double-blind, randomized, placebo-controlled, single and multiple dose study to evaluate the safety, tolerability, and pharmacokinetics of MK-0974 in healthy male Japanese subjects (K Masuo)
- Lipid profiling: early detection, monitoring and pathogenesis of atherosclerotic heart disease (P Meikle)
- The atrial electrical and structural effects of systemic and pulmonary hypertension in humans (P Kistler)
- Characterisation of electrophysiological and radiological substrates in ischaemic and dilated cardiomyopathy patients with and without ventricular tachycardia using three-dimensional electroanatomical mapping and magnetic resonance imaging (D Kaye)
- Randomised controlled pilot trial of n-acetylcysteine in the management of chronic heart failure with coexistent chronic renal failure (D Kaye)
- A randomised crossover trial to assess the impact of the dietary n-6/n-3 polyunsaturated fatty acid ratio on markers of cardiovascular health in patients with dyslipidaemia (J Chin-Dusting)
- Native kidney denervation in patients with end stage renal disease (M Schlaich)
- The influence of heart rate reduction upon central arterial pressure in younger and older healthy individuals (B Kingwell)
- Characterisation of electrophysiological, radiological and histological substrates for ventricular tachycardia in patients undergoing cardiac transplantation for ischemic and non-ischemic cardiomyopathy (D Kaye)
- The influence of heart rate reduction upon coronary blood flow as assessed by coronary wave intensity analysis (B Kingwell)
- Determination of central arterial pressure and left ventricular ejection fraction in humans by analysis of peripheral arterial pressure waveforms (B Kingwell)
- Cardiac magnetic resonance imaging in the evaluation of myocardial fibrosis in advanced heart failure (L Iles)
- Reversibility of chronic atrial remodeling late after curative atrial flutter ablation (P Kistler)
- A randomised study of a Nurse-led Intervention for Less Chronic Heart Failure: the NIL-CHF Study (S Stewart)
- A multicentre, randomised, double-blind, placebo-controlled study to evaluate the safety and efficacy of SCH 503048 in addition to standard of care in subjects with acute coronary syndrome (S Duffy)
- The role of the renin angiotensin aldosterone system activation in myocardial fibrosis, diastolic function and its link to liver fibrosis in morbid obesity (C Wong)
- A single center pilot study evaluating the use of the Osprey Medical CN System™ (S Duffy)
- Noradrenaline transporter dysfunction in neural circulatory disorders (M Schlaich)
- Understanding the acute effects of prolonged sedentary behaviour (sitting) on post-meal glucose and lipids – a pilot study (B Kingwell)
- Cardiac and liver fibrosis in patients with the metabolic syndrome as detected by magnetic resonance T1 mapping (M Butler)
- Role of the sympathetic nervous system in obesity and associated metabolic abnormalities in the early development of organ damage in young adults (G Lambert)
- Do coronary plaque biomechanical differences between diabetic and non diabetic subjects relate to differences in plaque morphology and measures of neovascularisation? (J Shaw)
- A 76-week, worldwide, multicenter, double-blind, randomized, placebo-controlled study to assess the tolerability and efficacy of anacetrapib when added to ongoing therapy with a statin in patients with hypercholesterolemia or mixed hyperlipidemia (N Nestel)
- Exertional dyspnea in patients with echocardiographic signs of diastolic dysfunction: are symptoms really caused by impaired left ventricular filling? A prospective case-control study (D Kaye)
- Effects of peri-procedural iron chelation on myocardial infarct size and oxidative stress in ST-elevation myocardial infarction (S Duffy)
- Does tricuspid regurgitation contribute to renal dysfunction in patients with heart failure? (D Kaye)
- Utilisation of coronary CT angiography in cardiac risk stratification (A Taylor)
- International ReValving™ Registry (T Walton)
- Cardiac and liver fibrosis in patients with viral hepatitis as detected by magnetic resonance T1 mapping (A Taylor)
- Anaemia and myocardial iron in heart failure (D Kaye)
- Applying novel biomarkers to assess cardiac risk in patients undergoing major vascular surgery (S Duffy)
- Correlation of CMR findings with subsequent ventricular arrhythmias in subjects with heart failure (A Taylor)
- A quality improvement initiative on the Discharge Management of Acute Coronary Syndromes (DMACS) (A Dart)
- Does coronary plaque biomechanical differences between diabetic and non diabetic subjects relate to differences in plaque morphology and measures of neovascularisation? (J Shaw)
- A multicenter, double-blind, randomized, placebo-controlled, parallel-group withdrawal-design study to assess the clinical effect of Droxidopa in subjects with primary autonomic failure, dopamine beta hydroxylase deficiency or non-diabetic neuropathy and symptomatic neurogenic orthostatic hypotension (M Schlaich)
- Time to transfusion study (M Philps)
- The influence of dairy on risk and progression of obesity and metabolic syndrome: an AusDiab prospective study (J Shaw, P Meikle)
- Does warfarin alter diastolic function? (D Kaye)
- The role of cardiac magnetic resonance imaging and serum biomarkers in the identification and monitoring of myocardial involvement in patients with established non-cardiac sarcoidosis (J Habersberger)
- Effects of a 10 or 15 mg single intravenous bolus of ivabradine versus placebo on heart rate control during a multicentre computed tomography coronary angiography for the evaluation of coronary artery disease. A randomised, double-blind, international multicentre study (A Taylor)
- A multi-center, double-blind, randomized, placebo-controlled, parallel-group withdrawal-design study to assess the clinical effect of Droxidopa in subjects with primary autonomic failure, dopamine beta hydroxylase deficiency or non-diabetic neuropathy and symptomatic neurogenic orthostatic hypotension (M Schlaich)
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The mission of the Centre for Obesity Research and Education (CORE) is to better understand the disease of obesity, obesity-related diseases and psychosocial conditions, and to identify optimal methods for the safe, cost-effective, long-term management of obesity, coupled with preventative strategies that can be implemented in the community leading to improved health.

CORE is unique in applying a multidisciplinary approach to the study of obesity, which integrates a major clinical obesity management program with strengths in clinical research, clinical epidemiology, public health, basic sciences and professional and community education. Through this integration, CORE is able to measure the health consequences of obesity, along with the unique capacity to evaluate the health benefits of weight loss.

The patient remains the central focus of all of CORE’s activities. We have learned about obesity from studies of patients with the disease. We have evaluated treatments of obesity as we seek to help these patients and, after achieving substantial and durable weight loss for them, we have been able to measure the benefits on health, quality of life and survival.

RESEARCH PROGRAMS

CORE is, first and foremost, a research centre. Research is central to its mission and its clinical research capability sets CORE apart from most other similar research groups.

Basic Research
- Weight regulation – appetite control and energy expenditure
- Mechanisms of obesity related diseases

Clinical Studies
- Randomised controlled trials
- Observational studies
- Optimising therapy
- Measuring outcomes – health, quality of life and survival

Public Health
- Population health
- Prevention of obesity – secondary
- Health impact of weight loss
- Epidemiological modelling
- Cost-effectiveness and health economic studies

CURRENT PROJECTS AND RESEARCH AREAS

- Adolescent randomised controlled trial (Professor Paul O’Brien)
- Sleep apnoea randomised controlled trial (Associate Professor John Dixon)
- Survival study (Dr Anna Peeters)
- Intensive care study (Professor Paul O’Brien)
- Knee pain study (Dr Peter Baquie)
- Satiety: brain imaging II study with Howard Florey Institute (Melissa Hayden)
- Psychological assessment study (Melissa Hayden)
- Focus group stigmatisation study (Melissa Hayden)
- Factor analysis of the BDI (Melissa Hayden)
- Change in BD factor scores (Melissa Hayden)
- In vitro studies of the band (Mr Paul Burton)
- Nuclear medicine study: gastric emptying (Mr Paul Burton)
- Upper gastrointestinal symptoms study (Mr Paul Burton)
- Video manometry study (Mr Paul Burton)
- In band manometry study (Mr Paul Burton)
- Anaesthesia and the LAP-BAND – a systematic review (Mr Paul Burton)
- Physical activity and weight loss in LAGB patients – systematic review (Kristine Egberts)
- Eating patterns and weight loss in LAGB patients – randomised controlled trial (Kristine Egberts)
- Erosions after LAP-BAND surgery – a systematic review of literature (Kristine Egberts)
- Cardiac study (Dr Ranjana Warrier)
- Liver fibrosis study (Dr Michelle Butler)
- Adipose tissue study (Dr John Wentworth)
- Cost-effectiveness review: BMI 30-35 (Catherine Keating)
- Cost-effectiveness review: diabetic study (Catherine Keating)
- Cost-effectiveness review: OSA (Marjorie Moody)

AWARDS

- Wendy Brown MBBS(Hons), PhD, FRACS
  - Academic appointment to Associate Professor (Monash University)
  - Awarded FACS by the American College of Surgeons
  - Accredited for upper gastrointestinal endoscopy by the Australian Conjoint Committee

POSTGRADUATE STUDENTS

- 3 PhD Students
The Clinical Pharmacology Unit provides drug-related services to The Alfred, including advice to and membership of the Drug and Therapeutics Advisory Committee and the Human Research Ethics Committee, leadership on the Adverse Drug Reactions Committee and consulting on drug and toxicology related clinical problems.

The Clinical Pharmacology Unit has a very active program of basic and clinical research with regard to evaluation of new and established drug therapies.

**CLINICAL RESEARCH**

Clinical research is focused on drugs that may affect the cardiovascular system. Agents under current active research evaluation include COX-2 inhibitors, angiotensin receptor blockers, statin therapies, clozapine and beta-blockers, as well as various experimental agents. Evaluations include assessment of autonomic and endothelial function as well as microcirculation tone in health and disease.

The unit also serves as a coordinating centre for multi-centre clinical trials. Current ongoing trials include:

- **CHAT (Chronic Heart Failure Assistance by Telephone):** This study has recruited over 400 patients and 300 general practitioners and has finished recruitment with results to be presented in 2009. CHAT is asking the question whether an automated telephone support system will reduce hospitalisations in patients with heart failure in rural and remote areas where access to medical services is limited.

- **SCREEN-HF (SCReening Evaluation of the Evolution of New Heart Failure):** The SCREEN-HF study involves recruiting 3,500 elderly (>60 years) subjects with at least one risk factor for heart failure and determining plasma brain natriuretic peptide (BNP) levels. This is a marker of risk of subject heart failure in populations. Patients in the highest quintile of BNP are then invited to the Caulfield Clinical Trial Centre for echocardiography and other cardiovascular assessments. SCREEN-HF will determine whether this strategy is effective and cost-effective in detecting patients with evidence of cardiac dysfunction early, even before they develop symptoms. Funding has been secured to longitudinally follow-up all 3,500 subjects for five years to assess for new heart failure development, and to randomise the highest BNP quintile to spironolactone versus placebo to lower BNP and reduce heart failure development.

- **Triple R (Reverse Remodelling Resynchronization) Study:** Patients with heart failure may be eligible to receive a biventricular pacemaker (cardiac resynchronization therapy) if they have evidence of dyssynchrony, either on ECG or imaging. However, the mechanism by which cardiac function is improved is poorly understood and, furthermore, approximately 30% of eligible patients either have no response or deteriorate with this therapy. This randomised controlled trial will seek to determine mechanisms by which patients improve cardiac function and/or whether certain markers of disease predict non-response.

- **INTEGRATE:** Evaluation of physician inertia in hypertension management and strategies to improve this problem.

**BASIC RESEARCH**

The unit also conducts a number of basic research programs within the Monash Medical School research laboratories at AMREP. Current programs include:

- Role of soluble epoxide hydrolase inhibitors in cardiac disease
- Role of p38 MAP kinase system in heart failure disease progression
- Role of Rho kinase in cardiac fibrosis
- Role of novel agents in cardiac fibrosis and inflammation
Radiologists Dr Wa Cheung (left) and Professor Ken Thomson during a tumour ablation procedure utilising irreversible electroporation.

DIAGNOSTIC AND INTERVENTIONAL RADIOLOGY
Director: Professor Kenneth Thomson MD, FRANZCR, FRCR

The Alfred Radiology Research Unit is committed to providing improvement and innovation in healthcare through leadership in diagnostic and interventional radiology research and education. The department maintains close links with the clinical units at The Alfred with weekly meetings, and provides imaging support and expertise for over 100 research trials to other departments across the hospital.

CURRENT PROJECTS

Tumour ablation and tumour embolisation
- Phase 1 safety study of irreversible electroporation for the ablation of focal tumours in the liver, kidney and lung (Prof. Ken Thomson)
- Postoperative pain management in patients undergoing uterine artery embolisation for symptomatic leiomyomata (Prof. Ken Thomson, Dr Stuart Lyon)
- Multiphase computer tomography in the management of hepatocellular carcinoma (Dr Wa Cheung)

Trauma – spinal, brain, adrenal injury
- Assessing potential spinal injury in the intubated multi-trauma patient: does MRI add value? (Dr Dinesh Varma, Dr Mark Schoenwaelder)
- Correlation between MRI and operative findings in acute cervical spine injury: a retrospective review (Dr Dinesh Varma)
- Anterior cervical discectomy and fusion in trauma patients (Dr Dinesh Varma)
- Fluid resuscitation of critically ill patients with traumatic brain injury: potential mechanisms behind the detrimental effect of albumin resuscitation (Dr Dinesh Varma; with Prof. Jamie Cooper, ICU)
- Traumatic adrenal gland injury: epidemiology and outcome in a major Australian trauma centre (Dr Dinesh Varma; with NTRI)
- Identifying susceptible critically ill patients who desaturate following hyperbaric treatment: characteristics and outcomes (Dr Dinesh Varma; with Dr Ian Millar, Hyperbaric Unit)

Vascular intervention
- Cardiovascular Outcomes in Renal Atherosclerotic Lesions – CORAL (Prof. Ken Thomson; with Dr Chris Cooper, University of Toledo, USA)
- retrievable Günther Tulip inferior vena cava filter – experience in 317 patients (Dr Stuart Lyon)
- Initial experience in 115 patients with the retrievable Cook Celect™ Vena Cava Filter (Dr Stuart Lyon)
- Incidence and timing of pulmonary embolisation following major trauma (Dr Stuart Lyon; with Miss Susan Liew, Orthopaedics, Lachlan Batty)
- The RELEVENT Study: the rate of lower limb deep venous thrombosis in patients with traumatic brain injury – a pilot observational study (Dr Helen Kavvoudias; with Dr Andrew Westbrook, ICU)

Splenic embolisation in blunt abdominal trauma: is splenic function preserved? (Dr Stuart Lyon)
- PICC line trial: reinsertion of PICC lines (Steffan Bush; with Sue Gonelli, Nursing)

Neurovascular intervention
- Fluid-structure interaction modelling of patient-specific cerebral aneurysms: influence of hypertension, modulus of elasticity and aneurysm shape (Dr Anoop Madan, Dr Helen Kavvoudias; with CSIRO)
- Cerebral aneurysm coiling study (Dr Anoop Madan)
- Alfred experience with axium coils (Dr Anoop Madan)
- The value of post-operative angiography on clipped intracranial aneurysms (Dr Anoop Madan; with Neurosurgery)
- Adult intracranial dural arteriovenous fistulas: illustrated review of hemodynamic patterns with correlation to clinical outcomes (Dr Anoop Madan)

Utilisation of digital subtraction angiography
- Retrospective analysis of diagnostic outcomes in lower GI bleeding using angiography and nuclear medicine (Brendan Erskine, Elissa Marshall)
- Reflection of intracerebral aneurysm identification of multislice computer tomography (64 slice) and digital subtraction angiography (Elissa Marshall, Brendan Erskine, Wendy Winslade)

Magnetic resonance imaging
- Aspirin for the prevention of cognitive decline in the elderly: a neurovascular imaging study (Dr Anthony Kam; with Prof. Elsdon Storey, Neurology)
- Evaluation of cerebral AVMs before and after radiosurgery utilising brain STAT cerebral perfusion with arterial input function (Dr Anthony Kam)

Cellular physiology
- Arterio-venous malformations (Prof. Ken Thomson; with Dr Rajesh Nair, Baker IDI Heart and Diabetes Institute)

COMMERCIALLY SPONSORED CLINICAL TRIALS
Current commercially sponsored trials are in the areas of tumour embolisation, vascular intervention, MRI, interventional radiology and multi-slice computer tomography coronary angiography.

POSTGRADUATE STUDENTS
3 Masters Students

PUBLICATIONS
15 Journal Articles
11 Book Chapters
1 Book
The Emergency and Trauma research programs continued to be active in 2008 and covered a broad spectrum of activity through a number of collaborations.

Trauma resuscitation remains a focus of research activity and results of the Trauma Reception and Resuscitation project, led by Associate Professor Mark Fitzgerald, have confirmed the utility and improved safety resulting from computerised algorithmic prompting during resuscitation. Investigation continues into team performance, communication and handover during resuscitation and improved resuscitation techniques. Related publications have confirmed the utility of video audit as a tool for improving trauma resuscitation tasks.

The management of thoracic trauma has been an ongoing collaboration between Emergency Services, Trauma and Cardiothoracic Surgery. A feature of the clinical impact of this collaboration – describing survival following resuscitative thoracotomy for combined left ventricle and left atrium ruptures secondary to blunt trauma – was published. A review of pleural decompression during trauma resuscitation was published by Mark Fitzgerald and Silvana Marasco, whilst an analysis of failed Emergency Department disposition to the ward of patients with thoracic injury was led by Gaby Blecher.

A research collaboration with Ambulance Victoria, led by Ian Patrick, has shown improved outcomes associated with increased pre-hospital use of intercostal catheters for traumatic pneumothorax.

An ongoing project is examining analgesia in trauma patients as part of Paul Jennings’ PhD.

Collaborations involving large registry databases include the Victorian State Trauma Registry, Victorian Orthopaedic Trauma Outcome Registry, Haemostasis Registry and the Victorian Ambulance Cardiac Arrest Registry, which have all resulted in important publications to improve patient outcomes.

There are some exciting clinical trials commencing now that involve multicentre collaborations, as well as multiple specialties, which will extend over the next few years. NHMRC-funded trials include:

- Early goal directed therapy in sepsis (ARISE Study)
- The effect of cooling in head injury (POLAR Study)
- Acupuncture in the emergency department for painful conditions (MEDACT Study)
- Hyperbaric treatment in fractured lower limbs (HOLLT Study)

Various projects have been led by individuals within the department including:

- The role of frusemide in acute pulmonary oedema (Dr Nick Adams)
- Neseretide in heart failure (Louisa Lam)
- Hypothermia in trauma patients (Sharyn Ireland)
- Urethral injuries (Dr Carl Ludhoff)
- Massive transfusion in trauma (Dr Dev Mitra)

In addition, a Nurse Practitioner program has been established, which is generating significant interest as a model of care.

An international program has resulted in a couple of international aid grants enabling ongoing support for development of trauma and emergency systems in Sri Lanka, India, China and a program in the Netherlands. Dr Gerard O’Reilly (who is undertaking a PhD in trauma system development) and Kylie Chou are responsible for coordinating the international program.

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- Massive transfusion in trauma (Dr Dev Mitra)

In addition, a Nurse Practitioner program has been established, which is generating significant interest as a model of care.

An international program has resulted in a couple of international aid grants enabling ongoing support for development of trauma and emergency systems in Sri Lanka, India, China and a program in the Netherlands. Dr Gerard O’Reilly (who is undertaking a PhD in trauma system development) and Kylie Chou are responsible for coordinating the international program.

POSTGRADUATE STUDENTS

2 Masters Students
1 DN Student
1 MD Student
1 PhD Student

PUBLICATIONS

26 Journal Articles
RESEARCH ACTIVITIES
Mechanisms of diabetic complications
Professor Leon Bach
Patients with diabetes develop complications including damage to the blood vessels, eyes, nerves and kidneys. Although high glucose levels are necessary for the development of these complications, the precise mechanisms remain incompletely understood. Leon Bach’s laboratory studies the role of proteins that are modified by glucose (advanced glycation end-products – AGEs). In particular, his laboratory has identified a novel interaction between AGEs and proteins that are important for maintaining cell shape and function. Current studies are aimed at identifying the role of this interaction in mediating diabetes-induced tissue damage. In 2008, the group published a paper in the International Journal of Biochemistry and Cell Biology describing the precise part of the cell shape molecules that interact with AGEs, which may lead to the development of a new approach for treating diabetic complications.

Regulation of growth factor activity
Professor Leon Bach
Insulin-like growth factors (IGFs) are important for normal growth and development, and the IGF system is perturbed in many disease states, including growth disorders, diabetic complications, cancer and atherosclerosis. A family of six IGF binding proteins (IGFBPs) regulates their actions. For many years, Professor Bach’s laboratory has focused on the biological role of IGFBP-6, particularly its role as an IGF-II inhibitor in cancer. These studies may lead to a new class of therapies aimed at modulating the IGF system, which may be relevant for IGF–dependent diseases. The group previously published an important paper in Journal of Biological Chemistry demonstrating that IGFBP-6 promotes migration of cancer cells in an IGF-independent manner. Further work in 2008 helped define other important molecules that are involved in these actions.

Clinical trials in diabetes care
Professor Duncan Topliss
The ADVANCE trial is a large trial in Type 2 diabetes that tests if there is a benefit of tight glycemic control versus standard control, and of routine perindopril / indapamide therapy versus placebo in macrovascular disease prevention. The results of the blood pressure arm of the study were published in The Lancet in 2007. The glycemic control arm, published in New England Journal of Medicine in 2008, showed that tight glycemic control decreased complications, especially nephropathy.

RESEARCH ACHIEVEMENTS
Professor Leon Bach and Dr Anne McRobert were awarded an NHMRC Project Grant entitled ‘The role of ezrin-radixin-moesin proteins, novel binding proteins for advanced glycation endproducts, in kidney cells’ ($473,250 over three years).

POSTGRADUATE STUDENTS
2 PhD Students

PUBLICATIONS
13 Journal Articles
RESEARCH ACTIVITIES

The Department of Epidemiology and Preventive Medicine has broad expertise in applied clinical and public health research. Its core skills of epidemiology, biostatistics and data management support extensive research programs aimed at reducing suffering, preventing illness and improving quality of life. The department’s research program takes place in settings ranging from remote communities and workplaces to intensive care units.

Special skills in handling large data sets have led to the department’s involvement in large-scale clinical trials, disease and procedure registries, drug and device surveillance and the monitoring of large occupational cohorts. Many of these have a high profile and require the highest levels of ethical conduct and quality control.

The main areas of research largely reflect the units, centres and registries listed below, with the greater concentration of research currently in epidemiology, pre-hospital and emergency trauma, including patient safety and intensive care, clinical trials and occupational and environmental health. There is increasing activity in the field of human research ethics, musculoskeletal disorders, and international health.

The Biostatistics Unit leads with epidemiological modelling and, in addition to overseeing and monitoring the high quality of biostatistics in departmental research, it offers a biostatistics consulting service for external clients. During 2008 the Epidemiology Modelling Unit was formed.

The extent of research activity is reflected in funds received from major funding bodies in 2008. These include grants from NHMRC, National Institutes of Health (USA), National Heart Foundation, VicHealth, Commonwealth and State Departments and numerous commercial contracts.

Registries are an increasingly important vehicle for medical research and the department holds many, with more anticipated in the near future. During 2008 the Clinical Informatics and Data Management Centre was formed to oversee and monitor consistent protocols for data management in both projects and registries, with the expectation that the department will become a national source of expertise for others to consult. Several collaborations were established, including the Transfusion Research Outcomes Collaboration with the Australian Red Cross Blood Service.

Through a growing short course program, research and public health updates are offered both internally and to participants from Australia and overseas, as are short courses in clinical research methods, ethics and good research practice and data management.

RESEARCH UNITS

- Biostatistics Unit (Professor Andrew Forbes)
- Cardiovascular Research Unit (Professor Andrew Tonkin)
- Clinical Epidemiology Unit – Alfred (Professor Michael Abramson)
- Clinical Epidemiology Unit – Cabrini (Professor Rachelle Buchbinder)
- Clinical Pharmacology Unit (Professor Henry Krum)
- Health Services Management & Research Unit (Professor Just Stoelwinder)
- Human Rights and Bioethics Unit (Associate Professor Bebe Loff)
- Infectious Disease Epidemiology Unit (Dr Karin Leder)
- International Public Health Unit (Professor Brian Oldenburg)
- Kidney Disease Prevention Unit (Professor Bob Aitken)
- Musculoskeletal Unit (Professor Flavia Cicuttini)
- Pre-Hospital and Emergency Trauma Group (Professor Peter Cameron)
- Preventive Medicine Unit (Professor John McNeil)

PhD student Lavinia Tran undertakes laboratory analysis for her thesis, “Therapeutic targeting of signalling pathways in cardiovascular disease.”
AWARDS
- Professor John McNeil – Member of the Order of Australia for service to preventive medicine and to epidemiology as a researcher and educator and as a contributor to the development of public health policy
- Professor David Wells – Medal of the Order of Australia for service to forensic medicine and to the development of educational and training programs
- Helen Walls, PhD student – National Heart Foundation Top Ranked Scholar in Victoria, 2008
- Professor Michael Abramson – Thoracic Society of Australia & New Zealand (TSANZ) annual scientific meeting 2008: TSANZ / Australian Lung Foundation Prize (with co-author) for best presentation on primary care related issues
- Professor Andrew Tonkin – National Heart Foundation John Loewenthal Award
- Miranda Davies, PhD student – Australian Rheumatology Association national conference: best presentation prize
- Dr Fahad Hanna – Australian Rheumatology Association national conference: best clinical poster prize
- Jo O’Toole and Basia Diug, PhD students – Research Matters Month at Monash: Award for Outstanding Contribution to the 2008 Higher Degree by Research Student Poster Exhibition
- Professor Andrew Tonkin – 2008 Research Australia Award for Excellence in Medical Media
- Judy Lowthian, PhD student – Cabrini Institute’s 12th Annual Research Day Best Poster Presentation
- Dr Suree Lekawanvijit – American Heart Association conference: poster prize for Basic Science

POSTGRADUATE STUDENTS
- 68 Masters Students
- 2 Other Doctoral Students
- 72 PhD Students

PUBLICATIONS
- 217 Journal Articles
- 5 Cochrane Systematic Reviews

CENTRES
- NHMRC Centre of Clinical Research Excellence in Therapeutics (Associate Professor Chris Reid)
- NHMRC Centre of Research Excellence in Patient Safety (Professor John McNeil)
- NHMRC Centre of Clinical Research Excellence in Circulatory and Associated Conditions in Urban Indigenous Peoples (Professor Brian Oldenburg)
- Cooperative Research Centre for Water Quality and Treatment (Dr Martha Sinclair)
- Monash Centre for Occupational and Environmental Health (Professor Malcolm Sim)
- Australian Centre for Human Health Risk Assessment (Professor Brian Priestly)
- Australian and New Zealand Intensive Care Research Centre (Professor Jamie Cooper)
- Australian Centre for Radiofrequency Bioeffects Research (based at RMIT, Professor Michael Abramson)

REGISTRIES
- Australasian 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
- Melbourne Vascular Surgeons Association (MVSA) Registry
- REduction of Atherothrombosis for Continued Health (REACH) Registry
- Southern Melbourne Integrated Cancer Service Registry
- Surveillance of workplace Based Respiratory Events (SABRE)
- Victorian Cardiac Arrest Registry
- Victorian Orthopaedic Trauma Registry (VOTOR)
- VSTORM – Monitoring and Evaluation of the Victorian State Trauma System

KEY PROJECTS
The Department of Epidemiology and Preventive Medicine has scores of projects under way at any one time. The summary below outlines one of these.

Factors Contributing to Bleeding Risk in Patients Receiving Warfarin
Warfarin is the mainstay of prophylaxis against stroke in atrial fibrillation and valve replacement. Optimal efficacy and patient safety revolve around requisite close monitoring of the international normalised ratio (INR), with dose adjustment as needed. Warfarin is known to interact with many commonly-used medications and other chemicals that may be present in appreciable quantities in food. These interactions may enhance or reduce warfarin’s anticoagulation effect. This research aims to identify common predisposing factors and potential system of care issues amongst patients with significantly elevated INR levels, and to develop a preliminary risk profile of patients being treated with warfarin who record elevated INR levels in the blood.

This project has two phases and is based in metropolitan Melbourne, with the pilot study of 40 patients completed in 2007. The case control comprises 450 patients, 150 cases and 300 controls, with recruitment ongoing. Patients are eligible if they are at least 18 years of age, reside in the community, provide informed consent and have been on warfarin for a minimum of six months. Cases must have an INR ≥ 6.0, whilst controls had to be within their target range for a minimum of three months.

Structured interviews were conducted in patients’ homes and also at recruitment facilities within their local area. Patient interviews investigate potential predisposing factors including demographic characteristics, comorbidities, diet, medication and warfarin knowledge. Standardised measures evaluated cognition, mood, social support, functional independence, medication complexity and adherence.
GASTROENTEROLOGY
Head: Associate Professor Stuart Roberts MBBS, MD, FRACP

RESEARCH ACTIVITIES
The Gastroenterology Department continued to focus on research in areas where there is nationally and internationally recognised expertise in chronic viral hepatitis, chronic liver disease and inflammatory bowel disease.

Chronic viral hepatitis
The two main areas of research interests in 2008 have been to further understand the pathogenesis of liver disease in chronic viral hepatitis C and the exploration of novel treatment strategies to treat chronic hepatitis C and B.

In chronic hepatitis C, evaluated treatment strategies include:
• Completion of a study of induction therapy with peg interferon alpha-2a
• Phase 1 study of a combination of a potent hepatitis C virus (HCV) polymerase and protease inhibitor
• Evaluation of a potent novel protease inhibitor, Telaprevir, in combination with peg interferon alpha-2a plus ribavirin in treatment-naïve patients and those who failed to respond to prior therapy

Clinical studies in chronic hepatitis B examined the combination of entecavir plus tenofovir as well as adefovir in combination with emtricitabine. The department was the lead site in a multicentre national study examining the prevalence and nature of viral mutations in hepatitis B patients receiving oral antiviral therapy.

Researchers evaluated the pathogenesis of hepatitis C-related liver disease by performing studies into the role of the innate immune response and, specifically, Toll-like receptors in the development of hepatitis C-related liver inflammation and fibrosis. In addition, the mechanisms by which GB virus C protects against the development of progressive severe liver disease in subjects with hepatitis C and HIV coinfection was studied at both the gene and protein level. The novel findings of this latter study may have implications for new therapies in the future.

Inflammatory bowel disease
Alternative treatment strategies to the standard of care are being evaluated in patients with both Crohn’s disease and ulcerative colitis. In addition, the role of measuring both azathioprine and methotrexate metabolites is being assessed to determine whether these compounds improve the management of patients with inflammatory bowel disease. A national study coordinated by The Alfred is under way to review the role of pharmacological studies of novel treatment strategies, including biological therapies, in patients with both Crohn’s disease and ulcerative colitis. Ongoing investigator-initiated research projects are examining the role of measuring the metabolites of both azathioprine and methotrexate, in an effort to optimise these treatment options.

RESEARCH ACHIEVEMENTS
Associate Professor Stuart Roberts, with Professor Eric Gowans and Dr Bruce Loveland of the Burnet Institute, was awarded an NHMRC Project Grant commencing in 2009 for a project entitled ‘A novel immunotherapy to treat hepatitis C virus infection’.

Dr Mark Berzsenyi’s studies identified differential intra-hepatic T-cell signalling associated with GBV-C RNA in HCV/HIV co-infected individuals, findings which were not seen in the periphery. The genes identified have critical importance to the intra-hepatic immune response and may have a role in the pathogenesis of HCV related liver disease in HCV/HIV co-infection.

Furthermore, studies performed into the genomics of both HCV and HCV/HIV infection identified an association with grade of inflammation and aspects of the innate immune system.

Dr William Kemp finalised projects towards his PhD thesis by publication. He examined the role of a novel vasoactive peptide, urotensin II, in the chronic liver disease population and the role it might play in the development of portal hypertension. It was confirmed that urotensin II can contribute to the development of hepatic fibrosis and concurrently results in the development of portal hypertension in animals. These findings are compatible with the group’s previous demonstration of a relationship between circulating urotensin II levels in humans and the severity of their liver disease.

POSTGRADUATE STUDENTS
3 PhD Students

PUBLICATIONS
2 Journal Articles
The Alfred Department of General Surgery has undergone significant consolidation during 2008 and has built on its research program. The department remains committed to clinical research, some areas of basic science research, databases, clinical trials and audit and quality assurance processes. Those entering into surgical training are well supported in research projects, and of the ten surgical trainee research presentations at the DS Rosengarten Prize in December 2008, seven were from the General Surgery Department.

**BREAST, ENDOCRINE AND GENERAL SURGERY**
Established databases in thyroid surgery, parathyroid surgery, adrenal surgery, parotid surgery, and soft tissue tumour surgery have contributed to clinical research projects. A dedicated thyroid cancer database has also been established.

**Current Projects**
- Anatomical studies on the recurrent laryngeal nerve (Prof. J Serpell). This study has identified that the motor fibres supplying both the abductors and adductors of the intrinsic muscles of the larynx are located in the anterior extra-laryngeal branch of the recurrent laryngeal nerve. This has important implications for thyroid surgery.
- Ongoing study of the rate of bifurcation of recurrent laryngeal nerves (Prof. J Serpell)
- Changes in the diameter of the recurrent laryngeal nerve during thyroid surgery and its relationship to recurrent laryngeal nerve palsy (Prof. J Serpell)
- Hypothyroidism following hemithyroidectomy (Dr S Su, Prof. J Serpell)
- Incidence of thyroid tumours in thyroid nodules greater than 4cm in diameter (Dr M Raj, Prof. J Serpell)
- The role of fine needle aspiration cytology in the management of thyroid cancer (Dr M Raj, Prof. J Serpell)
- Follicular thyroid cancer presenting as bone metastases without a demonstrable primary thyroid tumour (Dr A Andrabai, Prof. J Serpell)
- Preoperative investigation of brachial cysts facilitates surgical management (Dr J Slater, Prof. J Serpell)
- Preoperative fine needle cytology and imaging facilitates the management of submandibular gland lesions (Dr M Taylor, Prof. J Serpell)
- Contribution to a tissue bank for follicular tumours (Prof. J Serpell)
- The investigation and management of thyroglossal duct cyst (Dr J Eleutari, Prof. J Serpell)
- Heuristics of thyroectomy (Prof. J Serpell)
- The anatomy of the final 2cm course of the extra-laryngeal recurrent laryngeal nerve: a new operative surgery concept of two facial layers enveloping the recurrent laryngeal nerve (Prof. J Serpell)

**COLORECTAL AND GENERAL SURGERY**

**Current Projects**
- Deficiencies in pathological reporting of colorectal cancer in Victoria (Dr S Bell, Dr K Farmer)
- Clinical and endorectal ultrasound staging of circumferential rectal cancers (Dr A Smith, Dr K Farmer)

**UPPER GASTROINTESTINAL AND GENERAL SURGERY**
The Upper Gastrointestinal Unit has several databases in hepatectomy, pancreatic surgery, oesophagectomy, gastrectomy and bariatric surgery.

**Current Projects**
- Randomised trial of VLCD post FOLFOX chemotherapy prior to liver resection for colorectal metastases (Dr C Pilgrim, Dr A Smith, A/Prof. W Brown)
- The use of VLCD prior to liver resection for colorectal metastases (Dr C Pilgrim, Dr P Evans, Dr V Usatoff, A/Prof. W Brown)
- Vascular preconditioning of the gastric tube prior to oesophagectomy (Dr P Burton, Dr A Smith, A/Prof. W Brown)
- Traumatic bile duct injuries/leaks (Dr C Pilgrim, Dr V Usatoff, Dr M Smith, Dr P Evans)
- Outcome of patients with liver trauma (Dr P Evans, Dr V Usatoff, Dr P Burton)
- Follow-up of patients following traumatic diaphragmatic hernia repair (Dr P Burton, A/Prof. W Brown, Dr S Kemp)
- Follow-up of respiratory patients following laparoscopic fundoplication (Dr P Burton, A/Prof. W Brown, Dr A Smith, Dr S Hassen, A/Prof. P Nottle)
- Assessment of improvement of laparoscopic skills using a basic trainer (Dr J Choi, Dr P Evans, Dr V Usatoff, Dr A Smith, A/Prof. W Brown, A/Prof. P Nottle)
- Follow-up of patients treated surgically for achalasia (Dr K Heggie, Dr C Pilgrim, Dr A Smith, Dr S Hassen, A/Prof. W Brown, A/Prof. P Nottle)
- Laparoscopic hernia repair – tacker versus glue (Dr E Kaplan, Dr V Usatoff, Dr A Smith, Dr P Evans, A/Prof. P Nottle)
- Survival following hepatectomy (Dr V Usatoff, Dr M Smith, Dr P Evans)
- Follow up of liver resections for metastatic colorectal cancer (Dr V Usatoff, Dr M Smith, Dr P Evans)
- Laparoscopic liver resection (Dr C Pilgrim, Dr V Usatoff, Dr M Smith, Dr P Evans)
- Motility disorders and LAGB surgery (Dr P Burton, A/Prof. W Brown, Dr A Smith, A/Prof. P Nottle)

**PUBLICATIONS**
12 Journal Articles
GLOBAL HEALTH

AMREP’s Research Strategic Plan for 2007-2011 identified global health as a field that would benefit from further collaboration among partners at AMREP. During its inaugural year (2008), senior staff from The Alfred, Baker IDI Heart and Diabetes Institute, Burnet Institute (Centre for International Health) and Monash University (Monash Initiative for Global Health Improvement) have been involved in further developing the AMREP Global Health Research Consortium. A steering group has been established to further develop the consortium’s work program and activities.

AMREP GLOBAL HEALTH FORUM
The 2nd AMREP Global Health Forum was held on 7 April 2008 (World Health Day) with the overarching theme: ‘Research supporting policy and practice in low- and middle-income countries’.

The forum involved almost 200 students, academics, health practitioners, researchers and policy-makers to discuss and exchange ideas on how to improve links between research, health program effectiveness and health policy. Speakers and participants from government agencies such as AusAID, and NGOs including Oxfam, World Vision and Save the Children (Australia) attended the event.

Professor David Karoly from the University of Melbourne delivered the keynote presentation on the theme for World Health Day 2008: ‘Protecting health from climate change’. The Hon. Bob McMullan MP, Parliamentary Secretary for International Development Assistance, presented on ‘Health in Australia’s Aid Program’. The Make Poverty History campaign, Burnet Institute, Monash University and World Vision released a joint statement urging the Australian Government to strengthen its efforts in health aid.

Other international speakers included Dr Clement Malau (Secretary for Health, Papua New Guinea), Dr Thandi Puoane (a senior academic from University of Western Cape, South Africa) and Professor KR Thankappan (Director, Achutha Menon Centre for Health Science Studies, Sri Chitra Tirunal Institute for Medical Sciences and Technology, India).

RESEARCH PROJECTS
There are many research and capacity building projects being undertaken by staff from the AMREP partner institutions, particularly the Burnet Institute and Monash University. Below are some examples, some new and others ongoing.

Mpumalanga Project
A new collaborative research group has been established to investigate water, HIV and diarrhoea in South Africa with a seeding grant from the Monash University Deputy Vice-Chancellor (International) Office. The project involves researchers from Monash University (Australia and South Africa), The Alfred, Burnet Institute and the University of Witwatersrand (South Africa).

Rishi Valley, India
This collaborative project between Baker IDI Heart and Diabetes Institute, Monash University and the Rishi Valley Rural Health Centre aims to obtain baseline data on the extent of vascular disease and its risk factors in a typical rural Indian community. It will then become part of the process to plan effective public health interventions to treat or prevent vascular disease in a disadvantaged Indian community.

National Surveillance Non-communicable Disease Program, Vietnam
This study aims to establish a sustainable system for non-communicable disease surveillance in Vietnam. Baker IDI Heart and Diabetes Institute and Monash University work together with the World Health Organization, Menzies Research Institute and the Ministry of Health, Vietnam.

The Mauritius Diabetes Surveillance Project
Mortality and morbidity are being evaluated among participants who attended a series of longitudinal non-communicable disease surveys in 1987, 1992, 1998 (all conducted by the International Diabetes Institute). This project examines risk factors for all cause and cardiovascular mortality with a focus on diabetes as a risk factor for death (Baker IDI Heart and Diabetes Institute).

International Diabetes Federation Diabetes Atlas
The Diabetes Atlas, now in its third edition, reports on the global, regional and country specific prevalence of diabetes (adult and in the young), impaired glucose tolerance (‘pre-diabetes’) and diabetes complications (including mortality). Diabetes prevalence projections to 2025 are also provided, with the Diabetes Atlas being a key tool to track the progress of the diabetes epidemic, particularly in developing countries (Baker IDI Heart and Diabetes Institute).

The Heart of Soweto Study Cohort
This study increases the understanding of the characteristics and burden imposed by heart disease in an urban African community in probable epidemiological transition (Baker IDI Heart and Diabetes Institute).
RESEARCH ACTIVITIES

The Monash University Department of Immunology is internationally renowned for its combined expertise in research, teaching and service delivery in immunology and immunopathology. There are extensive research programs in basic and translational immunology, including highly successful collaborations with The Alfred and other AMREP partners. The department’s research activities target diseases including hay fever and asthma, autoimmunity, diabetes, cancer and malaria. Researchers are funded by NHMRC, ARC, Cooperative Research Centre and other research grants, and have a strong publication output and patent portfolio.

Early in 2008, the Head of Department, Professor Michael Berndt, accepted the position of Head, College of Medicine and Health, University College, Cork, Ireland. The Department of Immunology is poised for another exciting chapter with the recent appointment of Professor Fabienne Mackay as Head, commencing in March 2009. Professor Mackay was previously Head of the Autoimmunity Research Unit at the Garvan Institute of Medical Research, Sydney, and has a stellar track record in cutting-edge research into the molecular characterisation of inflammatory and autoimmune diseases.

HIGHLIGHTS

- Professor Robyn O’Hehir was appointed co-editor of Clinical and Experimental Allergy. She also was appointed to the Advisory Committee of the World Health Organisation affiliated alliance Allergic Rhiinits and its Impact on Asthma (ARIA), and chaired the NHMRC Program Grants Committee 2008.
- Professor Jennifer Rolland was appointed associate editor of Clinical and Experimental Allergy.
- The result for the DIRECT trial, of which Associate Professor Jennifer Wilkinson-Berka is an advisory member, was announced in 2008. This clinical trial was to a large extent based on her laboratory work. A five-year trial in over 5,000 patients, DIRECT reported a reduction in the incidence and an increase in the regression of diabetic retinopathy in Type 1 and Type 2 diabetic patients treated with the angiotensin type 1 receptor blocker, candesartan.
- Professor Magdalena Plebanski was appointed to the Faculty of Medicine, Nursing and Health Sciences Research Committee, and Chair of the Central Clinical School Research Committee, Monash University.
- Associate Professor Jennifer Wilkinson-Berka (and Dr Erica Fletcher, University of Melbourne) secured a major commercial contract with BiOlim and another with Geropharm, St Petersburg, Russia.
- Dr Sue Xiang and Professor Magdalena Plebanski were invited to speak at the BIT Life Sciences 1st Annual World Vaccine Congress 2008, Foshan, China. Professor Plebanski chaired a session at this conference.

CURRENT PROJECTS

Allergic Diseases

Professor Jennifer Rolland and Professor Robyn O’Hehir (Department of Allergy, Immunology and Respiratory Medicine, The Alfred)

Both clinical trials and in vitro studies are used to investigate mechanisms of allergen immunotherapy and optimal strategies for downregulation of the adverse T-cell response to allergen in allergic individuals.

- Identification of T-cell epitopes of peanut allergens and investigation of cross-reactivity with tree nuts
- Characterisation of major Bahia grass pollen allergens and identification of T-cell-reactive sites
- Modulation of the allergen-specific T-cell response and investigation of optimal strategies for inducing regulatory T-cell responses to allergens
- Effect of co-exposure to microbial inflammatory stimuli on T-cell cytokine response to allergen
- Role of natural killer cells in regulating allergen-specific T-cell responses
- Role of activin A in driving inflammation and remodelling in chronic airways disease
- Nanoparticle induction of lung resistance to development of allergen-induced lung inflammation in a mouse model; role for local dendritic cells
Autoimmune Diseases
Associate Professor Frank Alderuccio
Research centres on processes associated with the autoimmune response and loss of immunological tolerance, with the aim of devising strategies to prevent or reverse autoimmunity. Experimental models of autoimmunity are used to explore the potential of gene therapy strategies aimed at treating these diseases.
- Use of haematopoietic stem cell manipulation to induce immunological tolerance
- Understanding and utilising expression of AIRE for tolerance induction in autoimmunity
- The use of corticosteroids in strategies aimed a promoting disease remission
- Role of regulatory T-cells in experimental models of autoimmunity
- Induction of tissue specific antigen expression using retroviral vectors

Diabetic Retinopathy
Associate Professor Jennifer Wilkinson-Berka
The contribution of vasoactive and growth factor systems to the development of diabetic microvascular complications is studied. Goals are to develop new, safe and effective treatment regimens for patients with diabetic retinopathy, providing a major advance over current invasive therapies such as laser treatment.
- The role of the prorenin receptor in ischemic and diabetic retinopathy
- Aldosterone and angiotensin II: are they conspirators in diabetic retinopathy?
- Pathogenic associations between the microvasculature, glia and neurons in ischemic and diabetic retinopathy
- Do interactions between glyoxalase I and angiotensin contribute to pericyte and endothelial cell death in diabetic retinopathy?

Diabetes
Associate Professor Robyn Slattery
Elucidation of the role of β2M and MHC in directing the autoimmune response in diabetes is crucial to learn how to regulate the disease in predisposed individuals. Early identification of patients through genetic markers will provide a therapeutic window in which to immunomodulate at-risk individuals before the onset of diabetes.
- The role of β2 microglobulin in susceptibility and resistance to Type 1 diabetes
- The role of the human insulin promoter in the genetic predisposition to developing anti-insulin autoreactivity
- The role of antigen presenting cells in the pathogenesis of Type 1 diabetes

Inflammation and Vascular Biology
Dr Rob Andrews
Studies focus on ligand binding, signalling and proteolytic regulation of platelet receptors, and are relevant to thrombotic abnormalities associated with autoimmune disease or immunodeficiency.
- Platelet membrane glycoproteins, structure and function
- Mechanisms of cellular adhesion
- Structure-function of endothelial cell membrane proteins
- Inflammatory responses of white cells
- Receptor signalling

Microbial Immunopathology
Dr John Emmins
The molecular basis for infectious disease pathology and role of cytokines in disease protection are investigated.
- Immunopathogenesis of gas-gangrene (with Professor Julian Rood, Department of Microbiology, Monash University, and Professor Richard Boyd, Monash Immunology and Stem Cell Laboratories)

Molecular Signalling
Associate Professor Jun-Ping Liu
Cytokine regulation of cancer cell proliferation by mechanisms of telomerase maintenance of telomeres, and roles of a novel ATPase in neurodegenerative disease are studied.
- Cancer inhibition by targeting telomerase using a peptide
- Targeting telomerase as a tumour-associated antigen for immunotherapy
- Regulation of chromosome end (telomere) remodelling by hormones and cytokines
- Novel mechanisms of telomere maintenance and remodelling in cancer and stem cells
- Studies of a neural ATPase in neurodegenerative diseases

Leucocyte Membrane Proteins
Associate Professor Mark Wright
Investigations probe molecules expressed on the surface of white blood cells which serve as molecular antennae and thus play a critical role in the biology of white blood cells.
- Investigation of tetraspanin function in vivo using a gene targeting technology approach, in particular CD37 and CD151
- Identification and characterisation of novel molecules including FIRE and CIRE expressed at the surface of dendritic cells

Vaccine and Infectious Diseases
Professor Magdalena Plebanski
Research involves the development of novel vaccines against cancer and parasitic diseases.
- Development of malaria and cancer vaccines using a novel nanovaccine technology
- Investigation into the effect of nanoparticles on dendritic cells and other immune cells
- Nanoparticle induction of lung resistance to allergy and inflammation
- Understanding immunosuppression in malaria and cancer by studying changes in dendritic cell and regulatory T-cells (Tregs)
- Study of altered peptide ligand-mediated regulation of T-cell activity and use of peptide superagonists to enhance malaria vaccine efficacy
- Discovery and validation of new surface markers to distinguish Th1, Th2 and Treg subsets and their use to monitor diverse infectious diseases and cancer
The Alfred Infectious Diseases Unit (IDU) incorporates a large clinical service with active research programs in the fields of human immunodeficiency virus (HIV), viral hepatitis, neurovirology, infections in the immunosuppressed (such as those with malignancy, in intensive care and post-splenectomy), and infection control and hospital epidemiology.

**HIV**
Research in HIV ranges from basic laboratory studies through to clinical and public health programs. How the immune system recovers from HIV infection, where HIV ‘hides’ in patients on treatment and how HIV interacts with dendritic cells (unique infection-fighting cells) is being investigated. Novel tests to measure which particular co-receptor is used by a patient’s virus are being developed. This is essential in order to use a new class of anti-HIV drugs called CCR5 antagonists.

The Clinical Research Unit is actively involved in multiple international studies to evaluate new antiretroviral agents, in particular for the treatment of drug-resistant HIV. In addition, research is focused on how HIV treatment causes side effects such as cardiovascular and bone disease and neuropathy (nerve damage in the feet). More than 40 per cent of HIV patients attending the IDU clinic are affected by neuropathy. This causes pain and numbness in the feet and reduces quality of life and ability to work. The unit has also established a network of researchers within the Asia Pacific region to better understand the prevalence of dementia, peripheral neuropathy and depression in resource-poor countries.

**Viral Hepatitis**
Research in viral hepatitis combines basic laboratory and clinical work. Researchers are currently determining how immune cells, specifically T-cells, react to hepatitis B virus (HBV) and how HIV and HBV may potentially interact in the same liver cell. IDU has established a large cohort to determine the relationship between the sequence of HBV and the patient’s genetic make-up. This will indicate what parts of the virus are most ‘susceptible’ to the immune system. On the clinical side, we are collaborating in a multicentre international study on the natural history of HIV-HBV infection and have an active program to identify and characterise drug resistance to anti-HBV medication in Australia and Thailand.

**Fungal Infections**
Deep tissue infections caused by the fungus Aspergillus (known as invasive aspergillosis) are a major cause of death in patients with leukaemia or after bone marrow transplantation. The overall goals of research in this area are to improve the treatment of invasive aspergillosis by optimising the use of new and established antifungal agents and developing new diagnostics to accurately identify the infection.

**Spleen Registry**
The Spleen Registry commenced in late 2003 with the aim of improving the health of patients who have undergone splenectomy or have a poorly functioning spleen. Such patients are at increased risk of severe infections but the risk of these events can be minimised by patient education, vaccination and use of antibiotics. The objective of the registry is to improve adherence with these recommendations through education of patients and their health care providers, and facilitating access to these interventions.

**MAJOR FINDINGS**
- Identified that multiple chemokines can condition resting T-cells to establish latent HIV infection.
- Lodged an international patent to develop a test to rapidly identify patient virus from plasma. It is now planned to use this approach to develop a test to determine which strain of HIV a patient is infected with. This test is critical in order to determine which patients will respond to the new CCR5 antagonist class of anti-HIV drugs.
- Identified novel genetic risk factors that determine how effectively the immune system will recover following treatment for HIV.
- Identified that naive T-cells are important long term reservoirs for virus in HIV-infected patients on treatment.
- Showed that genes associated with inflammation may influence the risk of antiretroviral drug-associated neuropathy in HIV patients from several ethnic groups.
- Developed a new assay for quantifying apoptosis. Cell death is increased when patients are on particular drug therapies and also when they experience lipoatrophy (fat wasting) as a side effect from HIV treatments.
- By combining results from cohorts in Australia, Malaysia and Indonesia, it was shown that patient age and height are associated with the risk for neuropathy among people with HIV. Prioritising older and taller patients for access to drugs least likely to cause neuropathy could reduced rates of this problem in resource-limited settings (where some use of potentially neurotoxic drugs remains an economic necessity).

**CURRENT PROJECTS**

**Basic HIV research**
- The role of naïve T-cells in HIV viral persistence (Prof. S Lewin)
- The role of chemokines in establishing latent infection in resting T-cells (Prof. S Lewin)
- Role of histone deacetylase inhibitors in the elimination of HIV from the latent reservoir (Prof. S Lewin)
- Identification of the cellular defect that leads to long term HBV infection and how this is altered in the setting of HIV-HBV co-infection (Prof. S Lewin)
- Relationship between genetic polymorphisms and immune restoration in individuals receiving HAART (Prof. S Lewin)
HIV clinical research

- Development of a rapid high throughput test to assess HIV co-receptor usage and fitness (Prof. S Lewin)
- Characterisation of the role of the male genital tract in HIV persistence and pathogenesis (Dr M Xhlagaga)
- Lineage and functional relationship of dendritic cells and monocytes (Dr P Cameron)

HIV–hepatitis B co-infection

- The interaction of HIV and HBV in the cells of the liver, specifically the hepatocyte (Prof. S Lewin)
- The natural history of HIV and HBV infection and the role of HBV drug resistance in liver disease progression (Prof. S Lewin)
- Identification and characterisation of HBV mutations that lead to resistance to tenofovir in Australia and Thailand (Dr J Saeusseus)
- The change in the immune system in HIV-HBV co-infected patients who develop hepatitis after starting HIV and HBV treatment (Prof. S Lewin)

Hepatitis B virus research

- Defining the relationship between HLA type and HBV evolution (Prof. S Lewin)

NeuroAIDS research

- The Asia Pacific NeuroAIDS Consortium NIH Study (Dr E Wright)
- Rates and risk factors for sensory neuropathy in HIV/AIDS patients in Australia and around the world (Dr K Cherry)
- Genetic risk factors for antiretroviral toxic neuropathy (Dr K Cherry)
- Establishing the use and interpretation of an LM-PCR-based phenotypic assay for antiretroviral toxicity (Dr K Cherry)
- Study to examine a novel, soluble formulation of coenzyme Q10 for the prevention of neuropathy in an in vitro model (Dr K Cherry)

HIV clinical trials

- A randomised open-label study comparing the safety and efficacy of three different combination antiretroviral regimens as initial therapy for HIV infection (ALTIEAR Study (Prof. J Hoy)
- A placebo controlled multiple dose study of flupirtine in the treatment of painful HIV-associated NRTI neuropathy (Dr K Cherry)
- Prospective cohort study of women in Victoria infected with HIV assessing reproductive history and future reproductive intentions (Dr M Giles)
- Retrospective analysis of clinical management and disease outcomes of women infected with HIV who have delivered a live birth in Australia between 1982-2005 (Dr M Giles)
- Cross sectional study of 3100 general practitioners across Victoria and New South Wales assessing infectious diseases screening practice during pregnancy (Dr M Giles)

HIV prevention

- Risk behaviour for sexually transmitted infections in men who have sex with men (MSM) – ongoing study aiming to compare the associations of risk taking behaviours for HIV/STI transmission with mental illness and drug and/or alcohol use, in HIV infected and uninfected MSM (Dr A Mijch)

Impact of HIV infection and treatment with highly active antiretroviral therapy on reverse cholesterol transport (Prof. J Hoy)

- A multicenter, randomized, double-blind, placebo-controlled trial of a novel CCR5 antagonist, UK-427,857, in combination with optimized background therapy versus optimized background therapy alone for the treatment of antiretroviral-experienced HIV-1 infected subjects (Prof. J Hoy)
- A randomised, controlled, open-label trial to compare the efficacy, safety and tolerability of TMC114/RTV versus lopinavir/ritonavir in treatment-experienced HIV-1 infected subjects (Prof. J Hoy)
- Study of subcutaneous recombinant IL-2 in patients with HIV-1 infection and CD4 cell counts >300/ml. Evaluation of subcutaneous prolein (ESPRT) (Prof. J Hoy)
- The Australian HIV observational database and data on adverse events of anti-HIV drugs (AHOD and DAD) (Prof. J Hoy)

- A prospective cohort study of individuals recently infected with HIV to determine immunological, virological and therapeutic factors related to disease progression (PHAEDRA (Prof. J Hoy)
- Clinical and laboratory investigation of undiagnosed encephalitis (CLUE) study (Dr E Wright)

Infections in the immunosuppressed

- Strategies to improve adherence to current best practice guidelines for the prevention of overwhelming post splenectomy sepsis (OPSI) (A/Prof. D Spelman)
- Quantification of the risk of OPSI by using outcome data in specific patient sub-groups e.g. those patients who have undergone removal of their spleen or have damaged their spleen following trauma (A/Prof. D Spelman)
- The role of quantification of IgM specific immune memory B-cells as a marker of immune function in patients post-splenectomy (Dr P Cameron)
- A multicentre randomised, controlled trial comparing two strategies for the diagnosis of invasive aspergillosis in high-risk haematology patients – the ASPID Study (Dr M Sawa)
- Caspofungin as salvage monotherapy for invasive aspergillosis in patients with haematological malignancies or following allogeneic stem cell transplantation: efficacy and concomitant use of cyclosporin A (Dr D Morrissey)
- A randomised, stratified, open label, Phase 2 pilot study on the safety of a daily, intermittent, or weekly administration of 1, 3 or 10mg/kg of Ambisome® in antifungal prophylaxis of high-risk patients with acute myeloid leukaemia (Dr D Morrissey)
- An economic evaluation of invasive fungal infections among patients undergoing stem cell transplantation or chemotherapy for acute leukaemia (Dr D Morrissey)
- Prospective use of genes containing coding tandem repeats as markers for genotyping Aspergillus fumigatus clinical isolates and investigation of the relationship of genotype with the spectrum of clinical infection (Dr D Morrissey)

Antibiotic and antibiotic-resistance studies

- Development of in vitro and in vivo pharmacodynamic models to better understand dosing and toxicity of new antibiotic linezolid (A/Prof. D Spelman)
- Study of the usefulness of antimicrobial susceptibility testing in patients with cystic fibrosis (A/Prof. D Spelman)
- Case control study to identify risk factors for vancomycin-resistant enterococci (VRE) bacteremia (A/Prof. D Spelman)
- Case control study to identify risk factors for the development of metallo-β-lactamases (A/Prof. D Spelman)
- Investigation into optimal methods of typing VRE (A/Prof. D Spelman)
- Multi-national study of Acinetobacter bloodstream infection: clinical outcomes and global epidemiology (A/Prof. D Spelman)

General infectious diseases

- International Collaboration on Endocarditis (ICE) (A/Prof. D Spelman)
- The Australian Group on Antibiotic Resistance (AGAR) annual and bi-annual studies on resistance patterns for Staphylococcus aureus, both community and hospital acquired, gram negative bacilli, and Streptococcus pneumoniae (A/Prof. D Spelman)
- The Australian and New Zealand Collaboration on outcomes of staphylococcal sepis (A/Prof. D Spelman)
- Study of infections in ventricular assist devices (A/Prof. D Spelman)
- Study of the changing clinical patterns and microbiology of necrotising fasciitis and myonecrosis (A/Prof. D Spelman)
In 2008, the Intensive Care Unit continued its strong research program. The Alfred ICU is now regarded as one of the most successful research departments in critical care research in Australia. Research has continued on a number of themes built up over many years in collaboration with several important research organisations, including the Australian and New Zealand Intensive Care Society Clinical Trials Group (ANZICS CTG), the National Trauma Research Institute (NTRI) and the Australian and New Zealand Intensive Care Research Centre (ANZIC-RC).

In 2008, Intensive Care Unit researchers were awarded NHMRC funding for two new studies in traumatic brain injury (POLAR and EPO) for $1.96 million and $1.85 million respectively. The POLAR study (led by Professor Cooper and Associate Professor Bernard in association with Dr Nichol and Professor Peter Cameron) will investigate the early use of induced hypothermia to improve outcomes, and the EPO study (led by Professor Cooper and Dr Nichol) will investigate the use of erythropoietin to improve outcomes in traumatic brain injury patients.

The enthusiastic and hard-working ICU research coordination team continued to successfully enrol patients into several clinical trials. This team included Lynne Murray, Shirley Vallance, Cindy Weatherburn, Siouxzy Morrison, Rachael Nevill and is supported by Lucinda Gabriel.

RESEARCH ACTIVITIES

Professor Jamie Cooper continued to lead (with Professor Jeffrey Rosenfeld) the DECRA trial, an international randomised trial of decompressive surgery for severe traumatic brain injury, which is within 12 months of completion. He also leads the SAFE-TBI II study, searching for mechanisms behind improved mortality with saline compared to albumin in resuscitation in traumatic brain injury (TBI) patients, and the Australian effort on the PROTECT study, which is comparing unfractionated and low molecular weight heparins in a large Canadian-led international study of critically ill patients.

With Ruwan Wijemunige, Professor Cooper is investigating BIS monitoring in TBI patients, and testing CO₂ titration to improve brain oxygen concentrations. He is also principal investigator on the national STATINS (investigation of statin therapy) and ARISE (investigation of early goal-directed therapy) randomised trials in patients with severe sepsis.

Associate Professor Carlos Scheinkestel was a Steering and Management Committee member of the highly successful RENAL study (completed in late 2008), which randomised over 1,500 patients.

Dr Andrew Davies continued to lead the multicentre ENTERIC randomised trial, testing small bowel feeding versus gastric feeding in ICU patients. He also ran a nationwide observational study on feeding strategies in patients with pancreatitis and is gradually developing a critical care nutrition research program in collaboration with the ANZIC-RC.

Associate Professor David Tuxen, Dr Alistair Nichol and Carol Hodgson have continued their randomised, controlled trial of an improved method of lung recruitment in patients with acute respiratory distress syndrome (ARDS), the PHARLAP study.

Associate Professor Stephen Bernard has continued his pre-hospital research program. Recently he completed studies on pre-hospital intubation in severe head injury (RSI trial) and on improved methods of cooling post-cardiac arrest patients pre-hospital (RICH trial) and has moved on to co-lead (with Professor Cooper) a significant study into hypothermia (both pre- and then in-hospital) for patients with traumatic brain injury.

Associate Professor Warwick Butt has continued to lead a prolific and diverse research program in both paediatric and adult critical care.

Dr Vincent Pellegrino has been analysing results of the multicentre NAVIGATOR trial testing an improved monitoring and haemodynamic management system for acute cardiothoracic ICU patients. He has continued to further establish the growing clinical extracorporeal membrane oxygenation (ECMO) program, which has included the establishment of an international symposium on the use of the ventilator assist device (VAD) and ECMO therapies.

Dr David Pilcher has continued to study ICU outcomes using the bi-national ICU database, particularly in regard to ICU discharge patterns and survival.

Dr Megan Robertson ran a pilot study in understanding whether heparin has an effect as an intervention in patients with septic shock, and has contributed to several other department research projects.

Dr Andrew Hilton has expanded the ICU echocardiography program and has continued investigating cardiac abnormalities in patients with brain injury and lecturing at meetings on echocardiography. Dr Tim Leong has continued his work in infection control and central line associated blood stream infections and Dr Deirdre Murphy has taken over from Associate Professor Bob Salamonsen in developing skills in artificial heart technology.

Dr Silvana Marasco (cardiothoracic surgeon) continues to lead a randomised trial of surgical rib fixation patients with Professor Cooper and Dr Davies.

Continued on page 45
The Medical Oncology Unit provides coordinated multidisciplinary management for adult patients with malignancies. An important component of this care is the clinical trial and research activities, which enable the unit to offer forthcoming investigational treatments to patients.

The unit’s research activities include Phase 1, 2 and 3 trials across a wide range of tumour types, incorporating both pharmaceutical industry sponsored and investigator-driven studies, with active participation in both national and international clinical trials.

A highlight of 2008 was the mandatory regulatory inspection by the US Food and Drug Administration (FDA) of a Phase 1 international clinical trial conducted by the unit, in collaboration with Nucleus Network. This was a rigorous, formal, five-day audit. No reportable findings were made by the senior FDA auditor, who highly commended the study conduct at The Alfred.

The unit was an active participant in an important international colorectal study. The results, which were published in the *New England Journal of Medicine* in October 2008, translate into a major paradigm shift in the prognosis and management of metastatic colorectal cancer. The veracity of the results has been verified by other worldwide research groups. Dr Jeremy Shapiro was the principal investigator of the study at The Alfred.

The unit plans to join the Cancer Trials Australia (CTA) group in early 2009, which will allow access to clinical trials and enhance research capabilities. It is expected that a central ethics committee review process, acceptable to all the major teaching hospitals ethics committees, will be introduced in 2009. Its implementation will be a major development for all researchers, with significant benefits in enhancing research capacity as well as streamlining governance.

**CURRENT PROJECTS**

- Suppression of ovarian function trial: a Phase 3 trial evaluating the role of ovarian function suppression and the role of exemestane as adjuvant therapies for premenopausal women with endocrine responsive breast cancer (Professor Max Schwarz)
- A Phase 3 randomized trial of chemotherapy with or without panitumumab in patients with metastatic and/or recurrent squamous cell carcinoma of the head and neck (Dr Andrew Haydon)
- Multicentre international study of capecitabine +/- bevacizumab as adjuvant treatment of colorectal cancer (Dr Andrew Haydon)
- A Phase 3 randomized study of brivanib alaninate (BMS-582664) in combination with cetuximab (Erbitux, C225) versus placebo in combination with cetuximab (Erbitux, C225) in patients previously treated with combination chemotherapy for metastatic colorectal carcinoma (Dr Andrew Haydon)
- A multinational, randomized, double-blind study comparing aflibercept versus placebo in patients treated with second-line docetaxel after failure of one platinum based therapy for locally advanced or metastatic non-small-cell lung cancer (Dr Andrew Haydon)
- Adjuvant immunotherapy with anti-CTLA-4 monoclonal antibody (ipilimumab) versus placebo after complete resection of high-risk stage III melanoma: a randomized, double-blind Phase 3 trial of the EORTC Melanoma Group (Dr Andrew Haydon)

**MAJOR RESEARCH FINDINGS**

- The VASST study found that low dose vaspressin improved survival in selected patients with septic shock (published in *New England Journal of Medicine*). The Alfred coordinated the Australian sites in a Canadian-Australian non-industry research collaboration.
- The LOVS study (also a Canadian-Australian research collaboration) reported that higher levels of PEEP did not improve outcomes in patients with ARDS (published in the *Journal of the American Medical Association*).
- The RENAL study found that high-flow continuous renal replacement therapy (CRRT) did not improve major clinical outcomes in ICU patients with renal failure compared to standard flow CRRT.
The Monash University Department of Medicine is responsible for the provision of teaching and other academic programs at The Alfred for medical undergraduates and postgraduate research students. The department is the focus of many research activities undertaken by university personnel employed in the department and also by hospital clinical departments (refer to separate reports) integrated with the Department of Medicine.

In addition, many physicians and scientists employed in the hospital's clinical departments have honorary appointments within the Department of Medicine to facilitate the provision of the teaching program, research programs and supervision of postgraduate research students.

Respiratory Immunology Group
Research undertaken by physicians of the Department of Allergy, Immunology and Respiratory Medicine, and scientists in the Monash University Departments of Medicine and Immunology, is largely centred on the immunobiology of asthma (particularly atopic asthma), immunological and molecular characterisation of peanut allergens, chronic lung disease, cystic fibrosis and lung transplantation. A program of study of lung regeneration using stem cell technology has been established in association with Monash Immunology and Stem Cell Laboratories.

Renal Disease
Clinical research projects in Renal Medicine are predominantly in the area of glomerulonephritis, vasculitis, progression of renal disease, diabetic renal disease, chronic allograft rejection, evaluation or renal disease in patients with end stage heart and lung pathology facing heart or lung replacement, and renal disease following successful heart and lung transplantation. The broad theme of the laboratory research program is the mechanisms of progression of primary renal disease. Both human and experimental models of renal disease are studied, with particular focus on the role of the fibrogenic growth factors and apoptosis in progression of injury.

Neurosciences
The Van Cleef / Roet Centre for Nervous Diseases, established at The Alfred in 1996, conducts research programs in stroke, Alzheimer's disease and other dementias, inherited and sporadic ataxias, movement disorders and cognition in cerebellar stroke and hepatitis C. Traumatic brain injury is the focus of research of another neuroscience group within the department, using experimental models of injury. This group works in close collaboration with the National Trauma Research Institute.

Clinical Pharmacology
Pharmacological research is focused on drugs that may affect the cardiovascular system. Basic research programs investigate the role of: urotensin II in cardiac disease; p38 MAP kinase system in heart failure disease progression; Rho kinase in cardiac fibrosis; novel agents in cardiac fibrosis and inflammation.

Infectious Diseases
Research programs are conducted in the fields of HIV, viral hepatitis, neurovirology, infections in the immunosuppressed (such as those with malignancy, in intensive care and post-splenectomy) and infection control and hospital epidemiology.

Women's Health
The Women's Health Program undertakes research pertaining to the main conditions that affect the health of women at midlife and beyond. Major current research projects include a large study of the physical, psychological and social well-being of breast cancer survivors, a community based study of urinary incontinence in women, a study to increase the understanding of joint pain in women being treated for breast cancer, and studies to delineate the role of sex steroids in the preservation of cognitive function in women after menopause.

Endocrinology and Diabetes
Clinical and laboratory research is conducted, especially in the area of diabetes. Specific research programs include mechanisms in the development of diabetic complications, insulin-like growth factor dysregulation in diabetes and heart failure, and clinical trials in diabetes care and osteoporosis.

Experimental Anatomical Pathology
The laboratory of Experimental Anatomical Pathology has a strong focus on pathologic study of human tissue and through collaborative studies conducts research into the role of the endothelium in cardiac transplantation, new prognostic markers in breast and prostate cancer, imaging of dementia, pathologic diagnosis of early muscular dystrophy and pulmonary veno-occlusive disease and pulmonary hypertension. The particular focus within the laboratory is latent viral infections of the brain.

Centre for Ethics in Medicine and Society
The specific objectives of the centre are: (1) to stimulate a culture of reflection, debate, dialogue and awareness of ethical issues in the medical community and the faculty; (2) to deliver high quality teaching products; (3) to conduct research; and (4) to contribute to the development and enrichment of practice.

POSTGRADUATE STUDENTS
1 Masters Student
1 MD Student
73 PhD Students

PUBLICATIONS
84 Journal Articles
4 Book Chapters
Research conducted by the Victorian Melanoma Service is primarily clinical and aimed at facilitating earlier detection of melanoma. Early detection of melanoma remains the primary method to prevent mortality as there is still no therapy, other than complete removal of the primary tumour, with a clear survival benefit.

In 2008 Dr Hugh Roberts completed his review of the epidemiology of melanoma in Victoria over the past 20 years, working with the Victorian Cancer Registry. He studied pathology reports for more than 10,000 melanomas. His work shows that melanoma rates have doubled over the past 15 years and that this includes an increase in rates of advanced melanomas. The most important contributor by far to deaths from melanoma proved to be nodular melanoma, an uncommon, aggressive and under-recognised form of melanoma, which has been an important focus of our research. Dr Roberts showed that this form of melanoma comprises only 8% of melanomas but causes half of deaths from melanoma. In recent years Dr Alex Chamberlain and Dr Wendy Liu have pioneered understanding of this form of melanoma, describing its distinctive appearances, its risk factor profile and rapid growth.

Dr Yan Pan studied 117 patients who presented with melanoma that had spread to other parts of the skin through vessels. His is the first study to show that, contrary to assumptions made in the current melanoma staging system, these patients have a much better outlook than those with other forms of spread from melanoma. The current staging system for melanoma mistakenly indicates that patients with spread of melanoma to the skin are similar to patients with spread to internal organs and have a poor outlook, with only 19% expected to survive for five years. Dr Pan showed that these patients have a much better outlook, with half surviving for five years. This information will allow revision of the staging system and a different and more accurate prognosis that can be given to patients with spread to the skin.

Dr Lena Ly identified a new precursor for melanoma. She worked with a group of six patients who have large numbers of moles that are focused in a well-defined but large area of abnormal skin. All had developed between one and four melanomas in the affected skin. Patients with this characteristic but rare problem will be followed in future to detect their melanomas early. Dr Victoria Pearce completed the development of a predictive model for risk of developing melanoma. She is producing an online tool to enable people to assess their own five year risk to develop melanoma. This will enable doctors and patients to more effectively target early detection strategies.

The Melbourne Melanoma Project commenced in 2008 and involves tissue banking for melanoma. This is a collaborative project between Peter MacCallum Cancer Centre, The Alfred and the Austin Hospital. The project will enable identification of the molecular pathways involved in each patient’s melanoma, opening the opportunity for targeted chemotherapy.

Dr Cate Scarff joined the staff of the Victorian Melanoma Service to perform research using the new confocal microscope purchased in 2008 with support from the Muriel and Les Batten Foundation.

CURRENT PROJECTS

- The effectiveness of different biopsy types in detecting melanoma (Dr Jonathan Ng)
- Multicentre sentinel lymphadenectomy trial II (Mr Richard Bloom)
- Trial of ipilimumab for stage II melanoma (Dr Andrew Haydon)
- Prognosis for patients with regional cutaneous metastases (Dr Yan Pan)
- Changes in the epidemiology of melanoma in Victoria over 20 years (Dr Hugh Roberts)
- The features and associations of isolated dermal melanoma (Dr Sarah Brennand)
- The efficacy of imiquimod and the treatment of lentigo maligna (Dr Martin Haskett)
- Mathematical model to predict five year risk for the development of melanoma (Dr Victoria Pearce)
- Comparative study of the epidemiology of nodular melanoma, lentigo maligna melanoma and superficial spreading melanoma (Dr Wendy Liu)
- Efficacy of confocal microscopy in the non-invasive diagnosis of melanoma (Dr Cate Scarff)

POSTGRADUATE STUDENTS

1 Masters Student

PUBLICATIONS

2 Journal Articles

HIV research

The centre participated in a multinational clinical trial (STEAL) comparing two commonly used anti-HIV combination pills, truvada and kivexa. The most important finding was that drug combinations were equivalent in their ability to control HIV. Other ongoing studies include a trial of a nutritional supplement, safety data collection for maraviroc and continuous participation in a national observational database.
The Melbourne Sexual Health Centre (MSHC) is a specialised unit for the diagnosis and treatment of sexually transmissible infections (STIs) and is a principal training centre for health professionals in Victoria. The centre conducts epidemiological, public health and clinical research, primarily aimed at improving the services offered at MSHC.

Chlamydia trachomatis
MSHC research is designed to improve case finding of chlamydia among asymptomatic groups at high risk of infection, for example, in men who have sex with men (MSM), pregnant women and young women under the age of 25 years attending general practitioner clinics.

A study of pregnant women aged 16-25 years attending antenatal services in Melbourne was carried out to determine the associated risk factors for chlamydial infection and whether risk factors identified could be used for selective screening. Screening based on the selective criteria would have detected 72% of infections, and 27% of women would have been screened (M Chen, C Fairley, S Tabrizi, M Pirotta, S Garland).

The attitudes of young women to the introduction of chlamydial screening in general practice (GP) in Australia were examined. Young women reported that they would accept age-based screening in general practice, during both sexual health and non-sexual health related consultations (N Pavlin, C Fairley, J Gunn, J Hocking).

Sexually transmitted infections in MSM
The duration between onset of symptoms of primary and secondary syphilis, and diagnosis and treatment were determined among MSM. A considerable delay between the onset of symptoms of early syphilis and its diagnosis was found, creating a period where further transmission could occur. Greater awareness of symptoms and signs of syphilis is required among GPs and MSM, together with the need for early testing and treatment (M Bissessor, C Fairley, C Bradshaw, M Chen).

A study was conducted to ascertain the knowledge and attitudes of MSM about the human papilloma virus (HPV) vaccine and to determine the age at which MSM would ask for the HPV vaccine. MSM were strongly in favour of having HPV vaccine when advised of the risk of HPV-related anal cancer (D Simatherai, M Bush, C Fairley, S Heley, M Chen).

The clinical value of a questionnaire and clinically reported anorectal symptoms as reliable indicators of infection with N. gonorrhoeae and C. trachomatis in MSM was investigated. The absence of an association between symptoms and the presence of gonorrhoea or chlamydia infection highlights the importance of annual screening of MSM for sexually transmitted infections independent of symptoms (N Lister, C Pang, C Fairley).

Bacterial vaginosis (BV)
The Bacterial Vaginosis Antibiotic and Probiotic Study (BVAPS) is an NHMRC-funded randomized, controlled trial evaluating combination therapy with oral metronidazole/vaginal clindamycin against oral metronidazole/vaginal placebo and oral metronidazole/vaginal probiotic for the treatment of BV enrolled 230 women (C Bradshaw, M Pirotta, C Fairley, S Garland).

A meta-analysis of the behavioural risk factors associated with BV was conducted. BV was associated with new and multiple sexual partners, lack of condom use and findings that illustrate BV has the epidemiology of an STI (K Fethers, C Bradshaw, C Fairley).

The Female University Student Study (FUSS) examines the association between sexual practices and BV (K Fethers, C Bradshaw, C Fairley).

Mycoplasma genitalium
An audit of M. genitalium infections at MSHC from 2005-2007 was conducted and showed M. genitalium was detected in 10% of cases of nongonococcal urethritis and 11% of cervical infections/pelvic inflammatory disease in women. Azithromycin failure occurred in 16% of cases and all cases were successfully eradicated with moxifloxacin (C Bradshaw, M Chen, C Fairley).

A retrospective analysis of samples collected in 2002 during a study of M. genitalium in MSM attending sex on premises venues was conducted. There was found to be a 2% prevalence of M. genitalium, largely detected as an asymptomatic rectal infection (C Bradshaw, C Fairley, N Lister, M Chen, S Garland, S Tabrizi).

Partner notification of chlamydia
A study is exploring how Australian GPs undertake partner notification (PN) for chlamydia, their views on PN, and what supports GPs would find most useful to assist with PN.

Continued on page 47
Fully operational since mid-2004, the National Trauma Research Institute (NTRI) has brought together an expert group of researchers and collaborators from various disciplines that includes scientists, clinicians, nurses, allied health staff and other health professionals. NTRI’s state-of-the-art facility is located in close proximity to The Alfred Trauma Service, the largest and busiest trauma service in Australia.

NTRI has a wide range of collaborative partnerships with centres and groups such as:

- Trauma services – The Alfred, Royal Melbourne, Royal Children’s and Austin hospitals
- Interstate Trauma Services – Liverpool and Westmead hospitals
- Universities – Monash, Melbourne, Deakin, La Trobe and RMIT
- Ambulance Services – Metropolitan Ambulance Service and Rural Ambulance Victoria
- International centres.

NTRI's research and education programs are funded through grants received mainly from the Transport Accident Commission, Victorian Neurotrauma Initiative (VNI) and NHMRC, and supported by philanthropic organisations and AAMI.

NTRI's main focus is on improving trauma patient care and outcomes through research, and by effectively translating research outcomes into clinical practice through education programs. The institute’s areas of research extend along a continuum of pre-clinical animal based research, pre-hospital (paramedic), emergency presentation, intensive care management, definitive surgical care and rehabilitation medicine.

**HIGHLIGHTS**

**Trauma Melbourne Conference 2008**

The inaugural Trauma Melbourne Conference (TM2008), held in November 2008, was a multidisciplinary forum that focused on the two pressing issues in trauma resuscitation: interventions for brain and spinal cord injury, and the management of hypovolaemic shock. Trauma Melbourne 2008 was an initiative of the NTRI and VNI, and was supported by Alfred Health’s Emergency and Trauma Centre, AAMI and Ambulance Victoria. Trauma Melbourne 2008 was attended by 261 delegates: 74% Victorian, 21% interstate and 5% overseas.

**Trauma Melbourne Conference 2008 Workshop**

NTRI, in collaboration with Professor Russell Gruen, managed a pre-conference workshop on trauma research, which was held at the University of Melbourne and attended by 70 registrants.

**New Funding**

Associate Professor Cristina Morganti-Kossmann was awarded the inaugural Victorian Neurotrauma Initiative Senior Research Fellowship. Her team studies the role of brain inflammation in mediating the production of new neuronal cells, brain cell death and the accumulation of blood cells within brain tissue. Their aim is to identify the molecular targets responsible for the inflammatory cascade that is triggered by injury to the brain.

Dr Alistair Nichol was awarded a Tattersalls Foundation Trauma Research Fellowship to study the role of erythropoietin in head injury. When administered in high doses, erythropoietin (EPO) has been demonstrated in some animal studies and in early human trials to improve outcomes following head injury. However, there is a risk that it may increase the rate of clot formation. It is aimed to conduct a trial to determine if EPO improves neurological outcomes and whether it increases the rate of clot formation.

Dr Edwin Yan was awarded a grant from ANZ Trustees for the project entitled ‘Post traumatic hypoxia increases tryptophan metabolite production and exacerbates secondary brain damage’. Tryptophan is an essential amino acid for cellular function and survival, and plays a pivotal role in regulating the immune/inflammatory response. Studies on neurodegenerative diseases, as well as preliminary data on traumatic brain injury (TBI) patients, demonstrate that the brain increases the rate of tryptophan metabolism, including the production of its intermediate and end-products. This project will validate evidence on the increase of tryptophan metabolism in the injured brain possibly contributing to secondary brain damage that evolves after TBI.
Inherited and Sporadic Ataxias

Spinocerebellar ataxias (SCAs) affect those parts of the brain concerned with coordination. Many cases have a genetic cause. The department's clinical work in the inherited ataxias involves finding and describing new varieties of ataxic illness.

Gluten sensitivity (which underlies coeliac disease) has been proposed as a common cause of sporadic (non-genetic) ataxias, although this is contentious. NHMRC is funding the department to study this problem, both in a mouse model and in subjects with newly diagnosed coeliac disease, using clinical scales, an internally-developed electronic measure of coordination, and quantitative MRI scanning. Neurophysiologist Scientist Kate Tuck has continued validation and standardisation work on our battery of upper limb coordination measures, and a collaboration has been established with Monash University Gippsland campus to undertake the clinical and neurophysiological assessment of tremor and ataxia, a common consequence of trauma in The Alfred's large trauma patient base.

Alzheimer's Disease and Other Dementias

Optimally, treatment for Alzheimer's disease should be started as early in the disease as possible, when the only problem is of mild memory loss. In conjunction with Associate Professor Glynda Kinsella (La Trobe University), patients have been studied to ascertain whether teaching memory strategies at an early stage may improve everyday memory function. Carmela Germano and Sarah Ong, La Trobe University Masters students in Psychology co-supervised by Professor Storey, continued their studies on memory mechanisms and motor skills in Alzheimer's disease. Dr Louise Kelly's studies on the functions of APP , the nerve cell protein that is broken down to form the toxic amyloid protein of Alzheimer's disease, continue, and in 2008 she was joined by PhD student Judy Allen-Graham.

Professor Storey is on the steering committee of the ASPIRE trial of aspirin in the healthy elderly, for which dementia is a primary endpoint. He is also a chief investigator on an Australian National University-led NHMRC-funded substudy, ENVISion, assessing the effects of aspirin on brain MRI, cognition and retinal vasculature, running over five years from 2008.

Cognition in Cerebellar Stroke and Hepatitis C

General medical illnesses can affect brain function and therefore thinking. La Trobe neuropsychology Masters student Chris O’Halloran has commenced research with PSP .

The team has submitted seven abstracts for the International Movement Disorders Society meeting in Paris in 2009. Associate Professor Williams has been invited to talk at a number of international meetings, including the World Federation of Neurology Parkinson's Disease and Related Disorders meeting in Florida in December.

In collaboration with the team from the UCL Institute of Neurology, London, pathological tau protein deposition in progressive supranuclear palsy (PSP) via anatomical region will be assessed. The department is also involved in commercial studies and the ongoing cerebrospinal fluid (CSF) study, which began in 2008. A PhD student at the University of Rome is also performing longitudinal CSF studies and transcranial magnetic stimulation in patients with PSP.

Associate Professor Williams coordinates a regional collaboration looking at the outcomes of deep brain stimulation (DBS), and has started the DBS clinic at Monash Medical Centre as part of this broader collaboration. The Alfred Movement Disorders Clinic continues to attract new patients who are routinely offered participation in ongoing studies assessing nuclear medicine (cardiac MIBG) and olfaction testing in the diagnosis of Parkinsonism. Together with the scientists in The Alfred Movement Analysis Laboratory, researchers test diagnostic and electrophysiological measures of tremor (dystonic tremor, orthostatic tremor and essential tremor).

The Stroke Unit, under the leadership of Dr Judith Frayne, participates in many national and international multicentre stroke trials, including both industry-sponsored and investigator-driven trials. Associate Professor Richard Gerraty addresses the difficult management issues raised by cervical arterial dissection, a common consequence of trauma in The Alfred's large trauma patient base.

In collaboration with the team from the UCL Institute of Neurology, London, pathological tau protein deposition in progressive supranuclear palsy (PSP) via anatomical region will be assessed. The department is also involved in commercial studies and the ongoing cerebrospinal fluid (CSF) study, which began in 2008. A PhD student at the University of Rome is also performing longitudinal CSF studies and transcranial magnetic stimulation in patients with PSP.

Associate Professor Williams coordinates a regional collaboration looking at the outcomes of deep brain stimulation (DBS), and has started the DBS clinic at Monash Medical Centre as part of this broader collaboration. The Alfred Movement Disorders Clinic continues to attract new patients who are routinely offered participation in ongoing studies assessing nuclear medicine (cardiac MIBG) and olfaction testing in the diagnosis of Parkinsonism. Together with the scientists in The Alfred Movement Analysis Laboratory, researchers test diagnostic and electrophysiological measures of tremor (dystonic tremor, orthostatic tremor and essential tremor).

The team has submitted seven abstracts for the International Movement Disorders Society meeting in Paris in 2009. Associate Professor Williams has been invited to talk at a number of international meetings, including the World Federation of Neurology Parkinson’s Disease and Related Disorders meeting in Florida in December.

Cognition in Cerebellar Stroke and Hepatitis C

General medical illnesses can affect brain function and therefore thinking. La Trobe neuropsychology Masters student Chris O’Halloran has commenced studies on localisation of cognition and effective function in the cerebellum. Neuropsychologist Dr Rubina Alpitis is studying the effects of hepatitis C infection on cognition.
The Alfred Department of Neurosurgery continues to develop an active and multidisciplinary research program. It has expanded collaborations with the departments of Intensive Care, Trauma Surgery, Stroke, Radiology, Radiotherapy and Pathology. Neurosurgery staff also actively work on projects with Monash University, La Trobe University and University of Melbourne. The primary focus of collaborations is on the improvement of patient care and outcomes, although some projects may also result in the development of intellectual property assets.

The US National Institutes of Health-funded familial intracranial aneurysm study has recommenced recruitment after additional funds were obtained by the chief investigators. This second phase will examine genetic factors predisposing to aneurysm development in those patients without a documented family history.

A number of epidemiological studies are under way, utilising the large amount of data entered into the department's audit system over the last five years. The audit database, developed in-house, continues to prove its value as a tool for managing the day-to-day workload and also for facilitating a wide variety of neurosurgical research projects.

The department is also actively involved in developing minimally invasive neurosurgical techniques, and collaborates with major neurosurgical centres in Singapore and Germany on the development of new technologies. Manuscripts arising from this work have been accepted for publication in the foremost journal Neurosurgery.

An active student research program, with international and local junior and senior medical staff undertaking research projects under the direction of neurosurgery staff, will continue into the future, reinforcing the department’s commitment to teaching and research.

SUCCESSFUL GRANTS
- Victorian Cancer Agency Project Grant awarded to Professor Jeffrey Rosenfeld, Professor Gavin Fabinyi (Austin Health), Professor Michael Saling (University of Melbourne) and Dr Jacqueline Anderson for the project ‘Intentional forgetting in frontal lobe tumour patients’ 2008-2009: $80,000.
- Henry O’Hara Surgical Research Trust Grant for 2009 awarded to Dr Marc Seifman for the project ‘Identification of risk factors for the development of postoperative bleeding after cranial neurosurgery’.

CURRENT PROJECTS
- DECRA: a multicentre randomised trial of early decompressive craniectomy in patients with severe traumatic brain injury (Professor Jeffrey Rosenfeld)
- FIA: Familial Intracranial Aneurysm Study (Professor Jeffrey Rosenfeld)
- CONSCIOUS-2: a prospective multicentre, double blind, randomised, placebo controlled, parallel group study to assess the efficacy and safety of clazosentan in reducing vasospasm-related morbidity and all-cause mortality in adult patients with aneurysmal subarachnoid haemorrhage treated by surgical clipping (Mr Peter Hwang)
- The correlation of clinical and radiographic findings with long term outcomes in road trauma patients with acute cervical discoligamentous injury (Professor Jeffrey Rosenfeld)
- Establishment of a neurotrauma tissue/liquid bank within the National Neural Tissue Resource Centre (Professor Catriona McLean, Professor Jeffrey Rosenfeld)
- Identification of risk factors for the development of postoperative bleeding after cranial neurosurgery (Mr Peter Hwang)
- An investigation into the cognitive outcome of patients undergoing stereotactic radiotherapy for the treatment of arteriovenous malformations (Mr Peter Hwang)
- Intentional forgetting in frontal lobe tumour patients (Dr Jacqueline Anderson, Professor Jeffrey Rosenfeld)
- The determination of the expression of calcitonin receptor (CTR) and the characterisation of CTR-positive cell types in human brain tumours (Mr Peter Hwang)
- Cerebral autoregulation monitoring in paediatric traumatic brain injury (Philip Lewis, Associate Professor Warwick Butt, Professor Jeffrey Rosenfeld)
- A study of the assessment and management of blunt cerebrovascular injury in patients presenting with trauma: a study of 90 patients treated between 2004 and 2006 (Professor Jeffrey Rosenfeld, Mr Peter Hwang)
- Trauma reception and resuscitation – time for a new approach (Associate Professor Mark Fitzgerald, Professor Jeffrey Rosenfeld)
- The development of a neurosurgical audit system (Philip Lewis)
- Novel applications of ultrasonic intracranial distance measurements (Philip Lewis)

POSTGRADUATE STUDENTS
1 Masters Student
2 MD Students
3 PhD Students

PUBLICATIONS
18 Journal Articles
1 Book Chapter
The Department of Nuclear Medicine was established in 1968 and is primarily committed to providing patient services that involve the use of unsealed sources of medical isotopes either for therapy or diagnosis. It is especially active in training medical specialists in this field and nuclear medicine technologists who are an integral part of the provision of these services to patients.

The department is involved in research activities that support its principal areas of clinical involvement and with the presence of a dedicated positron emission tomography (PET)/computed tomography (CT) scanner, it is increasingly focused on improving the assessment of cancer patients treated in the William Buckland Radiotherapy Centre and other Alfred Health centres. PET/CT is the focus of research projects to determine its impact on patient management in several oncologic and non-oncologic conditions. The department’s long history of actively participating in a series of multidisciplinary research projects with many other Alfred departments and the Baker IDI Heart and Diabetes Institute continues.

Several recently completed studies are now either published in peer reviewed journals or are in various stages of the publication process. These include a publication by Dr Martin Cherk and colleagues, including Professor Duncan Topliss, on the incidence of radiation thyroiditis and ablation success rates following 1110 MBq and 3700 MBq post surgical I-131 ablation therapy for patients with differentiated thyroid carcinoma.

Dr Cherk and others, in a combined project with the Peter MacCallum PET Centre, also published an evaluation of pulmonary nodules and lung cancer with a one inch crystal gamma coincidence PET/CT, showing it is only mildly less sensitive than a dedicated PET/CT. However, the one inch crystal gamma coincidence PET/CT takes three times longer to image individual patients and consumes significant gamma camera resources. It therefore now acts as a backup device if the new dedicated camera has a breakdown. Dr Thomas Barber, Nuclear Medicine Fellow, demonstrated that PET/CT impacts on the treatment strategy in approximately 45% of patients with pancreatic cancer.

CURRENT PROJECTS

- Mechanisms of the disorders of circulatory control which may cause syncope: chronic low blood pressure (Dr Kenneth Yap with the Department of Cardiovascular Medicine)
- Mechanisms of the disorders of circulatory control which may cause syncope: pure autonomic failure, multiple systems atrophy and Parkinson’s disease with autonomic failure (Dr Kenneth Yap with the Department of Cardiovascular Medicine)
- Nuclear medicine studies of gastric and oesophageal emptying in lap-band patients (Dr Kenneth Yap with the Centre for Obesity Research and Education and the Monash Department of Surgery)
- Using I-123-MIBG to assess neuroendocrine function in patients with hypertension, postural orthostatic tachycardia syndrome and syncope (Dr Victor Kalf with the Department of Cardiovascular Medicine)
- Role of PET/CT in management of hepatocellular carcinoma (Dr Kenneth Yap and Associate Professor Stuart Roberts, Gastroenterology Unit)
- A pilot study of the use of magnetic seizure therapy for treatment resistant depression (Dr Kenneth Yap and Professor Paul Fitzgerald, Department of Psychiatry)
- Pilot study using PET/CT to assess mechanisms of tumour cell death following controversial IRE therapy (Dr Martin Cherk and Professor Ken Thomson with the Radiology Department)

The Nuclear Medicine Department’s PET/CT scanner.

PUBLICATIONS

- 3 Journal Articles
Nucleus Network is a not-for-profit clinical research and education company wholly owned by Baker IDI Heart and Diabetes Institute. The organisation is a centre for excellence in clinical research and one of Australia’s leading Phase 1 clinical research facilities.

Nucleus Network operates a 30-bed early phase clinical research unit on the AMREP site as well as a 16-bed facility run at the Austin Hospital, Heidelberg. New drugs and compounds are administered to healthy volunteers in a strictly controlled environment, attended to 24 hours a day by Nucleus Network’s specially trained medical support staff. Participants in trials are watched closely for any reactions and have blood samples, blood pressure and other vital signs taken and carefully recorded at regular intervals. The information is collected to monitor and protect the participants’ health and also provides vital information about the therapy under trial. These participant profiles inform the pharmaceutical company’s understanding of the drug and are a crucial part of the development of the therapy.

The clinical trials performed at Nucleus Network involve either healthy volunteers or sometimes patients with specific medical conditions. Nucleus Network relies heavily on community involvement in this process, and is grateful for the time and effort offered by volunteers, without whom new medicines would not reach the people who need them most.

As well as the clinical research activities, Nucleus Network provides a broad range of expertise on clinical research and product development to the global pharmaceutical, biotechnology and medical device industries. The company’s three core business activities are:

• Conduct of Phase 1–4 studies, with a particular emphasis on early phase studies
• Education and training in Good Clinical Practice (GCP)
• Clinical trial consulting services

Highlights of activities in 2008 include:

• Over 50 Phase 1 clinical trials conducted
• Staff growth to over 80 full-time and part-time staff
• Two Japanese–Caucasian metabolism studies completed
• Collaboration with specialist principal investigators in dermatology, oncology, rheumatology, gastroenterology, endocrinology and respiratory medicine
• In 2008 Nucleus Network was winner of the Governor of Victoria Export Awards in the category of Emerging Exporter and winner of the Victorian Export Award for Innovation Excellence.

Steady growth continues with strong repeat business from local and international sponsors. In fact, at the new site in Heidelberg, all companies using Nucleus Network for the first time returned with further business.

Nucleus Network is a unique and important AMREP participant with strong relationships with other groups. Altogether last year Nucleus Network brought more than $2.6 million in revenue to AMREP in the form of services, donations, education subsidies, contract work and scholarships.
LA TROBE/ALFRED CLINICAL SCHOOL
Current Projects
Emergency Nurse Practitioner Research
Collaborative research between the clinical school and the emergency department nurse practitioners (NPs) was the focus of three publications and presentations at the Australian Nurse Practitioner Association Conference and the National Conference for Emergency Nurses. The presentations were about expanding the NP role in emergency, the sustainability of the NP role in Victoria and the mentorship program as part of the NP Masters program. A patient satisfaction survey of NP patients and patients seen by emergency physicians was completed in 2008 and the results will be published in 2009. The model demonstrated consistent levels of patient satisfaction, with patients reporting more favourable satisfaction with NPs compared to emergency physicians.

Evaluation of a Fasting Protocol for Trauma Patients (Tarryn McConnell)
An evaluation of a protocol for fasting trauma patients was undertaken. The study showed that elderly patients are particularly prone to complications if fasted for long periods of time.

Diabetes Research (Geraldine Lee)
A multidisciplinary study has commenced for patients with diabetes involving the Department of Endocrinology and Diabetes, Nutrition Department and Baker IDI Heart and Diabetes Institute. The study, which received an Alfred Research Trusts Small Project Grant, is a randomised controlled study of a pre-operative intervention in patients with diabetes undergoing cardiac surgery.

The Placement of Pelvic Binders in Trauma Patients (Nicholas Santeloudi)
In the emergency department, a study examining the placement of pelvic binders on trauma patients with suspected pelvic fractures was undertaken. The study evaluated pelvic binder placement on X-ray in 50 trauma patients followed by extensive staff education about the importance of correct binder placement. A follow-up of 50 X-rays after the education sessions to examine if there is an improvement in binder placement is near completion.

Awards
Geraldine Lee was awarded a professional development grant for national conference presentations at the College of Emergency Nursing Australasia and the Australian Nurse Practitioner Association from La Trobe School of Nursing & Midwifery in November 2008. Geraldine was appointed a Nurse Fellow to the European Society of Cardiology in June 2008 for her education contributions and clinical experience in cardiac nursing.

THE ALFRED/DEAKIN NURSING RESEARCH CENTRE
The core research activities of the Alfred/Deakin Nursing Research Centre have focused on the evaluation of quality and safety of care delivery and the development and implementation of interventions to improve patient outcomes. PhD projects in progress involve investigations of symptom management in the oncology context, patient participation and preferences for participation in recovery after cardiac surgery, the quality of care of frail elderly in acute care to reduce functional decline, and the trajectory of pulmonary dysfunction following cardiac surgery.

Current Projects
- Evaluating quality of care in an oncology setting: symptom management and practices (Emma Cohen)
- Evaluating the quality of 24 hour acute care delivery: describing functional outcomes of older people using a model of best practice (Lenore Beddoes)
- Defining patient participation in treatment in acute care context (Lauren McTier)
- Interprofessional communication and team climate in complex clinical handover situations: issues for patient safety in the private sector (Professor Mari Botti)
- Implementing evidence-based practice for the nursing management of central venous catheters (Gabrielle Burdeu)
- Predictors of hospital admission of patients with chronic obstructive pulmonary disease in the Emergency Department (Julie Considine)
- Living with an artificial heart: experiences of patients and carers (Dr Judy Currey)
- Managing patients with a ventricular assist device: an exploration of international models for community-based care (Dr Judy Currey)
- Enhancing medication safety in hospitals: development of a core dataset and an exploration of factors influencing nurses’ decisions (Dr Judy Currey)
- Correlation between ETCO2 and PaCO2 in spontaneously breathing emergency department patients (Elaine Killeen)
- Presentation to emergency departments due to chemotherapy-induced complications: opportunities for improving service delivery (Dr Trish Livingston)
- A nurse-assisted screening and referral program for depression among survivors of cancer: a pilot study (Dr Trish Livingston).

POSTGRADUATE STUDENTS
12 Masters Students
1 DN Student
4 PhD Students

PUBLICATIONS
11 Journal Articles
1 Book Chapter
In 2008, the Nutrition Department maintained a research focus in the areas of nutritional assessment and dietary intervention for patients with chronic idiopathic urticaria, diabetes, cystic fibrosis, heart failure and geriatrics.

Kate Connell continued the randomised controlled trial investigating the efficacy of a pseudoallergen-free diet in chronic idiopathic urticaria, in conjunction with Associate Professor Jo Douglass (Department of Allergy, Immunology and Respiratory Medicine).

Suzannah Jackson continued a dietary intervention study in patients with chronic heart failure. She investigated the effect of two different dietary approaches – a conventional low fat, high carbohydrate diet and a Mediterranean style diet – on weight control, insulin sensitivity, inflammatory mediators and lipid status.

Rachel Stoney is a co-investigator on an Alfred Research Trusts Small Project Grant (with principal investigator Sue Wyatt, Diabetes Clinical Nurse Consultant) entitled ‘A randomised controlled study of a pre-operative intervention in patients with diabetes undergoing cardiac surgery’.

As part of the Council of Australian Governments long stay older patients (LSOP) initiative focusing on improving care for older people, Kathryn Marshall and Anne Gordon developed and tested an interdisciplinary framework aimed at preventing functional decline due to undernutrition in the sub-acute setting.

MAJOR FINDINGS
Dr Susannah King’s research into cystic fibrosis (CF) found that renal impairment was common, and was not confined to those with diabetes. Her research discovered that chronic renal impairment did not appear to be associated with usage of intravenous tobramycin, which is contrary to observations in acute renal failure. Ongoing work aims to understand the aetiology of renal impairment in CF, and in particular the role of advanced glycation end products (AGEs) and the potential for dietary modification of AGEs.

Suzannah Jackson’s study in heart failure patients found that the Mediterranean style diet produced favourable changes in lipid parameters, with no adverse outcomes on body weight. Analyses of the results of this study are ongoing, as is evaluation of the impact of this study on clinical practice in heart failure patients.

The LSOP project, conducted by Kathryn Marshall and Anne Gordon, found that a comprehensive interdisciplinary framework focused on nutrition care in elderly sub-acute care patients resulted in a shorter length of stay and improved nutritional outcomes compared with similar patients receiving standard care. The results of this project helped establish an approach to improving nutrition care and outcomes in older patients.

ACHIEVEMENTS
Kate Connell received the Lucy Battistel Prize for Allied Health Research at Alfred Week 2008 for her poster entitled ‘The efficacy of a pseudoallergen-free diet in the treatment of chronic idiopathic urticaria and/or angioedema: a randomised controlled study’.

Alison Spence was awarded a Deakin University research scholarship for her doctoral studies in childhood nutrition.

Emma Ridley was appointed Nutrition Research Fellow in a joint position with AUSPEN (Australasian Society for Parenteral and Enteral Nutrition) and ANZICS (Australian and New Zealand Intensive Care Society) in November 2008. Her projects include a study of pancreatitis, the International Nutrition Survey and nutritional requirements in traumatic brain injury.

CURRENT PROJECTS
• Can a modified fat diet with low glycaemic load improve insulin sensitivity and inflammatory mediators in overweight people with cardiac failure? (Suzannah Jackson, Rachel Stoney)
• The efficacy of a pseudoallergen-free diet in the treatment of chronic idiopathic urticaria and/or angioedema: a randomised controlled study (Kate Connell)
• Prevalence and predictors of malnutrition and reduced bone density in an adult cystic fibrosis population (Dr Susannah King)
• Reducing functional decline due to undernutrition in older patients in a subacute care environment (Kathryn Marshall, Anne Gordon)
• A randomised controlled study of a pre-operative intervention in patients with diabetes undergoing cardiac surgery (Rachel Stoney)
The Occupational Therapy Service at The Alfred provides clinical services across the speciality areas of medicine, surgery and psychiatry. The service strives to enhance people’s quality of life by enabling them to participate in their chosen life roles and personal occupations. Occupations include all of the activities that occupy people’s time across the course of a normal day such as self-care tasks, household duties, community involvement, work or study, and leisure pursuits.

Occupational Therapy at The Alfred is committed to excellence in practice, teaching and research. Research in occupational therapy examines the relationship of disease or injury to the occupational performance of the individual, and the effectiveness of occupational therapy interventions in maximising individuals’ abilities to overcome task limitations and participate in daily activities post-injury or illness. Research output for 2008 has included publications in peer-reviewed journals, as well as more than twelve free papers at national and international conferences.

Allison Cox, co-manager of the Occupational Therapy Department, is joint senior researcher on a project entitled ‘Seclusion reduction in acute psychiatry’ which has received a grant from The Alfred Foundation. This research aims to evaluate the introduction of sensory modulation techniques as a novel intervention within Alfred Psychiatry as a means to improve client and staff satisfaction as well as reduce rates of seclusion and aggressive incidents within the inpatient unit.

Allison is also undertaking a Clinical Doctorate (Occupational Therapy) and researches the use of a school-based social skills program for primary school children experiencing significant and longstanding social difficulties in the schoolyard. Taking place within school environments and addressing social participation, this intervention will aim to directly influence the social and emotional wellbeing of primary school-aged children.

Michelle Farquhar and Annabel Bond, in collaboration with their colleagues in Speech Pathology, received more than $20,000 in funding from the Sir Edmund Herring Memorial Scholarship to investigate optimal strategies for the effective assessment of high level cognition-based communication disorders in traumatic brain injury.

Lisa O’Brien continues her research into the comparative effectiveness of different splinting techniques in the management of mallet finger injury. She is supported in this research through a grant received through The Alfred Research Trusts. Preliminary results from this study have been reported nationally and internationally.

Sarah Li-En Cheah, an undergraduate Occupational Therapy student at La Trobe University, completed her Honours research examining the experiences of older adults hospitalised in the acute care setting.

Andrew Trahair, Masters of Art Therapy student, is in the recruitment phase of his investigation into the use of ‘safe-place’ imagery in the rehabilitation of burns patients.

Dr Rob Stirling, Jenny-Maree Marshall, Fiona Hore-LACY and Scott Presnell continued their research into adult accomplishment in individuals with cystic fibrosis. This research is being jointly conducted by Occupational Therapy and The Alfred Department of Allergy, Immunology and Respiratory Medicine, and will generate important insights into how people with chronic illness maximise their life opportunities whilst managing the demands of their illness.

CURRENT PROJECTS
• Alfred CAMHS (Child and Adolescent Mental Health Service) schoolyard participation project: implementation and evaluation of a targeted school-based intervention program to develop young children’s social competency (Allison Cox)
• Randomised controlled trial of splinting interventions in the treatment of mallet finger injuries (Lisa O’Brien)
• The effective assessment of high level cognition based communication disorders in traumatic brain injury (Tania Blyth, Amanda Scott, Michelle Farquhar, Annabel Bond)
• A qualitative analysis of older adults’ experiences of acute hospitalisation (Sarah Li-En Cheah, La Trobe University; Scott Presnell)
• The use of safe place imagery in burns injury rehabilitation (Andrew Trahair, La Trobe University; Hannah Menehemi, La Trobe University; Scott Presnell)
• Adult Accomplishment in Cystic Fibrosis (Rob Stirling, Fiona Hore-Lacy, Jenny-Maree Marshall, Scott Presnell)

The Occupational Therapy Service at The Alfred provides clinical services across the speciality areas of medicine, surgery and psychiatry. The service strives to enhance people’s quality of life by enabling them to participate in their chosen life roles and personal occupations.
PATHOLOGY
Director: Associate Professor Hans Schneider MD, FRACP, FRCPA, FACB

CLINICAL BIOCHEMISTRY
Head: Associate Professor Hans Schneider
The large randomised trial of B-type natriuretic peptide (BNP) testing was published. Further analysis of diagnostic accuracy showed similar performance of the test to the Emergency Department doctor but no obviously improved diagnosis in patients with the BNP test. A meta-analysis of published studies in the area is under way and research will continue to look at sub-groups where BNP testing might add to the diagnostic process.

Procalcitonin was measured in a cohort of the patients of the BNP and shortness of breath group. Further investigation will establish how well the assay identifies patients with bacterial infection that form a subgroup of patients presenting with shortness of breath.

Supported by an Alfred Research Trusts Small Project Grant, Dr Nilika Wijeratne is investigating the usefulness of heart type fatty acid binding protein as an outcome marker in patients with traumatic brain injury.

In a large collaboration with the Geelong Osteoporosis study, the department is investigating markers of bone resorption and bone formation as well as Vitamin D3 and Vitamin B12 levels. These data will allow the establishment of reference ranges in males and define better normal levels. Further investigations are looking at Vitamin D3 levels and seasonal variability.

MICROBIOLOGY
Head: Associate Professor Denis Spelman

Main Research Areas
• The detection and monitoring of antimicrobial resistance, both in hospitals and in the community
• Studies of the outcomes of specific diseases, including staphylococcal bacteraemia, endocarditis, Acinetobacter blood stream infections and necrotising fasciitis
• The determination of risk factors for the acquisition of specific acquired infections e.g. vancomycin-resistant enterococci (VRE) and organisms producing metallo-β-lactamases
• The description and determination of rates of infections complicating ventricular assist devices
• A hospital-wide VRE prevalence survey
• Optimisation of the clinical use of specific antibiotics e.g. colistin
• Studies concerning the effectiveness of a Spleen Registry in the prevention of overwhelming post splenectomy sepsis

Major Findings
• The collation and publication of two large case series of Candida endocarditis and endocarditis in the elderly
• The description for the first time of seasonal variation of Klebsiella blood stream infections at The Alfred and collaboration with four other centres across four continents to report this finding
• The development of an in vitro model to optimise clinical use of the antibiotic colistin
• The determination of the daily hazard of MRSA acquisition in the ICU

HAEMATOLOGY
Acting Head: Dr Susan Whitehead
In 2008, the focus of the Laboratory Haematology Unit continues to be primarily a consultative, educational and diagnostic service. Accordingly, research activities conducted by staff are predominantly developmental and are aimed at improving the quality of service offered to users.

Blood Bank
Medical, scientific and nursing staff from the Blood Bank have been involved in several studies designed to either collect data to ensure quality activities are correctly undertaken and which may be used as a basis for future research projects (Time to Transfusion Study), or to document blood component usage (Prospective Utilisation of Platelets and Plasma Study). These studies were undertaken in partnership with the Australian Red Cross Blood Service and Monash University Department of Epidemiology and Preventive Medicine, now formalised as the Transfusion Outcomes Research Collaborative.

General Haematology Laboratory
• In collaboration with the Monash University Department of Immunology, an assay to measure memory B cells is ongoing. It is postulated that patients with low levels of memory B cells (e.g. following splenectomy) are at greater risk of developing overwhelming septicemia.
• A study to evaluate the use of immunohistochemistry in detecting NPM1 mutations on bone marrow trephine biopsies
• Correlation of different laboratory methods with clinical features in the diagnosis of heparin induced thrombocytopenia
• A study on thrombin generation and Vitamin K-dependent procoagulant factors in patients on warfarin therapy and the effect of three-factor prothrombin complex concentrate (Prothrombinex-VF) is nearing completion.

POSTGRADUATE STUDENTS
1 Masters Student

PUBLICATIONS
10 Journal Articles
The development of the Centre for Medication Use and Safety (CMUS) as an approved research centre within Monash University is advancing. The governance process and business case have been completed, with formal support received from both the Faculty of Pharmacy and Pharmaceutical Sciences and the Faculty of Medicine, Nursing and Health Sciences. Final endorsement from the Deputy Vice-Chancellor (Research), Monash University is soon to be sought.

The infrastructure development of the CMUS facility has also been completed, with the generous financial support of the Ian Potter Foundation and Alfred Health. Building work was completed and staff commenced work within the new facility in October 2008, which provides significantly improved accommodation for private offices, drug information service, a conference room and several work stations for researchers.

The research activities of the Pharmacy Department fall under the broad banner of evaluating the quality use of medicines, and may be classified under the following themes:

- Medication safety
- Therapeutics
- Practice research
- Outcomes research

**CURRENT PROJECTS**

A collaboration between the Pharmacy Department, Monash University Department of Epidemiology and Preventive Medicine, The Alfred Department of Allergy, Immunology and Respiratory Medicine and Roche Pharmaceuticals resulted in a successful three-year Australian Research Council (ARC) Linkage Grant. Funding provided by the ARC is in excess of $387,000 and will enable the investigation of the economic impact of improved adherence to treatment plans in chronic disease.

Two collaborations between the Pharmacy Department, Monash University Faculty of Pharmacy and Pharmaceutical Sciences, Curtin University, Griffith University and Charles Sturt University resulted in two successful grants from the Commonwealth Department of Health and Ageing via the Pharmacy Guild Fourth Community Pharmacy Agreement Research and Development Program. The first was the successful tender to conduct research into palliative care in community pharmacy. The second, an investigator-initiated grant, is entitled ‘The integration of complementary medicines in community pharmacy practice’.

Another significant project is in collaboration the Monash University Department of Epidemiology and Preventive Medicine and the NHMRC Centre of Research Excellence in Patient Safety. This project is a case control study investigating factors contributing to the risk of bleeding in patients receiving warfarin therapy and is well advanced, with a number of conference presentations and publications arising so far.

Research collaboration with Rehabilitation, Aged and Community Care at Caulfield Hospital is investigating patients’ ability to self-administer medications when they are discharged home. Through this collaboration, a $49,000 research grant was obtained from the Collier Charitable Fund.

A collaboration with the The Alfred Gastroenterology Department investigates the role of thiopurine methyl transferase (TPMT) genotype and thiopurine metabolite monitoring for optimising thiopurine drug therapy in inflammatory bowel disease patients. The study is recruiting well and interim results have been presented at an international genetics conference, with a manuscript submitted for publication.

**OTHER PROJECTS**

- Validation of the modification of diet in renal disease (MDRD) equation and applicability for electronic reporting of glomerular filtration rate estimates by pathology departments (Professor Michael Dooley)
- The frequency of initiation of newly marketed medications in the acute hospital setting (Gavin Flett)
- Pharmacokinetics of oral and sublingual tacrolimus in patients receiving lung transplantation (Steven Ivulich, Bianca Levkovich)
- Prescribing and safety issues of molecular therapies and oral chemotherapy: a survey of medical oncologists (Maria Larizza)
- Assessing the incidence of nephropathy in HIV-positive patients: comparison of the Cockcroft and Gault and MDRD formulas (Kate Mackie)
- The impact of barcode scanning on dispensing accuracy and workflow in dispensing medication (Susan Poole)
- The impact of a vancomycin loading dose on time to achieve therapeutic levels (Jackson Truong)
- Quantification of the use of error-prone abbreviations in prescribing in the acute hospital setting (Meredith Wiseman)
- Initiation of medication in an acute hospital: implications for pharmacogenetic testing (David Zhu)

**POSTGRADUATE STUDENTS**

- 9 Masters Students
- 1 PhD Student

**PUBLICATIONS**

- 25 Journal Articles
- 1 Book Chapter
RESEARCH ACTIVITIES

The Alfred Physiotherapy Department’s research focus is on physical activity and mobilisation in hospitalised and chronically ill populations. It has active research programs investigating physiotherapy interventions for respiratory disorders, early mobilisation following surgery, physical activity in chronic disease and physiotherapy in intensive care.

Lara Kimmel received funding from the National Trauma Research Institute in 2008 to conduct a randomised, controlled trial of early mobilisation in patients with ankle fracture. This trial, currently under way in The Alfred’s Trauma Unit, is due for completion in 2009. Physiotherapists Leonie Oldmeadow, Melissa Dixon and Associate Professor Anne Holland are also investigators for this trial.

Burns physiotherapist Alison Kolmus received funding from the Physiotherapy Research Foundation and the Alfred Research Trusts to conduct a randomised controlled trial of splinting for axillary burns. The trial is a multidisciplinary collaboration between the Burns Service, Prosthetics and Orthotics Department, and Physiotherapy Department. This study builds on previous research conducted in the Physiotherapy Department that examined best practice management of patients with axillary burns.

This year has seen the publication of the first randomised, controlled trial of pulmonary rehabilitation for interstitial lung disease, a study conducted by a multisite team led by Associate Professor Anne Holland and including physiotherapist Prue Munro. The study is the first of its kind and showed that exercise rehabilitation is beneficial and improves exercise capacity at least as much as common pharmaceutical options. Associate Professor Holland also published a Cochrane Review of exercise training for interstitial lung disease in 2008, which showed beneficial effects of exercise even in patients with the most progressive form of interstitial lung disease.

Transplant physiotherapists Prue Munro and Kate Hayes published a book chapter detailing the physiotherapy management of thoracic organ transplantation this year. The chapter formed part of the new edition of the classic physiotherapy text, *Physiotherapy for Respiratory and Cardiac Problems* by Pryor and Prasad and will be a valuable reference for physiotherapists across the world. Prue Munro also published the first randomized, controlled trial of airway clearance techniques in lung transplant recipients in 2008, showing that routine airway clearance is not required following a lung transplant.

In 2008 Brenda Button was appointed Honorary Associate Professor, Faculty of Medicine, Nursing and Health Sciences, Monash University. This appointment acknowledges the significance of Brenda’s research, which identified the deleterious effects of gastro-oesophageal reflux during physiotherapy in cystic fibrosis (CF) and led to the modification of physiotherapy techniques around the world. Brenda’s appointment is the first of its kind for a physiotherapist.

CURRENT PROJECTS

- Gastro-oesophageal reflux in chronic obstructive pulmonary disease (COPD) and bronchiectasis (Annemarie Lee)
- Prevalence and significance of gastro-oesophageal reflux in adults with CF before and after lung transplantation, together with the effects of physiotherapy techniques on gastro-oesophageal function (Associate Professor Brenda Button)
- Validation of the PAL2 physical activity monitor in people with COPD (Associate Professor Anne Holland)
- What is the minimum clinically important difference for the 6-minute walk test in people with COPD? (Associate Professor Anne Holland)
- Development of normal values for the modified shuttle walk test in adults (Associate Professor Anne Holland)
- Prevalence of musculoskeletal pain in people with CF (Associate Professor Anne Holland)
- Does the 3-minute step test predict clinical outcome in adults with CF (Associate Professor Brenda Button)
- Exercise training following bone marrow transplantation (Catherine Walsh)
- A pilot study of exercise training for pulmonary arterial hypertension (Prue Munro)
- The effect of inhaled hypertonic saline (6%) in people with bronchiectasis (Caroline Nicolson)
- Physical activity in people living with HIV/AIDS (Soula Fillipas)
- Validation of a physical activity questionnaire in people living with HIV/AIDS (Soula Fillipas)
- Characteristics of responders and non-responders to recruitment manoeuvres in ventilated patients with acute respiratory distress syndrome (Carol Hodgson)
- Three day stay following hip and knee arthroplasty – who should be selected? (Lara Kimmel)
- Measurement of ankle swelling post fracture (Lara Kimmel)
- Why don’t people with COPD attend pulmonary rehabilitation? (Associate Professor Anne Holland)
- Cross-sectional study of physical activity following lung transplantation (Associate Professor Anne Holland)
- Early mobilisation for elbow fracture in adults (Paula Harding)
Severe mental illnesses such as schizophrenia, bipolar affective disorder, major depression and major anxiety disorders are crippling disorders. These illnesses destroy the quality of the sufferer's life, and may even shorten life. The individual’s family suffer greatly as a result and there is a huge cost to the community through both the burden of care of the sufferer and the loss of that individual’s contribution.

The broad vision for the Monash Alfred Psychiatry Research Centre (MAP-RC) is to develop new treatments, foster new understanding and provide new service approaches for people with mental illnesses to improve their quality of life and enhance the lives of their carers and their community.

Effective treatments that are able to restore the person as well as treat symptoms are not yet available. Treatments need to be specifically tailored, unlike current treatments that assume uniformity in the patient population. There are treatments that create side effects that are more troubling than the illness itself.

MAP-RC researchers are encouraged to work across the bench, bedside and public health domains, to foster translation of discoveries into new treatments. Being based at The Alfred enables specific clinical problems or symptoms to be identified and new treatments to be considered. The immediacy of the clinical problems is an important stimulus to the transition of clinical observations into hypotheses and, ultimately, new treatments. Adopting a broad biopsychosocial approach, with no biases against any discipline of medicine, neuroscience or the arts, allows MAP-RC researchers to utilise all available modalities to develop new treatments.

New modes of delivery of treatments or services are important in the advancement of the treatment of mental illness as a whole. Services such as home-based treatments, rapid and accurate diagnoses plus delivery of treatments in the emergency departments of hospitals or via primary care systems have great impacts on the individual and their health care systems. Preventative approaches, such as ensuring good physical health for people with mental illness, add greatly to their quality of life and diminish the burden of care for their carers. MAP-RC is ideally positioned to contribute to this area of developing and testing new services, by working in a network of health services and having the expertise to model and test health outcomes – including the economic and key performance indicator areas.

The overall vision for MAP-RC is to continue to develop into a world-class clinical psychiatry research institute that develops new treatments, new understandings and new services for mental illness. This vision is underpinned by the need for MAP-RC to continue to build on its excellent, broad clinical focus, backed by state-of-the-art neuroscience innovations and with important contributions from the arts or humanities domains. The MAP-RC mission is ‘to conduct world class psychiatric research with respect, equality and understanding’.

CURRENT RESEARCH PROGRAMS AND PROJECTS

Psychopharmacology
Team leader: Anthony de Castella
- Quality of life, functioning and adherence of patients receiving injectable Risperdal Consta
- Open label oral paliperidone trial
- Retrospective audit of clinical files for all patients receiving Risperdal Consta to learn more about usage patterns and outcomes
- STAI Study: investigating the risk of medication non-adherence in schizophrenia patients and whether there is a change to treatment as a result of this risk
- RUBY: 6-week study investigating the use of Seroquel XR alone, or with SSRI or venlafaxine, or lithium with SSRI or venlafaxine, in treatment resistant depression
- Risk of Relapse Observational Study (B033): visits at 1, 3, 12 months with monthly phone calls to better understand medication non-compliance in psychiatric patients
- PLATINUM Study: a multicentre double blind randomised withdrawal parallel group placebo controlled Phase 3 study of the efficacy and safety of quetiapine fumarate sustained release (Seroquel SR) as monotherapy in the maintenance treatment of patients with generalised anxiety disorder following an open-label stabilisation period
- ONYX Study: to investigate if quetiapine fumarate sustained release (Seroquel SR) together with the current antidepressant is effective in treating major depressive disorder
- Efficacy and safety of the treatment of bipolar depression with agomelatine, in addition to a mood stabiliser

Service Related Research
Team leader: Dr Yitzchak Hollander
- Seclusion reduction: a pilot project designed to improve the ability of the service to manage behavioural disturbances without the use of seclusion; involves patient discussion and sensory treatments
- Clozapine transitioning project: an investigation of barriers to transitioning clients on clozapine to private care
- Suicide and problem gambling study
- Problem gambling and mental health treatment service
- Problem gambling/mental illness education and training project
**Brain Stimulation and Neuroimaging**

Team leader: Professor Paul Fitzgerald

- Transcranial magnetic stimulation (TMS) for depression
- TMS for bipolar depression
- Deep TMS for autism and Asperger’s disorder
- Transcranial direct current stimulation (tDCS) for depression
- tDCS for schizophrenia
- Deep brain stimulation for treatment resistant depression
- Magnetic seizure therapy for treatment resistant depression
- Combining TMS and electroencephalography (EEG) to explore prefrontal cortical inhibition in depression and schizophrenia
- Diffusion tensor imaging in depression following TBI
- Using TMS, EEG and functional MRI to explore cortical function in autism spectrum disorders
- Can repetitive TMS improve motor function in autism and Asperger’s disorder?
- Mirror neurons and empathy for pain in schizophrenia
- Near infrared spectroscopy and prefrontal response to TMS
- Electropheniological correlates of major depression
- Investigating the relationship between alpha activity and major depressive disorder
- Multimodal studies of cortical plasticity in schizophrenia
- The role of the dorsal stream in early visual processing – feedforward and feedback from V1 to V5/MT+ in human perception
- Stop signal after-effects – episodic memory or selective inhibition?
- Pilot study of the potential therapeutic effects of caloric vestibular stimulation in mood disorders

**Women’s Mental Health**

Team leader: Professor Jayashri Kulkarni

- A Definitive Estrogen Patch Trial (ADEPT): 8-week add-on randomised controlled trial in women of childbearing age with schizophrenia or schizoaffective disorder
- Selective Estrogen Receptor Modulator (SERM): 12-week add-on randomised controlled (raloxifene 120mg/day vs placebo), double-blind study of menopausal women with a diagnosis of schizophrenia or schizoaffective disorder
- National Register of Antipsychotics in Pregnancy (NRAMP)
- Mood and the oral contraceptive: is there a relationship?
- Randomised controlled trial investigating the association of depression and the oral contraceptive pill
- Factors affecting cognitive function in a community sample of Victorian women: the role of hypertension and inflammatory markers
- The effects of estradiol on cognitive function in healthy pre- and post-menopausal women and the role of the cholinergic system

**Healthy Lifestyles and Outcomes**

Team leader: Professor Jayashri Kulkarni

- Healthy lifestyle intervention for cardiovascular disease risk reduction among people with psychotic disorders
- Becoming a smoke-free inpatient psychiatry ward – the staff and client experience
- Evaluation of the Smokey Support Group on the inpatient psychiatric ward

**Neurodiagnostics**

Team leader: Dr Brian Lithgow

- The diagnosis, biomarker identification and measurement of drug efficacy for neurological and mental disorders

**Consultation Liaison Psychiatry**

Team leader: Associate Professor Steve Ellen

- Letter intervention to improve patient outcomes
- An investigation of family members’ experiences of the psychiatric patient’s diagnosis and treatment
- Psychopathology following traumatic injury – screening for high risk
- Explicit and implicit memory functioning in post-traumatic stress disorder – an event-related potential investigation
- Promoting recovery following traumatic injury

**Participatory Action Research**

Team leader: Jon Kroschel

- Recovery group – testing and evaluation of effectiveness (by consumer criteria) of the Boston Centre for Psychiatric Rehabilitation model of recovery groups within a Melbourne metropolitan adult mental health service (Alfred Psychiatry) and psychiatric disability support service (Prahran Mission)
- Consumer evaluation of Alfred Psychiatry Community Care Unit
- Review and audit of Alfred Psychiatry Consumer Participation Program
- Consumer participation in Caulfield Aged Care Psychiatry

**Child and Adolescent Mental Health**

Team leader: Dr Paul Denborough

- Evaluation and stability of the impact of single session family based intervention
- Evaluation of a team based family therapy intervention at the Child and Adolescent Mental Health Service

**Cognitive Neuropsychiatry**

Team leader: Associate Professor Susan Rossell

- Semantic memory in psychosis
- Understanding the cognitive problems and neurobiological features of body dysmorphic disorder and other body image disorders
- Social cognition in psychosis
- Hormones and cognition
- The Voices Clinic – established for individuals with treatment resistant auditory hallucinations
- Investigating psychosis following traumatic brain injury
- Understanding auditory hallucinations

**POSTGRADUATE STUDENTS**

- 25 PhD Students
- 14 Other Doctoral Students
- 6 Masters Students

**PUBLICATIONS**

- 44 Journal Articles
The Psychology Department provides clinical psychology and clinical neuropsychology services to patients of The Alfred. The department is committed to providing best practice evidence-based psychological services to improve the quality of life of patients and their carers. Alfred Psychology is actively involved in providing research and evaluation as well as education and consultation to staff and community organisations. The department is strongly committed to the teaching and training of postgraduate students (provisional psychologists), offering clinical placements to both clinical psychology and clinical neuropsychology masters and doctoral students.

As part of Alfred Psychiatry, clinical psychology assessment and treatment services are provided to children, adolescents and adults. Within the acute hospital, clinical psychologists are involved in the assessment and treatment of patients who present with psychological problems such as depression, anxiety and adjustment issues. Clinical psychologists are attached to the Cystic Fibrosis, Oncology and HIV Services and in the Hospital Admission Risk Program.

The department also runs The Alfred Psychology Clinic, an outpatient service that accepts referrals from all units at The Alfred. Neuropsychology assessment and treatment services are provided to patients of all psychiatry programs and all medical and surgical units of the hospital.

CURRENT PROJECTS
The department is involved in a number of research projects. The following areas exemplify the applied research taking place.

Victorian HIV Service
Dr Michelle Earle received an Alfred Research Trusts Small Project Grant to explore information about the psychological correlates of sexual risk behaviour among men who have sex with men (MSM) at risk of HIV infection, and conducted a controlled trial of a psychological skills group for MSM to help address the identified psychological risk factors placing them at risk of HIV infection. The results indicated that there is a high prevalence of wide-ranging, clinical-level psychological problems among MSM. These include Axis I conditions such as state-based depressive or anxiety symptoms or substance abuse, and Axis II conditions such as trait-based mistrust of others, difficulties in relationships and self-harm behaviour.

Cystic Fibrosis
Dr Maxine Braithwaite received an Alfred Research Trusts Small Project Grant and funding from the Cystic Fibrosis Trust of Australia to conduct both qualitative and quantitative research exploring end of life care in cystic fibrosis (CF). Face-to-face interviews and focus groups with patients, families and staff identified themes that were explored through the development of a survey. Those completing the survey included 82 patients, 18 people who had a family member die of CF in the last four years and 39 current CF staff from a range of disciplines.

The results indicated that families and staff providing care for patients with CF have unmet end of life care needs of both a unique and shared nature. There is a tension between providing maximum comfort to the patient versus pursuing active treatment in the hope of transplantation. Patients and families used denial as a coping mechanism which hindered knowledge and, at times, preparation for death.

A parallel rather than a sequential model to end of life care in CF was supported, whereby if someone’s health declines and a referral to the transplant team is made, then end of life options are also discussed. Patients and families strongly endorsed the value of psychological support during end of life discussions and during end of life care.

Mental-Health Literacy Project
Dr Rachel Cousins (Senior Clinical Psychologist, Primary Mental Health Team) received an Alfred Research Trusts Small Project Grant to assess mental health literacy, stigma associated with mental illness and willingness to seek help from a health professional of new mothers utilising maternal and child health services.

Illness Effect
Dr Maxine Braithwaite (Senior Psychologist, Cystic Fibrosis Service) aims to determine if patients are less adherent and respond differently to a range of psychological variables when unwell, to establish psychological and dosing factors impacting upon adherence and to perform motivational interviewing to increase treatment adherence.

RESEARCH ACHIEVEMENTS
- Dr Michelle Earle presented at the 2008 Australasian Society of HIV Medicine Conference in Perth.
- Dr Maxine Braithwaite was keynote speaker at the 2008 Cystic Fibrosis Victoria Conference, presented oral and poster presentations at the 31st European Cystic Fibrosis Conference, and was keynote speaker at the 2008 Quality of Life Issues PAH 3rd Asia Pacific Pulmonary Arterial Hypertension Conference, Sydney.

POSTGRADUATE STUDENTS
1 DPsych Student

PUBLICATIONS
2 Journal Articles
RADIATION ONCOLOGY

Director: Associate Professor Jeremy Millar BMedSc, MB, ChB, FRANZCR, FAcPM, CertHlthEc, CertBiostat

The William Buckland Radiotherapy Centre (WBRC) has a research program focused on improving technologies for radiation treatments for cancer patients, looking at both fundamental radiation physics, and clinical studies in breast, prostate, head-and-neck, and central nervous system (CNS) tumours. WBRC members are active collaborators in a number of national and international studies, while the prostate brachytherapy (Associate Professor Jeremy Millar) and the stereotactic radiotherapy/radiosurgery (Dr Mike Dally) programs are leading efforts in Australia.

Dr Karen Taylor travelled to Europe in 2008 to look at new techniques for the treatment of breast cancer, using modulated beams and respiratory ‘gating’. Dr Ian Porter and Dr Jeremy Ruben attended training courses in Germany on stereotactic radiotherapy employing sophisticated computer and robot-assisted radiotherapy equipment that WBRC has or plans to acquire. Dr Daniel Zwahlen continued as WBRC’s Clinical Fellow supported by the Peter Grant Hay Trust and the Melbourne Prostate Institute.

CURRENT PROJECTS

Basic Radiation Physics Research

- Enhancement of radiation effects by gold nanoparticles for superficial radiotherapy (Trevor Ackerly)
- Scatter measurements with intensity modulated radiotherapy (IMRT) treatments (Dr Jeremy Ruben)
- Factors to be used with IAEA TRS398 for low kilovoltage X-rays (Trevor Ackerly)
- Characterisation and improvement of radiation beams used for radiotherapy of small lesions (Trevor Ackerly)
- Synchrotron microbeam radiation therapy (Jeff Crosbie)

CNS Tumours

- Quality of life outcomes among acoustic neuroma patients (Dr Michael Daily)
- Neuropsychology study of patients having fractionated stereotactic radiotherapy for large arteriovenous malformations (Dr Michael Daily)
- Glioblastoma multiforme patient treatments and outcomes (Dr Amy Shorthouse)
- Primary chemotherapy with temozolomide vs radiotherapy in patients with low grade gliomas after stratification for genetic 1p loss: a Phase 3 study (Dr Jeremy Ruben)

Breast Cancer

- PRIME phase 2 – Scottish Breast Cancer Trials Group: post-operative radiotherapy in minimum-risk elderly (Dr Karen Taylor)
- A randomised Phase 3 study of radiation doses and fractionation schedules in non-low risk ductal carcinoma in situ of the breast (Dr Karen Taylor)
- APBI – a multicentre feasibility study of accelerated partial breast irradiation using three-dimensional conformal radiation therapy for early breast cancer (Dr Ian Porter)

Head and Neck Cancers

- POST – post-operative concurrent chemo-radiotherapy versus post-operative radiotherapy in high-risk cutaneous squamous cell carcinoma of the head and neck (Associate Professor Sidney Davis)

Prostate Cancer

- TGAD – a collaborative randomised Phase 3 trial: the timing of intervention with androgen deprivation in prostate cancer patients with a rising prostate specific antigen (PSA) (Associate Professor Jeremy Millar)
- Variation in prostate volume marking in CT scans post seed implant (Associate Professor Jeremy Millar)
- Characterisation of ‘PSA bounces’ after seed brachytherapy for prostate cancer (Dr Daniel Zwahlen)
- Long term disease control of prostate cancer after high dose rate brachytherapy and external beam radiation (Dr Daniel Zwahlen)
- Improving treatment with permanent 125Iodine seed implants for prostate cancer using dosimetry with either fused CT/MR images or fused CT/US images (Ryan Smith)
- Relationship of radiation dose to vascular and nerve structures during prostate seed brachytherapy, and subsequent erectile function (Associate Professor Jeremy Millar)
- Relationship of rectal volume at planning for radiation treatment for prostate cancer, and subsequent disease control (Associate Professor Jeremy Millar)
- Pilot work for a randomised comparative trial of postoperative radiotherapy for men with high risk prostate cancer after radical prostatectomy (Dr Bronwyn Matheson)

Bone Metastases

- A Phase 3 international randomised trial of single versus multiple fractions for re-irradiation of painful bone metastases (Dr Bronwyn Matheson)

Projects with Active Follow-up

- Tumour volume as an independent prognostic factor in patients with non-small cell lung cancer: a protocol for a prospective database (Associate Professor Sidney Davis)
- A randomised clinical trial of surgery versus surgery plus adjuvant radiotherapy for regional control in patients with completely resected macroscopic nodal metastatic melanoma (Dr Ian Porter)
- A randomised trial of pre-operative radiotherapy for stage T3 adenocarcinoma of the rectum (Associate Professor Jeremy Millar)
- GOFURTGO – Phase 2 study of fixed dose rate gemcitabine-oxaliplatin integrated with concomitant fluorouracil and 3D conformal radiotherapy for the treatment of localised pancreatic cancer (Dr Jeremy Shapiro, Dr Ian Porter, in collaboration with the The Alfred Medical Oncology Unit)
REHABILITATION, AGED AND COMMUNITY CARE

Chair, Research Committee: Associate Professor Peter Hunter MBBS, FRACP, MBL

Caulfield Hospital’s new Research Strategy 2007-2011 has seen research activity grow steadily across the campus and within the Division of Rehabilitation, Aged and Community Care. In 2008 the implementation of the strategy has been a major focus for the Caulfield Hospital Research Committee, and significant progress has been made. Caulfield Hospital launched its inaugural Research Grants Program in 2008, with one major grant and four small project grants being awarded during the year. Monthly Research Interest Group meetings have been established to foster research activity and provide support and mentoring to experienced and novice researchers. A monthly campus-wide research newsletter has been established and is distributed to update staff about research activities and opportunities at Caulfield.

SIGNIFICANT GRANTS AND AWARDS

- Dr Michael Chou, Prof. Lenore Manderson, Dr Narelle Warren and Sophie Driver: Department of Planning and Community Development in Victoria Project Grant: ‘Computer based social and health support program’, 2008-2010: $35,020.
- Veronica Delafosse: YBP/Lindsay & Croft Research Award for Collection Services 2008 from the Australian Library and Information Association: $4,000.
- Melissa Raymond, Emma Hicks, A/Prof. Peter Hunter and A/Prof. Anne Holland: Caulfield Hospital Research Grant: ‘Does a high intensity functional exercise group improve clinical outcomes for older patients in the subacute setting?’ 2008-2009: $7,500.
- Dr Frances Wise, Lynn O’Neill, Jennie Patrick and Kirstan Corben: Caulfield Hospital Research Grant: ‘Phase 3 cardiac rehabilitation – a collaborative pilot project between the Cardiac Rehabilitation Unit and Caulfield Community Health Service’, 2008-2009: $20,000.
- Prof. Stephen Gibson received the best poster award at the Australian Pain Society meeting 2008: ‘Relative influence of uncertainty and harm components of anxiety on pain perception’.
- Fiona Harding, Lauren Dircks, Ronald Leong and A/Prof. Anne Holland won the best poster presentation at the 3rd Australian and New Zealand Falls Prevention Conference 2008: ‘Does written feedback improve client recall of risks and falls prevention strategies?’
- Dr Fary Khan received the Excellence in Academic and Research Mentoring Award from the Royal Australasian College of Physicians.
- A/Prof. Glynda Kinsella received the Dean’s Award for Excellence in Teaching from the Faculty of Science, Technology and Engineering, La Trobe University.
- Kathryn Marshall, A/Prof. Peter Hunter, Lisa Gill and Anne Gordon won the Caulfield Hospital Research Poster Award: ‘Reducing functional decline due to under-nutrition in older patients in a subacute care environment’.
- Natalie McGregor, Anne Clarke, Edwin McLachlan, Heather Curtis and Ronald Leong won the Caulfield Hospital Quality Improvement Poster Award: ‘Falls take two – better the second time round?’
- Anna McMeekin, Kristy Probert and Patrick Alewood won the best presentation award in the Innovation in Service Delivery category at the Department of Human Services Leading the Way in Continuing Care Conference: ‘Safe travel on public transport’.
- Jennie Patrick and Helen McBurney won the best physical activity paper award at 18th Annual Scientific Meeting and Exhibition of the Australian Cardiovascular Health and Rehabilitation Association: ‘When is one six minute walk test enough?’
- Karen Roberts was awarded a Churchill Fellowship.

POSTGRADUATE STUDENTS
- 1 Masters Student
- 2 MD Students
- 1 PhD Student

PUBLICATIONS
- 15 Journal Articles
The Department of Renal Medicine provides comprehensive services, which include general nephrology, acute and chronic dialysis and renal transplantation. It has satellite services in the Peninsula Health network, Caulfield Hospital and Sandringham Hospital, and strong links with satellite services in the Latrobe Valley and the Peter James Centre. The clinical research program reflects the nature of the clinical services provided by the department and the service links with other major clinical services at The Alfred.

**CLINICAL RESEARCH**
Research projects are predominantly in the area of glomerulonephritis, vasculitis, progression of renal disease, diabetic renal disease, evaluation of renal disease in patients with end stage heart and lung pathology facing heart or lung replacement, and renal disease following successful heart and lung transplantation. Recently, a program of study of renal disease in HIV/AIDS has commenced. The department is also engaged in several national and international programs studying the various drug therapies for renal disease and its complications.

**LABORATORY RESEARCH**
The broad theme of the laboratory research program is the mechanisms of progression of primary renal disease. Both human and experimental models of renal disease are studied, with particular focus on the role of the fibrogenic growth factors and apoptosis in progression of injury. The techniques of immunohistochemistry and molecular biology (particularly real time RT-PCR) are widely applied to these studies and these have been highly refined.

**Rheumatology continued from page 66**

The effect of body composition on knee structure in an HIV population
Davies M, Filippas S, Cherry C, Wluka AE, Cicuttini F
It is well recognised that lypodystrophy syndrome, a condition suffered by many HIV-positive individuals, is characterised by a range of symptoms, including abdominal fat deposition. Fat may have an adverse effect on knee structures. This project will examine the relationship between body composition and knee cartilage and bone in an HIV-positive population.

Investigating the mechanism of action of obesity on knee structure
Cicuttini F, Wluka AE, Davies M, Dixon J, Bennell K, Jones G, Strauss B, Forbes A
Obesity is the strongest modifiable risk factor for OA and there is some evidence to suggest that obesity may lead to the increased risk of OA via biomechanical mechanisms. This study involves examining the relationship between obesity, body composition and knee alignment and changes in knee structure indicative of OA development.

The role of bone marrow lesions in the pathogenesis of knee OA
Davies M, Wluka A, Berry P, Hanna F, Cicuttini F
Bone marrow lesions (BMLs) detected by MRI have been implicated in the pathogenesis of knee OA and have been shown to be present in symptomatic and asymptomatic populations. The aim of this study is to examine the natural history of BMLs in a healthy population, and to identify factors associated with incidence and progression of BMLs over two years and whether these changes are associated with changes in knee structures and development of pain.
The main focus of research activity in the Department of Rheumatology is in understanding factors that influence joint structure in health and disease and the outcome of this. In a very successful year, the team has published extensively in international peer-reviewed journals, and holds six NHMRC Project Grants.

CURRENT PROJECTS
The effect of sociodemographic and lifestyle factors on the risk of primary and revision joint replacement
Knee and hip osteoarthritis (OA) are a major cause of disability. End stage OA frequently needs treatment with joint replacement, which results in a significant economic burden on the community, and is likely to increase as the population ages. Understanding the impact of sociodemographic and lifestyle factors such as obesity and diet on the risk and outcome of joint replacement will help identify potential socioeconomic inequalities and potential strategies for improving outcomes of joint replacement.

The role of lifestyle factors on knee cartilage volume and rate of cartilage loss in a normal community-based population: a longitudinal study
This study aims to identify lifestyle factors that affect knee cartilage volume in healthy subjects, thereby identifying potential targets for prevention of OA. This is being done by utilising an existing cohort, the Melbourne Collaborative Cohort Study, and recently developed methodology for measuring articular cartilage volume pioneered by our group.

Role of musculoskeletal biomechanical factors in cartilage loss in those who undergo partial meniscal meniscectomy
Cicuttini F, Lloyd D, Bennell K, Stachowiak G, Forbes A
This project aims to determine whether musculoskeletal-biomechanical factors are associated with the rate of knee cartilage loss in people who have recently undergone an arthroscopic partial meniscectomy.

The predictors of knee cartilage loss: a five year natural history based on an existing cohort
Wang Y, Wluka A, Forbes A, Jones G, Cicuttini F
The natural history and factors influencing knee OA are poorly understood. The existing cohort is being followed at five years to determine the rate of change of joint cartilage in early knee OA and the factors that influence this.

The relationship between body composition and hip cartilage
Wluka A, Berry P, Hanna F, English D, Giles G, Cicuttini F
Factors increasing the risk of hip OA, including obesity, are poorly understood. The group has developed a method of measuring structural change in the hip using MRI. A cohort of healthy middle aged adults is being studied to determine how body composition relates to hip OA.

Low back pain (LBP) and urinary incontinence (UI): what are the risk factors and are these conditions associated?
Urquhart D, Cicuttini F, Bell R, Davis S
LBP and UI can have a profound effect on an individual’s function and wellbeing, and result in substantial socioeconomic burden. This study aims to investigate risk factors for the development of LBP and UI, their association with physical, psychological and social factors, and the relationship between these conditions.

Identification of serum and urinary biomarkers associated with OA disease progression in a well established cohort of subjects with knee OA
Berry P, Maciewicz R, Cicuttini F, Downey-Jones M, Mills E, Oakley C, Wluka A
There has been increasing interest in different biomarkers that may be useful in identifying subjects most likely to lose joint cartilage. In 1997, the group began a longitudinal study of subjects with knee OA. A novel method was used that enabled measurement of knee cartilage volume and presence of cartilage defects using MRI. In collaboration with AstraZeneca, biomarkers of cartilage and bone metabolism and a panel of known mediators in the serum and urine of subjects were tested. The plan is to examine how this relates to the rate of cartilage loss, defect progression and risk of joint replacement.

Factors affecting knee structure in healthy women
Wluka A, Pasco J, Kotowicz M, Henry M
OA has the largest impact of any chronic disease on burden of disease borne in later life, affecting women more frequently than men. The aim of this study is to examine how modifiable factors such as obesity affect change in knee structure in an established healthy cohort of community based women.

POSTGRADUATE STUDENTS
9 PhD Students

PUBLICATIONS
25 Journal Articles
1 Book Chapter
CURRENT PROJECTS

The effective assessment of high level cognition based communication disorders in traumatic brain injury (TBI)

Funded by the RACV Sir Edmund Herring Memorial Scholarship, this study commenced in February 2009 and aims to determine the best way to assess whether there are any mild cognitive communication difficulties in people who have had a mild TBI. Patients who have had a TBI will be recruited from the Trauma and Neurosurgery Units at The Alfred to participate in this study. Two different tests of high level cognitive function will be given: one by a speech pathologist and the other by an occupational therapist.

The study will look at whether there is a relationship between any cognitive communication problems and the location of the brain injury and the immediate symptoms after the injury. The results of this research have the potential to change the way in which patients with TBI are assessed and improve the identification of problems. Recommendations of the project will be discussed with key stakeholders of the Trauma and Neurosurgery Units. A policy will then be developed and rolled out, with education sessions outlining how patients with TBI will be assessed.

Ongoing review of swallowing and nutrition of head and neck cancer patients

In 2005, the Speech Pathology Department received a Southern Melbourne Integrated Cancer Service research grant to develop a database to follow the swallowing and nutritional outcomes after treatment for head and neck cancer. This project addressed a gap in the data for Australian head and neck clinical populations concerning the swallowing and nutritional outcomes following surgery, radiotherapy, chemotherapy or combined modality treatments.

The database now includes data from over 150 patients and specifically examines the implications of site and severity of tumour, the impact of treatment modalities on outcomes and the patterns of side effects. These data have already influenced the type and timing of speech pathology intervention and have provided information regarding enteral nutrition requirements.

The project has developed to become a collaborative multisite project involving speech pathology and nutrition departments across three Melbourne metropolitan sites: The Alfred, Monash Medical Centre and Peter MacCallum Cancer Centre. This will enable services and outcomes to be benchmarked and the outcomes of new and current practice to be evaluated.

Review of speech pathology requirements post-anterior cervical discectomy and fusion (ACDF)

Swallowing and voice problems post-ACDF have been documented in the literature. ACDF procedures are frequently performed by the Neurosurgery and Trauma Units; however, the Speech Pathology Department had no guidelines for their involvement with this patient group.

This project aimed to identify the percentage of patients requiring speech pathology intervention and to describe the type and extent of problems found. The voice and swallowing functions of patients were assessed post-ACDF and, in some cases, pre-ACDF. It was found that 90% of patients had either a swallowing or voice problem immediately post-surgery that required speech pathology services. Of these patients, 50% had not been recognised by nursing or medical staff as requiring speech pathology intervention. Whilst most of the problems were transient, 28% still required speech pathology intervention at the time of discharge.

In response to these findings the Speech Pathology Department developed management guidelines. All ACDF patients are to be reviewed post-surgery and all patients will be provided with appropriate intervention, an information brochure and contact details for speech pathology services should their problems persist.
The Monash Department of Surgery at The Alfred is a department of the Monash University Central Clinical School, one of three schools created by the restructure in 2008 of the Central and Eastern Clinical School. The Department of Surgery now encompasses the hospitals of Alfred Health and Cabrini Health. This new structure provides an excellent opportunity for increased integration with Alfred Health.

The department continues to contribute significantly to postgraduate research, training, audit and quality assurance processes. The past year has seen the department continue to grow, with the restructuring of the Department of General Surgery, including the consolidation of endocrine surgery and the establishment of a Monash-wide endocrine surgery database.

The Department of Surgery has research interests in a number of areas:
- Cardiothoracic Surgery (refer to Cardiothoracic Surgery report)
- General Surgery (refer to General Surgery report)
- Neurosurgery (refer to Neurosurgery report)
- Trauma (refer to National Trauma Research Institute report)
- Orthopaedic Surgery

**CURRENT RESEARCH PROGRAMS**

**Cardiothoracic Surgical Research**
- Metabolic, physical and mental preparation for major surgery
- Antioxidant therapy for the treatment of iron overload cardiomyopathy
- The evaluation of hearts obtained after cardiac arrest for use as heart transplant donors
- Mechanical and biological properties of absorbable polylactide plates for use in operative fixation of fractured ribs
- Cardiac mitochondrial metabolism in health and disease states
- Epidemiology-based projects
- Thoracic/pulmonary surgery related projects

**General Surgery Research – Breast, Endocrine, Colorectal and Upper Gastrointestinal**
- Endocrine surgery
- Thyroid surgery
- Parathyroid surgery
- Adrenal surgery
- Parotid surgery
- Soft tissue tumour surgery
- Colorectal cancer
- Management of faecal incontinence
- Transanal endoscopic microsurgery
- Laparoscopic colorectal surgery
- Endorectal ultrasound
- Pancreatic surgery
- Oesophagectomy
- Gastrectomy and bariatric practices

**Neurosurgical Research**
- DECRA: a multicentre randomised trial of early decompressive craniectomy in patients with severe traumatic brain injury (TBI)
- Intensive monitoring of severe TBI, including brain oxygen and microdialysis
- Traumatic spine and spinal cord injury
- Familial intracranial aneurysm study
- Arteriovenous malformations
- Skull base fractures
- Outcome of subdural haematoma in the elderly
- Blunt vertebral and carotid artery injuries
- Bispectral index monitoring in severe TBI

**Orthopaedic Research**
- International collaborative multicentre randomised trials
- Femoral fracture fixation in multi-trauma patients
- Posterior pelvic fixation
- Vacuum assisted closure device
- Use of retrievable inferior vena cava filters
- Non-operative treatment of type II dens fractures
- Use of Gamma nail for the fixation of proximal femur fractures in the elderly

**Trauma Research**
- Laboratory studies in the NTRI
- Traumatic brain injury models in rodents
- Inflammation post-trauma
- Neural precursor cells
- Cytokine response
- Effect of hypoxia
- Neurosurgical ethics including organ donations issues

**HIGHLIGHTS**
- Dr Tony Goldschlager and Dr Edwina Moore were equal winners of the DS Rosengarten Surgical Trainee Research Prize
- Dr Marc Seifman was awarded the Henry O’Hara Surgical Research Award for 2009
- Professor Rosenfeld became a Section Editor on neurotrauma research for the *Journal of Emergencies, Trauma and Shock* (the official publication of INDO-US Emergency and Trauma Collaborative)

**POSTGRADUATE STUDENTS**
- 3 Masters Students
- 1 MD Student
- 6 PhD Students

**PUBLICATIONS**
- 47 Journal Articles
- 1 Book Chapter
RESEARCH ACTIVITIES

The Women’s Health Program undertakes research to advance knowledge pertaining to the main conditions that affect the health of women at midlife and beyond.

Major current research projects include a large study of the physical, psychological and social well-being of breast cancer survivors, a community based study of urinary incontinence in women, a study to increase the understanding of joint pain in women being treated for breast cancer, and studies to delineate the role of sex steroids in the preservation of cognitive function in women after menopause.

In 2008 the Women’s Health Program team published over 20 papers in international journals, reporting findings from original studies. A series of papers reported on female sexual function, including the validation of a new approach to the assessment of female sexual function, the effectiveness and safety of testosterone therapy for postmenopausal women not using any HRT (published in New England Journal of Medicine) and for pre-menopausal women (published in Annals of Internal Medicine), and the finding of no significant change in risk of breast cancer for Australian women ever treated with testosterone therapy.

We reported the first findings from the MBF Foundation ‘After Breast Cancer Study’. We found that women with a first degree relative with breast cancer had smaller, earlier stage cancers at diagnosis, possibly reflecting more diligent use of breast screening amongst women who considered themselves at increased risk of developing the disease.

We also reported that that self-knowledge of hormone receptor status amongst the 1,684 women with breast cancer in our study was independently associated with likelihood of receiving endocrine therapy, suggesting that the methods of helping women understand the nature of their breast cancer are worthy of review.

Nearing the completion of her PhD, Mary Panjari presented the findings of the randomised, placebo controlled trial of the efficacy and safety of DHEA therapy in postmenopausal women at the Annual Meeting of the North American Menopause Society in Orlando, Florida. She presented her research in a symposium for the three best research free communications submitted for the meeting. The fundamental finding was that the treatment of postmenopausal women with low sexual desire with 50 mg/day DHEA resulted in no significant major improvements in sexual function over placebo therapy over 26 weeks.

As part of her PhD studies, Dr Sonal Shah reported that higher blood levels of DHEA sulphate are associated with more favourable cognitive function in women (Journal of Clinical Endocrinology and Metabolism). She also found favourable independent associations between living with other people, doing crosswords, playing a musical instrument and cognitive performance.

TRANSLATING RESEARCH INTO CLINICAL PRACTICE

The Women’s Health Program website continues to provide updates in women’s health information for health care professionals and the community. In November 2008 the Women’s Health Program held its first Women’s Health Education Update for general practitioners. It was an outstanding success, with guest speakers sharing the latest health information and providing up-to-date clinical guidance in the management of menopausal symptoms, osteoporosis, incontinence, heart disease and prevention of the metabolic syndrome.

DEPARTMENTAL HIGHLIGHTS

- Dr Fahad Hanna and Associate Professor Robin Bell (joint first authors), Professor Flavia Cicuttini, Sonia L Davison, Dr Anita Wluka and Professor Susan Davis won the Best Clinical Poster Award at the Australian Rheumatology Association Annual Scientific Meeting for their poster entitled ‘High sensitivity C-reactive protein is associated with lower tibial cartilage volume but not lower patella cartilage volume in healthy women at midlife’.
- Dr Sonia Davison, Associate Professor Robin Bell, Maria LaChina, Samantha Holden and Professor Susan Davis were awarded the Australasian Menopause Society Annual Scientific Award for the most meritorious contribution to the field of menopause based on a published or accepted paper in the previous 12 months for their article ‘Assessing sexual function in well women: validity and reliability of the female sexual satisfaction questionnaire’ published in the Journal of Sexual Medicine.
- Professor Susan Davis was also awarded an NHMRC Principal Research Fellowship.

POSTGRADUATE STUDENTS

- 3 PhD Students

PUBLICATIONS

- 23 Journal Articles
- 1 Book Chapter
INTERNAL GRANTS AND AWARDS

ALFRED RESEARCH TRUSTS STRATEGIC GRANTS

Professor Leon Bach, Department of Endocrinology and Diabetes
(Medical Research Trust)

Professor Peter Cameron, Emergency Medicine
(Medical Research Trust)

Professor Jamie Cooper, Intensive Care Unit
(Marian & Edwin Harold Flack Trust)

Professor Anthony Dart, Department of Cardiology
(Marian & Edwin Harold Flack Trust)

Professor Michael Dooley, Department of Pharmacy
(Sol Green Trust)

Professor Don Esmore, Cardiothoracic Surgery Department
(Sol Green Trust)

Associate Professor Mark Fitzgerald, Emergency Medicine
(Medical Research Trust)

Professor Paul Fitzgerald, Monash Alfred Psychiatry Research Centre
(Edward Wilson Trust)

Professor Russell Gruen, National Trauma Research Institute
(Sir William Phillip Trust)

Professor Jayashri Kulkarni, Monash Alfred Psychiatry Research Centre
(Edward Wilson Trust)

Professor Sharon Lewin, Infectious Diseases Unit
(Medical Research Trust)

Professor Catriona McLean, Anatomical Pathology
(Paula Josephine Jung Trust)

Professor John McNeil, Department of Epidemiology and Preventive Medicine, Monash University
(Sir William Phillip Trust)

Associate Professor Jeremy Millar, William Buckland Radiotherapy Centre
(Peter Grant Hay Trust)

Professor Paul Myles, Anaesthesia and Perioperative Medicine
(Sol Green Trust)

Professor Robyn O’Hehir, Allergy, Immunology and Respiratory Medicine
(Marian & Edwin Harold Flack Trust)

Professor Jennifer Rolland, Department of Immunology, Monash University
(Marian & Edwin Harold Flack Trust)

Professor Jeffrey Rosenfeld, Department of Surgery, Monash University
(Paula Josephine Jung Trust)

Professor Hatem Salem, Australian Centre for Blood Diseases
(Peter Grant Hay Trust)

Associate Professor Max Schwarz, Medical Oncology Unit
(Peter Grant Hay Trust)

Professor Jonathan Serpell, General Surgery
(Paula Josephine Jung Trust)

Associate Professor Andrew Spencer, Clinical Haematology and Bone Marrow Transplant Unit
(Patricia Leonora Anderson Trust)

Professor Elsdon Storey, Department of Neurosciences
(Richard Carus Choice Trust)

Professor Ken Thomson, Department of Radiology
(Peter Grant Hay Trust)

Professor Napier Thomson, Department of Medicine, Monash University
(Sir William Phillip Trust)

Nursing Research Grant
To support the research programs of the Alfred/Deakin Nursing Research Centre and the La Trobe/Alfred Clinical School of Nursing
(Donald Raymond Stuart Research Trust)

Allied Health Research Grant
Annemarie Lee, Physiotherapy: ‘Exercise training in non-cystic fibrosis bronchiectasis – a multi-centre randomised controlled trial’
(Marian & Edwin Harold Flack Trust)

ALFRED RESEARCH TRUSTS SMALL PROJECT GRANTS

Dr Nicole Bye, National Trauma Research Institute: ‘Enhancing endogenous neurogenesis with anti-inflammatory treatment as a potential therapy following traumatic brain injury’

Dr Anthony Camuglia, Department of Cardiovascular Medicine: ‘Randomised controlled pilot trial of n-acetylcysteine in the treatment of chronic heart failure with coexistent chronic renal failure’

Dr Kate Carroll, Department of Allergy, Immunology and Respiratory Medicine: ‘The clinical consequences of mannose-binding lectin deficiency in lung transplantation’

Dr Rachel Cousins, Primary Mental Health and Early Intervention Team: ‘Assessing the mental health literacy and willingness to seek help of new mothers utilising maternal and child health services’
Dr Michelle Earle, Infectious Diseases Unit: ‘A randomised controlled trial of a skills training group intervention to reduce psychological risk factors associated with sexual risk behaviour; and to increase safer sex behaviour, in men who have sex with men’

Dr Lachlan Miles, Intensive Care Unit: ‘Relevance of PaO2/FiO2 ratio in ICU management of immunosuppressed patients’

Dr Charles Pilgrim, Upper Gastrointestinal Surgery: ‘A randomised trial of a very low calorie diet after FOLFOX chemotherapy prior to liver resection for colorectal metastases’

Dr Donal Ryan, Intensive Care Unit: ‘Permissive Hypercapnia and Alveolar Recruitment with Limited Airway Pressures (PHARLAP): a Phase 2 randomised trial in ARDS patients’

Dr Andrew Westbrook, Department of Epidemiology and Preventive Medicine, Monash University: ‘Heparin in severe sepsis: IL-6 as a marker of efficacy’

Sue Wyatt, Department of Endocrinology and Diabetes: ‘A randomised controlled study of a pre-operative intervention in patients with diabetes undergoing cardiac surgery’

HENRY O’HARA SURGICAL RESEARCH AWARD
Dr Marc Selzman, Neurosurgery Department: ‘Incidence and risk factors for postoperative intracranial haemorrhage requiring repeat craniotomy’

AMREP RESEARCH PRIZE 2008
For article describing original research published in the journal with the highest impact factor in 2007
Professor Jamie Cooper (Intensive Care Unit/National Trauma Research Institute, The Alfred)

GLAXOSMITHKLINE PRIZE FOR ADVANCED TRAINEE PHYSICIANS
Dr Jonathon Habersberger (Baker ID Heart and Diabetes Institute)
‘A conformational change in C-reactive protein induces platelet activation in vitro’

DS ROSEGARTEN SURGICAL TRAINEE RESEARCH PRIZE
Dr Edwina Moore (Monash Department of Surgery/Burns Unit, The Alfred)
‘Candida and thermal injury: 10 years experience from a specialist burns centre’

Dr Tony Goldschlager (Monash Department of Surgery)
‘Allogeneic mesenchymal precursor cells safely and effectively increase the rate and robustness of cervical interbody fusion’

THE KATHLEEN AB SMITH MEMORIAL PRIZE IN NURSING
For best publication in Nursing in 2007/2008
Gordon Bingham (The Alfred)

ALFRED WEEK RESEARCH POSTER PRIZES
Alfred Week Psychology Research Prize
Jayashri Rajasuriar (Monash Alfred Psychiatry Research Centre)
ESTROGEN – A POTENTIAL NEW TREATMENT APPROACH FOR SCHIZOPHRENIA

Hennieta Law Memorial Prize for Allied Health Research
Jacqueline Salway (Occupational Therapy Department, The Alfred)
FACTORS ASSOCIATED WITH NON-ADHERENCE TO AHDN SPLINTING REGIMES IN AN ACUTE INAPPTIENT BURNS POPULATION
Salway J, O’Brien L

Noel and Imelda Foster Prize for Cardiovascular Research
Michelle Butler (Heart Centre, The Alfred)
COMPARISON OF PERCUTANEOUS CORONARY INTERVENTION AND CORONARY ARTERY BYPASS GRAFTING FOR REVASCULARISATION OF PATIENTS WITH DIABETES MELLITUS
Butler M, Duffy S, Dinh D, Smith JA, Ajani AE, Andrianopoulos NE, Shardey GE, Clark DJ, Brennan A, New G, Dart AM, Reid CE, on behalf of the Melbourne Interventional Group and Australasian Society of Cardiac and Thoracic Surgeons registries

Lucy Battistel Prize for Allied Health Research
Kate Connell (Nutrition Department, The Alfred)
THE Efficacy of a pseudoallergen free diet in the treatment of chronic idiopathic urticaria: a single blinded randomised controlled study
Connell K, Here-Lacy F, Douglass J, White S, Nyulasi IB

Michael J Hall Memorial Prize for Research in Respiratory Disease/Physiology
Sally Ho (Department of Allergy, Immunology and Respiratory Medicine, The Alfred)
HOME SLEEP APNOEA MONITORING WITH OXIMETRY AUDIT: HIT OR MISS?
Ho S, Roebeck T, Van Braak E, Naughton MT

Tony Charlton Prize for Research in Cardiac Surgery
Rishi Mehra (Anaesthesia and Perioperative Medicine, The Alfred)
EVALUATION OF ACTIVATED PARTIAL THROMBOPLASTIN TIME FOLLOWING CARDIOPULMONARY BYPASS
Mehra R, Marwaha G, Subramainum S, Kumbharathi R, Quantz M

Professor Daniel Czarny Prize for Allergy and Asthma Research
Neeru Varese (Department of Immunology, Monash University)
T CELL RESPONSE TO RYE GRASS POLLEN ALLERGEN IS COUNTER-REGULATED BY INDUCTION OF ALLERGEN-SPECIFIC REGULATORY T CELLS
Mittag D, Varese N, Baxter L, Paukovics G, Rolland JM, O’Hehir RE

Phillips Ormonde & Fitzpatrick Prize for Research in Infectious Diseases (Basic Science)
Reena Rajasuriar (Department of Medicine, Monash University)
BIOLOGICAL DETERMINANTS OF LONG-TERM IMMUNE RECONSTITUTION FOLLOWING HIGHLY ACTIVE ANTIRETROVIRAL THERAPY (HAART)

The Janet A Secatore Nursing Research Award (sponsored by Nurses First Credit Union)
Anne Kenneally (Ward 4 East, The Alfred)
SLIDING DOWN SNAKES AND CLIMBING LADDERS – CREATIVE LEARNING OPPORTUNITIES, HIGH SUPPORT AND HIGH CHALLENGE INSPIRES LEADERSHIP IN OTHERS
Kenneally A, Atkins R, Cairns J, Dyer K, Winter R
The Nursing Research and Access Committee Award  
(sponsored by Nurses First Credit Union)  

**Emma Cohen** (Alfred/Deakin Nursing Research Centre)  
A MODEL FOR ENHANCING QUALITY SYMPTOM MANAGEMENT IN AN ONCOLOGY SETTING  
Cohen E, Botti M, Duke M

Baker IDI Heart and Diabetes Institute Prize for Cardiovascular Research  

**Kate Owen** (Baker IDI Heart and Diabetes Institute)  
THE PROTECTIVE EFFECTS OF EXERCISE AND PHOSPHOINOSITIDE 3-KINASE (P110α) ACTIVATION IN A SETTING OF HEART FAILURE  
Owen KL, Gao XM, Kiriazis H, Ming Z, Cemeralang N, Tan JW, Du XJ, Woodcock EA, McMullen JR

Baker IDI Heart and Diabetes Institute Prize for Diabetes Research  

**Adeline Tan** (Baker IDI Heart and Diabetes Institute)  
COMPARISON OF OXIDATIVE PARAMETERS FOLLOWING RAGE DELETION, AGE ACCUMULATION INHIBITION OR DIETARY AGE CONTROL IN DIABETIC NEPHROPATHY  

Burnet Prize for Infectious Diseases Research (First Prize)  

**Megan Lim** (Burnet Institute)  
COMMUNITY-BASED SURVEILLANCE OF SEXUAL BEHAVIOUR, 2005–2008  
Lim M, Hocking JS, Aitken CK, Hellard ME

Burnet Prize for Infectious Diseases Research (Second Prize)  

**Lachlan Gray** (Burnet Institute)  
TISSUE-SPECIFIC ADAPTIVE CHANGES IN R5X4 HIV-1 ENV VARIANTS COMPARTMENTALISED IN BRAIN AND LYMPHOID TISSUES OF INDIVIDUALS WITH AIDS  

Burnet Prize for Infectious Diseases Research (Third Prize)  

**Mike Toole** (Burnet Institute)  
HIV INFECTION AND RISK BEHAVIOURS AMONG MEN WHO HAVE SEX WITH MEN IN VIENTIANE, LAOS  
Sheridan S, Phimphachanh C, Chanlivong N, Toole M, van Griesven F

Whole Time Medical Specialists Private Practice Scheme Prizes for Clinical Research  

**Susan Harch** (Anatomical Pathology, The Alfred)  
THE FAILURE OF BOSENTAN THERAPY IN PULMONARY ARTERIAL HYPERTENSION. IS THERE AN ALTERNATIVE DIAGNOSIS?  
Harch S, Whitford H, McLean C

**Colleen D’Arcy** (Anatomical Pathology, The Alfred)  
A CLINICOPATHOLOGICAL STUDY OF ‘JUVENILE POLYMYOSITIS’  
D’Arcy CE, Ryan MM, McLean CA

Senior Medical Staff Prize for Clinical Research  

**Amy McRae** (Pharmacy Department, The Alfred)  
THE 50/25 RULE: IMPLEMENTATION OF A STRATEGY TO VALIDATE HIGH INSULIN DOES TO PREVENT ERRORS  

Senior Medical Staff Prize for Basic Science/Laboratory Research  

**Hyun-Ja Ko** (Department of Immunology, Monash University)  
ECTOPIC EXPRESSION OF AIRE REGULATES THE EXPRESSION OF TISSUE SPECIFIC ANTIGENS AND MODULATES THE DEVELOPMENT OF EAE IN MICE  
Ko HJ, Kinkel SA, Nasa Z, Chao J, Siatkas C, Scott HS, Toh BH, Hubert FX, Alderuccio F
Listed are the major national competitive, peer-reviewed research grants held by AMREP staff in 2008; inclusion is based on the Australian Competitive Grants Register (ACGR). Major international grants are also listed.

**AUSTRALIAN GRANTS**

Cooperative Research Centres (CRC) Program


National Health and Medical Research Council Program Grants


**Capacity Building Grants**


Centre of Clinical Research Excellence


Centre of Research Excellence in Patient Safety


Centre of Research Excellence in Radiofrequency Electromagnetic Energy


Health Services Research Grants


Medical Bioinformatics, Genomics and Proteomics Strategic Grant


Palliative Care Research Grant

Preventive Healthcare and Strengthening Australia’s Social and Economic Fabric Research Grant


Dementia Research Grant


Development Grants


Enabling Grants


Project Grants


Febbraio MA. Ciliary neurotrophic factor can prevent muscle insulin resistance. 2006-2008: $578,625. Administering institution: Baker IDI.


Hughan N, Nesbitt W. Investigation of Dok2 and Dok1 adapter proteins in the negative regulation of integrin (β3) platelet signalling. 2008-2010: $437,615. Administering institution: Monash University.


Peter K, Bobak A. Monomeric C-reactive protein as pathogenic factor and therapeutic target in atherothrombotic disease. 2008-2010: $647,625. Administering institution: Baker IDI.


Research Fellowships
Chin-Dusting J. 2006-2010. Administering institution: Baker IDI.
Head G. 2006-2010. Administering institution: Baker IDI.
Kaye D. 2008-2012. Administering institution: Baker IDI.
Kingwell B. 2006-2010. Administering institution: Baker IDI.
Little P. 2006-2010. Administering institution: Baker IDI.
Meikle P. 2008-2012. Administering institution: Baker IDI.
Practitioner Fellowships
Industry Fellowship
INSERM Exchange Fellowship
Career Development Awards
Schlaich MP. 2006-2010. Administering institution: Baker IDI.
Thomas MC. 2006-2010. Administering institution: Baker IDI.
Training (Postdoctoral) Fellowships
Other Australian Grants
AusAID – Bilateral Program Grants
AusAID – Development Research Award
AusAID – NGO Project Grants


Australia and New Zealand Burns Association – Project Grants

Australian and New Zealand College of Anaesthetists – Research Grants


Australian and New Zealand Intensive Care Society – Project Grants


Australian Centre for Health Research – Project Grant


Australian Centre for HIV and Hepatitis Virology – Project Grants


Australian Health Minister’s Advisory Council (AHMAC) Priority Driven Research Program – Project Grant

Australian Research Council – Discovery Grants


Jackson S. Examination of the calcium signalling dynamics linked to integrin adhesion utilising a novel micro-imaging system. 2006-2008: $294,000. Administering institution: Monash University.


Australian Research Council – Linkage Grants


Australian Rotary Health Research Fund – Research Grants


Bethlehem Griffiths Foundation – Research Grants


beyondblue Victorian Centre of Excellence in Depression and Related Disorders – Research Grants


Cancer Council Victoria – Project Grants


Cardiac Society of Australia and New Zealand – World Congress of Cardiology/CSANZ Research Investigatorship

Department of Health and Ageing (Federal Government)


Department of Human Services (Vicotorian Government)


Department of Innovation, Industry and Regional Development (Vicotorian Government) – Science, Technology and Innovation Grant
Australian Centre for Health Care Innovation (joint venture between Bayside Health, Monash University, La Trobe University, Baker IDI). 2005-2008: $4,950,000.

Diabetes Australia Research Trust – Type 1 Millennium Awards


Diabetes Australia Research Trust – Type 2 Millennium Award

Diabetes Australia Research Trust – Research Grants

Bruce C, Meikle P. Lipidomics and lipid profiling: identifying novel lipid species involved in the development of skeletal muscle insulin resistance. 2008: $50,000. Administering institution: Baker IDI.


Lancaster G. The role of macrophage lipid accumulation in obesity-induced inflammation and insulin resistance. 2008: $49,550. Administering institution: Baker IDI.

Matthews V, Febbraio M, Pedersen B, Steinberg G. The potential of brain derived neurotrophic factor as a therapy to treat obesity-induced insulin resistance. 2008: $50,000. Administering institution: Baker IDI.


Diary Innovation Australia – Research Services Grant

Helen MacPherson Smith Trust – Research Grant

Ilhan Food Allergy Foundation – Research Grant

Juvenile Diabetes Research Foundation (Australia) – Research Grants
Slattery R. The role of the human insulin promoter in regulating beta cell autoimmunity. 2007-2010: $495,000. Administering institution: Monash University.

Kidney Health Australia – Bootle Grant
Thomas M. Novel diabetes research – to explore a link between insulin and the complications it causes. 2006-2010: $1,000,000. Administering institution: Baker IDI.

L.E.W. Carty Charitable Fund – Research Grant

National Heart Foundation of Australia – Career Development Fellowship

National Heart Foundation of Australia – Grants-in-Aid

Chai ZL, Cooper M, Toh BH, Cao Z. Role of cell division autoantigen 1 (CDA1) in atherosclerosis. 2008-2009: $125,787. Administering institution: Baker IDI.


Peter K. Does the binding of distinct conformations of C-reactive protein regulate the pro-inflammatory property of low-density lipoproteins and thus define a novel anti-atherosclerotic target? 2008-2009: $126,000. Administering institution: Baker IDI.


Schoenwaelder SM, Salem HH. Investigate the mechanisms by which type 1 phosphoinositide 3-kinase isoforms p110β and p110γ promote arterial thrombosis. 2007-2008: $123,000. Administering institution: Monash University.


Woollard K, Chin-Dusting J, Dart A. The role of soluble P-selectin in mediating leukocyte-endothelial adhesion in peripheral arterial occlusive disease. 2008-2009: $126,000. Administering institution: Baker IDI.


National Heart Foundation of Australia – Overseas Research Fellowship

National Heart Foundation of Australia – Postdoctoral Fellowships

Dawood T. The brain and the heart: understanding the neurobiology of major depressive disorder and how this generates increased cardiac risk. 2008-2009. Administering institution: Baker IDI.


Woollard K. The role of P-selectin in the pathophysiology of peripheral arterial occlusive disease, diabetes and hypertension. 2007-2008. Administering institution: Baker IDI.
Venardos K. Modification of L-arginine transport to improve the ischemic heart. 2008-2009. Administering institution: Baker IDI.

**National Heart Foundation of Australia – World Congress of Cardiology/NHF Clinical Fellowship**

**Pfizer – Cardiovascular Lipid Research Grant**
Wong C. The role of the renin angiotensin aldosterone system activation in myocardial fibrosis, diastolic function and its link to liver fibrosis in morbid obesity. 2008: $50,000. Administering institution: Baker IDI.

**Pfizer – Neuroscience Research Grant**
Williams DR. CSF studies in PSP and dementia. 2008: $50,000. Administering institution: Monash University.

**Pfizer – Senior Research Fellowship**

**Pfizer – Research Grant**

**Pharmacy Guild of Australia – Investigator Initiated Grants**


**Prostate Cancer Foundation – Project Grant**

**Royal Australasian College of Physicians – Research Initiative Grant**

**Royal Australasian College of Physicians – GSK Australia Fellowship in Neurology**

**Sylvia and Charles Viertel Charitable Foundation – Project Grant**

**Transport Accident Commission and Department of Human Services (Victorian Government) – Outcomes Grant**

**Transport Accident Commission – Fellowship**

**Transport Accident Commission – Grants**


**Victorian Endowment for Science, Knowledge and Innovation (VESKI) – Innovation Fellowship**

**VicHealth – Discovery Grants**

**VicHealth – Fellowships**


**Victorian Cancer Agency – Early Career Seed Grant**


**Victorian Cancer Agency – Supportive Care Infrastructure Grants**


**Victorian Cancer Agency – Clinical Trials Infrastructure Grant**


**Victorian Neurotrauma Initiative – Neurotrauma Fellowships**


**Victorian Neurotrauma Initiative – Traumatic Brain Injury Project Grants**


**INTERNATIONAL GRANTS**

**American Foundation for AIDS Research (amFAR) – Fellowships**


**American Foundation for AIDS Research (amFAR) – Project Grant**


**Bill and Melinda Gates Foundation – Global Health Development Program**


**Canadian Institutes of Health Research – RCT Grant**


**Ford Foundation – Asset Building and Community Development Grant**


**Heart and Stroke Foundation (Canada) – Grant-in-Aid**


**Juvenile Diabetes Research Foundation International – Career Development Award**


**Juvenile Diabetes Research Foundation International – Clinical Investigations Research Grant**


**Juvenile Diabetes Research Foundation International – High Priority, Short Term Grant**

Allen T. The role of urotensin II in Type 2 diabetes. 2008: US$55,000. Administering institution: Baker IDI.
Juvenile Diabetes Research Foundation International – Project Grants


Juvenile Diabetes Research Foundation International – Sub Grant to Albert Einstein Center Australian Arm Core B


Juvenile Diabetes Research Foundation International – Albert Einstein Center Australian Arm Project 4


Juvenile Diabetes Research Foundation International – Training Grant


Levi Strauss Foundation – Strategic Grant


Leukaemia and Lymphoma Society (USA) – Specialised Centre of Research


Muscular Dystrophy Association – Research Grant


NARSAD (USA) – Young Investigator Award


National Institutes of Health (USA)


Society for Progressive Supranuclear Palsy – Research Grant


Stanley Medical Research Institute (USA)


Susan G Komen Breast Cancer Foundation – Research Grants


The International Society of Heart and Lung Transplantation – Career Development Award


United Nations Development Program – Fund for HIV/AIDS in Myanmar Grant


Juvenile Diabetes Research Foundation International – Project Grants


NHMRC GRANTS COMMENCING IN 2009

Project Grants


McMullen J, Woodcock E. Targeting critical nodes on the IGF1-Pi3K pathway to improve function of the failing heart. 2009-2011: $493,000. Administering institution: Baker IDI.


Sviridov D, Thomas M, Bach L. Impact of advanced glycation on anti-atherogenic properties of high density lipoprotein. 2009-2011: $357,750. Administering institution: Baker IDI.


Development Grants


Urgent Research – H1N1 Influenza Research Grants


Australia Fellowship
Cooper M. 2009-2013. Administering institution: Baker IDI.

Research Fellowships
El-Osta A. 2009-2013. Administering institution: Baker IDI.


Practitioner Fellowship

Career Development Awards


Matthews V. 2009-2012. Administering institution: Baker IDI.


Training (Postdoctoral) Fellowships


Tonna S. 2009-2012. Administering institution: Baker IDI.


Allen-Graham J. Inhibition of APP and APLP2 to investigate protein function possible therapies for AD. Monash University. Anticipated completion: 2012. Department of Medicine, Monash.


Ben-Shabat E. Central processing of proprioception: functional neuro imaging and psychophysical studies in healthy and stroke participants. La Trobe University. Completed 2008. Rehab, Aged and Community Care, Caulfield Hospital.


Brooks N. Membrane permeable multiple antigen peptides for the immunotherapy of cancer. RMIT University. *Burnet.*


Bullen H. The characterisation of a novel family of invasion associated membrane proteins in Apicomplexan parasites with particular focus on those found in *Plasmodium falciparum* and *Toxoplasma gondii.* University of Melbourne. *Burnet.*

Burch ML. A novel link between G protein coupled and serine/therline kinase receptors regulating proteoglycan synthesis in vascular smooth muscle: Relationship to lipid binding and atherosclerosis. Monash University. Anticipated completion: 2013. *Department of Medicine, Monash / Baker IDI.*


Butler M. Novel imaging modalities for detection of organ fibrosis. Monash University. Anticipated completion: 2013. *Department of Cardiovascular Medicine, Alfred / Department of Medicine, Monash / Baker IDI.*

Cameron A. The metabolic syndrome in Australia. Monash University. Anticipated completion: 2010. *Department of Epidemiology and Preventive Medicine, Monash / Baker IDI.*


Chan W. Iron and oxidative stress in coronary artery disease. Monash University. Anticipated completion: 2010. *Department of Cardiovascular Medicine, Alfred / Department of Medicine, Monash / Baker IDI.*


Chang L. Gene activity patterns associated with the development of pathological cardiac hypertrophy are mediated by specific epigenetic changes. Monash University. Anticipated completion: 2011. *Department of Medicine, Monash / Baker IDI.*


Chen YC. Targeting stem cell to the sites of endothelial damage and atherosclerotic lesions. Monash University. Anticipated completion: 2011. *Department of Medicine, Monash / Baker IDI.*

Chew C. Antiretroviral toxic neuropathy in HIV patients: genetic and other risk factors. University of Western Australia. *Burnet.*

Chin G. The study, observation and improvements in Obstetric Clinical Handover to improve the efficacy and patient safety in this practice. Monash University. Anticipated completion: 2010. *Department of Epidemiology and Preventive Medicine, Monash.*


Desmond C. Interaction of hepatitis B virus and the adaptive immune system. Monash University. Anticipated completion: 2009. *Infectious Diseases Unit, Alfred / Department of Medicine, Monash / Burnet.*


Diou B. How do social risk factors effect warfarin therapy? What are the social responsibilities and strategies in place to deal with these risk factors. Monash University. Anticipated completion: 2011. *Department of Epidemiology and Preventive Medicine, Monash.*


Dowrick A. Development of an orthopaedic trauma registry to evaluate and monitor treatment effectiveness. Monash University. Completed 2008. *Department of Epidemiology and Preventive Medicine, Monash / National Trauma Research Institute, Alfred.*

Drew B. The role of HDL and dyslipidemia in NO medicated glucose uptake in Type 2 diabetes. Monash University. Completed 2008. *Baker IDI / Department of Medicine, Monash / Department of Cardiovascular Medicine, Alfred.*


Dwyer J. The role(s) of molecular signalling in the regulation of telomerase. Monash University. Anticipated completion: 2009. Department of Immunology, Monash.


Evans V. Dendritic cells and their role in HIV-1 pathogenesis. Monash University. Anticipated completion: 2010. Department of Immunology, Monash / Infectious Diseases Unit, Alfred / Department of Medicine, Monash / Burnet.


Fillipas S. Physical activity in people living with HIV/AIDS. Monash University. Anticipated completion: 2010. Physiotherapy Department, Alfred / Department of Epidemiology and Preventive Medicine, Monash / Department of Rheumatology, Alfred / Burnet.


Ghasemzadeh M. Examining the signalling mechanisms regulating platelet activation and in particular the role of PI3-kinases in this process. Monash University. Anticipated completion: 2009. Australian Centre for Blood Diseases, Monash.


Giles M. HIV, reproduction and women in Australia. Monash University. Completed 2008. Infectious Diseases Unit, Alfred / Department of Medicine, Monash / Burnet.

Goeman D. Improving the quality and content of General Practice consultations for people with asthma, Monash University (part-time). Anticipated completion: 2012. Department of Allergy, Immunology and Respiratory Medicine, Alfred / Department of Medicine, Monash.


Habersberger J. Proinflamatory effects of monomeric C reactive protein in vascular endothelium. Monash University. Anticipated completion: 2010. Department of Medicine, Monash / Baker IDI.


Harcourt B. Interactions between receptors for advanced glycation end products and estrogen substrates in Type 2 diabetes and its complications. Monash University. Anticipated completion: 2010. Department of Immunology, Monash / Department of Medicine, Monash / Baker IDI.


Herbert D. The social and ethical dimensions of genetic testing a longitudinal of the haemophilia community. Monash University. Anticipated completion: 2010. Department of Medicine, Monash.


Huynh K. The casual role of ROS induced damage in the development of LV dysfunction in the diabetic heart in vitro. Monash University. Anticipated completion: 2013. Department of Medicine, Monash / Baker IDI.

Iles L. Myocardial fibrosis and heart failure. Monash University. Anticipated completion: 2012. Department of Cardiovascular Medicine, Alfred / Department of Medicine, Monash / Baker IDI.

Department of Epidemiology and Preventive Medicine, Monash.


Keating S. The role of epigenetic chromatin remodelling in the expression of genes relevant to diabetic nephropathy. Monash University. Anticipated completion: 2011. Department of Medicine, Monash / Baker IDI.

Kelly V. The effects of heterogeneity and airway closure on airway distensibility measurements in asthma. Monash University. Anticipated completion: 2009. Department of Allergy, Immunology and Respiratory Medicine, Alfred.


Khong S. The role of arginine II in cardiovascular pathology, Monash University. Anticipated completion: 2010. Department of Cardiovascular Medicine, Alfred / Baker IDI / Department of Medicine, Monash.


Lam N. Biology of stem cells in the failing heart. Monash University. Anticipated completion: 2011. Department of Medicine, Monash / Baker IDI.


Lee PS. Influence of n3:n6 fatty acids ratio on vascular inflammatory profile in patients with hypercholesterolemia. Monash University. Anticipated completion: 2011. Department of Medicine, Monash / Department of Cardiovascular Medicine, Alfred / Baker IDI.


Lunke S. Epigenetic regulation of the human survival of motor neuron gene in spinal muscular atrophy. Monash University. Anticipated completion: 2012. Department of Medicine, Monash / Baker IDI.


Maslin C. Effect of HIV-1 infection on the capacity of monocyte subsets to traffic into and out of tissues. Monash University. Completed 2008. Department of Medicine, Monash.

Mathiyagan M. Epigenetics in human health and disease lab. Monash University. Anticipated completion: 2010. Department of Medicine, Monash / Baker IDI.


McWilliams T. Lung post airway transplant remodelling. Monash University. Completed 2008. Department of Allergy, Immunology and Respiratory Medicine, Alfred / Department of Medicine, Monash.


Mukherjee S. Nitric oxide and oxidative stress in human hypertension. Monash University. Completed 2008. Department of Cardiovascular Medicine, Alfred / Department of Medicine, Monash / Baker IDI.

Murphy A. Soluble mediators of monocyte activation. Monash University. Completed 2008. Department of Cardiovascular Medicine, Alfred / Department of Medicine, Monash / Baker IDI.

Nair R. Role of angiogenesis in the pathogenesis of atherosclerosis. Monash University (part time). Anticipated completion: 2012. Department of Medicine, Monash / Department of Cardiovascular Medicine, Alfred / Baker IDI.


Ooi J. Epigenetic modification and the role of chromatin modifying determinants in the hypertrophied heart. Monash University. Anticipated completion: 2012. Department of Medicine, Monash / Baker IDI.

O’Reilly G. International trauma epidemiology: paths and challenges to the establishment of trauma registries in developing (and developed) countries. Monash University. Anticipated completion: 2016. Department of Epidemiology and Preventive Medicine, Monash.


Prabhu S. To develop a non-invasive mechanism of identifying unstable atheromatous plaques from stable plaques, as well as intravascular thrombosis, using MRI technology. Monash University. Anticipated completion: 2010. Department of Medicine, Monash.

Pretorius L. Beneficial role of genes activated in the athlete’s heart in a set of heart failure: Role of P53 (p110) and exercise. Monash University. Anticipated completion: 2011. Department of Medicine, Monash / Baker IDI.


Rajasuriar R. Biological determinants of immune reconstitution. Monash University. Anticipated completion: 2010. Infectious Diseases Unit, Alfred / Department of Medicine, Monash / Burnet.

Roche M. Understanding HIV-1 entry: insights through the envelope protein. Monash University. Department of Medicine, Monash / Burnet.


Semple B. Chemokines in secondary tissue damage following traumatic brain injury. Monash University. Anticipated completion: 2010. Department of Medicine, Monash / National Trauma Research Institute, Alfred.


Sulclosi I. Characteristics of sleep disordered breathing in heart failure. Monash University. Anticipated completion: 2009. Department of Allergy, Immunology and Respiratory Medicine, Alfred / Department of Medicine, Monash.


Tran H. The development of COPD in a cohort of childhood asthma. Monash University. Anticipated completion: 2010. Department of Allergy, Immunology and Respiratory Medicine, Alfred.


Tu YG. The anti-proliferative activity of COAT is mediated by p53- and TGF-B-signalling pathways. Monash University. Completed 2008. Department of Cardiovascular Medicine, Alfred / Department of Medicine, Monash / Baker IDI.


Vaddadi G. Sympathetic neurobiology of recurrent syncope. Monash University. Anticipated completion: 2010. Department of Cardiovascular Medicine, Alfred / Department of Medicine, Monash / Baker IDI.


Wright E. Neuropathogenesis of HIV dementia. Monash University (part time). Anticipated completion: 2009. Infectious Diseases Unit, Alfred / Department of Medicine, Monash / Burnet.


Yap SH. Role of mutations in the connection domain of the HIV reverse transcriptase in drug resistance. Monash University. Burnet.

Young A. Hypoxia and hypercapnia in cystic fibrosis – mechanisms, clinical effects and treatment. Monash University. Completed 2008. Department of Allergy, Immunology and Respiratory Medicine, Alfred / Department of Medicine, Monash.


**OTHER DOCTORATES**


Ireland S. Optimising the monitoring and management of hypothermia in adult major trauma patients. Doctor of Nursing, La Trobe University. Anticipated completion: 2010. *Nursing, Alfred / Emergency Medicine, Alfred.*


Leet A. Myocardial fibrosis and function after heart transplantation. Doctor of Medicine, Monash University (part time). Anticipated completion: 2014. *Department of Medicine, Monash / Department of Cardiovascular Medicine, Alfred.*


Ng WH. Glial cell line-derived neurotrophic factor family of ligands is a mitogenic agent in human glioblastoma and confers resistance in a ligand-specific fashion. Doctor of Medicine, National University of Singapore. Anticipated completion: 2010. *Department of Neurosurgery, Alfred.*


Roberts K. People's experience of return to work following upper limb amputation. Doctor of Occupational Therapy, La Trobe University. Anticipated completion: 2012. *Caulfield Hospital.*


PUBLICATIONS

JOURNAL ARTICLES


Ahimastos AA, Dart AM, Lawler A, Blombery PA, Kingwell BA. Reduced arterial stiffness may contribute to angiotensin-converting enzyme inhibitor induced improvements in walking time in peripheral arterial disease patients. J Hypertens 2008;26(5):1037-42.


Davies JM, Mittag D, Dang TD, Symmons K, Voskamp A, Rolland JM, O’Hehir RE. Molecular cloning, expression and immunological characterisation of Pas n 1, the major allergen of Bahia grass Passatrum notatum pollen. Mol Immunol 2008;46(2):286-93.


Davis SR, Nijlend EA. Pharmacological therapy for female sexual dysfunction: has progress been made? Drugs 2008;68(3):259-64. Review.


Furtado CP, Maller JJ, Fitzgerald PB. A magnetic resonance imaging study of the entorhinal cortex in treatment-resistant depression. *Psychiatry Res* 2008;163(2):133-42.


Kitson MT, Yong MK, Hof JF. Ocular syphilis: are we seeing all there is to see? Med J Aust 2008;189(7):411.


Inhibition of inducible nitric oxide production and iNOS protein expression in lipopolysaccharide-stimulated rat aorta and Raw 264.7 macrophages by ethanol extract of a Chinese herbal medicine formula (RCM-101) for allergic rhinitis. *Arch Vasc Pharmacol* 2008;81(3):377-80.


Use of a cancer registry is preferable to a direct-to-community approach for recruitment to a cohort study of wellbeing in women newly diagnosed with invasive breast cancer. *BMC Cancer* 2008;8:126.


McNamee KM, Fairley CK, Hocking JS. Chlamydia testing and notification in Australia: more money, more tests. Sex Transm Infect 2008;84(7):565-9; discussion 569.


O’Reilly RE, Garside RH, Lawes CM, makes the transition to a position of director of the chair in cardiovascular and stroke research at University of Queensland. Heart 2008;93(2):157-63.


Books


**COCHRANE REVIEWS**


AMREP 2009 Honours Scholarship Awardees

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