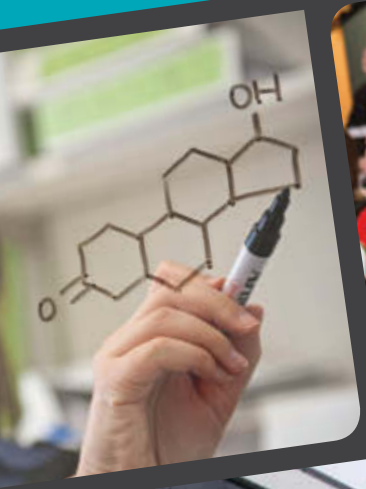


2013

AMREP RESEARCH REPORT

The Alfred Medical Research & Education Precinct

AMREP

The Alfred Medical Research and Education Precinct

The Alfred Medical Research and Education Precinct - AMREP - is a partnership between Alfred Health, Monash University, Baker IDI Heart and Diabetes Institute, Burnet Institute, La Trobe University and Deakin University.
AMREP is located on the campus of The Alfred hospital, Melbourne.

ISSN 1445-8853

Professor Brendan Crabb

Director and CEO, Burnet Institute

Chair, AMREP Council

It is with great pleasure that I introduce the AMREP Research Report for 2013. I would like to take this opportunity to congratulate all AMREP partners on a successful year of research endeavour.

AMREP has continued to perform strongly, with increased levels of publications in peer-reviewed journals and, although more difficult to quantify, we have made strong progress in the translation of our research.

AMREP plays an important role in the provision of tangible health benefits for the Australian community and those countries in our region. Our partnership approach and our national and international collaborations have led to new opportunities and to the expansion of our research endeavours into new markets. The recent opening of Nanjing Biopoint Diagnostics in China by Burnet Institute, which will develop rapid point-of-care diagnostic tests, is a good example of how research developed at AMREP can be exported to other countries, providing a strong return on investment to our communities here in Australia, and at the same time building our international reputation for research excellence.

AMREP can be justifiably proud of the amazing contribution we make in delivering better health care to the community – from cancer to cardiovascular disease, mental health to Indigenous health, and in improving the efficiency of health services to help those with disease avoid hospital visits. Through medical research we create change, improve the health and the lives of many, and at the same time contribute strongly to a healthier economy.

All AMREP partners have been very active over the past few years building stronger relationships with government at State and Federal level, and in building the case for greater support of our sector. We can take some pride in the announcement by the Federal Government of the formation of the $20 billion Medical Research Future Fund (MRFF) in the recent budget. The announcement of the fund, a big vision and bold policy for health and medical research, is crucial to Australia's future – to secure quality of life for an ageing population, and to ensure our economy continues to prosper in an age where knowledge and innovation become the most valued commodities.

The MRFF is a step change that is strongly in the national interest, and in the interest of all those in poor health. Medical research done in Australia has long delivered incredible health and economic benefits that would otherwise not have happened. It has underpinned our world-class health system. Doubling medical research funding through the MRFF will go a long way to ensuring we continue to have such a system. Should it pass through the Senate, this increased investment will enable AMREP to play a greater part in delivering health benefits for the community.

Thank you your significant contributions during the year. I look forward to working with you in another productive year of research endeavour.

Contents

AMREP Highlights 2013/2014

20th International AIDS Conference

AMREP played a major role in staging AIDS 2014, the 20th International AIDS Conference, which was held at the Melbourne Convention and Exhibition Centre from 20-25 July. Internationally renowned expert in infectious diseases, Professor Sharon Lewin (Director of Infectious Diseases, Alfred / Monash, and Co- Head of the Centre for Biomedical Research, Burnet Institute) was Local Co-Chair.

Convened every two years, the International AIDS Conference is the largest gathering of professionals working in the field of HIV, including scientists, activists, policy makers and people living with HIV. AIDS 2014 attracted some 14,000 delegates to Melbourne, and examined the global, regional and national trends of the epidemic, as well as presenting the latest breaking science within the field of HIV. Speakers included former US President Bill Clinton and anti-poverty campaigner Sir Bob Geldof. Tragically, six conference delegates lost their lives on 17 July aboard Malaysia Airlines flight MH17.

Former US President Bill Clinton meets members of the International AIDS Society (IAS) backstage before his speech at AIDS 2014 in Melbourne. (L-R) Owen Ryan, Executive Director IAS; Professor Sharon Lewin, Local Co-Chair, AIDS 2014; Bill Clinton; Chris Beyrer, President-Elect IAS; Françoise Barré-Sinoussi, IAS President to July 2014. Photography: IAS / Steve Forrest.

Monash Department of Immunology Symposium – 50 Year Anniversary

The Monash Department of Immunology marked fifty years of research and education on 4 October 2013 by holding a symposium to showcase their achievements and current activities. One hundred and eighty friends, colleagues, alumni and immunologists attended the event.

The Department of Pathology was established in 1962 at the Alfred campus, primarily for the delivery of pathology education programs for medical students and for service delivery in pathology. However, as immunology quickly became its particular research strength, and undergraduate programs in basic and clinical immunology were introduced, the department was renamed the Department of Pathology and Immunology and later the Department of Immunology. The department played a key role in establishing state-of-the-art technology for its research programs, especially in flow cytometry, and was one of the first to introduce undergraduate teaching programs in immunology in Australia.

NHMRC Funding Success

Prime Minister, the Hon. Tony Abbott, Federal Health Minister the Hon. Peter Dutton and Victorian Health Minister, the Hon. David Davis announced NHMRC grants across eight schemes in Melbourne on 23 October, at AMREP. Mr Abbott did a tour of Central Clinical School laboratories prior to the announcement.

AMREP researchers were successful with the following grants in the 2013 NHMRC funding round:

- Centres of Research Excellence (CRE) ($2.5 million each): Professor Michael Abramson (Monash Department of Epidemiology and Preventive Medicine) for the CRE for Population Health Research on Electromagnetic Energy; and Professor Neville Owen (Baker IDI Heart and Diabetes Institute) for the CRE on Sedentary Behaviour and Chronic Disease Risk: Mechanisms, Measurement and Research Translation
- A $1.5 million Development Grant to Professor Jeffrey Rosenfeld (Monash Department of Surgery) for commercialisation of a wireless multi-electrode cortical device to restore vision
- A Partnership Projects grant of $861,706 to Professor Jamie Cooper (Alfred Intensive Care Unit) to improve outcomes for patients with critical bleeding requiring massive transfusion
- NHMRC-European Union Collaborative Grants to Professor Jamie Cooper (Alfred Intensive Care Unit) and Professor Assam El-Osta (Baker IDI)
- Thirty-seven Project Grants totalling $23.7 million
- Six Research Fellowships, including a Senior Principal Research Fellowship awarded to Professor Bronwyn Kingwell of Baker IDI
- Four Career Development Fellowships
- Eleven Early Career Fellowships
- Seven Postgraduate Scholarships

Full details are on page 72 of this report.

Prime Minister, the Hon. Tony Abbot tours the Central Clinical School's Australian Centre for Blood Diseases (ACBD) Laboratories.

Honours student Ashlee Conway (seated), who progressed to PhD studies in the ACBD Stem Cell Group in 2014, explains her research to (L-R: standing) the Hon. Kelly O'Dwyer (MP, Federal Member for Higgins); Tony Abbot; Federal Health Minister, the Hon. Peter Dutton; and Professor Stephen Jane (Head of Monash Central Clinical School and ACBD).

AMREP Highlights 2013/2014

NHMRC Excellence Awards

Three AMREP scientists were presented with NHMRC Research Excellence Awards at the NHMRC 200th Council Dinner in June 2014. These awards recognise excellence in health and medical research and are awarded to the top-ranked applicants across NHMRC's funding schemes. Those recognised were:

- Professor Bronwyn Kingwell, Baker IDI Heart and Diabetes Institute
  Elizabeth Blackburn Fellowship (Clinical) – highest ranked female Research Fellowship applicant in Clinical Medicine and Science;
- Associate Professor Allen Cheng, Monash Department of Epidemiology and Preventive Medicine and Alfred Infectious Diseases Unit
  Highest ranked Career Development Fellowship – Clinical Level 2;
- Dr Michael Roche, Burnet Institute and Monash Department of Infectious Diseases
  Frank Fenner Early Career Fellowship – highest ranked applicant from the Biomedical or Public Health Early Career Fellowship category.

Professor Bronwyn Kingwell (Domain Head of Prevention / Head of Metabolic and Vascular Physiology Laboratory, Baker IDI Heart and Diabetes Institute) received an NHMRC Excellence Award in 2014 as the highest ranked female Research Fellowship applicant in Clinical Medicine and Science.

AMREP Researchers Highly Cited

Professor Rinaldo Bellomo (ANZICS, Monash University), Professor Paul Zimmet (Baker IDI) and Associate Professor Jonathan Shaw (Baker IDI) were named by Thomson Reuters as some of the world's most influential scientific minds in a recently launched 'Highly Cited Researchers' report, a compilation of influential names in science whose published work in their specialty area has consistently been judged by peers to be of particular significance and utility. These researchers earned the distinction by writing the greatest numbers of reports officially designated by Essential Science Indicators as Highly Cited Papers – ranking among the top 1% most cited for their subject field and year of publication – between 2002 and 2012.

Research Poster Display and Research Day

The 2013 Alfred Week Research Poster Display attracted 184 research posters from across AMREP. Generous prizes were awarded for the posters judged to be the best in their category. Details of the winning posters are available at http://alfredresearch.org/alfredweek/resprize.htm

Research Day, held during Alfred Week, featured a keynote address by Professor Kathryn North AM, Director of the Murdoch Children's Research Institute, entitled 'Next generation sequencing in action, with a focus on neuromuscular disorders".

Professor North presented the 2013 AMREP Research Prizes to Professor John Dixon, Dr Tin Soe Kyaw and Dr Xiaowei Wang, all of Baker IDI, in recognition of their high impact original research articles published in *Journal of the American Medical Association* and *Circulation* respectively. The Research Day session concluded with brief oral presentations from the three prize winners.

Other Major Awards and Honours in 2013/14

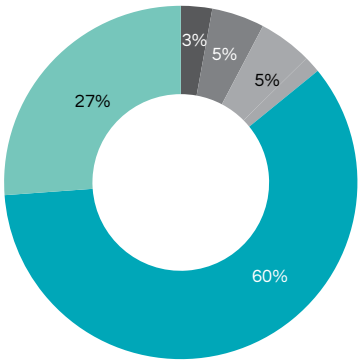
- Professor Paul Komesaroff, Centre for the Study of Ethics in Medicine and Society, Monash University, was appointed Member of the Order of Australia in the 2014 Queen's Birthday Honours for his significant service to ethics in medicine as a physician, researcher and philosopher.
- Professor Garry Jennings AO, Director, Baker IDI, was awarded the European Society of Hypertension's Bjorn Folkow Award for his research contribution to the understanding of the pathogenesis of hypertension.
- Professor Fabienne Mackay, Head of Monash Department of Immunology, was recognised by the French government for her exceptional contribution to education and research overseas.
- The work of Professor Mackay and her team on understanding the complexities of the autoimmune disease Systemic Lupus Erythematosus (SLE) featured in the NHMRC's 'Ten of the Best 2013'.
- Professor Murray Esler, Baker IDI, was awarded the American Heart Association Excellence Award for Hypertension Research.
- Professor Paul Zimmet, Baker IDI, received the Research Australia Peter Wills Medal in recognition of his outstanding contribution to building Australia's international reputation in the area of health and medical research.
- Professor Geoff Head, Baker IDI, received the inaugural International Society of Hypertension Paul Korner Award for outstanding contributions to research on hypertension in the field of neuroscience.
- Associate Professor Anna Peeters, Baker IDI, received the André Mayer Award for Young Investigators from the International Association for the Study of Obesity; this award recognises outstanding research in the field of obesity by a young investigator.
- Professor Karlheinz Peter, Baker IDI, was awarded the 2014 RT Hall Prize by the Cardiac Society of Australia and New Zealand during the World Congress of Cardiology in recognition of sustained and outstanding research achievements.
- Professor Michael Abramson, Monash Department of Epidemiology and Preventive Medicine, was the recipient of a Community Service Award from the Asthma Foundation Victoria, in recognition of his significant contribution to the understanding of asthma through research and support.
- Dr Kate Hoy, MAPrc, won the Australian Institute of Policy and Science 2013 Victorian Young Tall Poppy Science Award for her research into developing new treatments for the cognitive impairments associated with schizophrenia.

The work of Professor Fabienne Mackay's (Head of Immunology, Monash Central Clinical School) BAFF laboratory was included in the NHMRC's Ten of the Best research projects in 2013. The BAFF Laboratory group: (L-R) Melanie Le Page, Dr Will Figgett, Professor Fabienne Mackay, Damien Saulep-Easton, Pin Shie Quah, Dr Fabien Vincent, Indzi Katik. (Photography: NHMRC/James Braund).

Research Outputs

2013 at a glance

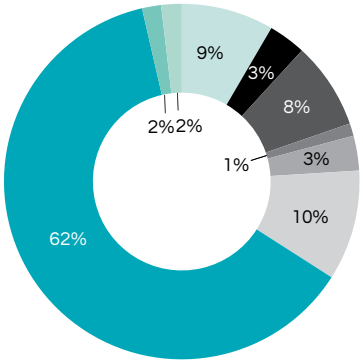
External funding received 2013



- NHMRC
- Other
- NIH
- AusAID
- ARC

Total $100,813,066

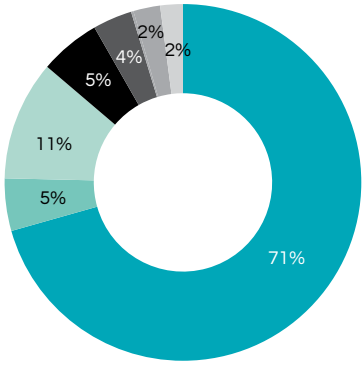
New NHMRC funding commencing in 2014



- Project Grants
- Program Grants
- Research Fellowships
- Early Career Fellowships
- Career Development Fellowships
- Development Grants
- Partnership Projects
- EU Collaborative Grants
- Postgraduate Scholarships

Total $46,280,732

Publications 2013



- Original research articles
- Reviews
- Editorials and comments
- Systematic reviews
- Letters and author replies
- Books and book chapters
- Other

Total	**1,856**

In 2013, AMREP researchers published original research articles in top-ranking international journals including:

New England Journal of Medicine [IF: 51.658]

Lancet [IF: 39.06]

Nature Genetics [IF: 35.209]

Nature Reviews Cancer [IF: 35]

Physiological Reviews [IF: 30.174]

The average impact factor of all original research articles published in 2013 was 4.435

25% of these articles were published in journals with an impact factor of ≥ 5

Note: 2012 impact factors

For a list of high-impact factor publications by AMREP staff in 2012, see page 86 of this report.

Higher degree completions

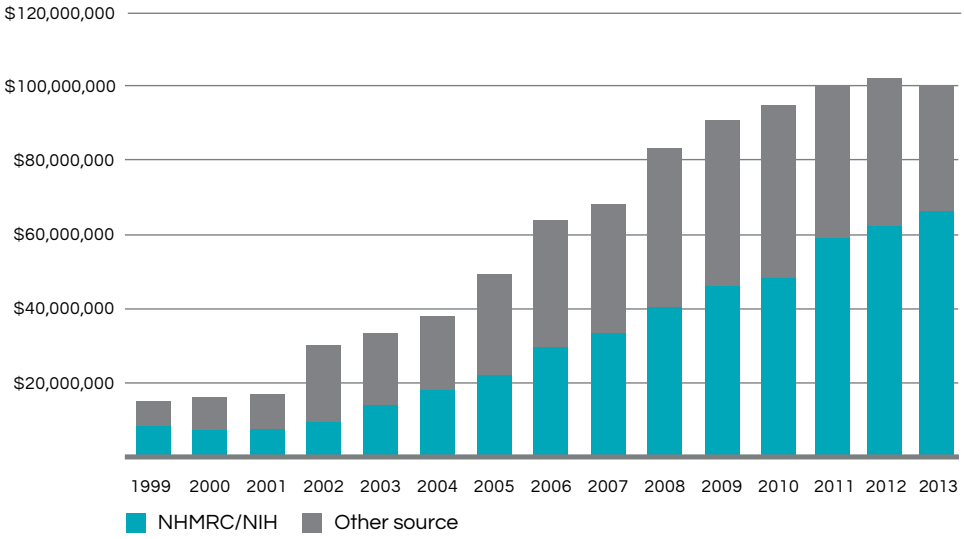
40 PhD completions
3 Other doctoral completions
175 Masters completions

In 2013, there were 404 current PhD students and 30 other doctoral students at AMREP.

Research Outputs

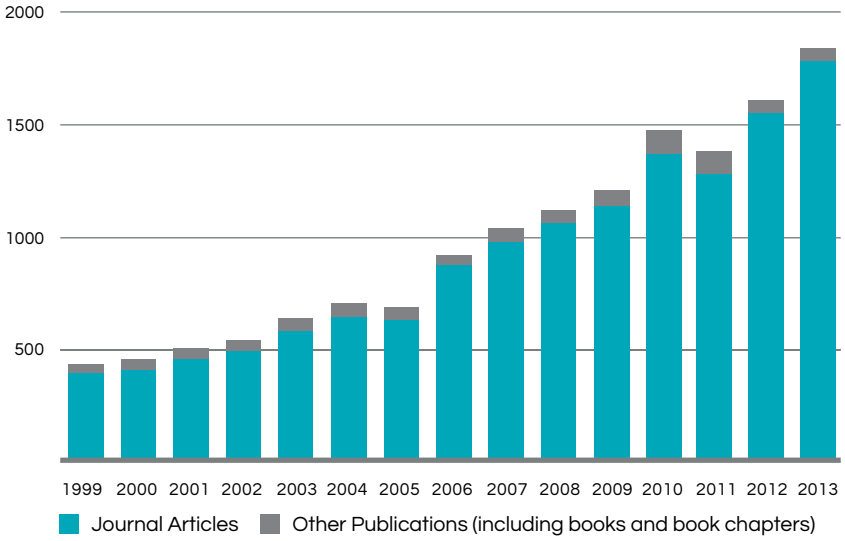
year by year

External research funding received



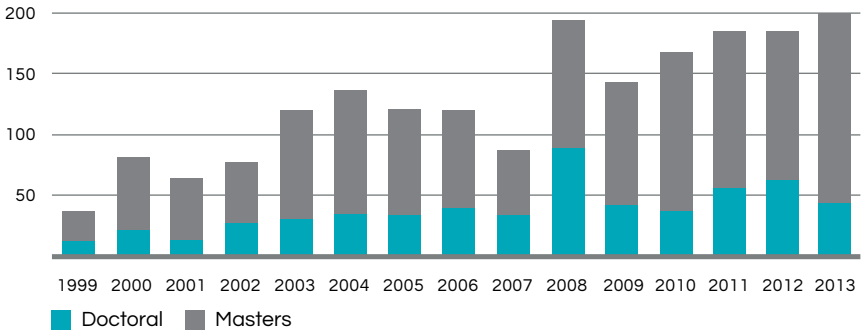
External research funding refers to competitive peer reviewed grants from schemes offered by funding bodies such as NHMRC, National Heart Foundation and NIH or government grants (e.g. Department of Human Services), industry and university grants. Funds received from commercially sponsored clinical trials are not included.

Publications



Abstracts, conference procedings and 'in press' articles are not included.

Completed and passed higher degrees

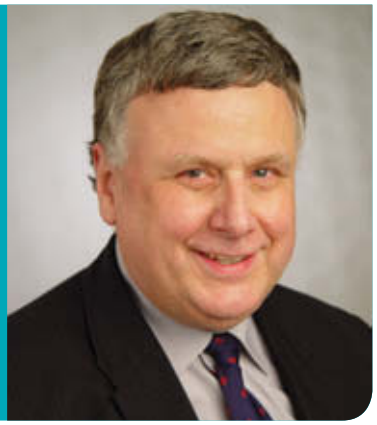


Masters include course work and research degrees.

Human Ethics and Research Governance

Professor John McNeil AM
Chair, Alfred Hospital Ethics Committee

www.alfredresearch.org



Alfred Hospital Ethics Committee

In Australia, Human Research Ethics Committees (HRECs) review research proposals involving humans in accordance with the *NHMRC National Statement on Ethical Conduct in Human Research* (the National Statement). HREC approval provides public assurance of ethically acceptable research that complies with endorsed standards and guidelines.

Applications

In 2013, the Alfred HREC reviewed 300 research projects including 124 health and social sciences, and176 drugs and interventions applications. A further 279 'low risk' applications that were received did not require review by the full HREC.

Multicentre Research

The streamlined processes for reviewing Australian multi-centre projects have operated for over four years, and most projects reviewed are commercially sponsored clinical trials. Much human research, including university research, is submitted to each individual HREC for approval. In 2013, 11 applications were submitted to the Ethics Committee for review under the streamlined process and 7 projects were authorised for commencement at Alfred Health after review by another HREC.

New Application Management System

In April 2014, a secure online ethics application management system called ERA (Ethics Research Administration) was launched. ERA provides researchers, Ethics Committee members and office staff access to the application, acts as a document repository and allows application tracking through the review process. ERA enables more direct communication between the user groups and aims to improve time to ethics approval and governance authorisation.

Research Governance at AMREP

Each AMREP partner has a research governance framework to ensure proper conduct of human research under its auspices. The Australian Code for the Responsible Conduct of Research outlines requirements for institutions and researchers which include:

- Management of research data
- Supervision of research trainees
- Dissemination of research results
- Authorship
- Peer review of research
- Conflicts of interest
- Management of collaborative research
- Research misconduct

Audits conducted at Alfred Health monitor research progress, and facilitate an educative process allowing researchers to communicate face-to-face with the Research Governance Officer.

General Ethical Issues Sub-committee

The General Ethical Issues Sub-committee (GEI S-C) considers broader ethical matters rather than individual research projects. Members are selected from the main Ethics Committee, experts from within Alfred Health and AMREP, the wider community and other experts as required. Matters considered may be specific to Alfred Health, AMREP partners, or of relevance to the research community or general public. The GEI S-C contributes to public consultations led by the NHMRC and others. It also supports the main Ethics Committee by developing guidance documents to promote both good research practice and assists with ethical decision making. The GEI S-C met bi-monthly in 2013.

Discussion Topics in 2013

Public Consultations

- NHMRC Public Consultation – Review of Chapter 2.3 of the National Statement: Qualifying or waiving conditions for consent. ***Outcome***: The addition of guidance to the National Statement on using an opt-out approach to participant recruitment.
- NHMRC Public Consultation on Conflicts of Interest – Supplementary guidance to Chapter 7, Australian Code for the Responsible Conduct of Research (2007). ***Outcome***: A review of the Ethics Committee's processes for declaring conflicts of interests, resulting in a policy of recording an annual declaration of members' private interests for reference when allocating projects to Ethics Committee members for review.
- Royal Australasian College of Physicians' Guidelines for ethical relationships between health practitioners and industry

Review of Ethics Committee Guidelines and Processes

- Consent Guideline
- Tissue / Biospecimen Guideline
- Discarded Tissue delegated review process
- Safety Reporting and Monitoring Guidelines and Reporting Flow Chart
- Archiving Guideline
- Committee Members Annual Declaration of Private Interests

Guidance on Research Ethics

- Requirements for a witness to written consent
- Ethically acceptable sponsor enrollment initiatives / incentives
- Sensitive contact with bereaved families of research participants
- Use of electronic consent forms

Ethical Opinion for Institution

- Alfred Health End-of-Life Strategy
- Clinical Registries and the interface between Health Informatics and the Ethics Committee

Animal Ethics

Dr Alana Mitchell
Chair, AMREP Animal Ethics Committees A and B

amrepaec.bakeridi.edu.au

AMREP Animal Ethics Committee

Two Animal Ethics Committees (AECs) are in operation at AMREP, with each committee meeting monthly. The AECs assess proposals for the use and breeding of animals for scientific purposes from Baker IDI Heart and Diabetes Institute, Monash University Central Clinical School, the Burnet Institute, The Alfred hospital and AMREP Animal Services. The AECs determine whether a proposal to use animals is justified on ethical grounds, and whether the welfare of the animals will be adequately protected. Modifications and other project-specific documentation relating to an approved project are reviewed by the AEC that reviewed the original application.

From April 2013, Associate Professor David Curtis (Monash Central Clinical School) will chair AEC A; Dr Alana Mitchell will remain as chair of AEC B.

AEC Applications in 2013

The AMREP AECs reviewed 95 new experimental applications in 2013. A summary of applications in all categories is shown in the table below.

SUMMARY OF APPLICATIONS REVIEWED BY THE AMREP AEC IN 2013				
	Baker IDI Heart and Diabetes Institute	Monash Central Clinical School	Burnet Institute	Alfred Health
New experimental applications	50 (68)	39 (38)	3 (3)	3 (3)
Modifications to experimental applications	95 (67)	63 (60)	10 (4)	0 (1)
Tissue applications	9 (9)	3 (3)	0 (1)	0 (0)
Colony applications	15 (20)	87 (91)	0 (2)	0 (0)
Antibody applications	0 (0)	0 (0)	0 (0)	0 (0)

In brackets: number of applications reviewed in 2012.

New Australian Code

The long awaited revision of the *Australian Code for the Care and Use of Animals for Scientific Purposes 8th Edition* (The Code) was released on 25 July 2013. The new version has been restructured to better reflect and emphasise the governing principles that determine how animals may be used for scientific purposes. Greater emphasis is placed on defining the responsibilities of all involved with the scientific use of animals and on maintaining the health and welfare of animals. Like the previous version, The Code continues to hold the principles of the 3Rs (Replacement, Refinement and Reduction) at its core and still mandates that the use of animals for scientific research is fully justified before it can be approved by an AEC.

AMREP Animal Ethics Governance and Policy Committee

The AMREP Animal Ethics Governance and Policy (GAP) Committee facilitates consistent operation across the two AMREP AECs in accordance with The Code and the relevant Victorian Legislation.

The main responsibilities of the GAP committee are to:

- Develop and approve policies for the operation of AMREP AECs A and B
- Oversee post-AEC approval monitoring of project compliance
- Monitor issues of compliance with governance and The Code
- Oversee the education and training of AEC applicants and AEC members
- Monitor the performance of the AECs
- Serve as the first point of contact for the resolution of disputes involving AEC members and/or AEC applicants that cannot be resolved at the AEC level

During 2013, the GAP Committee developed policies and procedures for the reporting of adverse incidents, non-compliance with the Code, and grievances and complaints regarding the use of animals.

Updated AEC Application Platform

A substantial revision of the AEC application platform EthicsAppOrder was launched in November 2013. The new platform comprises an online component for provision of administrative details and a Word form in which to provide the information on the proposed animal work. The changed application format has been well received by the AECs and applicants. After eight months in use, some refinements have been identified that will further improve the Word form.

Post-approval Monitoring of Project Compliance

The AMREP Scientific Procedures Premises Licence (SPPL) holders appointed the Animal Ethics Officer to initiate a process of post-approval monitoring of AEC-approved projects on behalf of the AECs. This review process will assist both researchers and licence holders to meet their requirements under The Code by ensuring that animals issued to AEC projects have undergone procedures and monitoring in accordance with the approved AEC application and subsequent modifications. Each year, six projects will be randomly selected for review. A report, sent to the AEC and the investigator, will include recommendations and resources to assist researchers meet their requirements under The Code.

Baker IDI Heart and Diabetes Institute Research Programs and Domains

Director: Professor Garry Jennings AO

Five research Programs underpin Baker IDI's major scientific goals, each addressing a key question of interest.

Behavioural and Generational Change - Head: Prof. Neville Owen
Lead Laboratory: Behavioural Epidemiology – N Owen

Metabolism and Inflammation - Head: Prof. Mark Febbraio
Lead Laboratory: Cellular and Molecular Metabolism – M Febbraio

Diabetic Complications - Head: Prof. Karin Jandeleit -Dahm
Lead Laboratory: Diabetes and Kidney Disease – K Jandeleit-Dahm

Atherothrombosis and Vascular - Head: Prof. Karlheinz Peter
Lead Laboratory: Atherothrombosis and Vascular – K Peter

Hypertension and Cardiac Disease - Head: Prof. David Kaye
Lead Laboratory: Heart Failure Research – D Kaye

Baker IDI's research Domains are built around the full range of life-stage disease themes encompassed by the Institute's science. Aboriginal Health is a key research focus. Each Domain comprises a group of laboratories.

Prevention
Head: Prof. Bronwyn Kingwell

Metabolic and Vascular Physiology – B Kingwell
Genomics and Systems Biology – K Bozaoglu
Metabolomics – P Meikle
Muscle Research and Therapeutics – P Gregorevic
Physical Activity – D Dunstan

Vascular Disease
Head: Prof. Jaye Chin-Dusting

Vascular Pharmacology – J Chin-Dusting
Computational Biology – R Lazarus
Lipoproteins and Atherosclerosis – D Sviridov
Vascular Biology and Atherosclerosis – A Bobik
Vascular Biotechnology – C Hagemeyer

Diabetes
Head: Prof. Mark Cooper

Molecular Group – M Cooper
Beta Cell Biology Group – R Shi
Biochemistry of Diabetic Complications – M Thomas
Diabetes and Atherosclerosis – T Allen
Human Epigenetics – A El-Osta
Epigenomic Medicine – T Karagiannis
Nutrition, Glycation and Metabolism – M Coughlan

Heart Disease and Neuroscience
Head: Prof. Geoff Head

Neuropharmacology – G Head
Cardiac Hypertrophy – J McMullen
Experimental Cardiology – X-J Du
Heart Failure Pharmacology – R Ritchie
Human Neurotransmitters – G Lambert
Molecular Cardiology – E Woodcock
Clinical Electrophysiology – P Kistler
Hypertension and Kidney Disease – M Schlaich

Cardiometabolic Risk
Head: A/Prof. Jonathan Shaw

Clinical Diabetes – J Shaw
Clinical Obesity – J Dixon
Diabetes and Population Health – D Magliano
Obesity and Population Health – A Peeters

Aboriginal Health
Head: Prof. Sandra Eades

Indigenous Population Health Research – S Eades
Associate Director Aboriginal Health – G Maguire
Deputy Director Aboriginal Health – J Ward

Clinical Research Centre
Acting Head: Lisa Keam

Diabetes Clinics – N Cohen
Diabetes Education Group – M Mack
Clinical Imaging – A Taylor
Healthy Hearts Group – L Jenkins and J Jennings
Cardiovascular and Other Non-Diabetes Clinics – A Ellims
Healthy Lifestyle Research Centre

Baker IDI
HEART & DIABETES INSTITUTE

www.bakeridi.edu.au

Baker IDI Heart and Diabetes Institute

Director: Professor Garry Jennings AO, MBBS, MD, FRCP, FRACP, FAHA, FCSANZ

Baker IDI Heart and Diabetes Institute is a world renowned medical research facility, with a history spanning more than 88 years. Our work extends from the laboratory to hospital research and wide-scale national and international community studies with a focus on diagnosis, prevention and treatment of diabetes and cardiovascular disease.

Our mission is to reduce death and disability from cardiovascular disease, diabetes and related disorders, two prevalent and complex diseases responsible for the most deaths and the highest costs in the world in terms of treatments and hospitalisation.

Our main laboratory facilities located at AMREP in Melbourne are complemented by a network that includes a research facility in Alice Springs dedicated to Indigenous health, and leading researchers based around the country.

The Institute's work covers six broad themes of research, each of which supports groups of scientists who work in laboratory settings as well as researchers who work in the community. This integration of basic scientists with epidemiologists, clinicians and public health professionals is central to Baker IDI's strategy to perform research that is directly informed by community needs and to translate discoveries into everyday clinical practice.

Institute Research Themes

Population Studies and Profiling

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

Human Physiology and Behavioural Science

The focus of this group is on metabolism and blood vessel function including behavioural and environmental influences such as physical activity and nutrition. This work is directed toward prevention, risk prediction and novel intervention strategies for obesity, diabetes, coronary and peripheral blood vessel disease.

Metabolism

The group explores the complex relationship between 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 disease and is currently the fastest growing disorder in Australia. Among its many debilitating complications are heart and vascular disease, kidney and eye disease. This group 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 Biology and Hypertension

This group 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, acute coronary syndromes and better treatment options for atrial fibrillation (AF) are among the research areas investigated by this group. The focus is on taking laboratory findings and translating them into better drugs, surgical and therapeutic devices for people suffering from heart disease.

As well as these research themes, we have a strong presence in health care that includes a multidisciplinary, evidence-based diabetes clinic, diabetes education, and the Healthy Hearts Clinic, providing cardiovascular disease risk assessments to the community.

Baker IDI is also active in training health professionals and collaborating on international projects in heart disease and diabetes.

Head of the Lipoproteins and Atherosclerosis Laboratory, Professor Dmitri Sviridov (R) with Research Assistant, Leah Cui.

Over the years, our researchers have been responsible for many groundbreaking advances including:

- Proving that exercise can lower blood pressure
- Finding new non-drug approaches to lower blood pressure
- Greater understanding of the impact of scarring within the heart using cardiac imaging
- Proving that mental stress provides powerful, selective and potentially harmful stimulation of the nerves of the heart
- Advancing understanding of how obesity leads to insulin resistance and diabetes
- Establishing open heart surgery in Australia in collaboration with The Alfred hospital
- Developing a method to repair heart valves without surgery
- Identifying key factors involved in clotting
- Defining the differences between type 1 and type 2 diabetes
- Identifying pathways that explain how sugar can cause permanent damage to blood vessels
- Leading research efforts and helping to inform guidelines around weight-loss surgery

Baker IDI Research Framework

Baker IDI's research agenda is based on the notion of a disease continuum from birth to death, with the opportunity of preventing the progression of disease at any stage. These themes encompass our activities ranging from cellular and molecular biology, to integrative physiology, population studies, preventative health initiatives and clinical services focused on:

- **Early life:** includes the experiences during pregnancy and infancy that may be a determinant of an individual's propensity to develop diabetes, metabolic syndrome and subsequently, cardiovascular disease in middle age.
- **Childhood and adolescence:** with a view to informing policy and developing novel ways of altering the balance in an individual between energy expenditure, food intake and nutrient density, as well as providing better information on optimal diets and physical activity programs.
- **Adults with risk factors:** including assessment of cardiac and metabolic risk; the causes and treatment of the major cardiovascular risk factors particularly diabetes, hypertension and abnormalities of blood fats; and risk factor clusters such as the metabolic syndrome.
- **Sub-clinical organ damage:** with a focus on the time in life when asymptomatic risk factors cause measurable changes in the body, particularly the arteries of the heart, brain, kidneys and eyes.
- **Acute complications:** heart attack, stroke and sudden death; with a focus on understanding the mechanisms underlying the development and rupture of unstable plaques.
- **Clinical complications:** angina, kidney failure, with a focus on the development of disease management programs, particularly in high risk communities such as the Australian Indigenous community.
- **Heart failure and terminal disease:** includes fundamental research aimed at maintaining the viability and function of heart cells in the context of advanced disease, the prevention of complications of a failing heart such as arrhythmia, and stem cell research to replace damaged heart muscle or help arteries heal.

Head of Epigenomic Medicine, Dr Tom Karagiannis (R) with Honours student, Runa Lindblom.

Research Highlights

Our work spans cellular and molecular studies to wide-scale community screening and intervention programs, and the translation of research findings into the next stage of therapy development. Highlights over the past year include a focus on disease and disease prevention in the following life stages:

Early Life

- Baker IDI is participating in the Northern Territory (NT) Diabetes in Pregnancy Partnership Project to develop a clinical register of women with diabetes in pregnancy in the NT. This project aims to assist with healthcare planning and service delivery.
- Description of the molecular mechanism that explains how blood vessels are damaged by prior episodes of high glucose. A well-described clinical phenomenon called metabolic memory is starting to be unravelled using modern molecular biology techniques.

Childhood and Adolescence

- Baker IDI researchers are collaborating on a study to determine if children identified with minor heart abnormalities are at greater risk of rheumatic heart disease or contracting acute rheumatic fever.
- Discovery that activation of Heat Shock Protein 72 with a small molecule activator improves glucose homeostasis in patients with type 2 diabetes.

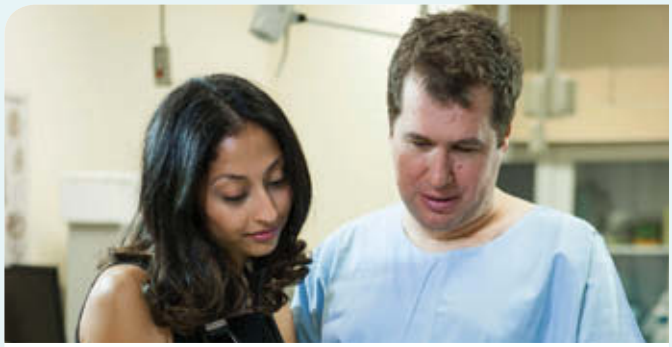
Adults with Risk Factors

- Presented the findings of a 12-year follow-up study of 11,000 participants in the Australian Diabetes, Obesity and Lifestyle Study (AusDiab) in August 2013. The findings showed: living in the most socially-disadvantaged areas of Australia doubled the risk of developing diabetes; people with previously known diabetes had a similar risk of mortality to smokers; and diabetes, obesity and kidney disease each increased the risks of having depression.
- Baker IDI worked with a publisher to produce a book explaining diabetes. Understanding Type 2 Diabetes provides information for the community about practical changes people can make to their lifestyle to maintain and improve health, and explores the medical aspects of diabetes care.
- Baker IDI researchers played a lead role in the International Diabetes Federation's World Diabetes Congress, which was held in Melbourne in December 2013 and attracted around 10,000 delegates. The scientific program was chaired by Professor Paul Zimmet AO, with Associate Professor Jonathan Shaw and Professor Mark Cooper leading scientific streams.

- The NT Department of Health and Families and Baker IDI hosted an educational symposium in Alice Springs in October 2013 for health professionals working with the impact of chronic disease in Indigenous communities, particularly in remote settings.
- Baker IDI researchers identified a model to study stress-related high blood pressure. They demonstrated that a defect in a receptor in the brain pathway is activated during emotional stress, which leads to an overactive nervous system, particularly to the kidney, resulting in greater release of the hormone, renin, during the active period when it is normally suppressed. This work was published in *Hypertension* in July 2013.
- Described a new cholesterol transporter gene, ABCA12, which may be a key to managing cellular cholesterol homeostasis. This research was published in *Cell Metabolism* in August 2013.

Sub-clinical Organ Damage

- Developed a new clot-busting drug that overcomes the risk of bleeding – a complication that prevents many stroke and heart attack patients receiving potentially life-saving treatment. The study was published in *Circulation Research*.
- Demonstrates that depleting CD8+T- cells has the potential to limit plaque progression. This finding (*Circulation*, November 2013) could help tackle atherosclerosis.
- Identified an important new role for members of the Bone Morphogenetic Protein family in controlling skeletal muscle size. (*Journal of Cell Biology,* October 2013). This changes the perspective on the mechanisms at work inside muscle cells during health and disease.
- Discovered that patients with hypertrophic cardiomyopathy with specific pathogenic mutations have significantly more regional scarring around the heart but less stiffness of the cardiac muscle. (*Journal of the American College of Cardiology,* March 2013).
- Demonstrated in a *Journal of the American Medical Association* publication that patients with peripheral arterial disease (PAD) of the legs can enjoy longer and more pain-free time on their feet when treated with a standard anti-hypertensive drug, Ramipril. This drug is not currently indicated for leg pain caused by PAD but Baker IDI researchers are lobbying the Therapeutic Goods Administration and industry for a change in guidelines.
- Baker IDI and Alfred Health researchers have identified a protein called MIF (macrophage migration inhibitory factor) that could be used as a test to promptly diagnose heart attacks and rapidly estimate the extent of damaged heart muscle. Collaboration is ongoing with China's Peking University to evaluate the prognostic value of MIF as a biomarker in 2000 cases of myocardial infarction.



Dr James Shaw (R), Interventional Cardiologist, with Alfred hospital registrar, Dr Meenal Sharma.

Head of Vascular Biotechnology Laboratory, Professor Christoph Hagemeyer (R) with PhD student, Katie Ardipradja.

Clinical Complications

- Identified that older adults with diabetes are at least 50% more likely to have a physical disability than those without diabetes. The results of this systematic review and meta-analysis were published in *The Lancet Diabetes and Endocrinology* in July 2013.
- Demonstrated the need for screening of mild cognitive impairment in patients with chronic AF to identify patients for whom more intensive surveillance is required to maintain clinical stability and optimise disease management following hospital discharge. The findings were published in *Heart* in April 2013.
- Identified that inhibiting various forms of an enzyme called Nox (e.g. Nox1 and Nox4) could reduce blood vessel, kidney and eye complications in diabetes. This has stimulated a clinical trial of a Nox inhibitor in diabetic kidney disease.
- Developed a potential new target called CDA1 for the treatment of renal fibrosis in people with diabetic and non-diabetic kidney disease. This work, published in *Journal of American Society of Nephrology*, has now led to a major program to identify inhibitors of this target as a strategy to reduce kidney scarring.
- One of Baker IDI's leading Indigenous researchers was the local convenor of the 2013 Australasian HIV and AIDS conference in Darwin, which examined the experiences of Aboriginal and Torres Strait Islander people affected by HIV. This research is important in understanding the intersection of communicable and non-communicable diseases, which contributes to a greater chronic diseases burden in remote communities.

Acute Complications

- Baker IDI researchers led one of the largest studies assessing the perceptions of Australian heart attack survivors and those who care for them. The report entitled 'Two Hearts One Future', released in July 2013, uncovered a concerning level of patient complacency and highlighted the emotional burden faced by their carers.
- Baker IDI researchers co-authored a report on diabetic eye disease in Australia, in conjunction with the Centre for Eye Research Australia. 'Out of Sight' outlined the impact of eye disease and what can be done to combat this leading cause of irreversible blindness. The report was released in October 2013 to coincide with World Sight Day.

Future Directions

The Institute has established a range of state-of-the-art facilities designed to enhance diabetes and heart disease research and management.

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 this 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 disease.

DNA and Blood Profiling

The establishment of this facility several years ago represents a major advance in the area of personalised 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 this 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.

Bioinformatics

An internal, web accessible analysis workbench called 'Galaxy' runs on dedicated hardware at Baker IDI, allowing scientists to use popular third party tools to study large data sets without needing to manage complex code. Galaxy supports transparent translational genomic and genetic research, and supports sharing of analyses and results among Baker IDI researchers. Head of Computational Biology at Baker IDI, Dr Ross Lazarus is a founding member of the team that created 'Galaxy'. He has also contributed new tools and code, including the Galaxy 'Tool Factory'.

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. Australia's first Healthy Lifestyle Research Centre is enabling Baker IDI scientists to examine how genetic and environmental factors combine to influence body weight. This unique facility is helping to improve our understanding of the effects of physical activity and nutrition for the prevention, management and treatment of obesity and its complications, including diabetes and cardiovascular disease.

Head of Diabetes Clinics, Associate Professor Neale Cohen (L), with a patient in the diabetes clinic.

Specialist Diabetes Clinic

The Baker IDI Specialist Diabetes Clinic provides diabetes services in Melbourne's inner southeast and west, to communities in and around Alice Springs, and via a telehealth service that has commenced in collaboration with the Royal Flying Doctor Service in Mildura.

The Clinic services more than 5,000 patients and is the largest facility of its kind in Australia. The co-location of these clinical services with Baker IDI's research facilities provides significant opportunities to link groundbreaking research with patient care. Recent additions to the Clinic's services include a Weight Assessment and Management Clinic for people with severe obesity, and a respiratory specialist for diabetes patients with respiratory and sleep disorders.

Baker IDI's Indigenous Health Program

Infectious and chronic non-communicable diseases such as cardiovascular, kidney disease and diabetes are major contributors to the gap in life expectancy between Indigenous and non-Indigenous Australians. Baker IDI's Indigenous health program aims to address the profound disadvantage experienced by Aboriginal Australians and Torres Strait Islanders, and to build a long-term strategic platform for health and medical research in these communities.

The Indigenous health program now supports four higher degree research students undertaking PhDs and three new post-doctoral research fellows, including Aboriginal and Māori researchers. Indigenous maternal and child health expert, Professor Sandra Eades has been appointed as the Indigenous program lead and joins Indigenous researcher and Deputy Director of the program, James Ward.

Indigenous Research Fellow, Ricky Mentha, who has previously worked as an Aboriginal Health Worker and community development officer, undertook a Master's degree.

Clinical Research Centre

Baker IDI is home to leading researchers skilled in the use of cardiac imaging technology. To cement our position in this field, the Institute is establishing Australasia's first comprehensive 'Research Centre of Excellence in Cardiac, Diabetes and Metabolic Imaging', which will incorporate MRI (magnetic resonance imaging), CT (computed tomography) and echocardiography. The imaging suite will be located on the AMREP campus with direct links to the Institute's Diabetes Clinic and Healthy Lifestyle Research Centre. The facility, which is expected to be operational by the second half of 2014, will form the basis of a broad-based preventative health and clinical research centre, opening up new imaging modalities to researchers and clinicians.

International Collaborations

Baker IDI has a long and proud history of international collaboration and this approach continues to underpin the Institute's research program. Below is a brief snapshot of international collaborations. For a more comprehensive overview, see Baker IDI's latest Annual Reports at www.bakeridi.edu.au/Reports/

Informing Health Care Policy in South Africa

The Baker IDI / NHMRC Centre of Research Excellence to Reduce Inequality in Heart Disease is collaborating with the Hatter Institute, University of Cape Town in South Africa to document emergent heart disease in Africa's largest urban concentration of black Africans. Comprehensive data from more than 6,000 hospital cases (2006-2008) and 1,300 primary care cases (2009) has resulted in unique reports on emergent heart disease, heart failure, hypertension, rheumatic heart disease, HIV and heart disease, AF and the primary care burden of heart disease. The data have informed and influenced health care policy in South Africa. A new phase of research involving wider collaborations in Africa (particularly Nigeria) has extended heart disease surveillance in sub-Saharan Africa, as well as a multicentre primary prevention study involving pregnant women and their families.

Infectious Disease and Risk of Cardiovascular Disease

The laboratory of Lipoproteins and Atherosclerosis has been collaborating with the Department of Microbiology, Immunology and Tropical Diseases, and Division of Cardiology at George Washington University in the US for the past 12 years on a series of projects connecting infectious and cardiovascular diseases. Funded by four NIH grants and three NHMRC grants, the projects aim to identify how infectious diseases, especially HIV, increase the risk of cardiovascular diseases.

Plasma Lipids in Chronic Disease

The Metabolomics Laboratory is collaborating with the Department of Genetics at San Antonio's Texas Biomedical Research Institute. This collaboration is focused on the integration of lipidomic and genomic datasets from the San Antonio Family Heart Study to better understand the relationship between genetic plasma lipids and the risk of cardiovascular disease and type 2 diabetes. The collaboration is funded from NIH and NHMRC Project Grants and has resulted in four publications.

Associate Professor Anna Peeters, Head of Obesity and Population Health, runs a research program that aims to build the evidence base for public health policy regarding the prevention and management of obesity and its consequent diseases.

Early Markers of Diabetes Complications

The Biochemistry of Diabetes Complications laboratory is working with the Finnish Diabetic Nephropathy (FinnDiane) Study at the University of Helsinki, Finland. The project aims to identify and validate early markers of an increased risk of complications, including kidney disease, cardiovascular disease and mortality. Samples from the FinnDiane cohort are being assessed at Baker IDI, while hypotheses generated at the Institute are being tested in Finland. This ongoing collaboration has already generated over 20 high impact publications.

Director Emeritus at Baker IDI, Professor Paul Zimmet AO (L), receives the Peter Wills Medal from Research Australia Deputy Chair, Mr Peter Wills AC (R) at the Research Australia Awards in November 2013.

Selected Awards

- Baker IDI Chief Executive, Professor Garry Jennings, was recognised with an Officer of the Order of Australia (AO) in the 2013 Queen's Birthday Honours List for his contribution to medical research and education.
- Director Emeritus at Baker IDI, Professor Paul Zimmet AO, was presented with The Peter Wills Medal at the Research Australia Awards in November 2013.
- Hypertension expert and Senior Director at Baker IDI, Professor Murray Esler AM, was recognised with the American Heart Association's Excellence Award in Hypertension Research in New Orleans in October 2013.
- Chief Scientific Officer, Professor Mark Cooper, was awarded the Outstanding Foreign Investigator Award by the Japanese Society of Diabetic Complications.
- Head of Obesity and Population Health, Associate Professor Anna Peeters, was awarded the André Mayer Award by the International Association for the Study of Obesity.
- Professor Bronwyn Kingwell was named in the NHMRC's list of High Achievers in 2013.
- PhD student, Arpeeta Sharma, from the Molecular Group in the Diabetes Complications Division was the recipient of the Young Investigator Award at the Australian Atherosclerosis Society and the Ken Piafsky Trainee Presentation Award from the Canadian Society of Pharmacology and Therapeutics.
- Dr Kathryn Backholer from Obesity and Population Health was awarded the Australian and New Zealand Obesity Society Young Investigator Award.
- Dr Alex McLellan from the Clinical Electrophysiology Group was awarded the Young Investigator Award at the Asia Pacific Heart Rhythm Society conference.

Postgraduate Students

76 PhD Students
3 Masters Students

Publications

412 Journal Articles
5 Book Chapters
2 Books
1 Commissioned Report

www.nucleusnetwork.com.au

A volunteer trial participant is monitored in the Nucleus Network facility.

Nucleus Network

Chief Executive Officer: Bev Thomas BPharm, PhD, MBA, Graduate of Australian Institute of Company Directors

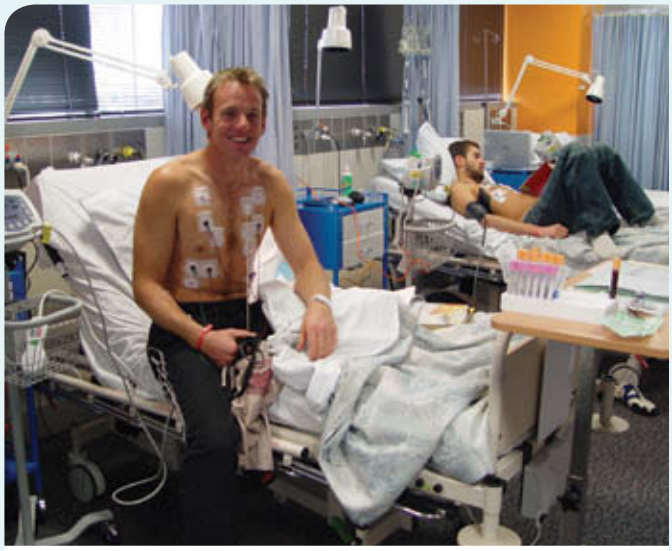
Nucleus Network is a not-for-profit clinical research company wholly owned by Baker IDI Heart and Diabetes Institute. The organisation is one of Australia's leading early phase clinical research facilities. The not-for-profit status enables the establishment of unique collaborations with hospital-based principal investigators, medical schools and access to dedicated research facilities and capabilities across AMREP.

The Centre for Clinical Studies at AMREP, together with the Centre for Clinical Studies at the Austin Hospital in Heidelberg, are purpose-built facilities for the conduct of clinical trials and are core to the business of Nucleus Network. In addition to conducting early phase clinical trials, Nucleus Network provides clinical trial consulting services focusing on the transition of new products from preclinical testing into clinical application.

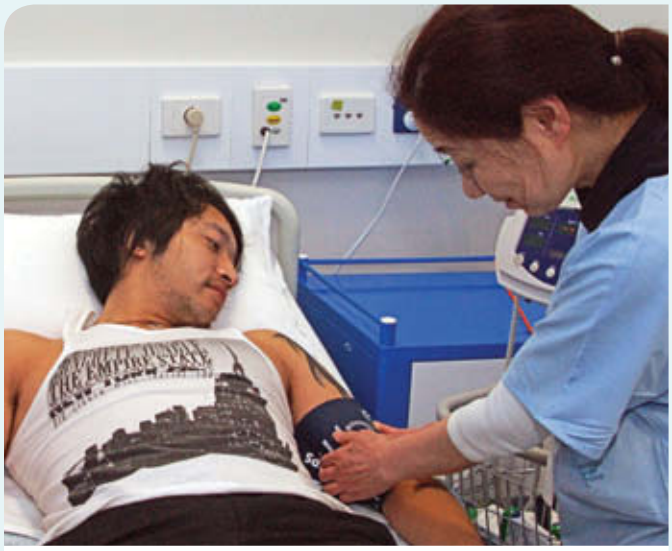
Phase 1 clinical trials, where a new drug therapy is tested in a healthy volunteer or in patients with specific medical conditions, are integral in the development of new therapies. Nucleus Network relies on community involvement in this process, and is grateful for the time and effort volunteered by participants, without whom new medicines would not reach the people who need them most. The information collected from clinical trials monitors and protects the participants' health and also provides crucial information about the therapy under trial.

Highlights in 2013

- Over $2 million of services, donations, education subsidies and contract work paid to AMREP members
- Approximately $10 million in direct export revenue generated for the Australian biopharmaceutical industry in addition to flow-on benefits for the industry and other economic sectors
- Clients include international pharmaceutical and biotech companies from Australia, USA, France, New Zealand, China, India and the United Kingdom
- More than 30 clinical trials conducted
- Expansion of AMREP facility from 24 to 41 beds
- New dedicated website for recruiting healthy volunteers and patient studies: clinicalstudies.com.au
- Support of investigator-led studies in spinal cord injury patients and heart failure patients
- Appointment of Head of Clinical Operations, Cameron Johnson, who has over 10 years of international early-phase clinical trial experience and has held various senior management roles at a number of Australian early phase clinical trials organisations
- Five direct student placements plus support provided to external researchers (including PhDs)



Volunteer trial participants in the Nucleus Network facility.



A volunteer trial participant has his blood pressure monitored by a Clinical Trial Research Nurse in the Nucleus Network facility.


Burnet Institute
Medical Research. Practical Action.

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Burnet Institute – Centres and Working Groups

Director: Professor Brendan Crabb
Deputy Directors: Professor Mike Toole AM and Associate Professor David Anderson

Centre for Biomedical Research

Heads: Prof. Sharon Lewin and Prof. James Beeson
Deputy Head: Prof. Paul Gorry

Anderson Laboratory
Diagnostics Development

Beeson / Richards Laboratory
Malaria Immunity & Vaccines

Caminschi Laboratory
Dendritic Cell Biology & Immunotherapy

Churchill Laboratory
HIV Neuropathogenesis

Crowe Laboratory
International Clinical Research & HIV

Drummer/Poumbourios Laboratory
Viral Fusion

iCRL
International Clinical Research Laboratory WHO-Accredited Regional Reference Laboratory

Gilson/Crabb Laboratory
Malaria Research

Gorry Laboratory
HIV Molecular Pathogenesis

Gugasyan Laboratory
Lymphocyte Biology

Hogarth Laboratory
Inflammation, Cancer & Infection

Jaworowski Laboratory
HIV Pathogenesis

Lahoud Laboratory
Dendritic Cell Receptors

Lewin/Cameron Laboratory
HIV & Hepatitis Immunopathogenesis

Ffrench Laboratory
Viral Immunology

Fowkes Group
Malaria & Infectious Diseases Epidemiology

O'Keeffe Laboratory
Dendritic Cell Research

Pietersz Laboratory
Bio-organic & Medicinal Chemistry

Ramsland Laboratory
Structural Immunology

Tachedjian Laboratory
Retroviral Biology & Antivirals

Tannock Laboratory
Influenza

Wright Group
Neuro AIDS Research

Gowans/Loveland Laboratory
Hepatitis C Immunity & Imunotherapies

Centre for Population Health

Head: Prof. Margaret Hellard

Infectious Diseases & Malaria: F Fowkes

Drugs and Alcohol: P Dietze & P Higgs

Justice Health: M Stoové

Viral Hepatitis: M Hellard

HIV: M Stoové

Sexual Health: M Hellard & M Lim

Modelling & Biostatistics: E McBryde

Infectious Disease Surveillance: C El-Hayek

Centre for International Health

Head: Prof. Robert Power

Internatonial Operations: M Tennant

Infectious Disease & Harm Reduction: C Hughes

Women's & Children's Health: S Luchters

Education & Capacity Development: E Kennedy

Associate Professor Stanley Luchters was Co-head of the Centre for International Health until June 2013.

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Burnet's public health programs on women and children's health in resource-poor settings have included Lao PDR. Girl holding child in Lao. Photography: Burnet Institute.

Burnet Institute

Director: Professor Brendan Crabb PhD

In 2013, in addition to our core activities, we implemented a number of new strategic initiatives that build on our existing capacity and open up new opportunities for the Institute across the region.

Our research quality and innovation was reflected in a significant increase in competitive funding received from the NHMRC. Close to 33% of grants submitted from Burnet researchers received funding, against a national average of 19%. A total of 15 grants received funding with a combined value of $7.08 million, up almost $2 million on the previous year. We continued to meet other indicators of success with 200 publications in peer-reviewed journals, an increase of 10% on 2012, and the significant progression of our translational research program activity.

A number of health priorities have emerged in our region that require urgent attention. These include the emergence of multidrug-resistant tuberculosis (MDR-TB) as well as the incredibly high rate of women and newborns who die as a result of childbirth in countries such as Papua New Guinea (PNG) and Myanmar. We have developed a number of new initiatives to address these problems.

TB has been neglected for many years and we now have an epidemic emerging on our doorstep. Globally, 58% of TB cases and 40% of MDR cases are located in our region requiring a multifaceted approach to address the problem. Over the past 12 months we have commenced building a strong team of TB clinicians, researchers and epidemiologists as well as hosting the first regional forum on TB. One of the major outcomes of the forum was the development of collaborations between other research groups, public health partners, commercial organisations and regional governments, and the formation of the soon-to-be launched Australasian Tuberculosis Forum (ATF). Our plans are to develop a robust research and public health response to the issues, and progress the development of rapid diagnostic tests, new drug therapies and vaccines.

In another major new initiative, Burnet launched its 'Healthy Mothers, Healthy Babies' program in PNG in May. The program was officially launched by the then Australian Minister for Foreign Affairs, Senator the Hon. Bob Carr and the PNG Minister for Foreign Affairs, the Hon. Rimbink Pato. The $5 million five-year program is focused on developing research to identify the major causes of the high mortality rate in women and newborns during, or shortly after, childbirth and to formulate the most effective strategies. The initiative involves a cross-centre approach at Burnet and multiple collaborations with our partners in PNG, the PNG Institute for Medical Research (IMR), the National Department of Health, and the University of PNG.

We continued to progress the roll out of clinical trials of our CD4 rapid diagnostic point-of-care test in PNG, India and in Africa, with funding received from the NHMRC and the Bill and Melinda Gates Foundation, and have significantly progressed our hepatitis C candidate vaccine initiative.

In addition, we recently secured a partnership in China to develop in-country a rapid diagnostic test for the detection of liver disease. To enable this to progress, we have formed Nanjing Biopoint Diagnostics through the support of the Chinese Government, which will utilise and adapt core Burnet Institute technologies to develop the specific test. This is a significant initiative for the Institute and consolidates many years of working within China, to help address some of the major health issues in the country.

The programs mentioned above underscore the significance of Burnet's internal and international collaborations that are critical to the Institute's success and how we operate today.

Centre for Biomedical Research

Through integrating discovery-based research, translational research, and clinical and population research, the Centre for Biomedical Research aims to achieve new advances in treatments, vaccines, diagnostic tests and prevention strategies to address diseases of major global importance.

The Centre has a broad research program in infectious diseases, autoimmune and inflammatory diseases, and cancer, as well as research into understanding how the immune system fights infectious diseases and cancer, or malfunctions in autoimmune diseases. This includes the infectious diseases HIV, malaria, hepatitis B and C, tuberculosis and influenza, as well as arthritis and lupus, and breast, ovarian, cervical and prostate cancer.

Professor Paul Gorry supervising a student in his laboratory.

Creation of Collaborative Research Programs

The establishment of four Collaborative Research Programs (CRPs), focused on the major themes that encompass our primary areas of research, brings together researchers with common or complementary interests and expertise. The CRP initiative aims to enhance interactions and sharing of knowledge and expertise between research groups, and promote collaborations and partnerships across Burnet. In addition, the Centre's research and CRPs link with the whole-Institute priority areas of infectious diseases, immunity, vaccines and immunisation, maternal and child health, sexual and reproductive health, and young person's health. During 2013, we also promoted the continued growth of emerging areas of research on TB and nutrition, with links to other Burnet Centres.

Grants and Funding

It was an exceptionally successful year in obtaining research funding from the NHMRC, international funding agencies and other sources. In the last round of NHMRC funding, 16 of the Centre's Laboratory heads featured in successful NHMRC grants. We also received several grants in the latest round of funding from the Australian Centre for HIV and Hepatitis, funding from international agencies, including the National Institutes of Health USA, and the Bill and Melinda Gates Foundation, and other funding sources.

New Approaches for HIV Vaccines

The Drummer / Poumbourios Laboratory discovered a new method for enhancing the presentation of neutralising antibody epitopes on an HIV-1 vaccine candidate by forcing evolutionary changes in the viral surface glycoproteins. The findings provide a starting point for designing new, more effective vaccines aimed at stopping the spread of HIV-1.

Publication highlight: *Drummer HE et al. Allosteric modulation of the HIV-1 gp120-gp41 association site by adjacent gp120 variable region 1 (V1) N-glycans linked to neutralization sensitivity. PLoS Pathog 2013;9(4):e1003218.*

Malaria Vaccine Development

Results from a comprehensive study of human immunity to malaria led by Professor James Beeson and Dr Jack Richards identified key targets of protective antibodies that have strong potential for development as malaria vaccines. The team evaluated immune responses to over 90 different malaria antigens in 200 children in PNG who were monitored over time for malaria infection. In related studies, the group showed that antibodies to some of these proteins block the ability of malaria to infect human red blood cells. However, malaria also has a trick up its sleeve, being able to dodge immune responses by using different proteins to attach to red blood cells. Overcoming this evasion strategy will be important in developing an effective vaccine.

Publication highlights:
Richards JS et al. Identification and prioritization of merozoite antigens as targets of protective human immunity to Plasmodium falciparum malaria for vaccine and biomarker development. J Immunol 2013:191(2):795-809.

Persson KE et al. Erythrocyte-binding antigens of Plasmodium falciparum are targets of human inhibitory antibodies and function to evade naturally acquired immunity. J Immunol 2013;191(2):785-94.

Burnet staff are involved in providing training in laboratory and public health research at the Honours and postgraduate (Masters and PhD) levels.

Malarial Molecular Mechanisms: Future Drug Target

The Crabb / Gilson Laboratory revealed the mechanism of a molecular switching system in malaria parasites that could be a future drug target. As malaria parasites grow inside human cells they need to make a range of decisions, such as when to invade new red blood cells and when to get ready to spread by mosquitoes. Kinases are enzymes that play an important role in the parasites' decision-making circuits by switching other proteins on and off. The Laboratory is identifying ways to develop new malaria drugs capable of blocking kinases.

Publication highlight: *Azevedo MF et al. Inhibition of Plasmodium falciparum CDPK1 by conditional expression of its J-domain demonstrates a key role in schizont development. Biochem J 2013;452(3):433-41.*

Vaccine Targeting to Dendritic Cells

The Caminschi Laboratory has shown that delivering vaccines directly to dendritic cells is an extremely potent method of eliciting immunity. Ongoing work is focusing on identifying the mechanism that facilitates this immunity so that they can harness the knowledge for the rational design of new vaccine strategies. In collaboration with multiple teams they are looking to apply their knowledge to different technologies and different diseases.

Publication highlight: *Park HY et al. Evolution of B cell responses to Clec9A-targeted antigen. J Immunol 2013;191(10):4919-25.*

Therapeutic Approaches to Flush out HIV

When HIV-infected patients are treated, the virus is able to hide in resting T-cells in a 'latent' form. Latency is the main reason why current treatment is unable to cure HIV. In a major achievement, the first clinical trial was completed of a cancer drug, vorinostat, in HIV treatment. The drug was used to 'flush out' HIV from the latent reservoir of infected cells. The Lewin Laboratory has identified a number of additional signals required in order to establish latent infection in the laboratory. They initially identified the importance of the chemokine CCL19 and, more recently, the role of dendritic cells. Dendritic cells are in close contact with T-cells in lymphoid tissue and via this close contact can give the T-cell a specific signal that opens the door to the virus. These models of latent infection are very important for finding new ways to lure the virus out of hiding.

Publication highlights: *Evans VA et al. Myeloid dendritic cells induce HIV-1 latency in non-proliferating CD4+ T cells. PLoS Pathog 2013;9(12):e1003799.*

Spina CA, Anderson JL et al. An in-depth comparison of latent HIV-1 reactivation in multiple cell model systems and resting CD4+ T cells from aviremic patients. PLoS Pathog 2013;9(12):e1003834.

HIV Drug Resistance and Clinical Management of HIV

The Gorry Laboratory discovered the mechanism of HIV-1 resistance to maraviroc, an antiretroviral drug in the CCR5 receptor antagonist class. Unlike resistance to other anti-HIV drugs, resistance to maraviroc was not due to common genetic changes within the HIV sequence, but rather, different genetic changes that resulted in HIV adopting a common but altered function. They also produced new clinical tools that predict HIV response to maraviroc; these are available on the Burnet website and will assist in the clinical management of HIV patients.

Publication highlight: *Roche M et al. A common mechanism of clinical HIV-1 resistance to the CCR5 antagonist maraviroc despite divergent resistance levels and lack of common gp120 resistance mutations. Retrovirology 2013;10:43.*

Centre for Population Health

The Centre aims 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. HIV, hepatitis C, sexually transmitted infections, malaria, tuberculosis, and drug and alcohol use are serious health concerns in Australia, Asia and the Pacific. Reducing the impact of these infectious diseases, particularly in highly vulnerable populations and disease endemic areas, is an enormous challenge. We address these major health problems by implementing novel, multidisciplinary scientific programs that use cutting-edge epidemiology, high quality laboratory science, excellent clinical and social research, and strong public health principles.

Rapid HIV Test Clinic: PRONTO!

PRONTO! is Australia's first shop front rapid HIV test clinic, which was opened by the Victorian Minister for Health, the Hon. David Davis MP in August 2013. The venture is a collaboration between Burnet Institute and the Victorian AIDS Council / Gay Men's Health Centre (VAC/GMHC). It provides a quick HIV test using a simple pinprick of blood with results available within 20 minutes. More than 1000 clients have attended PRONTO! in Fitzroy, Victoria since its opening. The aim of the service is also to reduce HIV transmissions by overcoming barriers to more frequent testing by men for HIV. Burnet's Dr Alisa Pedrana and Mr David Leitinger (Honours student) will evaluate PRONTO! during its 24-month trial period, including the impact of the service on HIV testing frequency, service acceptability, and community engagement.

ACCESS Surveillance System

Previously focused on surveillance of chlamydia, ACCESS (Australian Collaboration for Chlamydia Enhanced Sentinel Surveillance) has received new funding to enable its testing of a broader range of sexually transmitted infections (STIs) and blood-borne viruses (BBVs). Testing and positivity information will now be gathered for chlamydia, gonorrhoea, syphilis, hepatitis C virus and hepatitis B virus. The Australian Collaboration for Enhanced Sentinel Surveillance of STIs and BBVs, is a collaboration with The Kirby Institute and NRL (the Australian not-for-profit organisation that supports testing for infectious diseases).

Funding Boost for Malaria Researcher

Head of Burnet's Malaria and Infectious Disease Epidemiology Group, Dr Freya Fowkes, has received more than $1.2 million for her research through an NHMRC grant and an ARC Future Fellowship. The funding will enable Dr Fowkes to undertake her research in malaria immuno-epidemiology, which aims to understand the immune response to malaria in pregnant women and infants, and to understand the interaction between immunity and the assessment of emerging drug resistance. The over-riding hypothesis is that differences in malaria transmission will lead to differential acquisition of immunity and efficacy of malaria interventions within, and between, populations. Understanding population dynamics of immunity to malaria is pivotal to develop new interventions, to understand the effectiveness of current malaria treatment, and control programs to reduce the global burden of malarial disease.

Tuberculosis in PNG's Western Province

Burnet's Dr Emma McBryde has used mathematical modelling to analyse the incidence of TB in PNG's Western Province. Dr McBryde was commissioned to undertake two evaluations on behalf of the Government of PNG, supported by the Department of Foreign Affairs and Trade (DFAT) - Australian Aid, of the high incidence of tuberculosis including drug-resistant forms. In the first evaluation, Dr McBryde quantified the incidence of TB, the rates of MDR-TB in the Western Province, and made a preliminary estimate of the burden of disease in comparison to the other high burden health conditions. In the second evaluation, she led a group to investigate different control strategies, developing mathematical and economic models of TB control in Western Province. TB remains a major contributor to the infectious diseases burden in PNG.

A community TB treatment support worker supervises a TB patient in Western Province PNG taking her daily medication. Photography: AusAID.

Risky Drinking by Young People

The second wave of data collection from the Young Adults and Alcohol Study was completed during 2013. The study has already provided unique data, highlighting the importance of packaged liquor in the high-risk drinking of young Victorians. The second wave of data collection will allow an examination of how drinking patterns change over time and how these changes relate to changes in the life circumstances of participants.

Evaluation of Take-Home Naloxone Programs

Professor Paul Dietze is involved in the evaluation of take-home naloxone programs that have been established in the ACT, New South Wales, Western Australia and, most recently, in Victoria. Naloxone is an overdose reversal drug that is being distributed to friends and family members of people who inject drugs, which is designed to improve overdose management and prevent fatalities.

Centre for International Health

The Centre responds to health problems in developing countries through the provision of technical advice and support, organisational capacity building, applied research, policy analysis and development, and training and education programs. Our expertise spans HIV prevention and care, women's and children's health, sexual and reproductive health, drug use, primary health care, strengthening national health systems, and education across these fields. Innovation, inquiry and influence underpin our public health approach. Working closely with communities, civil society organisations, governments, international non-government organisations (NGOs) and UN agencies, we can respond effectively to local health issues.

Long-term Burnet public health researcher Professor Robert Power was appointed to head up the Centre for International Health, having previously held a number of senior positions within the Institute. After 17 years as Head, Professor Mike Toole AM took on a new role as a Deputy Director of the Institute. During Professor Toole's extraordinary leadership, the Centre expanded from five staff to a team of more than 150, with many based in overseas offices. Professor Power is building on the significant work of the Centre whilst ensuring it is well positioned to respond to the challenges of working in the ever-changing development sector.

Myanmar

Dr Phone Myint Win, who has had a long association with Burnet Institute Myanmar (BIMM) since 2007, was appointed National Country Representative based in Yangon in June 2013. Building on the work of previous Country Representatives, Dr Phone has already made a significant contribution to Burnet's programs and oversaw the signing of a new four-year Memorandum of Understanding (MOU) with the Myanmar Ministry of Health that granted access for Burnet to work in all 14 regions of the country for the first time.

It has been a year of growth and change for the Myanmar Program. The scope of our HIV work is expanding by delivering services as well as providing capacity building and organisational support to civil society partners. Two long-running projects were completed – 'Strengthening HIV Responses through Partnership (PFHAB)'; and 'Male participation in improving maternal and newborn health: A community based intervention in Myanmar'. Both projects have provided important services to the populations and our local partners, and more broadly to the sector.

Five new projects are to commence that reflect our priority themes: 3MDG (Three Millennium Development Goal Fund) maternal, neonatal and child health with SAVE UK in Magway; GFATM (Global Fund to Fight AIDS, Tuberculosis, and Malaria) harm reduction, setting up drop-in-centres in five sites; 3MDG harm reduction, setting up drop-in-centres in Yangon and providing capacity building to local partners; monitoring and evaluation operational research; and the UNDP (United Nations Development Program) National HIV Household Socio-Economic Survey. Dr Karl Dorning is leading Burnet's component of the recently commenced Myanmar Education Consortium, providing an excellent base from which to build on our contribution to the health needs of the Myanmar population.

Papua New Guinea

East New Britain is the site for one of our two Global Fund projects to deliver 'Home-based Malaria Management'. The team of ten locally engaged staff provides training and supervision for more than 200 community-based volunteers. The aim of the project is to provide a first response to malaria via diagnosis and treatment, especially targeting the under-five-year-old age group. The outcome of this pilot will provide the government with important information to guide a national rollout of the approach. The Australian NGO Cooperation Program (ANCP) funded initiative, 'Engaging Men to Improve Health and Prevent Gender Based Violence in Papua New Guinea', which works through sporting clubs, has finalised the research component and in 2014 will commence providing the participants with information on the topics they have selected to improve their own health.

Women and children in Myanmar. Photography: Soe Lin Htut.

Since 2012, Burnet has partnered with the international health and social sector consulting firm Abt JTA and DFAT on the Health and HIV/AIDS Implementation Service Provider (HHISP) program. Since the program's inception, Burnet's role in HHISP has included general technical support; identification of resources (individuals and consultants); assisting the development of research initiatives; and implementing initiatives, ranging from consultancies to longer-term research projects. Among the nine HHISP projects, were a four-year Medical Supplies Impact Evaluation, the development of the National Health and HIV Research Agenda, and the redesign of documents for The PNG IMR and the Health Education and Clinical Services (HECS) program at the University of PNG. With the overarching objectives of improving maternal and child health outcomes, and delivering health and HIV services to rural and high risk populations, Burnet will continue to assist in the strengthening of the health system through HHISP until the program's closure in 2015.

Burnet continues to work with a wide range of stakeholders, national and East New Britain provincial government health departments, donors and locally-based health organisations including NGOs. We have an MOU to support the School of Public Health within the School of Medicine, and this year strengthened that relationship through facilitation of a curriculum development workshop aimed at providing an in-service opportunity for the teaching staff. Burnet has a close relationship with the PNG IMR and is currently supporting them in the appointment of a post-doctoral scientist.

The Butuwin clinic laboratory in Kokopo, East New Britain, PNG. Photography: Alex Umbers.

Compass: The Women's and Children's Health Knowledge Hub

The Women's and Children's Health Knowledge Hub concluded on 30 June 2013. The successful five-year partnership between Burnet, Menzies School of Health Research and the Centre for International Child Health, University of Melbourne has contributed to a range of outcomes including: setting global, regional and national health research priorities; consolidating evidence through systematic reviews and knowledge synthesis; and promoting and implementing evidence-based interventions for maternal and child health in the region.

Centre's First NHMRC Project Grant

Headed by Associate Professor Stanley Luchters, the Centre secured its first cross-Centre NHMRC Project Grant valued at more than $900,000. This research is a world-first intervention study to assess the effectiveness and impact of two newly-developed and unique low-cost, point-of-care (POC) tests for assessment of CD4 count (POC Visitect® CD4 test; developed by Burnet Institute) and early infant diagnosis of HIV (POC LYNX HIV p24; developed by Northwestern University). The study will be undertaken in PNG and China.

China (Tibet)

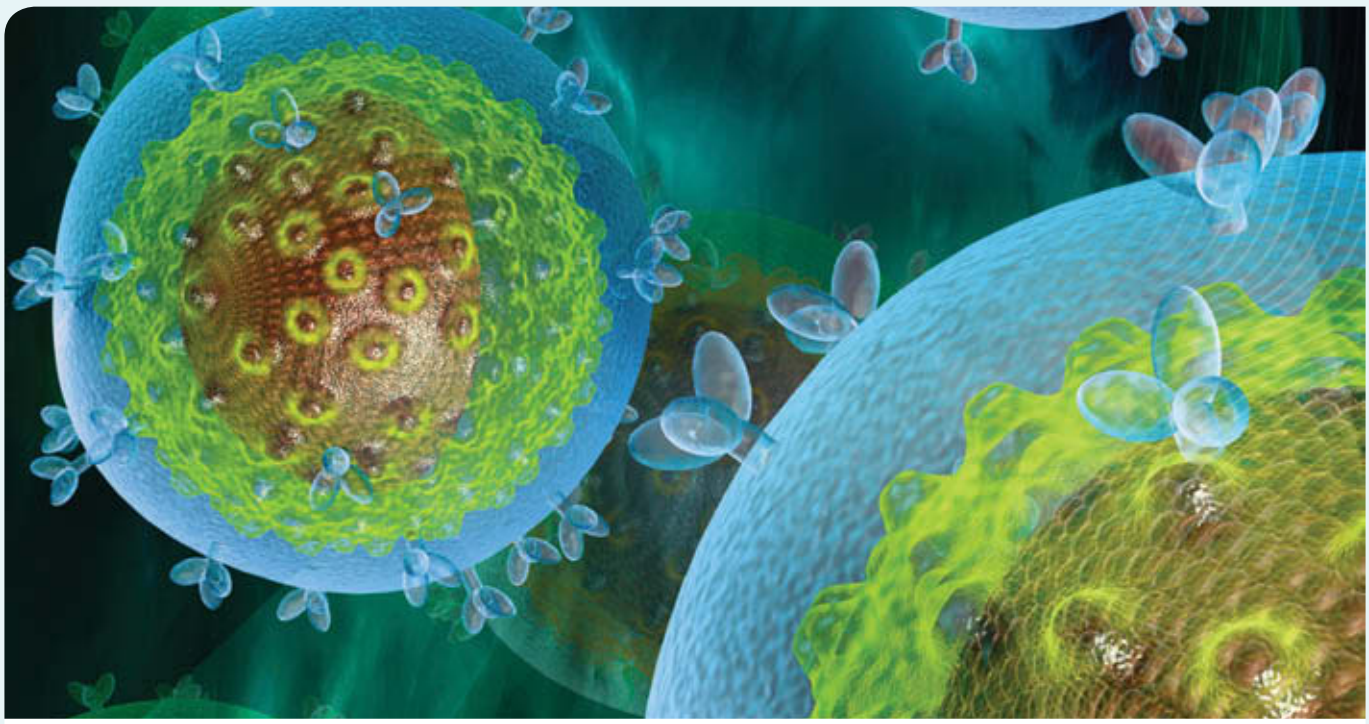
The Tibet Health Capacity Building Program was implemented in 2013. The Program is funded by the Australian and Chinese governments and is managed by the Burnet Institute in association with the Australian Red Cross. Activities have been designed to support and build the capacity of the Tibet Regional Health Bureau to implement the region's 12th five-year plan for health and beyond. In the first year, we trained over 800 health managers across areas of health policy, health law, health information management, safe blood use, hospital infection control, human resource management and financial management. One tangible and much needed resource that has been developed is a service guideline for county hospitals and clinics. These guidelines cover management and clinical areas, and will be used by the hospitals and clinics to make continuous improvements in service provision. We also supported the development of the region's infectious disease outbreak response plan.

Postgraduate Students

48 PhD Students

Publications

196 Journal Articles
3 Book Chapters



Graphic of HIV particles. Image: Burnet Institute.

MONASH University

Monash School of Public Health and Preventive Medicine

School of Public Health and Preventive Medicine
Head: Professor John McNeil AM

Prevention Science
Head: Prof. John McNeil

- **ASPREE** — Assoc. Prof. Robyn Woods
- **Cardiovasular Research** — Prof. Andrew Tonkin
- **Centre for Obesity Research & Education** — Assoc. Prof. Wendy Brown
- **Women's Health Research Program** — Prof. Susan Davis

Clinical Epidemiology
Head: Prof. Michael Abramson

- **CCRE Therapeutics** — Prof. Henry Krum
- **Clinical Epidemiology (Alfred)** — Prof. Michael Abramson
- **Musculoskeletal Epidemiology** — Prof. Flavia Cicuttini
- **Clinical Epidemiology (Cabrini)** — Prof. Rachelle Buchbinder
- **Infectious Diseases** — Assoc. Prof. Karin Leder
- **Australasian Cochrane Centre** — Prof. Sally Green, Steven McDonald

Renal Disease Prevention — Prof. Robert Atkins

Research Methodology
Head: Prof. Andrew Forbes

- **Biostatistics** — Prof. Andrew Forbes
- **Data Management** — Prof. Chris Reid
- **Epidemiological Modelling** — Prof. Andrew Forbes
- **Research Governance** — Marina Skiba

Health Services and Global Research
Head: Prof. Just Stoelwinder

- **Health Services Management** — Prof. Just Stoelwinder
- **Michael Kirby Centre for Public Health & Human Rights** — Assoc. Prof. Bebe Loff
- **Global Health & Society** — Prof. Brian Oldenburg
- **Clinical Registries** — Dr Sue Evans
- **Health Services Research** — Assoc. Prof. Catherine Joyce
- **Jean Hailes Research Unit** — Prof. Jane Fisher

Occupational and Environmental Health
Head: Prof. Malcolm Sim

- **Monash Centre for Occupational & Environmental Health** — Prof. Malcolm Sim
- **Australian Centre for Human Health Risk Assessment** — Prof. Brian Priestly
- **Water Quality** — Assoc. Prof. Karin Leder

Critical Care Research
Head: Prof. Jamie Cooper

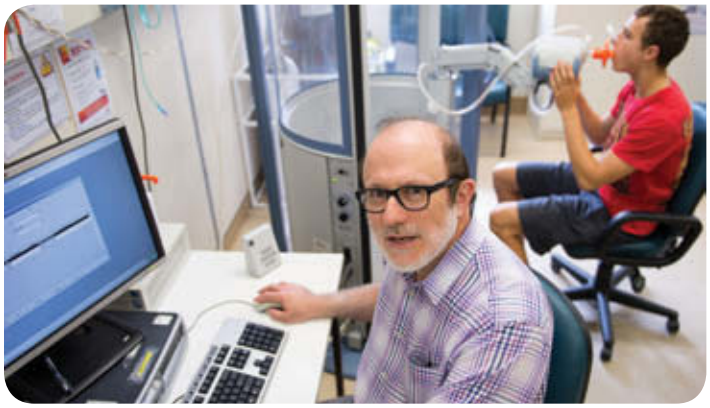
- **Intensive Care** — Prof. Jamie Cooper
- **ANZCA Research** — Prof. Paul Myles
- **Pre-hospital, Emergency & Trauma** — Assoc. Prof. Belinda Gabbe
- **Transfusion Research** — Assoc. Prof. Erica Wood

MONASH University

www.med.monash.edu.au/sphpm/

Epidemiology and Preventive Medicine

Director: Professor John McNeil AM, MSc, MBBS, PhD, FRACP, FAFPHM



Professor Michael Abramson (Deputy Head of the School of Public Health and Preventive Medicine / Head of Clinical Epidemiology) in The Alfred Lung Function Research Laboratory.

The Department of Epidemiology and Preventive Medicine (DEPM) 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 (QoL). The Department's research program takes place in settings ranging from remote communities and workplaces to intensive care units.

ASPREE Healthy Ageing Biobank

Headed by Professor John McNeil, the DEPM is developing the largest biobank in the world to focus on older people. Called the ASPREE (ASPirin in Reducing Events in the Elderly) Healthy Ageing Biobank, over 9,000 Australian participants aged 70 plus have donated blood and urine samples for long term storage, creating a valuable dataset for future research. Research into biomarkers may help predict diseases of ageing, such as dementia and cardiovascular disease, or even good health. Each sample in the biobank is matched with a wealth of clinical information about the participant's health at the time the sample was taken and throughout the duration of the study.

This year the National Cancer Institute in the US funded the collection of follow up samples taken three years from the first, significantly extending the research potential of the biobank. Specifically, the two samples will enable researchers to compare and measure changes in biomarkers and the effect of aspirin on key components in the blood and urine.

In order to reach participants living in regional and rural areas, the ASPREE Biobank team designed a mobile laboratory called the ASPREE 'Biobus' – a specially fitted out vehicle fully equipped to collect, process and store samples in portable nitrogen freezers. Specimens can then be safely transported back to main holding freezers for long-term storage. Combined, the three ASPREE Biobuses, two in Victoria and one in Tasmania, have travelled in excess of 150,000 km bringing research to the people.

Electromagnetic Energy Research Centre

Professor Michael Abramson secured a five-year $2.5 million NHMRC Centre of Research Excellence (CRE) grant for Population Health Research on Electromagnetic Energy, which commenced in 2013. Together with co-investigators including Professor Malcolm Sim and Dr Geza Benke (both with Monash Centre for Occupational and Environmental Health; MonCOEH), this international research collaboration includes researchers from the University of Wollongong, the University of Queensland, Utrecht University (Netherlands) and the Karlsruhe Institute of Technology (Germany). This CRE brings together leading population health researchers on the health effects of radiofrequency (RF) electromagnetic energy to address the WHO Research Agenda for RF Fields related to population health.

The CRE will generate new knowledge leading to improved health outcomes through a research program that includes:

- International studies of brain tumours in young people, cancer and neurological outcomes in older adults;
- Prospective cohort studies of neurocognitive function in children and adolescents;
- RF provocation studies on children;
- Human studies to identify processes underlying effects on brain function;
- Quantifying personal exposures from RF sources in the community;
- Monitoring personal exposure of RF and Magnetic Resonance Imaging (MRI) workers; and
- Risk perception and communication.

Outcomes will be translated into health policy and practice through linkages with international and national organisations.

Women's Health Research and Cancer

The Women's Health Research Program, led by Professor Susan Davis, secured a $655,321 NHMRC Project Grant to undertake the first clinical trial to investigate the use of the anti-diabetic drug metformin for the prevention of endometrial cancer. This study, to commence in 2014, will be a novel collaboration between Monash University, Prince Henry's Institute of Medical Research and leading oncologists, gynaecologists and expert diagnostic gynaecological ultrasonographers.

The Bupa Health Foundation Health and Wellbeing after Breast Cancer study led by Professors Susan Davis and Robin Bell was completed in 2013. The study involved the annual follow up of 1683 women recruited from the community within the first year of their diagnosis of invasive breast cancer. The researchers have documented the physical, psychological and social consequences of invasive breast cancer in women over six years of follow up. This is the largest and longest study of this nature conducted. It has resulted in 20 publications reporting on aspects ranging from the impact of breast cancer on sexual and psychological wellbeing, the relationships between breast cancer and pregnancy, hormone replacement therapy use, and cosmetic breast surgery, through to the use of alternative therapy, persistence with prescribed breast cancer therapy and factors influencing survival.

Veterans Health

Over the past decade MonCOEH has built a strong track record of achievement in the field of veterans' health research. MonCOEH has developed new areas of evidence-based research to investigate emerging issues relevant to Australian veterans to assist with policy development and practice.

Australia has about 80,000 active service men and women and reservists. Over the past 20 years Australian Defence personnel have been involved in an increasing number of deployments in combat and peacekeeping operations. These deployments put them at risk of being disabled by chronic illnesses, physical injury, post-traumatic stress disorders (PTSDs), other mental health problems or a combination of these conditions.

In 2003, MonCOEH completed its landmark research into the physical and mental health of Australian Gulf War Veterans, the first major piece of research conducted on Australian veterans since the Vietnam War. Over 80% of Gulf War Veterans took part in the study with their health compared to a military comparison group who were in the Defence Force at the time, but did not deploy to the Gulf. The study found notable increases in physical and mental health issues in the Gulf War Veterans with problems such as multi-symptom disorder and PTSD, and strong relationships with many exposures and experiences during their deployment to the Gulf. This study resulted in a major research report to the Department of Veterans' Affairs (DVA) and these findings, as well as a series of further analyses, have been published in the scientific literature over the past 10 years.

A follow up study is currently under way to investigate the longer-term health outcomes in these veterans and the impact on their wellbeing and physical and social functioning. There have been several innovative features in this body of research, including in the initial study a face-to-face physical and psychological assessment, as well as the taking of blood samples for storage. In the initial study there was linkage to the National Death Index and the Australian Cancer Database, while in the follow up study this linkage has been extended to Medicare, PBS and DVA held data. A key focus of the analysis is the persistence of, or recovery from, conditions found to be in excess at the time of the initial study and influencing factors.

Monash Centre for Occupational and Environmental Health has completed a decade of research into the health of Australian veterans.

Awards

- Professor Malcolm Sim received the Vice Chancellor's Award for Excellence in International Engagement and marked 25 years in DEPM.
- Professor Michael Abramson received a Community Service Award from the Asthma Foundation Victoria in recognition of his significant contribution to the understanding of asthma through research and support.
- Professor Olaf Drummer was presented with the Jean Servais Stas Medal at the 2013 German Society of Toxicology and Forensic Chemistry biennial meeting in recognition of his achievements in the field of forensic chemistry.

Postgraduate Students

136 PhD Students
12 Doctor of Public Health Students
1 MD Student
490 Masters Students

Publications

655 Journal Articles
1 Book
4 Book Chapters

www.core.monash.org

Centre for Obesity Research and Education

Head: Associate Professor Wendy Brown MBBS (Hons), PhD, FACS, FRACS

The Centre for Obesity Research and Education (CORE) applies a multidisciplinary approach to the study of obesity, which integrates a clinical obesity management program with strengths in clinical research, clinical epidemiology, public health, basic sciences and professional and community education. This integration enables CORE to measure the health consequences of obesity with the unique capacity to evaluate the health benefits of predictable weight loss. Obesity is our most prevalent disease and focused research on effective treatments will benefit a significant proportion of our population.

In 2013 our senior research fellow Dr Leah Brennan departed to accept a senior role at the Australian Catholic University; however, our research program remains strong. Major areas of research are the health benefits of weight loss and the basic mechanisms underlying satiety. The innovative work of Senior Research Fellow / surgeon Mr Paul Burton has increased knowledge of the mechanisms that underlie the success that we have achieved with the adjustable gastric band over the past 15 years. We have explored these mechanisms through collaborations with Monash Department of Physiology colleagues Professor Brian Oldfield and Professor Michael Cowley, who work in the area of metabolic neuroscience. These collaborations give us the possibility of better defining our findings in basic models.

CORE has also been heavily involved in supporting the development of the national Bariatric Surgery Registry, which will track the risks and benefits of bariatric surgery across the community.

Postgraduate Students

1 PhD Student
1 Master of Surgery Student
3 Doctor of Psychology Students

Publications

6 Journal Articles

THE COCHRANE COLLABORATION®

acc.cochrane.org

Australasian Cochrane Centre

Co-Directors: Professor Sally Green BAppSc(Physio), PhD
Steve McDonald BA(Hons), MA, GradDiplntlHlth

The five-year SEA-URCHIN project aims to evaluate the impact of a skills-based education strategy on the rate of hospital-acquired infection in neonatal units in South East Asia. The program includes a component in learning about breastfeeding in Khon Kaen, Thailand.

The Australasian Cochrane Centre (ACC) is part of the Cochrane Collaboration, a global independent network of health practitioners, researchers, patient advocates and others from over 120 countries. Cochrane's mission is to promote evidence-informed health decision-making by producing high-quality, relevant, accessible systematic reviews and other synthesised research evidence.

The ACC, which is funded by the NHMRC, coordinates the activities of the Cochrane Collaboration in Australia and in the wider Asia-Pacific region. Functions of the ACC include: training and support to authors of Cochrane reviews; advocating on behalf of Cochrane regionally; and conducting commissioned reviews and reports for government. The ACC has an extensive program of research exploring effective ways to inform decisions through the uptake of evidence. Current projects include prevention of neonatal infection in low- and middle- income countries, care of people with dementia in general practice and the use of evidence from research by policy makers.

IRIS

IRIS (Investigating Research Implementation Strategies) investigates the care of people with dementia in general practice by assessing the degree and impact of implementation of evidence-based clinical practice recommendations. In 2013, the focus was on the outcome assessment of the cluster randomised trial of General Practitioner (GP) diagnostic behaviours. GP behaviour was determined through searching de-identified electronic medical records, avoiding the need to enrol or follow up patients. Concordance with guidelines was determined through assessment of individual behaviours, which will allow the study team to assess the impact of the intervention on specific guideline recommendations.

CIPHER

The Centre for Informing Policy in Health with Evidence from Research (CIPHER) is an NHMRC-funded collaborative Centre of Research Excellence investigating the tools, skills and systems that might contribute to an increased use of research evidence in policy. The trial at the heart of CIPHER is SPIRIT (Supporting Policy In health with Research: an Implementation Trial), which aims to test a multifaceted program designed to build organisational capacity for the use of research evidence in policy and program development. The trial began in 2012 and runs until April 2015. Two policy agencies received the program in 2013, with the remaining four agencies to receive the program in 2014. The effectiveness of the program is being measured using tools designed by staff at the ACC and the Sax Institute.

SEA-URCHIN

SEA-URCHIN (South East Asia – Using Research for Change in Hospital acquired Infection in Neonates) is a five-year project (2011-2015) investigating the effectiveness of an educational intervention to prevent hospital-acquired neonatal infection in hospitals in Indonesia, Malaysia, Thailand and the Philippines. In 2013, the yearlong audit of clinical practice and neonatal outcomes was completed. Twenty-two nursing and medical clinical educators from the 11 South East Asian sites came to Sydney for an intensive two-week training program in SCORPIO (Structured, Clinical, Objective Referenced, Problem-oriented, Integrated and Organised) teaching in hand hygiene, breastfeeding, kangaroo mother care, management of central lines, hospital infection control, perinatal audit and antibiotic policy. The resulting educational interventions were rolled out at all 11 sites, with more than 70 workshops conducted and over 2,000 staff trained during the first six months.

Australasian Cochrane Symposium

The theme of the 2013 Australasian Cochrane Symposium held at AMREP, which marked the 20th anniversary of the Cochrane Collaboration, was the future of systematic reviews. Systematic reviews have advanced in the last 20 years, but significant challenges remain for producing timely reviews that answer the right questions asked by patients, practitioners and policy makers. The Symposium explored the possibilities for reviews of innovations in technology, tools and 'big data', developments in review methods, and new forms of user engagement. Presentations from the symposium are available at www.cochrane.org.au/symposium.

Achievements

- Matthew Page, a PhD student, was recipient of the Australasian Epidemiological Association (AEA) Early Career Researcher Travel Award and the AEA Student Conference Award for submitting one of the best abstracts to the 2013 AEA Annual Scientific Meeting.
- Sue Brennan was awarded a doctorate for her thesis entitled 'Towards better evidence for informing quality improvement in primary care: A research synthesis to evaluate the effects of Continuous Quality Improvement (CQI) and develop a model for improved evaluation'.

Postgraduate Students	Publications
4 PhD Students	18 Journal Articles

Rheumatology (Musculoskeletal Epidemiology)

Head: Professor Flavia Cicuttini MSc, MBBS, PhD, FRACP, FAFPHM

Students examine back muscles from magnetic resonance images in a study investigating causes of back pain.

The Rheumatology Unit's research focus is on novel approaches to the treatment and prevention of musculoskeletal diseases. Our aim is to understand the role of common lifestyle factors including diet, obesity and physical activity in knee, back, foot and hip osteoarthritis (OA). We have a number of new clinical trials under way. These include examining lipid lowering and bone therapies as new disease modifying agents in knee osteoarthritis. Such studies are underpinned by our work using novel and sensitive methods for assessing joints.

Knee Osteoarthritis

Knee OA remains a major public health problem and we still do not have treatments to prevent disease progression. End-stage knee OA is commonly treated with joint replacement. Understanding factors affecting the knee in health and disease is a major focus of our research. We and others have previously shown that obesity is a major risk factor for knee OA.

We found that weight gain in the last year is the major predictor of developing new knee pain, even in those who are already obese. The implication for management of our patients is that it may be important to advocate weight maintenance (i.e. avoiding weight gain) rather than just suggesting weight loss. While this sounds simplistic, we see a trend for ongoing weight gain in our patients, with many not succeeding in losing weight. Our data suggest that this weight gain contributes to knee pain.

This year we have started NHMRC-funded studies examining new approaches to the treatment of knee OA. We are investigating the potential disease modifying effect of two different agents: simvastatin, a cholesterol lowering agent, and zoledronic acid, a bisphosphonate commonly used in the treatment of osteoporosis. Knee OA is now considered a heterogeneous disease and these two different approaches address alternative mechanisms responsible for different disease causing pathological processes.

Joint Replacement Registry

We are continuing our collaborative work with the Australian Orthopaedic Association (AOA) National Joint Replacement Registry. We are working in a number of areas which vary from understanding socio-economic factors in knee and hip replacement, through to using the Joint Registry to answer the question of whether metal on metal hip replacement is associated with an increased cancer risk.

Back Pain

Back pain and disability is a major clinical problem. We are in the final stages of an NHMRC- funded clinical trial examining whether low dose amitriptyline will improve outcomes for patients. In parallel we have been undertaking studies that examine the relationship between early structural changes in the back and lifestyle factors.

Grants

- Dr Yuanyuan Wang (CIA) and Professor Flavia Cicuttini (CIB) received a $971,020 NHMRC Project Grant with CIs from Monash University and the Universities of Adelaide and Tasmania for the study 'Does statin have a disease modifying effect in symptomatic knee OA? A multicentre, randomised, double-blind, placebo-controlled trial' (2013-2015).
- Professor Flavia Cicuttini (CIB) is a co-investigator on a $954,597 NHMRC Project Grant led by Professor Graeme Jones (University of Tasmania) to conduct 'A randomised trial of zoledronic acid for OA of the knee' (2013-2015).
- Dr Yuanyuan Wang and Professor Flavia Cicuttini are co-investigators on a $25,000 AOA Research Foundation grant received with colleagues (Stephen Graves, Nicole Pratt and David Wood) to conduct the nationwide cohort study 'Are metal on metal hip replacements associated with an increased cancer risk?' in 2013.
- Musculoskeletal Epidemiology staff, including Associate Professor Anita Wluka, are collaborating on a $10,000 Arthritis Australia Grant-in-Aid (2013) led by Dr Sharon Brennan (Melbourne and Deakin Universities) to conduct the study 'The association between socioeconomic status and total joint replacement across Australia'.
- Dr Donna Urquhart and colleagues were awarded a $48,000 Monash Strategic Grant in 2013 for the project 'Is there bacterial infection in the spinal discs and bone of individuals with low back pain?'
- Dr Donna Urquhart received a Monash Accelerator Program Award of $68,252 for 2013-2014.

Postgraduate Students	Publications
3 PhD Students	18 Journal Articles

Ji-Yu Chung, Department of Immunology PhD student in Associate Professor Frank Aldreuccio's Gene Therapy Laboratory, won most outstanding poster presentation at the 2013 Central Clinical School Postgraduate Symposium for his research on the mechanisms of tolerance induction following autoantigen expression.

MONASH University

Monash Central Clinical School

Central Clinical School
Head: Professor Stephen Jane

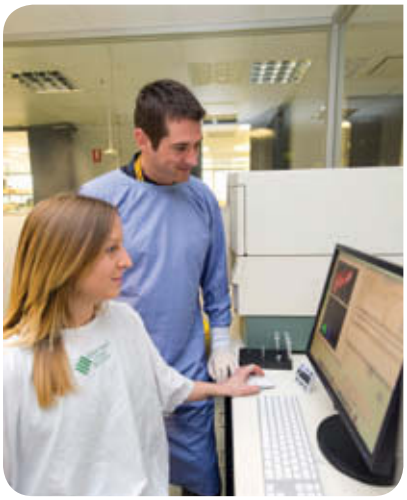
- *** Department of Allergy, Immunology and Respiratory Medicine (AIRmed)** Head: Professor Robyn O'Hehir
- *** Department of Gastroenterology** Head: Professor Peter Gibson
- **Australian Centre for Blood Diseases (ACBD)** Acting Head: Professor Stephen Jane
- **Monash Alfred Psychiatry Research Centre (MAPrc)** Director: Professor Jayashri Kulkarni
- **Undergraduate Medical Directorate** Director: Associate Professor Rob Selzer
- **Division of Clinical Sciences** Head: Professor Jeffrey Rosenfeld
- **Department of Immunology** Head: Professor Fabienne Mackay
- **Department of Infectious Diseases** Head: Professor Sharon Lewin
- ***Melbourne Sexual Health Centre** Head: Professor Christopher Fairley
- **Department of Medicine** Head: Professor Stephen Jane
- **Department of Surgery** Head: Professor Jeffrey Rosenfeld
- **Monash Micro Imaging Facility at AMREP** Manager: Stephen Cody
- **Anaesthesia and Perioperative Medicine** Head: Professor Paul Myles
- **National Trauma Research Institute (NTRI)** Director: Professor Russell Gruen
- **Van Cleef/Roet Centre for Nervous Diseases** Director: Professor Elsdon Storey

* Included in the Alfred Health section of this report.

[+] The Research Division of Melbourne Sexual Health joined Monash Central Clinical School in November 2013.

ACBD
Australian Centre for Blood Diseases

www.acbd.monash.org



Dr Justin Hamilton (R), Head of the Platelet and Megakaryocyte Cell Biology Laboratory, with Jessica Mountford, who completed her PhD with ACBD in December 2012. Dr Hamilton was awarded an ARC Future Fellowship for 2013-2017.

Australian Centre for Blood Diseases

Acting Head: Professor Stephen Jane MBBS, PhD, FRACP, FRCPA

The Australian Centre for Blood Diseases (ACBD) is a leading national and international blood diseases centre with recognised research, treatment, and educational programs for blood diseases. The ACBD is affiliated with Monash University, The Alfred hospital, 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

Non-Malignant Haematology

Thrombosis Research Unit

Head: Professor Shaun Jackson

The formation of thrombi throughout the microvasculature of vital organs is a serious complication of a variety of local and systemic disorders. Microvascular thrombi promote organ damage by obstructing blood flow and promoting a pro-inflammatory response, which in critically ill patients is associated with a poor prognosis. We discovered a distinct leukocyte recruitment mechanism mediated by microvascular thrombi that has the potential to dramatically increase leukocyte infiltration into ischaemic tissues. This mechanism involves the development of a chemically-designated chemotactic gradient within the body of thrombi to guide leukocytes from the thrombus margins to sites of endothelial injury. We have termed this process 'directed intravascular leukocyte migration' (Ghasemzadeh *et al.*, Blood 2013).

Platelet and Megakaryocyte Cell Biology

Head: Dr Justin Hamilton

Arterial thrombosis causes heart attacks and strokes and is the most common cause of death and disability in Australia. Activated platelets form these arterial thrombi, so a clinical need exists for improved strategies to inhibit platelet function to prevent heart attack and stroke. Our Laboratory examines the production and function of blood platelets to discover novel approaches for pharmaceutical platelet inhibition. We recently discovered a new platelet protein important for stable arterial thrombus formation that may provide a novel drug target for heart attack prevention.

Systems Haematology Unit

Head: Associate Professor Robert Andrews

Our Unit has used a unique analytical platform for quantifying changes in platelet receptor expression, experimentally and clinically, to determine disease-related consequences on bleeding or thrombotic risk. We have identified how myeloproliferative disease, infection, rheological changes or other factors can downregulate platelet receptors by controlling the activity of metalloproteinases that remove receptors from the cell surface, thereby reducing function and generating unique platelet-specific biomarkers. Aspects of this research were published in Blood (Qiao *et al.*, 2013) and presented in Amsterdam and New Orleans.

Cancer and Immune Cell Signalling

Head: Professor Steve Gerondakis

Our Laboratory investigates how the NF- κB signal transduction pathway controls the development and function of Foxp3+ CD4 regulatory T-cells (Tregs). We have now shown that RelA transcription factor is necessary for the 'tolerigenic' properties of Tregs as well as being required for Treg development.

Fibrinolysis and Gene Regulation Unit

Head: Professor Robert Medcalf

Our Unit studies how the fibrinolytic enzyme, tissue-type plasminogen activator (t-PA) modulates brain function. The enzyme t-PA has therapeutic benefits in removing blood clots in patients with ischaemic stroke, but also has unwanted effects that increase permeability of the blood brain barrier (BBB) and influence severity of traumatic brain injury (TBI) via BBB disruption. We established *in vitro* and *in vivo* methods to study how t-PA modulates the BBB. We apply this knowledge in mouse models of TBI and ischaemic stroke with a view to clinical translation.

Malignant Haematology and Stem Cell Transplantation

Myeloma Research Group

Heads: Professor Andrew Spencer (Clinical) / Professor Steve Gerondakis (Basic)

Our research into novel compounds (HDAC, β-catenin and MEK inhibitors) has led to the identification of biomarkers and genetic signatures associated with drug resistance as well as further understanding of the Wnt and MEK/ERK signalling pathways in multiple myeloma (MM). Investigator-initiated clinical trials and collaborations with pharmaceutical companies have facilitated

further evaluation of novel compounds. We also continued our investigation of circulating nucleic acids in MM patient plasma samples as a tool to study the biology of the disease.

Mammalian Functional Genetics Unit

Head: Associate Professor Jody Haigh

Our Unit was established at the ACBD in August 2013. We use embryonic stem cell technologies and transgenic mouse models to understand the role that the SNAI and ZEB family of transcription factors play in both normal hematopoiesis and in leukemia transformation. Our group is finalising a manuscript concerning the role of Zeb2 as a molecular driver in the development of aggressive forms of T-cell acute lymphoblastic leukemia (T-ALL) using both mouse models and human patient material.

Leukaemia Research Group

Heads: Dr Mark Guthridge and Dr Andrew Wei

Activation of intracellular survival pathways in malignant cells and their ability to over-ride apoptotic triggers is proposed to be a universal feature of all human cancers. Dr Guthridge's research focuses on the mechanisms by which cancer cells co-opt intracellular signalling pathways to promote deregulated cell survival, proliferation and growth. The overall aim is to develop targeted approaches to reactivate cell death programs in cancer cells such as acute myeloid leukemia (AML) cells. Dr Guthridge's laboratory has validated several potentially new therapeutic approaches for AML treatment using mouse models.

Stem Cell Research Unit

Heads: Associate Professor David Curtis and Dr Stephen Ting

Our goal is to understand the regulation of self-renewal, a unique property of hematopoietic stem cells and their leukemic counterparts with the aim of targeting these processes for *ex vivo* expansion of normal stem cells and killing of leukemic stem cells. Associate Professor Curtis' research group studies two types of blood cancers: T-ALL, a common type of childhood leukemia; and myelodysplasia (MDS), a cancer of 'ageing' hematopoietic stem cells. Professor Curtis published work (McCormack MP *et al., Blood* 2013) describing a role for the transcription factor LYL1 in the development of an immature type of T-ALL. Led by Dr Chris Slape and PhD student Dr Andrew Guirguis, the group also published two new mouse transgenic models of MDS (Saw *et al., Leuk Res* 2013).

The Ting Laboratory studies the molecular mechanisms of how AP2A2, a subunit of the endosomal clathrin-complex, enhances hematopoietic stem cell (HSC) activity. Dr Ting has constructed an Ap2a2 conditional knock-out mouse to assess the effect of deleting this gene specifically in embryonic and adult HSCs, and also during blood cancer development.

Red Cell Group

Heads: Professor Stephen Jane and Associate Professor David Curtis

Our group studies the regulation of red cell production with a focus on globin 'switching', a process that involves suppression of foetal type globin and activation of adult-type globin at six months of life. In collaboration with the Cancer Therapeutics CRC, we developed a lead series of compounds that potently and selectively inhibit the enzyme PRMT5. We are testing these compounds for their ability to reactivate foetal globin in human erythroid cultures and a 'humanised' mouse model of sickle cell disease. Our other focus is ENU mutagenesis to discover critical regulators of red cell production.

Eastern Clinical Research Unit (ECRU) Translational Research Division (TRD)

Head: Dr Anthony Dear

Major outcomes from 2013 projects include: (i) characterisation of a novel therapeutic approach to the treatment of HIV infection, in conjunction with Professor Sharon Lewin (Wightman *et al., AIDS* 2013); (ii) identification of vasculo-protective effects of a novel glycemic treatment used in type 2 diabetes, in collaboration with Novo Nordisk and Monash Pharmacology (Gaspari *et al., Diab Vasc Dis Res* 2013; (iii) characterisation of potential benefits in the management of stroke of a new small molecule treatment for diabetes (Daly *et al., Int J Stroke* 2013) and (iv) identification of a potentially novel treatment in the management of peripheral arterial disease.

Achievements

- Dr Justin Hamilton (Platelet and Megakaryocyte Cell Biology Laboratory) was awarded an ARC Future Fellowship (2013-2017), an NHMRC Project Grant (2013-2015) of $522,270 and a CASS Foundation Science and Medicine grant for 2014, all related to his research on platelet activation mechanisms.
- Dr Cedric Tremblay (Stem Cell Research Unit) was awarded a grant of $100,000 for 2014 from the Leukemia Foundation for the project 'Finding new and more efficient treatments for T-ALL'.
- James McFadyen (Thrombosis Research Unit) was runner-up for the 2013 Australasian Society of Thrombosis and Haemostasis Scientific Medal for his presentation 'Tractopods are novel platelet glycoprotein IIb / IIIa dependent adhesion structures that are dysregulated in diabetes and chronic oxidative stress'.
- Dr Andrew Guirguis (Stem Cell Research Unit) won the 2013 Haematology Society of Australia and New Zealand Albert Baikie Memorial Medal in recognition of the best oral presentation by a new investigator at the Annual Scientific Meeting.
- Hannah Lee (Platelet and Megakaryocyte Cell Biology Laboratory) and Jianlin Qiao (Systems Haematology Unit) completed their PhDs, respectively entitled, 'Defining the roles of protease-activated receptors in thrombosis' and 'Shedding of platelet receptors in health and disease'.
- Dr Fiona Brown (Red Cell Group) completed her PhD entitled 'The analysis of erythropoiesis through ENU mutagenesis' and will move to Memorial Sloan Kettering Cancer Centre, New York for postdoctoral studies. Dr Brown published part of her PhD work in the journal Blood Cells, Diseases and Moelcules (Brown *et al., Blood Cells, Mol Dis* 2013).

Postgraduate Students	Publications
20 PhD Student	66 Journal Articles
2 Masters Students	6 Book Chapters

www.med.monash.edu.au/cecs

Division of Clinical Sciences

Head: Professor Professor Jeffrey V Rosenfeld AM, OBE MBBS, MD, MS, FRACS, FRCS(Edin), FACS, FRCS(Glasg) Hon, FCNST(Hon), FRCST(Hon), FACTM, MRACMA, RAAMC

Professor Jeffrey Rosenfeld AM, OBE, Head of the Division of Clinical Sciences and the Monash Department of Surgery.

The Division of Clinical Sciences within the Monash Central Clinical School has an emphasis on the integration of clinical practice with basic scientific research. We are closely affiliated with Alfred Health, with many staff holding joint appointments as practising clinician-researchers. These links make us well placed to expedite the clinical translation of research projects into innovative treatments. The Division has 370 staff, including adjuncts, affiliates and higher degree research students.

The Division includes:

- Department of Anaesthesia and Perioperative Medicine
- Department of Medicine
- National Trauma Research Institute
- Department of Surgery
- Van Cleef / Roet Centre for Nervous Diseases

Research projects investigate disease processes, applications and treatments and span a wide range of medical subject areas from anaesthetic protocols to vision prosthetics. Research methodology ranges from investigating fundamental physiological processes involved in the aetiology of disease, to creating clinical registries. We enable fresh approaches to solving problems and improving current treatment options for patients by drawing on novel technological advances and collaborations with other disciplines.

All the research ultimately contributes to improved diagnosis of complex illnesses, better treatment for acute problems and improving the quality of life for people with chronic conditions. In addition, our work contributes to the body of knowledge for researchers and clinicians worldwide.

The Division provides quality education to MBBS undergraduates and research opportunities to university graduates and medical practitioners from a variety of disciplines. In 2013 our achievements included numerous peer-reviewed publications, $7,765,739 in grant funding and six PhD completions.

Anaesthesia and Perioperative Medicine

Head: Professor Paul Myles MBBS, MPH, MD, FANZCA, FFARCSI, FRCA

www.med.monash.edu.au/cecs/anaesthesia/

The Department of Anaesthesia and Perioperative Medicine at The Alfred hospital is amongst the largest in Australia, consisting of 29 full-time and over 50 visiting specialist anaesthetists, as well as 40 registrars in training. In 2013 its research unit coordinated five multicentre international trials, and participated in several others including randomised clinical trials, audits and surveys. Over the duration of the trials, the expected income is approximately $14 million.

ENIGMA-II Trial

Nitrous Oxide Anaesthesia and Cardiac Morbidity after Major Surgery

There are more than 20 million anaesthetics given each year in the US alone (almost 10% of the population), with the majority receiving nitrous oxide. Approximately 25% of patients undergoing major surgery have known coronary artery disease (CAD) or risk factors for CAD. In 1990, approximately 1 million of the 25 million Americans who underwent non-cardiac surgery suffered a perioperative cardiac event, resulting in $20 billion in costs.

Our previous trial (ENIGMA) studied 2,050 patients and identified some serious adverse effects, but most patients did not have cardiac risk factors and so we could not reliably assess serious cardiovascular complications. We identified a possible increased risk of myocardial infarction in the nitrous oxide group, 1.3% versus 0.7% (adjusted $p = 0.19$) and 10 postoperative deaths (1.0%) in the nitrous oxide group compared with 4 (0.4%) in the control group ($p = 0.26$). Therefore, ENIGMA-II was designed as a large, practical multicentre randomised trial to definitively evaluate the safety of nitrous oxide in at-risk patients undergoing non cardiac surgery.

Nitrous oxide interferes with vitamin B12 and folate metabolism. This impairs production of methionine (from homocysteine), used to form tetrahydrofolate and thymidine during DNA synthesis. It has been repeatedly demonstrated that nitrous oxide anaesthesia increases post-operative homocysteine levels. Chronic hyperhomocysteinaemia is associated with cardiovascular disease and acute hyperhomocysteinaemia is known to cause endothelial dysfunction. Reducing post-operative myocardial infarction and death are important aims for those with CAD undergoing major surgery.

Professor Paul Myles (L) and Dr Stefan Dieleman (R) view an echocardiogram result in theatre.

ENIGMA-II is one of the largest trials conducted in Anaesthesia. It is an international, randomised, assessor-blinded trial in patients with known or suspected coronary artery disease having major non-cardiac surgery. Patients were randomly assigned to receive a general anaesthetic with or without nitrous oxide. The primary outcome measure was a composite of death and cardiovascular complications (nonfatal myocardial infarction, stroke, pulmonary embolism or cardiac arrest) within 30 days of surgery. Secondary endpoints included surgical site infection, severe nausea and vomiting, and hospital length of stay.

Among 10,102 eligible patients, we enrolled 7,112 consenting patients; 3,569 were assigned to the no-nitrous oxide group and 3,543 were assigned to the nitrous oxide group. The primary outcome occurred in 296 (8.4%) patients in the no-nitrous oxide group and 283 (8.1%) patients in the nitrous oxide group (relative risk, 1.04; 95 percent confidence interval, 0.89 to 1.21; p = 0.64). In the no-nitrous oxide and nitrous oxide groups respectively, surgical site infection occurred in 8.9% and 9.2% of patients (p = 0.85), and severe nausea and vomiting occurred in 11% and 15% of patients (p < 0.001). The median hospital length of stay was 6.1 (interquartile range: 3.3 to 10) days in both groups (p = 0.69). In conclusion, nitrous oxide did not increase the risk of death and cardiovascular complications or surgical site infection in patients having major non-cardiac surgery.

Postgraduate Students	Publications
2 PhD Students	27 Journal Articles 1 Book Chapter

Department of Medicine

Head: Professor Stephen Jane MBBS, PhD, FRACP, FRCPA

www.med.monash.edu.au/medicine/alfred/

The Department of Medicine has a broad ranging program of research including dermatology, developmental biology, endocrinology, neuroscience, oncology, pathology and skin cancer. Here we have highlighted research from the Epidermal Development Laboratory.

Craniofacial Defects

One in 25 children is born with some form of prenatal defect and three quarters of those affected have a craniofacial defect caused by poor bone formation in the face and skull. That is, 0.1-0.3% of all babies born present with a facial defect, which can vary from almost undetectable to such problems as a cleft palate or serious disfigurement. Surgery can help facial reconstruction for some children, but it is not available, or suitable, for all. Prevention of the defect would be optimal, which requires understanding the genetic instructions for the facial formation and where errors may occur. There are hundreds of possible causes, and without knowing exactly which genes are involved in the process of embryo formation, it will not be possible to develop preventive gene therapies.

Dr Seb Dworkin is a Senior Research Officer in the Epidermal Development Laboratory headed by Professor Stephen Jane. Dr Dworkin is working on identifying the specific gene sequence errors that result in craniofacial deformity. In 2013 Dr Dworkin was awarded both an NHMRC grant and an ARC Discovery Early Career Researcher Award for his research.

An ancient gene family, called the Grainy head-like (Grhl) genes, spanning over 750 million years of evolution are conserved in diverse organisms, from flies to humans.

Dr Seb Dworkin, Senior Research Officer in the Department of Medicine's Epidermal Development Laboratory, working on his scientific 'fishing expedition' with zebrafish embryos.

Previous research has shown that the Grhl genes regulate many functions, including skin development, wound healing and neural tube closure, which was Dr Dworkin's first area of investigation. His research is now showing the gene family's role in facial bone formation. One gene, Grhl2 is responsible for facial skeleton development and another, Grhl3, regulates multiple stages of embryonic formation. These genes play a similar role in fly, frog, zebrafish and mouse, and using these animal models can help researchers understand the genetic causes of human disease.

The ARC funded project is using the zebrafish model to investigate the role played by Grhl3 in embryonic development. This project is characterising the role of Grhl3 in the regulation of cellular migration, craniofacial skeleton and brain development. The project also aims to identify the target genes that Grhl3 regulates. The identification of the networks controlling the genetic flow of information is essential to understanding genetic control of embryogenesis and development.

The NHMRC funded project is looking at upper and lower jaw development in a mouse model, because the mechanism of jaw formation is similar to humans. It will also entail analysis of human tissue from cleft palate and facial defect patients to identify if they have similar genetic defects to those observed in the animal models.

The projects involve interdisciplinary collaboration with local (Walter and Eliza Hall Institute stem cell and developmental biologists), national (craniofacial surgeons) and international (US and German cleft palate and facial deformity) researchers.

Postgraduate Students	Publications
67 PhD Students 1 Masters Student 3 MD Students	118 Journal Articles

National Trauma Research Institute

Head: Professor Russell Gruen MBBS, PhD, FRACS

www.ntri.org.au

The mission and the goals of the National Trauma Research Institute (NTRI) are focused on reducing death and disability, and improving the quality of life of survivors of traumatic injury. This is achieved through innovative programs of research and research translation; exchanging knowledge through effective partnerships and dialogue; improving systems of trauma care; building awareness of the personal and community impact of traumatic injury; and mentoring the next generation of research leaders in this field.

Co-investigators of the NET Project, Professors Sally Green (Co-Director of the Australasian Cochrane Centre) and Russell Gruen.

Neurotrauma Evidence Translation

Funded by the Transport Accident Commission (TAC) in 2009, the five-year Neurotrauma Evidence Translation (NET) Program aims to improve evidence-based care and outcomes of traumatic brain injury through a program to facilitate knowledge transfer and exchange. Led by co-investigators Professors Russell Gruen and Sally Green (Co-Director of the Australasian Cochrane Centre at Monash University) the program includes six projects within four themes, spanning a range of disciplines and settings relevant to neurotrauma. The program develops and test strategies to increase the uptake of research into policy and practice.

One of the key research themes has been to develop and trial a consistent approach to the screening and identification, referral and follow-up of concussed patients in Australian Emergency Departments (EDs). With an overall goal of minimising the medium- to long-term problems that follow a proportion of apparently minor head injuries, the final strategy within this theme is to evaluate the effectiveness of the program through a cluster randomised trial. The trial is currently under way and involves 34 Australian EDs. It is measuring the key clinical behaviours in managing concussion using strategies developed in the program and comparing the same behaviours in EDs that have not implemented these strategies to investigate the effect on patient outcomes. Further information about this project can be found at www.netprogram.org.au/.

John Mitchell Crouch Fellowship

In 2013 Professor Russell Gruen was awarded the John Mitchell Crouch Fellowship, the highest award for academic excellence from the Royal Australasian College of Surgeons. Professor Gruen and his team will use the funds from this award to further their research on coagulopathy in surgery and trauma, with two main strands of work. One looks at acute traumatic coagulopathy in severely injured patients in association with the PATCH-Trauma Study of pre-hospital tranexamic acid that is soon to commence. The other strand aims to improve the safety of surgery in patients on anticoagulant and antithrombotic therapy, with a view to developing safer regimens for perioperative management of warfarin and other drugs in a broad range of elective general surgical, orthopaedic, urological and other procedures in Victorian public and private hospitals.

Postgraduate Students	Publications
12 PhD Students 2 Masters Students 1 MD Student	33 Journal Articles

Department of Surgery

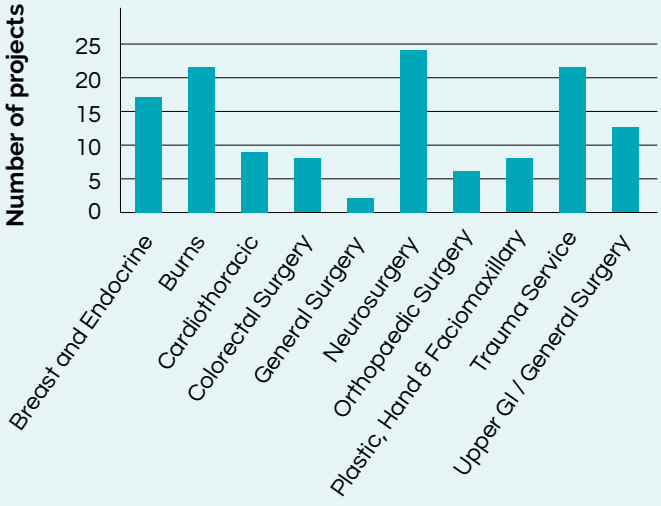
Head: Professor Professor Jeffrey V Rosenfeld AM, OBE

www.med.monash.edu.au/surgery/alfred/

The Monash Department of Surgery (DoS) research program incorporates endocrine surgery and thyroid cancer, colon cancer, burns, brain and spine trauma, cardiothoracic surgery, bionic vision, gastroesophageal disorders and prostate cancer.

Involvement in research by Alfred based surgery staff and students is substantial as revealed by an NTRI census. DoS staff and students were involved in 50 funded and 80 unfunded projects. Not all of these projects are conducted at The Alfred. The total value of funding over the lifetime of the projects is almost $47 million, half of which is via Category 1 Australian Competitive Grants.

The subject matter of the research projects ranges from epidemiological studies and establishment of registries to examination of clinical procedures, devices, interventions and observations. Almost half (47%) of the 130 studies were investigating the effectiveness of a procedure or diagnostic test, while a close second (45%) entailed using data from existing databases. This indicates that Alfred hospital clinicians have a critical and constructive approach to their every day practice, seeing possibilities for improvement and using research to identify how best to achieve this goal. Also, databases are central organisational platforms, which allow data to be readily extracted and analysed.



The collection of clinical data in research forms the basis of many projects to answer questions and to change practice. Databases are used by clinicians and health service providers. The Victorian Adult Burns Service (VABS) registry is developed and managed within the VABS and used in 'real time' for burn unit management and weekly case audits. Junior medical staff are responsible for registry data. It is unfunded by any grant, though it is used for research. The extent to which staff and students are involved in unfunded projects is also testament to their commitment to improving their practice.

Professor Jeffrey Rosenfeld with the 2013 winners of the Rosengarten Surgical Prize, Dr Charles Milne (Vascular Unit) and Dr Samuel Joseph (Orthopaedics Unit). (L-R) Professor Jeffrey Rosenfeld, Dr Charles Milne, Mrs Candice Rosengarten, Dr Samuel Joseph, Heather McGuirk (Johnson & Johnson Medical), Mr Stewart Skinner (Chairman of Rosengarten Prize Giving Committee).

The DS Rosengarten Prize is an important annual event in the surgical calendar at The Alfred, commemorating a distinguished past surgeon at the Alfred Hospital, Mr Sam Rosengarten. The prize of $1000 and a silver plaque was established to encourage residents who are planning surgical careers and our surgical registrars to present a brief research paper. The 2013 winners were Dr Charles Milne (Vascular Unit) and Dr Samuel Joseph (Orthopaedics Unit). Their presentations were titled, respectively, 'Ultrasound guided thrombin injection for pseudo aneurysms' and 'Nail Fit: A new predictor of fixation failure in pertrochanteric fractures'.

Congratulations to Dr Jin Wee Tee, who completed his PhD during the year.

Postgraduate Students	Publications
8 PhD Students	63 Journal Articles
2 Masters Students	4 Book Chapters
1 MD Student	

Van Cleef / Roet Centre for Nervous Diseases

Head: Professor Elsdon Storey MBBS, DPhil, FRACP

www.med.monash.edu.au/medicine/alfred/research/neuroscience/

The Unit's cerebellar ataxia research continued along several lines including NHMRC-funded work on symptomatic treatment of incoordination in spinocerebellar ataxia type 1 mice. Part-time PhD student Evelyn Lindsay continued development of a portable electronic battery of upper limb coordination tasks in conjunction with Dr Mark Symmons of Monash University. Dr David Szmulewicz (University of Melbourne PhD candidate / former Alfred Neurology Registrar) continued our collaborative work on characterisation of the newly-described, late-onset recessive ataxia, namely CANVAS (cerebellar ataxia with neuropathy and bilateral vestibular areflexia syndrome). Several presentations at international meetings have resulted. PhD candidate Perdita Cheshire finished her project on the serotonin hypothesis of dyskinesias in advanced Parkinson's disease (PD) and passed her thesis assessment.

Professor Storey's involvement as a trial investigator continued in the large international NIH-funded ASPREE trial of aspirin in the normal elderly, as well as its NHMRC-funded ENVISion (MRI and retinal vascular imaging) and SNORE-ASA (sleep apnoea) sub-studies. Professor Storey is also a chief investigator on the STAR-EE trial of statins in the healthy elderly funded by the NHMRC and beginning in 2014.

The Movement Disorder Team has continued its research interests in clinical and pathological aspects of PD, progressive supranuclear palsy (PSP) and other movement disorders. In 2013 we continued with our prospective study of patients with PSP, PD and multiple system atrophy (MSA) using transcranial magnetic stimulation as a measure of neurodegeneration (Dr Kelly Bertram, Dr Sarah Hewer).

This study was designed in collaboration with the Movement Disorder team at University of Rome, and we have contributed to a number of other studies that have been presented at international meetings in poster format. Our research into patterns of cognitive dysfunction in PSP compared to PD has been completed and prepared for publication (by PhD student Claire Lee).

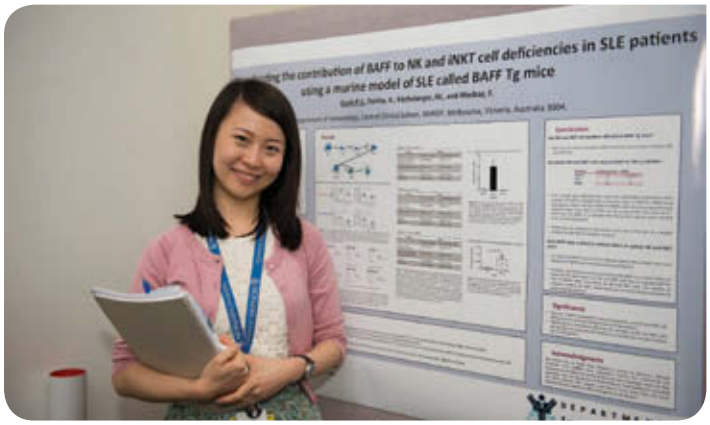
Perdita Cheshire completed her PhD research on dyskinesias (involuntary movements) in advanced Parkinson's disease under the supervision of Professor Elsdon Storey and Associate Professor David Williams, both from Van Cleef / Roet Centre for Nervous Diseases.

The laboratory-based work exploring the pathological basis for levodopa dyskinesias in PD has been completed by Perdita Cheshire and has led to a number of publications, speaking engagements and further research collaborations. We have completed data collection for our project assessing the impact of sleep on movements in PD (Dr Will Lee) and the tool for assessment of PD severity has been validated (Dr Will Lee).

Postgraduate Students	Publications
3 PhD Students	25 Journal Articles

MONASH University

www.med.monash.edu.au/immunology



Pin Shie Quah, Immunology PhD Student, presents her research on the role of BAFF in SLE at the 2013 Central Clinical School Postgraduate Symposium.

Immunology

Head: Professor Fabienne Mackay BBiomedEng, PhD

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 hospital and other AMREP partners. Our research activities target diseases including allergy, asthma, autoimmunity, inflammation, diabetes, lupus, organ fibrosis, cancer and malaria. We also focus on engineering novel treatments such as nanoparticle-based vaccines in cancer and infection, as well as therapeutic proteins and monoclonal antibodies. Researchers are funded by NHMRC, ARC and other research grants, and have a strong publication output, patent portfolio and biotech activity.

The department has consolidated its research activities on the Clayton campus, establishing an effective link between basic science / target discovery from the main campus as well as AMREP, and translation / clinical trials on the Alfred side. We regularly organise a scientific retreat to promote scientific integration and collaboration within the department. The retreat includes a very successful mentoring program for young researchers aimed at providing important scientific strategies to prepare their transition from postdoctoral researchers to independent laboratory heads.

Promotion of immunology to students and encouragement of progression to Honours and postgraduate research studies has been a major focus of Professor Mackay's activity. In 2013 Christopher Chan and Hong-An Thi Nguyen completed their PhD theses and Dr Rose Ffrench was appointed to coordinate and further develop immunology teaching.

In 2013 the department held a highly successful symposium to mark its 50th anniversary, which was attended by 180 immunology alumni, guests and department members. Emeritus Professor Jennifer Rolland coordinated the symposium.

Research Highlights

Innate-Activation Induced B-Cell Death

Nobel Prize winner Sir Frank Macfarlane Burnet described a process involving early recognition of the self-antigen by self-reactive lymphocytes inducing their negative selection or some form of neutralisation called immune tolerance. That means the body eliminates cells that might attack their own host, the self. This process of elimination is largely but not completely successful.

Pioneer as he was, Burnet did not consider the case of lymphocytes that have a low affinity to self-antigen and fail to be eliminated this way. The reality is that we normally live with pools of autoreactive T- and B-cells. We know that self-reactive T-cells can be regulated by regulatory T-cells but, in the case of B-cells, little is known about what may regulate them when they are activated. This is particularly relevant during an infection, as many microbial components can activate B-cells via innate receptors, irrespective of whether the B-cells are good or harmful. Indeed, it is quite common to detect levels of autoantibodies in patients with an infection but these levels are usually undetectable once the infection has been treated. This reveals two important facts: firstly, we normally have self-reactive B-cells that can be activated during infection; secondly, something regulates the activation of these cells so we do not develop an autoimmune disease.

Professor Fabienne Mackay's BAFF laboratory has discovered a mechanism regulating the non-specific activation of B-cells by microbial agents. It involves signalling co-operation between the BAFF receptor TACI and toll like receptor 4 (TLR4), which induces the expression of the death receptor Fas and its ligand on B-cells and terminates their nonspecific activation (Figgett WA *et al.*, *Immunity* 2013). Through evolution, the immune system has taken advantage of infections to develop safety mechanisms terminating nonspecific B-cell activation. Our next step is to determine whether this mechanism is also critical for B-cell tolerance.

Gene Therapy to Re-program the Immune System

Autoimmune diseases are common, affecting approximately one in twenty people, and are on the rise. They include diseases such as multiple sclerosis (MS), type 1 diabetes, rheumatoid arthritis, lupus, and many more. MS, as one example, affects about 25,000 Australians and the financial burden is estimated at $50,000 per person annually. There is an imperative to not only understand the mechanisms driving autoimmunity but to develop techniques and strategies whereby autoimmune diseases can be treated.

Associate Professor Frank Alderuccio's Autoimmunity and Gene Therapy Laboratory has been focused on harnessing our understanding of the immune system to devise strategies aimed at promoting targeted immune tolerance in these diseases. In MS there is an immune response against myelin proteins in the insulating layer surrounding nerve fibres, which is subsequently damaged. The exact reason why MS occurs is not known but the disease results in a breakdown in tolerance to molecules such that they are seen as foreign rather than self.

For their studies, PhD students Zeyad Nasa, Jie-Yu Chung and Amit Joglekar use a gene therapy approach in a mouse model of MS. In this model, genes encoding the self-target proteins

are introduced into the bone marrow stem cells and then transferred back into mice. This has the effect of enhancing the 'education' of the immune system as it develops and purges the system of autoreactive cells. These mice are resistant to the development of experimental MS.

Jie-Yu Chung, who has a scholarship from the MS Society of Australia, has presented his work at a number of national and international meetings and won the best poster presentation at the AMREP 2013 Postgraduate Symposium. In addition, the study by Zeyad Nasa was nominated by the Australasian Gene Therapy Society as the Best Published Gene Therapy Paper (Nasa Z *et al.*, *Am J Transplant* 2012) by a Society member.

Retinopathy Research Closer to Clinical Translation

The Diabetic Retinopathy Laboratory, headed by Professor Jennifer Wilkinson-Berka, has published research with potential to impact future treatment for retinal disease (Wilkinson-Berka J *et al.*, *Antioxid Redox Signal* 2014). Professor Wilkinson-Berka's laboratory focuses on understanding the fundamental factors that lead to inflammation and angiogenesis in the retina in order to develop effective and preventive treatments for diabetic retinopathy and other neovascular retinal pathologies. The published research involved a collaboration with Baker IDI (Professor Karin Jandeleit-Dahm and Professor Mark Cooper) and The University of Maastricht in Holland (Professor Harald Schmidt). The research builds on the group's interest in NADPH oxidase enzymes (NOX), which are critical in generating oxidative stress in organs including the eye.

The research was the first to study, in parallel, NOX1, NOX2 and NOX4 knockout mice and identify that NOX1 is the main NOX isoform involved in retinal inflammation and angiogenesis. In an on-going collaboration with Genkyotex, a Swiss biotech company that developed the 'first-in-class' effective inhibitor of NOX1 and NOX4, the group reported that ischaemic retinopathy (inflammation of the retina due to poor blood supply, which can be caused by a number of disease processes) was improved with the compound, GKT137831.

The next step is to determine whether the novel inhibitor has benefits in animals with diabetic retinopathy. An exciting aspect of the work is that this novel inhibitor is already in a phase 2 clinical trial for diabetic kidney disease involving Australian patients. Hence, there is potential for clinical translation to a study of patients with diabetic retinopathy. The work was highlighted in a press release in December 2013 and has been presented at national and international conferences. The research also formed part of Devy Deliyanti's PhD thesis.

Postgraduate Students	Publications
30 PhD Students	52 Journal Articles 1 Book Chapter

In 2013, The Department of Immunology held a symposium to mark its 50th anniversary.

L-R: Professor Richard Boyd, Head of the Immune Regeneration Laboratory, Monash School of Biomedical Sciences and former Department of Immunology Laboratory Head; Professor Fabienne Mackay, Head of Department (HoD) of Immunology since 2009; Professor Ban Hock Toh, Leader of Autoimmunity Team, Monash Centre for Inflammatory Diseases and HoD of Immunology 1995-2005; Emeritus Professor Jennifer Rolland, Joint Head of Allergy Research Laboratory, Department of Immunology/AIRMed and Deputy/Acting HoD of Immunology 1997-2010; Professor Doug Hilton, Director of the Walter & Eliza Hall Institute and Department of Immunology alumnus; Professor Jim McCluskey, Deputy Vice-Chancellor Research, The University of Melbourne and former Department of Immunology Laboratory Head.

www.med.monash.edu.au/cecs/infectious-diseases/

Professor Sharon Lewin (front, centre) with her research group.

Infectious Diseases

Head: Professor Sharon Lewin MBBS(Hons), FRACP, PhD

The Department of Infectious Diseases, Alfred Health and Monash University incorporates a large clinical service with active research programs in the fields of HIV, viral hepatitis, infections in the immunosuppressed (such as those with malignancy, in intensive care and post-splenectomy), influenza, drug resistant organisms, antibiotic use, infection prevention and hospital epidemiology.

HIV Treatment

Professor Sharon Lewin and Associate Professor Paul Cameron are leading a major effort towards understanding how HIV persists in patients on antiretroviral therapy (ART) and strategies to achieve a cure. Currently treatment for HIV is life-long, so there is high interest in finding a way to safely cease ART while controlling the virus. Understanding where the virus hides (HIV latency) while patients are on treatment is key to this effort.

The Lewin Laboratory, as part of a major international collaboration funded by the US. National Institutes of Health (NIH), is investigating whether chemokines and their receptors define a subset of cells where HIV can hide. Professors Lewin and Cameron have developed multiple laboratory models to understand HIV latency. One of their models, which adds chemokines to resting CD4+ T-cells, was shown to align closest to patient derived cells. The results from this international collaboration appeared in PLoS Pathogens (Spina CA *et al.*, *PLoS Pathog* 2013).

Dr Vanessa Evans, a post doctoral fellow and PhD student Nitasha Kumar, have also shown that dendritic cells play a key role in allowing the virus to go into hiding in T-cells (Evans VA *et al.*, *PLoS Pathog* 2013).

Professor Jennifer Hoy (L) and PhD Student Dr Janine Trevillyan (R) work on the risk of cardiovascular disease in HIV patients.

Work on HIV cure has extended into several clinical trials in collaboration with Dr Julian Elliott, Head of the Clinical Research Unit in our department. The first of these studies demonstrated that vorinostat, a drug used to treat some cancers, can 'wake up' HIV from dormant cells. A second study, in collaboration with the University of California San Francisco and funded by the American Foundation for AIDS Research, is investigating the ability of disulfiram, a drug used to treat alcohol addiction, to activate HIV.

The HealthMap study, funded by an NHMRC Partnership Grant and Alfred Health, completed development of an online platform to improve the long-term health of people with HIV. A large randomised trial of the platform combined with health coaching and online peer support will begin in early 2014. The Positive Ageing Project, funded by the Victorian Government, developed a model program for maintaining the health of people ageing with HIV. The program includes positive messaging, accurate information for people with HIV and their friends and family, and a phone-based health coaching service, run in collaboration with the Victorian AIDS Council and the Royal District Nursing Service.

Professor Jennifer Hoy, in collaboration with PhD student Dr Janine Trevillyan and researchers at Baker IDI and the Australian Centre for Blood Diseases (ACBD), has been leading a team focusing on the risk of cardiovascular disease in HIV positive patients. Using novel mass-spectrometry techniques, Professor Hoy's team described the detailed changes in blood lipid profile that occur following commencement of ART. This has led to new lipid-based models, which have the potential to improve cardiovascular risk prediction in HIV positive patients and lead to targeted prevention strategies.

Associate Professor Edwina Wright is leading a Victorian Department of Health (DoH) funded HIV prevention study called Victorian Pre-exposure Prophylaxis (VicPrEP), which will recruit 100 people at high risk of HIV infection. Participants will take a daily antiretroviral tablet to help prevent HIV infection. Associate Professor Wright also demonstrated the importance of early ART (Le T *et al.*, *N Engl J Med* 2013) and successfully led a submission to the Australian Pharmaceutical Benefits Advisory Committee to allow prescription of ART at any stage of disease, independent of CD4 count.

Supported via strategic investment funds from Monash Central Clinical School and our department, Dr Judy Chang returned to our department from Harvard Medical School to establish a new laboratory focusing on the innate immune response to HIV.

Influenza

Our department leads the Influenza Complications Alert Network (FluCAN), a hospital-based surveillance program for severe influenza conducted at 14 hospitals around Australia. Our findings suggest that influenza was responsible for at least 5,000 admissions to hospitals in Australia in 2013 and that the influenza vaccine is associated with a 50% reduction in the risk of hospitalisation for influenza. These results support the use of the influenza vaccine for 'at-risk patients' as part of the National Immunisation Program.

Drug Resistance and Antimicrobial Prescribing

The Infection Prevention and Epidemiology Team performed a series of studies on the epidemiology of vancomycin resistant enterococcus (VRE) at The Alfred hospital. Evaluation of the risks and benefits of alternative control measures has resulted in a change to our control policies. The Antimicrobial Stewardship Team fully implemented a post-prescription audit and review system, which has made more than 3,000 recommendations in patients on antibiotics over three years and resulted in a fall in the use of broad spectrum antibiotics.

Infection Prevention

Our team succeeded in reducing the rates of central line-associated bloodstream infection in intensive care, with only two infections reported in the 2012/13 year. An educational intervention resulted in a modest reduction in hospital-acquired urinary tract infections. Ongoing initiatives are aiming to improve aseptic technique (particularly associated with peripheral intravenous lines), the standard of hospital cleaning and reducing infections in high-risk patients at Alfred Health.

Infections in the Immunosuppressed Host

Dr Orla Morrissey continues studies on the prevention, diagnosis and treatment of invasive fungal disease. Dr Morrissey and her national collaborators reported on the efficacy of a new management strategy for invasive aspergillosis (Morrissey CO *et al., Lancet Infect Dis* 2013) in a paper cited as one of the top ten mycology papers at the 2013 Interscience Conference on Antimicrobial Agents Chemotherapy – ICAAC. This has changed management of invasive aspergillosis and will be reflected in the 2014 Australasian Antifungal Guidelines.

Victorian Spleen Service

The Victorian Spleen Service, formerly called the Victorian Spleen Registry, turned ten years old in Sept 2013. The service is now following approximately 80% of all the splenectomies in Victoria, and has initiated discussions with the Tasmania and Queensland DoHs regarding a collaboration to expand the service nationally.

Achievements

Awards

- Associate Professor Anton Peleg received the 2013 Commonwealth Health Minister's Award for Excellence in Health and Medical Research.
- Ms Deb Rhodes received the 2013 Elaine Graham Robertson Award for Excellence in Infection Control at the Australian College of Infection Prevention and Control Conference.
- The Alfred Health Antimicrobial Stewardship Team was the Gold Winner in the 'Optimising Health Status of Victorians' category of the 2013 Victorian Health Care Innovation Awards.
- Ms Morgane Griesbeck, PhD student, was awarded the ANRS Fellowship from the French government.
- Associate Professor Denis Spelman won the 2013 Allen Yung Award for Excellence in Infectious Diseases Teaching.

NHMRC CEO Professor Warwick Anderson AM (R) presents Associate Professor Anton Peleg (L) with the 2013 Commonwealth Health Minister's Award for Excellence in Health and Medical Research.

Grants

- Professor Sharon Lewin and Professor Stephen Kent are co-investigators on an NHMRC Program Grant of $12.6 million awarded to a team of seven groups in Sydney and Melbourne led by Professor David Cooper (University of New South Wales) for the study 'HIV cure and immune mediated control' (2014-2018).
- Professor Lewin received $300,000 as program supplements for 2013-2014 from the US NIH together with Associate Professor Paul Cameron, Dr Jennifer Anderson, Dr Hao Lu, Associate Professor Melissa Churchill and Dr Lachlan Gray.
- Associate Professor Paul Cameron was awarded a $752,950 NHMRC Project Grant entitled 'The impact of HIV integration sites on eliminating HIV latency' to commence in 2014.
- Associate Professor Allen Cheng (CIC) is a co-investigator on a $390,832 NHMRC Project Grant (2014-2018) led by Professor Peter Choong (University of Melbourne), which will involve a clinical trial to assess a surgical skin preparation for preventing wound complications in hip and knee surgery.
- Associate Professor Allen Cheng was awarded an NHMRC Career Development Fellowship (Level 2) to commence in 2014.
- Dr Julian Elliott was awarded a Proof-of-Concept Grant worth $150,000 for 2013-2104 from Commercialisation Australia with a further $150,000 of partner contributions for the project 'Regroup: a web-based platform for healthcare knowledge synthesis'.
- Professor Lewin received $115,236 from Merck Sciences for the follow up study, 'The effect of vorinostat in patients receiving ART'.
- Associate Professor Kate Cherry received a South African National Research Council Project Grant (2013-2015) with her collaborator Professor Peter Kamerman (University of Witwatersrand, South Africa) to study the 'Incidence and risk factors for HIV-sensory neuropathy in the post stavudine era'.
- Associate Professor Cherry was awarded an International Association for the Study of Pain Developed-Developing Countries Collaborative Research Grant.
- Associate Professor Edwina Wright received $320,000 from the Victorian DoH for the VicPreP study.
- The Victorian Spleen Service received a Sanofi Pasteur $20,000 'Vaxigrant' to develop a spleen immunisation and education 'app'.

Postgraduate Students	Publications
30 PhD Students	152 Journal Articles 2 Book Chapters

MAPrc
We mend minds

www.maprc.org.au

Professor Jayashri Kulkarni (front row) with members of the MAPrc team.

Psychiatry

Director: Professor Jayashri Kulkarni MBBS, MPM, FRANZCP, PhD

The Monash Alfred Psychiatry research centre (MAPrc) is one of Australia's largest clinical research centres in psychiatry. The key goal of MAPrc is to conduct clinical research aimed at developing new treatments with direct, effective, and immediate applications. Our research covers many different mental illnesses and all age groups, with over 100 clinically focused projects currently being conducted. MAPrc research is integrated with clinical practice in The Alfred hospital, in affiliation with Monash University. Our research agenda meets clinical and social needs and has a short one to five year timeline to real clinical impact.

Our five key streams of research are Women's Mental Health, Psychiatric Neurotechnology, Psychopharmacology, Cognitive Psychiatry and Service Evaluation Research. Our multidisciplinary team of 170 staff includes postgraduate students and affiliated researchers, drawn from medicine, nursing, psychology, allied health, science, engineering and health information services. At our premises we have 60 staff. This rich mix of skills and expertise drives cross-pollination of ideas and problem solving, positioning MAPrc to play a leading role in innovative mental health research.

Women's Mental Health

Antipsychotic Medication in Pregnancy

Principal Investigator: Professor Jayashri Kulkarni, Director, MAPrc

The National Register of Antipsychotic Medication in Pregnancy (NRAMP) is a unique, ongoing, observational, Australia-wide research study for women of childbearing age who take antipsychotic medication during pregnancy. The aim is to develop safety guidelines for antipsychotic medication use during pregnancy and breastfeeding, which will provide clinicians with comprehensive treatment options.

NRAMP consented participants currently total 250, and a significant percentage of women in this group developed gestational diabetes mellitus (GDM) during pregnancy. GDM occurred in 21% (52/250) of the NRAMP group compared with an Australian Institute of Health and Welfare 2010 report of 5.6% in the general population. Pre-pregnancy BMI of ≥ 30 (obesity) is also of concern in the NRAMP group. We noted 6% (12/205 births) of infants with respiratory distress at birth, while 2% (5/205 births) of infants were born prematurely to mothers with a pre-pregnancy BMI of ≥ 30. Maternal outcomes for women with a pre-pregnancy BMI of ≥ 30 included 9% (23/250) of women with GDM, while 19% (39/205) of births required either elective or emergency caesarean section. This group presents an ongoing challenge for maternal and neonatal risk management and care planning.

Worsley R, Gilbert H, Gavrilidis E, Naughton B, Kulkarni J. Breastfeeding and psychotropic medications. (Correspondence) Lancet 2013;381(9870):905.

Psychoneurotechnology

Enhancing Cognition in Schizophrenia

Principal Investigator: Dr Kate Hoy, Senior Research Fellow

Cognitive deficits in schizophrenia underlie more functional disability than any other symptom of the illness and existing treatments are largely inadequate. Non-invasive brain stimulation has been shown to enhance aspects of cognition in both healthy controls and patient populations; however, there has been little research into the use of transcranial direct current stimulation (tDCS) for enhancing cognitive performance in schizophrenia. We conducted an investigation into the post stimulation effects of tDCS on cognitive performance in a repeated measures design in 18 patients with schizophrenia, in particular looking at dose of stimulation. A single 20-minute session of anodal left dorsolateral prefrontal tDCS (1mA, 2mA, sham) was delivered and performance was measured on a working memory task across three time points post-stimulation (0, 20 and 40 minutes). We saw a significant improvement in performance over time following the 2mA dose only, suggestive of the feasibility of tDCS for enhancing cognitive performance in schizophrenia and the importance of dose of stimulation. This is a critical step in the development of a new therapeutic approach for cognitive impairment in schizophrenia.

Hoy KE, Arnold SL, Emonson MRL Daskalakis ZJ, Fitzgerald PB. An investigation into effects of tDCS dose on cognitive performance over time in patients with schizophrenia. Schizophr Res 2014;April 1:155(1-3):96-100.

Cognitive Psychiatry

Cognition and Bipolar Disorder

Principal Investigator: Professor Susan Rossell, Professorial Research Fellow

Bipolar Disorder (BD) is a serious mood disorder, the aetiology of which is still unclear. The disorder is characterised by extreme mood variability in which sufferers fluctuate between markedly euphoric, irritable and elevated states to periods of severe depression. The literature indicates that BD patients show compromised cognitive ability in addition to these mood symptoms. However, the precise phenomenology of these abnormalities and their inter-relationships is not well established.

Tamsyn Van Rheenen, who completed her PhD in 2014 supervised by Professor Susan Rossell, explored the neurocognitive, social cognitive and emotion regulation features in BD. The results indicated that BD patients show mood independent impairments in basic neurocognition, social cognition (primarily facial emotion processing and theory of mind, with specific deficits evident for emotional prosody processing) and emotion regulation. Further analyses revealed that neurocognition explained a significant proportion of the variance in social cognition, but neither neurocognition nor social cognition had any effect on emotion regulation. The research has appeared in journals including *Bipolar Disorders, Journal of Affective Disorders* and the *International Journal of Neuropsychological Society.*

Van Rheenen TE and Rossell SL. An empirical evaluation of the MATRICS Consensus Cognitive Battery in bipolar disorder. Bipolar Disord 2014;16(3):318-25.

Van Rheenen TE and Rossell SL. Is the non-verbal behavioural emotion-processing profile of bipolar disorder impaired? A critical review. Acta Psychiatrica Scandinavica 2013;128(4):163-178.

Psychopharmacology

Smoking Cessation Study

Principal Investigator: Professor Jayashri Kulkarni, Director, MAPrc

Smoking is the leading preventable cause of illness and premature death in Australia, claiming thousands of lives a year by directly increasing the risk of heart disease, stroke, emphysema, and a variety of cancers. Approximately 25% of adults in Australia continue to smoke, despite information about the negative health consequences. People with severe mental illness (SMI) have a higher smoking rate than those of the general population and in schizophrenia the rate can reach 65%. The relationship between smoking and mental health problems is complex; however, research shows that people with SMI can safely quit smoking. MAPrc is participating in a randomised, double blind, active and placebo-controlled trial to evaluate the neuropsychiatric safety and efficacy of varenicline and bupropion hydrochloride for smoking cessation in subjects with and without a history of psychiatric disorders. Response to the study has been positive, with 50 participants screened, 20 participants currently undertaking the study and recruitment ongoing.

Services

Burn Injuries

Principal Researcher: Jason Wasiak, Senior Research Fellow, Victorian Adult Burns Service

The Alfred hospital operates the statewide Victorian Adult Burns Service (VABS), providing hospital care to approximately 250 patients annually. The experience of a moderate to severe burn injury can require repeated acute and reconstructive treatment and result in an array of physical, lifestyle and psychological changes that are often still present some years after the injury was sustained. A recently completed study collected 12-month follow-up data for a sample of 114 patients treated by the VABS for a moderate to severe burn injury. The study aimed to assess how distress, health status and health-related quality of life changed over the 12 months following the burn injury. At 12 months post-injury, 26% of patients were experiencing at least moderate psychological distress, a level 2.5 times higher than the Australian general population. Reductions in multiple physical health status indicators were also still evident at 12 months post-injury. Older age, being female and experiencing more extensive full thickness burns were the factors found to be uniquely predictive of persistent difficulties in physical health status at 12 months post-injury. These findings highlighted a need for more intensive outpatient care focused on addressing the delayed recovery in some burn patients.

Wasiak J, Lee SJ, Paul E, Mahar P, Pfitzer B, Spinks A, Cleland H, Gabbe B. Predictors of health status and health-related quality of life 12 months after severe burn. Burns 2014;40(4):568-74.

Wasiak J, Paul E, Lee SJ, Mahar P, Pfitzer B, Spinks A, Cleland H, Gabbe B. Patterns of recovery over 12 months following a burn injury in Australia. Injury 2014; 45(9):1459-64.

Achievements

- MAPrc was officially launched by The Honourable Dame Quentin Bryce AD CVO, previous Governor General of the Commonwealth of Australia in October 2013.
- Professor Susan Rossell (Deputy Director of Brain and Psychological Sciences Research Centre, Swinburne University of Technology / Honorary Professorial Fellow, MAPrc) received Swinburne University's Vice Chancellor's Award for Research Excellence in 2013 to acknowledge her outstanding contribution to the understanding of the neurobiology of auditory hallucinations. Professor Rossell also received an NHMRC Project Grant of $466,093 to commence in 2014 for the study 'Improving our understanding of hearing voices'.
- Professor Paul Fitzgerald was awarded an ARC Linkage Grant of $581,643 for the project 'The development and testing of a device to enhance the application of repetitive transcranial (rTMS) magnetic stimulation (2013-2106).
- Dr Kate Hoy won the Australian Institute of Policy and Science 2013 Victorian Young Tall Poppy Science Award for her research into developing new treatments for the cognitive impairments associated with schizophrenia.
- Professor Paul Fitzgerald (PF) and Dr Kay Hoy (KH) both received Monash University Faculty of Medicine, Nursing and Health Sciences Strategic Grants for funding in 2014 for their respective projects entitled 'Development of an enhanced magnetic field concentrator design for rTMS (PF) and 'Investigating optimal methods of cognitive enhancement: A comparison of the behavioural and biological effects of tDCS and TMS (KH)'.
- Dr Rebecca Segrave received a beyondblue Victorian Centre of Excellence in Depression and Anxiety award for her project entitled 'Cognitive control training for treatment resistant depression: Application, evaluation and augmentation'.
- Dr Jerome Maller received an Acute Care Fellowship from the AMREP-based Transport Accident Commission funded Centre of Excellence in Traumatic Brain Injury Research.
- Dr Bernadette Fitzgibbon and Dr Nigel Rogasch secured NHMRC Early Career Research Fellowships to commence in 2014.
- The Australasian Society for Psychiatric Research presented Dr Tamsyn Van Rheenen with the Schizophrenia Fellowship of NSW Research Trust Fund Bursary Award.

Postgraduate Students	Publications
24 PhD Students	61 Journal Articles
8 Doctor of Psychology Students	9 Book Chapters
	1 Book

The ALFRED

AlfredHealth

Alfred Health Departments Conducting Research

Chief Executive Alfred Health: Andrew Way
Director of Research: Professor Stephen Jane

*Medical and Surgical Departments

- Allergy, Immunology and Respiratory Medicine
  Head: Prof. Robyn O'Hehir
- Burns (Victorian Adult Burns Service)
  Head: Dr Heather Cleland
- Cardiothoracic Surgery
  Head: Prof. David McGiffin
- Cardiovascular Medicine
  Head: Prof. Anthony Dart
- Emergency and Trauma Centre
  Head: Dr De Villiers Smit
- Endocrinology and Diabetes
  Head: Prof. Duncan Topliss
- Gastroenterology
  Head: Prof. Peter Gibson
- General Surgery
  Head: Prof. Jonathan Serpell
- Intensive Care
  Head: Prof. Carlos Scheinkestel
- Medical Oncology
  Head: Prof. Max Schwarz
- Melanoma (Victorian Melanoma Service)
  Head: Assoc. Prof. John Kelly
- Orthopaedic Surgery
  Head: Assoc. Prof. Susan Liew
- Radiation Oncology
  Head: Assoc. Prof. Jeremy Millar
- Rehabilitation, Aged and Community Care
  Head: Assoc. Prof. Peter Hunter
- Renal Medicine
  Head: Prof. Rowan Walker
- Sexual Health
  Head: Prof. Christopher Fairley

Medical Services

- Anatomical Pathology
  Head: Prof. Catriona McLean
- Diagnostic and Interventional Radiology
  Head: Prof. Ken Thomson
- Nuclear Medicine
  Head: Prof. Victor Kalff
- Pathology Services
  Head: Assoc. Prof. Hans Schneider
- Pharmacy
  Head: Prof. Michael Dooley

Information Development

- Health Informatics
  Head: Dr Chris Bain

Nursing

- Nursing Services
  Head: Prof. Janet Weir-Phyland

Allied Health

- Head: Lyndell Keating
- Nutrition and Dietetics
  Head: Assoc. Prof. Ibolya Nyulasi
- Occupational Therapy
  Head: Jacqui Morarty
- Patient and Family Services
  Head: Bridget Wall
- Physiotherapy:
  Head: James Sayer
- Psychology
  Head: Lynda Katona
- Speech Pathology
  Head: Janine Mahoney

*The Anaesthesia and Perioperative Medicine Department and the Infectious Diseases Department are included in the Monash Central Clinical School section of this report.

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MONASH University

www.med.monash.edu.au/cecs/airmed/

Allergy Immunology and Respiratory Medicine

Director: Professor Robyn O'Hehir BSc, MBBS, FRACP, PhD, FRCP, FRCPath

Professor Robyn O'Hehir (L) and Dr Sara Prickett (R) work on development of a vaccine for peanut allergy.

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 (COPD) disease, interstitial lung diseases, sleep apnoea and sleep disordered breathing, the Cystic Fibrosis (CF) State Centre of Excellence, 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 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.

AIRmed has a very active clinical and biomedical research focus with considerable success in competitive NHMRC, ARC and other research grant funding. High international and national profiles of senior personnel are reflected in numerous peer review 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.

Weight Loss Treatment for Obstructive Sleep Apnoea

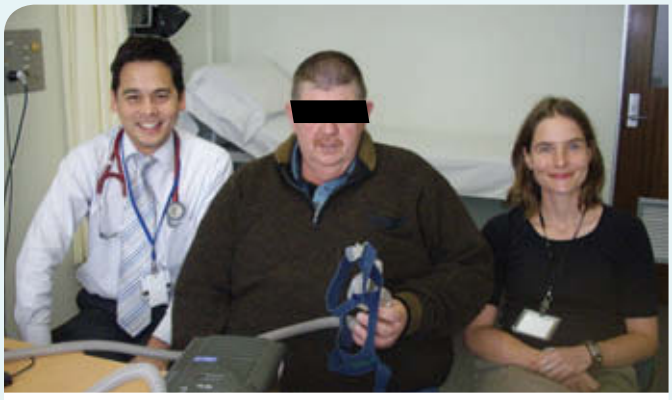
An AIRmed and Baker IDI collaborative publication* won the 2013 AMREP Research Prize for an article describing original clinical research published in a journal with the highest impact factor in 2012. This study was the first published randomised controlled trial (RCT) of bariatric surgery for the treatment of obstructive sleep apnoea. Although significant weight loss was achieved in the surgical group, and was associated with improved quality-of-life (QoL) plus exercise performance, there were similar improvements in the severity of sleep apnoea and treatment adherence with Continuous Positive Airway Pressure (CPAP) in both arms of the trial. This has led to speculation that obesity may be related to irreversible upper airway instability predisposing to ongoing obstructive sleep apnoea.

**Dixon JB, Schachter LM, O'Brien PE, Jones K, Grima M, Lambert G, Brown W, Bailey M, Naughton MT. Surgical versus conventional therapy for weight loss treatment of obstructive sleep apnea: A randomised controlled trial. JAMA 2012;308(11):1142-9.*

Peanut Allergy Immunotherapy

Peanut allergy is the leading cause of food-induced anaphylactic fatality worldwide and its prevalence is increasing. There is no cure and patients rely on strict avoidance and adrenaline for anaphylaxis due to inadvertent exposure. Treatment with whole allergen preparations, as for grass pollen and house dust mite allergy, is inappropriate for peanut allergy due to the high risk of serious adverse reaction. Following several years of careful mapping of T-cell epitopes of the major peanut allergens Ara h 1 and Ara h 2, the Monash/Alfred Allergy Research Group, led by Professor Robyn O'Hehir, Emeritus Professor Jennifer Rolland and Dr Sara Prickett, has finalised a selection of short peptides that encompass dominant peanut T-cell epitopes and can be readily synthesised in soluble form.

Importantly, the peptide mix does not activate the allergic inflammatory cells, basophils, of peanut-allergic subjects. Therefore, by targeting allergen-specific T-cells, these peptides can be used to safely and effectively down-regulate the adverse immune response to peanuts in patients. A provisional patent for the peanut peptide vaccine has been filed and the supporting data published in Clinical and Experimental Allergy (Prickett SR *et al.*, *Clin Exp Allergy* 2013; 43(6):684-97). This work was funded by the NHMRC, the Ilhan Food Allergy Foundation and Alfred Research Trusts.



Dr Alan Young (L) (Sleep Medicine Specialist) and Esther Van Braak (R) (Sleep Scientist) with a sleep apnoea patient.

Hayfever and Dust Mite Immunotherapy

The Allergy Research Laboratory is pleased to note the successful completion in Canada of a phase 2 clinical trial of a short pre-seasonal grass pollen immunotherapy in patients with hayfever compared to placebo treated patients. Following an assignment agreement with Circassia, a spin out company of Imperial College, UK, research led by Professor Robyn O'Hehir and Emeritus Professor Jennifer Rolland with Research Officer Neeru Varese identified the dominant T-cell peptides in Bermuda (couch) grass which form a major part of this vaccine. As a non IgE binding product, this approach offers therapeutic options for allergic patients with asthma in addition to those with hayfever only. Recently similar success was achieved by Circassia in phase 2 trials for house dust mite peptide immunotherapy and cat immunotherapy. The science behind the Circassia approach is based on the published PhD and postdoctoral studies by Professor O'Hehir in the UK in the 1990s. She demonstrated T-cell anergy induction by high dose T-cell epitope allergen peptides focusing initially on aeroallergen immunotherapy in particular with house dust mite allergens. In the first major IPO by a UK biotech company in years, Circassia has recently raised $332 million from its debut on the London Stock Exchange.

Achievements and Awards

- Dr Jeremy Wrobel had success at the Thoracic Society of Australia and New Zealand (TSANZ) 2013 Annual Scientific Meeting (ASM) as a finalist for the Ann Woolcock Young Investigator Award and winning Best Oral Presentation within a Special Interest Group for his research on the role of pulmonary pressure in COPD.
- Adjunct Professor Bruce Thompson was awarded Best Oral Presentation at the 2013 Australia and New Zealand Society of Respiratory Science ASM for his presentation 'Airway Hyper-responsiveness to hypertonic saline in lung transplant recipients'.
- Dr Christian Osadnik was awarded the COPD prize at the 2013 TSANZ ASM for his oral presentation describing an RCT of positive expiratory pressure therapy in COPD.
- Three AIRmed PhD students were successful in the Monash Central Clinical School 'Three Minute Thesis' Competition. Dr Kathryn Hackman was ranked first with Ms Jodie Abramovitch and Dr Kirk Kee tying for second place.

Monash University Adjunct Appointments

- Robert Stirling, who leads the clinical program for patients with non-CF bronchiectasis and plays a pivotal role in the multidisciplinary care of Alfred patients with lung cancer, was appointed Adjunct Clinical Associate Professor of Medicine.
- Brenda Button was re-appointed as Adjunct Clinical Associate Professor of Medicine, in recognition of her significant academic contributions to physiotherapy, particularly in the care of CF patients.
- Bruce Thompson, Head of The Alfred hospital Physiology Service, was appointed Adjunct Professor of Medicine in recognition of his high level of achievement in respiratory physiology and overall contribution to Monash University.
- Bronwyn Levvey was re-appointed as Adjunct Clinical Associate Professor of Medicine, in recognition of her considerable clinical and academic contributions to lung transplantation.

Selected Major Grants

- Professor Trevor Williams is a co-investigator (CIE) on the $1.14 million collaborative NHMRC Project Grant entitled 'A multicentre double-blind randomised placebo-controlled trial of oral anticoagulation in systemic sclerosis-related pulmonary arterial hypertension' to be led by Dr Mandana Nikpour (CIA) of the University of Melbourne, commencing in 2014.
- Dr Nicole Goh (CIF) and Dr Ian Glaspole (CIG) are co-investigators on a $655,210 NHMRC Project Grant entitled 'Novel methods for the early identification of progressive disease in idiopathic pulmonary fibrosis to be led by Dr Tamera Corte (CIA) of the University of Sydney, commencing in 2014.
- The Num Pon Soon Charitable Society awarded $200,000 for research investigating clinical and immunological efficacy of an oral tablet pre-seasonal immunotherapy for grass pollen hayfever and for a separate study addressing the problem of excessive snoring and obstructive sleep apnoea in Chinese-Australians. The research will be led by Professors Robyn O'Hehir and Matthew Naughton with Associate Professor Mark Hew and Emeritus Professor Jennifer Rolland.

Other Professional Achievements

- Associate Professor Tom Kotsimbos was appointed an Associate Editor of the European Respiratory Journal and Professor Trevor Williams was appointed to the foundation Editorial Board of Respirology Case Reports.
- Two AIRmed publications were honored by selection for Editor's Choice accolades.

Mittag D, Varese N, Scholzen A, Mansell A, Barker G, Rice G, Rolland JM, O'Hehir RE. TLR ligands of ryegrass pollen microbial contaminants enhance both Th1 and Th2 inflammatory responses and decrease induction of regulatory T cells. Eur J Immunol 2013; 43(3):723-33.

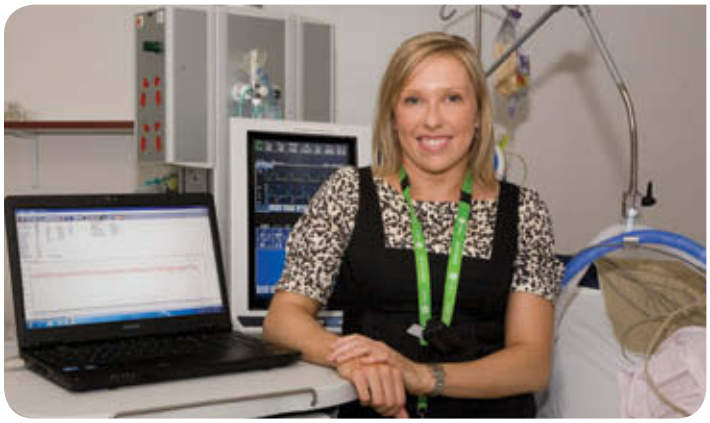
Thompson BR, Douglass JA, Ellis MJ, Kelly VJ, O'Hehir RE, King GG, Verbanck S. Peripheral lung function in patients with stable and unstable asthma. J Allergy Clin Immunol 2013;131(5):1322-8.

Postgraduate Students	Publications
8 PhD Students	87 Journal Articles 3 Book Chapters

TheAlfred

MONASH University

LA TROBE UNIVERSITY



Emma Ridley, Intensive Care Unit dietitian, researches methods to optimally determine the nutritional needs of critically ill patients.

Allied Health

Head: Lyndell Keating

Nutrition

Head: Associate Professor Ibolya Nyulasi BSc(Nut & Diet), MSc, GradDipBusMgt

The Nutrition Department provides acute and chronic disease management services. Research includes the aetiology and impact of nutritional disorders in disease and targeted nutrition interventions with intensive care, respiratory medicine and pregnancy currently active areas. We have research collaborations with Monash and La Trobe University with involvement in Monash's 'Be Active, Sleep and Eat' and La Trobe's 'Food for Life, Health and Performance' programs.

Associate Professor Ibolya Nyulasi sits on the European Society for Clinical Nutrition and Metabolism Faculty and is President of the Australasian Society for Parenteral and Enteral Nutrition (AuSPEN).

Nutrition in the ICU

The Intensive Care Unit (ICU) Nutrition Research Program, led by Dr Audrey Tierney and Emma Ridley, has focused on patients receiving extra-corporeal membrane oxygenation (ECMO). Emma led the largest multicentre study to examine nutrition provision in ECMO patients, which enrolled 112 patients in Australasia. Emma also set up a multicentre randomised controlled trial (RCT) to examine the impact of supplemental parenteral nutrition in ventilated ICU patients.

Emma Ridley and Dr Tierney supervised Honours student Oana Tatucu to conduct a single-centre pilot study of energy requirements in ECMO patients. The study demonstrated that energy requirements can be approximated using indirect calorimetry (IC) and measurement of carbon dioxide clearance from the ECMO circuit. The next step will be to validate this method.

Dr Tierney conducted a study in 86 Alfred ICU patients comparing the IC method with formulaic and weight based calculations to determine resting metabolic rate (RMR) and nutritional requirements. First time-point results indicated that predictive equation estimates were within 10% of measured RMR. However, the equations underestimated energy expenditure compared with the IC method with increased length of stay (LOS), indicating that IC should be used in patients with complexities and with a LOS over 5 days.

Pregnancy and Nutrition

Dr Tierney leads studies examining the impact of dietary interventions on pregnancy outcomes. In a pilot study at Sandringham Hospital, obese pregnant women had one face-to-face consultation with a dietitian and telephone follow-up. Individuals who attended the service (n = 32) gained significantly less weight (mean difference: 3.76 kg) and had a lower incidence of gestational diabetes (3.1% versus 22.7%) than non-attendees (n = 22). A larger controlled trial is now investigating if early nutritional intervention and ongoing antenatal dietetic support in obese pregnant women will achieve weight gain targets and reduce antenatal and postnatal complications in mother and child.

Cystic Fibrosis

Dr Susannah King and Dr Tierney have evaluated nutritional status changes of the outpatient cystic fibrosis (CF) population since 1997 and results may now inform a revision to the high fat CF dietary recommendations. In 2013 CF nutritional studies were extended to investigate dietary FODMAP (fermentable oligosaccharides, disaccharides, monosaccharides and polypols) intake. Dietary FODMAP intake correlated with energy intake, but was not associated with gastrointestinal symptoms, suggesting a high FODMAP load may not be the reason for otherwise unexplained symptoms such as bloating.

Achievements

- Lisa Murnane and Rachelle Opie were awarded Alfred Research Trusts Small Project Grants for their respective research on the Mediterranean diet in non-alcoholic fatty liver disease and nutritional intervention in obese pregnant women.
- Staff presented at various conferences in 2013 including the European Society of Cardiology Heart Failure Congress, 7th Congress of the International Paediatric Transplantation Association, 10th Australasian CF conference and the AusPEN Annual Scientific Meeting (ASM).
- Sarah Porteous was awarded the Mölnlycke Health Care Award prize at the 2013 Australian and New Zealand Burn Association ASM for her poster 'Resting Energy Expenditure in Critically Ill Burns Patients', which led to a grant from the Julian Burton Burns Trust.
- Dr Tierney won the CF Australia Abbie Fennessy Memorial Fellowship to support her work on the update of the Australasian Nutrition Clinical Guidelines.
- Dr Tierney is a member of a La Trobe University team awarded an AuSPEN research grant to investigate intestinal permeability in the critically ill.
- The Alfred was in the top ten (placed 7th) of hospitals worldwide in the 2013 Internal Nutrition Survey of Best Practice in Nutrition in the ICU.

Postgraduate Students	Publications
2 PhD Students	7 Journal Articles

Occupational Therapy

Head: Jacqui Morarty BAppSc(OT), MOT

The Occupational Therapy (OT) Service has built on achievements in the areas of ageing and rehabilitation, hand therapy, oncology, stroke, and acquired brain injury. Research activities have focused on the evaluation of quality, efficacy, and safety of OT assessments. The department is committed to providing evidence-based practice and professional development.

Associate Professor Natasha Lannin continued to build Alfred OT's profile in collaborative multi-site research, most notably with involvement in the NHMRC funded STROKE 123 Partnership Project and the Acquired Brain Injury (ABI) Research Program, funded by a Collaborative Grant from the Institute for Safety, Compensation and Recovery Research. The STROKE 123 program is a collaborative, national effort to monitor, promote and improve the quality of stroke care in hospitals. Associate Professor Lannin has also been involved in recruitment of more than 200 participants to a multicentre RCT examining the impact of pre-discharge OT home visits for community dwelling people aged over 65 years.

Anna Loughnan, Occupational Therapist, provides fatigue education management to patients prior to commencement of chemotherapy and /or radiotherapy.

Education for Cancer-Related Fatigue

Southern Melbourne Integrated Cancer Services funded an RCT comparing individual delivery of the Cancer-related Fatigue Intervention Trial (CAN-FIT) program with standard care for people undergoing chemotherapy and/or radiotherapy. We found no significant difference between groups on performance of daily living activities, but a significant difference between the control and treatment groups for overall quality of life (QoL) (as measured by the EQ-5D health state visual analogue scale) and physical fatigue. The treatment group rated their overall health state worse and their physical fatigue higher than the controls. This unexpected finding may be explained by participants' expectations of a more dramatic benefit, the phenomenon of 'response shift', or the possibility that these interventions are only effective in group-delivery mode due to peer support and interaction (O'Brien L *et al.*, *Support Care Cancer* 2014;22(1):209-15).

Hand Therapy

A retrospective cohort study included 224 Alfred patients with carpal tunnel syndrome, trigger finger/thumb, de Quervain's tenosynovitis and trapeziometacarpal osteoarthrosis. All were invited to attend for assessment and non-operative treatment with an experienced senior hand therapist and were followed up for at least one year. We compared those who attended non-operative treatment (n = 164) with those who did not (n = 60) and found a statistically significant difference (p = 0.02) in surgery uptake in the treatment group (40.8%) versus the non-treatment group (65%). This potentially makes a case for extension of scope in hand therapy roles in terms of screening and treatment for conditions that have established evidence to support conservative management (O'Brien L *et al.*, *J Hand Therapy* 2013;26(4):318-22).

Achievements

- Dr Lisa O'Brien was an invited speaker at the International Federation of Societies of Hand Therapy Congress in India. She received Small Grant funding for research into wrist injuries (via The Alfred Research Trusts and Monash University) and hand burns (via The Alfred and Australian Hand Therapy Association). Lisa was awarded the Australian Hand Surgery Society Prize for the Best Research Free Paper at the Australian Hand Therapy Association's national conference.
- Overall, the department had 16 oral and 3 poster presentations at national and international conferences.

Postgraduate Students	Publications
1 Doctor of Clinical Science (OT)	14 Journal Articles

Patient and Family Services

Head: Bridget Wall MSW, GradDipEval, Grad Dip Work Place Leadership, Cert Psychotherapy, Cert Trauma Counselling

The Department of Patient and Family Services incorporates Social Work, Interpreters and Multicultural Services, Pastoral Care, a Volunteer Program and Aboriginal Hospital Liaison Officers. Social Work has developed academic links with the University of Melbourne via a consultancy with Associate Professor Lou Harms, which has aided research project progress. Social Work has also pursued multidisciplinary research and a partnership with La Trobe University. Research areas include cancer, trauma, neurosurgery and burns.

Burns

Collaborative projects with the Burns Unit are in preparation. One project will investigate the psychosocial issues of burns patients presenting to a level 1 trauma centre and this will involve Rose Knol, Emma Kelly, Anna Wellington-Boyd, Associate Professor Lou Harms (University of Melbourne), Jason Wasiak (Senior Researcher, Burns Unit) and Heather Cleland (Director, Burns Unit). Emma Kelly and Rose Knol also plan to lead a project examining the interventions provided to Burns patients by Social Work, which will develop Social Work specific outcome measures for the interventions.

Social Work and Trauma Team members Rose Knol (L) and Emma Kelly (middle) discuss a Patient and Family Services / Burns Unit collaborative project with Jason Wasiak (R) (Research Fellow, Victorian Adult Burns Service, The Alfred).

Cancer

Social Work (Sue De Bono) collaborated with the Psychology Department on the Sense of Coherence (SOC) and level of psychological distress and QoL in hematopoietic stem cell transplant (HSCT) patients described below in the Psychology report. Sue De Bono has also been involved in development of a stem cell transplant self help manual with the Psychology Department.

Trauma and Traumatic Brain Injury

Preliminary work commenced on research into supporting children visiting the ICU in the context of a traumatic admission of a parent or significant family member. The project involves Associate Professor Lou Harms, Anna Wellington-Boyd, Roslyn Tassicker and Joanne Matchado. Data collection has started on a joint project with Epworth Hospital on the prevalence of relocation stress for patients and families moving from an acute setting to rehabilitation. The Social Work / Epworth collaboration involves Rose Knol, Elaine Talbot (Epworth), Jane Serong and Emma Kelly. A collaborative project between OT (Associate Professor Natasha Lannin), Social Work (Anna Wellington-Boyd) and La Trobe University (Kate D'Cruz) is exploring experiences of goal setting and planning for severe ABI patients and their carers.

Postgraduate Students

3 Masters Students

Physiotherapy

Head: James Sayer BAppSc(Physio), GradDipExercise & Sports Sc, MHlthSc(ManipPhysio), MBA

The Alfred Physiotherapy Department's areas of research strength are in physical activity and rehabilitation for hospitalised patients and people with chronic illness. We have active research programs investigating new models of rehabilitation for people with respiratory disorders, early rehabilitation following surgery, physical activity in chronic disease, and physiotherapy in intensive care.

Acute Respiratory Disease

Physiotherapist Dr Christian Osadnik completed a study which redefines the role of physiotherapy in the acute care of people with respiratory illness. The study, conducted in hospitalised people with chronic obstructive pulmonary disease, found that positive expiratory pressure therapy to clear sputum from the airway conferred no additional benefit over routine physiotherapy care (Osadnik *et al.*, *Thorax* 2014;69(2):137-34). The trial took place at two sites in Melbourne, including The Alfred hospital. Dr Osadnik led the trial as part of his doctoral studies and received a number of awards including two international travel grants to present his research in Europe and North America.

Cystic Fibrosis

A program of doctoral research has highlighted the importance of physical activity in people with CF. Doctoral research conducted by physiotherapist Narelle Cox included a Cochrane review showing the gaps in scientific knowledge regarding strategies to enhance physical activity in people with CF. Narelle found that higher levels of physical activity are associated with better lung function and fewer days in hospital and that tele-health strategies have the potential to enhance physical activity participation in this unique patient group. Narelle was supported by an NHMRC Dora Lush Biomedical PhD Scholarship and a Cystic Fibrosis Australia Research Trust PhD stipend top-up.

Physiotherapist Narelle Cox is conducting studies that highlight the importance of physical activity for people with cystic fibrosis.

Achievements

- Associate Professor Anne Holland was awarded a grant from the Norwegian Research Council for a study of tele-rehabilitation for chronic lung disease. This study, which will be conducted in Australia, Norway and Denmark, will investigate whether provision of long-term, home-based exercise training and physiological monitoring using broadband technologies can improve wellbeing and reduce the need for hospitalisation. This builds on Associate Professor Holland's work published in 2013 showing that a low cost tele-rehabilitation program is safe and feasible for people with a chronic lung disease, many of whom have never previously used the internet. This multi-national study will be the largest trial of in-home tele-rehabilitation to be conducted in people with chronic lung disease.
- Associate Professor Brenda Button won the 2013 Monash University School of Physiotherapy Award for Excellence in Clinical Education, as voted by students in 2012.

Postgraduate Students

8 PhD Students
6 Masters Students

Publications

27 Journal Articles

Psychology

Head: Lynda Katona BA(Hons), MA(ClinPsych)

The Psychology Department (Clinical and Neuropsychology) is committed to providing best practice evidence-based services to improve the QoL of patients and their carers. In the acute hospital setting, clinical psychologists provide psychological assessment and treatment to patients with problems such as depression, anxiety and adjustment issues and are attached to the CF, Oncology, HIV, Heart Transplant and Burns Services as well as the Hospital Admission Risk Program. In Alfred Psychiatry, clinical psychologists take a leading role in the treatment of clients with personality disorder. Neuropsychology assessment and treatment services are provided to patients of all psychiatry programs and all medical and surgical units of the hospital, in particular neurology, neurosurgery, trauma and HIV services.

Hemotopoietic Stem Cell Transplant

Lynda Katona with colleagues from Social Work (Sue De Bono), Haematology, Monash Alfred Psychiatry research centre (MAPrc), Monash University and Cabrini Health investigated the psychosocial experience and QoL of patients undergoing HSCT at The Alfred. A clinical psychology student from Monash University, Brindha Pillay, undertook the research as part of her doctoral degree. In particular, the demographic, medical and psychosocial factors that were associated with overall survival and various QoL domains at different stages of treatment

were explored. An aspect of this research was based on a retrospective audit of data collected as part of routine clinical psychology assessments of patients undergoing allogeneic HSCT between 2005 and 2011. A second aspect of this research encompassed a prospective longitudinal study, which involved following up patients at three time-points, immediately prior to transplantation, two to three weeks post-transplant and three months post-transplant. Psychosocial measures were administered to assess patients' levels of anxiety and depression, coping responses to cancer diagnosis and SOC.

Approximately eight to 18% of the patients surveyed experienced clinical levels of depression and/or anxiety prior to HSCT. None of the psychological variables independently predicted post-transplant survival. As expected, acute post-transplant factors such as relapse and graft-versus-host disease largely accounted for poorer survival. However, the addition of a series of pre-transplant psychosocial and medical variables further improved the prediction of survival. In particular, relationship status (being single) and experiencing greater somatic symptoms pre-transplant were associated with shorter survival times.

A range of psychosocial factors were associated with QoL outcomes of patients. After controlling for medical and demographic factors, weaker fighting spirit and higher levels of depression were associated with poorer physical and social QoL prior to HSCT. In contrast, stronger SOC was associated with increased physical, functional and emotional wellbeing at this point. Patients who were younger, female, and did not have a significant other tended to have a weaker SOC, compared to patients who were male, older and in a relationship. However, at the second and third time-points following transplantation, patients' baseline level of SOC was no longer predictive of physical wellbeing. Nevertheless, the relationship between SOC and social, emotional and functional QoL remained.

These findings have several implications for clinical practice. Despite the significant influence of acute post-transplant factors on survival, multidisciplinary pre-transplant assessments may serve to identify patients who may be particularly vulnerable to experiencing poor survival outcomes. Given that poor psychosocial functioning pre-transplant renders an increased likelihood of experiencing impaired QoL across various dimensions, it seems important that psychologically vulnerable patients are identified early in the treatment process. This would enable clinicians to provide appropriate psychological support prior to commencement of an arduous treatment that would further impact on QoL.

Aspects of the research described above have been presented at the Victorian Integrated Cancer Services Conference and ASM of the Haematology Society of Australia and New Zealand, the Australian and New Zealand Society of Blood Transfusion and the Australasian Society of Thrombosis and Haemostasis.

Lynda Katona (Manager Psychology Services) and Anthony Talbot (Clinical Psychologist, Cystic Fibrosis Service).

Postgraduate Students	Publications
1 Doctor of Psychology	1 Journal Article

Speech Pathology

Head: Janine Mahoney BAppSc(SpPath)

Two main areas of study have been a collaborative project with the Endocrine Surgery Department looking at voice changes following thyroid surgery and a study investigating swallowing outcomes in patients with head and neck cancer.

Swallowing after Head and Neck Cancer

A study examining the effectiveness of an exercise program on swallowing function in patients receiving radiotherapy for oral and pharyngeal cancer was completed by Amanda Dwyer. Although the number of patients recruited was small, the results indicated that patients who completed more exercises had more favourable outcomes relating to weight maintenance and BMI. This information was presented at the Australian and New Zealand Head and Neck Cancer Society ASM. Information on patient compliance with the exercise program, which will provide more insight into the patient journey through the treatment period, will be explored over the coming year.

Speech Pathologist Amanda Dwyer (L) and Allied Health Administrator Rachel Saunders (R) work on the 'Swallowing Exercises for Radiotherapy Patients' program.

Thyroid Surgery and Voice Changes

A collaborative project with General Surgery (Professor Jonathan Serpell) and Speech Pathology (Dr Amanda Scott and Miriam Voortman) has investigated the effect of thyroidectomy on voice. The data collected on voice outcomes have been utilised in three different ways. The relationship between voice outcome and type of thyroid tumour and extent of surgery was examined, with no significant differences found between these factors.

Another analysis focused on the validity of the acoustic measures obtained using the lingWAVES computerised system. The acoustic measures matched the reported results from other systems of acoustic analysis in both the pattern of impairment and recovery. Perceptual ratings measured using the CAPE-V (Consensus Auditory-Perceptual Evaluation of Voice) scale were correlated with an overall severity score, the Dysphonia Severity Index. Strong correlations were found between measures. The value of the lingWAVES system of acoustic voice analysis was supported by these studies.

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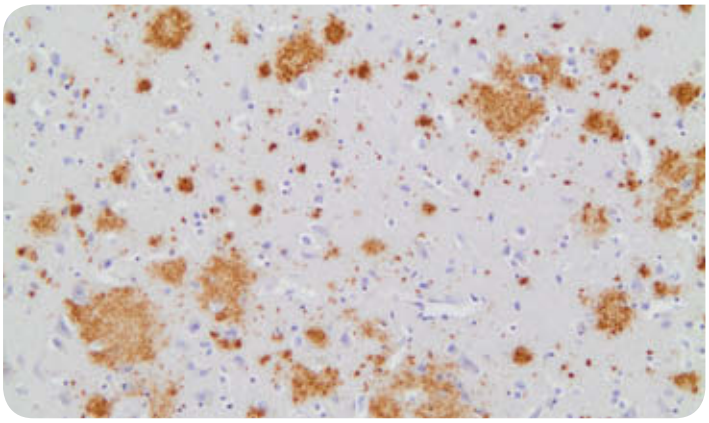
Anatomical Pathology

Head: Professor Catriona McLean, BSc, MBBS, FRCPA, MD, FFSc(RCPA)



Histological staining of tissue from an Alzheimer's Disease brain shows deposition of abnormal amyloid ß protein (brown staining) plaques.

The Department of Anatomical Pathology provides a diagnostic service to Alfred Health, with reporting of 15,000 tissue and cytology specimens per year. The department includes the Victorian Neuromuscular Laboratory Service, a State funded Victorian (and Tasmanian) referral centre for all nerve and muscle biopsies. In 2013, a Solid Tumour Molecular Laboratory was established to report on gene mutation status in tumours such as melanoma, lung and colorectal carcinoma using Sequenom technology.

Anatomical Pathology collaborates widely within AMREP and also with Cancer Council Victoria, Peter MacCallum Cancer Centre (PMCC) and the School of Biomedicine, Monash University. Professor McLean also heads the Australian Brain Bank Network, centred at the Florey Neurosciences Centre at The University of Melbourne. The main areas of research are in the field of neurodegeneration (such as Alzheimer's Disease), muscle disease, breast cancer, lung and heart transplantation, and liver cirrhosis.

Breast Cancer and Melanoma

A collaboration with the Cancer Council Victoria and multiple breast cancer research groups throughout the world led to the identification of four loci associated with estrogen receptor (ER)-negative breast cancer via a meta-analysis of genome-wide association studies (Garcia-Closas M *et al., Nature Genetics* 2013). The study provides evidence of distinct aetiological pathways associated with ER-negative and -positive tumours. Understanding genes and proteins related to breast cancer has potential translational roles in diagnosis, management and treatment for breast cancer.

A collaborative study led by the Victorian Melanoma Service (Associate Professor John Kelly and Dr Victoria Mar) and PMCC (Professor Grant McCarthur) led to the finding that melanomas arising in severely sun-damaged skin have higher mutation loads and contain a spectrum of molecular subtypes compared with BRAF- and NRAS-mutant tumors (Mar V *et al., Clin Cancer Res* 2013).The study indicates that multi-gene screening approaches and combination therapies may be required for management of these patients.

Brain and Muscle Disorders

Our greatest research output in 2013 was in the area of Alzheimer's Disease and other brain or muscle disorders, including devastating brain infections, unusual blood vessel diseases of the brain, movement disorders, brain trauma, Creutzfeldt–Jakob disease (within Australia) and other rare neurological disorders. Professor McLean co-authored an editorial (Brew BJ *et al., Med J Aust* 2013) discussing the potential for the BK virus as causative in progressive multifocal leucoencephalopathy.

Lung Transplantation

A collaborative study with the Alfred Lung Transplantation Service (Clinical Associate Professor Glen Westall and Dr Miranda Paraskeva) explored the histological processes that lead to chronic allograft dysfunction and the long-term failure of lung transplantation. Our study revealed that acute fibrinoid organising pneumonia is a novel form of chronic allograft dysfunction exhibiting spirometric, radiological, and histopathological characteristics that differentiate it from the traditionally recognised small airway histopathological process of obliterative bronchiolitis (Paraskeva M *et al., Am J Respir Care Med* 2013). Further characterisation of chronic allograft dysfunction and its heterogeneous manifestations will allow the targeting of clinical and experimental efforts to prevent and treat chronic allograft dysfunction.

International Collaborations

Professor McLean has contributed to discussions with her international peers on neuropathology teaching world-wide (Del Biogio MR *et al., Brain Pathol* 2014) and the issues surrounding banking of brain tissue to study neurological disorders (Samarasekera N *et al., Lancet Neurology* 2013). These publications have highlighted the need for neuropathology training to be more than simply diagnostic histopathology and the potential role of brain banks in scientific advances for increasingly common neurological disorders.

Achievements

- Professor McLean (CIB) was awarded a $576,269 NHMRC Project Grant with Monash colleagues Professor Christina Mitchell (CIA) and Dr Lisa Ooms (CIC) to study the role of a PI3K regulator in breast cancer, to commence in 2014.
- In 2013, NHMRC Grants held by Professor McLean included: a $2.5 million Enabling Grant for the Australian Brain Bank (2010-2015; CIA): a $2.5 million Centre for Excellence into Neuromuscular Disorders (2012-2016; CIJ): and four Project Grants (CIB).
- Professor McLean supervised two BMedSc students, including Shivani Bhatt, who was awarded a Poster Prize for Respiratory Medicine during Alfred Week for a study investigating pulmonary fibrosis and pulmonary hypertension.

Publications

20 Journal Articles

TheAlfred

Michelle Paul (Research Assistant, Burns Tissue Laboratory) grows a cultured epithelial autograft (CEA) preparation in the Skin Tissue Culture Manufacturing Laboratory. CEA is a technique involving the in vitro expansion of a patient's own keratinocytes for the treatment of burns.

Burns

Head: Dr Heather Cleland MBBS, FRACS

The Victorian Adult Burns Service (VABS) operates from the Burns Unit at The Alfred hospital. The Unit admits over 300 patients per year. Given the variability, unpredictability and complexity of patients presenting to VABS with burn injury, the aim of our research is to:

- Examine acute burn care practices and monitor patient outcomes;
- Benchmark acute burn care practices against other units in Australia and overseas;
- Participate in studies to evaluate new or emerging technologies using the Skin Tissue Culture Laboratory; and
- Adopt an evidence-based approach to burn care delivery.

Skin Tissue Culture Laboratory

The Skin Tissue Culture Laboratory, headed by Dr Heather Cleland and Dr Shiva Akbarzadeh, found that cryopreserved cadaver skin had a positive and definite role as an adjunct to conventional dressing and grafting, particularly in patients with a high proportion of total body surface area burns. Tissue viability in cadaveric allograft may not be essential for its clinical function as a wound dressing or even as a permanent dermal substitute (Clelend H *et al.*, *Burns* 2014;40(1):61-6).

Outcomes in Black Saturday Victims

We completed a cohort study with retrospective assessment of pre-injury status and prospective assessment of physical and psychosocial functioning in Black Saturday Wildfires burns patients. Generic health status and burn specific quality of life using the 36-item Short Form Health Survey (SF-36) and Burn Specific Health Scale (BSHS) were collected at three, six and twelve months post-burn injury. Similar time points were used to measure level of psychological distress and the presence of pain using the Kessler-10 questionnaire (K-10) and the McGill Pain Questionnaire.

Patients affected by the 2009 Victorian wildfires still experienced a significant reduction in generic health, increased psychological distress and persistent pain at 12 months post-burn injury. The need for early and ongoing identification of physical and psychosocial impairments during hospital admission and upon discharge could be helpful to establish systematic interdisciplinary goals for long-term rehabilitation after severe burn injury (Wasiak J *et al.*, *Injury* 2013;44(11):1443-7). The publication from this research was shortlisted and nominated for the 2013 Early Career Researcher Best Paper Award in 2013 by Monash University's School of Public Health and Preventive Medicine.

Toxic Epidermal Necrolysis

Dermatology Registrar Patrick Mahar, who is undertaking a PhD at Deakin University and is closely affiliated with VABS, undertook a number of retrospective cohort studies and systematic reviews in 2013. These reviews looked at mortality outcomes in patients with toxic epidermal necrolysis (TEN), a severe drug reaction that has many clinical similarities with major burns and has a reported mortality rate of 30-50%. Several papers have been published or accepted for publication looking at the mortality outcomes of TEN in the international literature with a focus on prognostic tools, sepsis management, ophthalmological complications and withdrawal of care. Five articles have been accepted for publication in the last year on the topic in international peer-reviewed journals such as the Journal of Burn Care and Research, Burns and Dermatology.

Achievements

- Tanya Katz, a former burns Resident, was awarded Best Poster at the 37th Annual Scientific Meeting of the Australian and New Zealand Burns Association for her research 'Incidence of non-candidal fungal infections in severe burn injury: An Australian perspective', which was also published in the journal Burns (Katz *et al.*, *Burns* 2013).
- VABS, in collaboration with Alfred departments of Ophthalmology and Occupational Therapy, received over $10,000 in funding to investigate ocular involvement in patients presenting with facial burns and to examine the impact of burn injury on hand functioning up to 12 months post-discharge.

Michelle Paul examines fibroblast cells to be used as a feeder layer for experimental keratinocyte culture.

Postgraduate Students

2 PhD Students
5 Masters Students

Publications

8 Journal Articles

Associate Professor Silvana Marasco (centre) with Research Assistants Margaret Quayle (L) and Robyn Summerhayes (R), who were involved in the work leading up to securing funding for development of an improved cannulation system.

Cardiothoracic Surgery

Director: Professor David McGiffin MD

The Cardiothoracic Unit provides a full range of adult cardiac and thoracic surgery including heart and lung transplantation and mechanical assist device implantation. Over 2013, the main research areas have focused on improving organ preservation for transplantation, improving outcomes in chest trauma, particularly in flail chest injury and development of improved peripheral circulatory support techniques.

Professor David McGiffin was appointed Director of Cardiothoracic Surgery and Transplantation during 2013 and an Honorary Professorial Fellow of Baker IDI and Monash University. Professor McGiffin was previously at The University of Alabama, Birmingham, USA.

Heart Preservation for Transplantation

The organ preservation project focuses on improved preservation of donor hearts to allow longer storage and transport times, as well as the potential utilisation of 'donation after circulatory death' donor hearts. The project has been spearheaded by Professor Frank Rosenfeldt over the last five years. Professor Rosenfeldt and Associate Professor Silvana Marasco have been awarded funding of $1.8 million over the next two years to develop the novel organ preservation system, with the aim of commencing a clinical trial by 2016 and ultimately proceeding to commercialisation.

Development of a Cannulation System

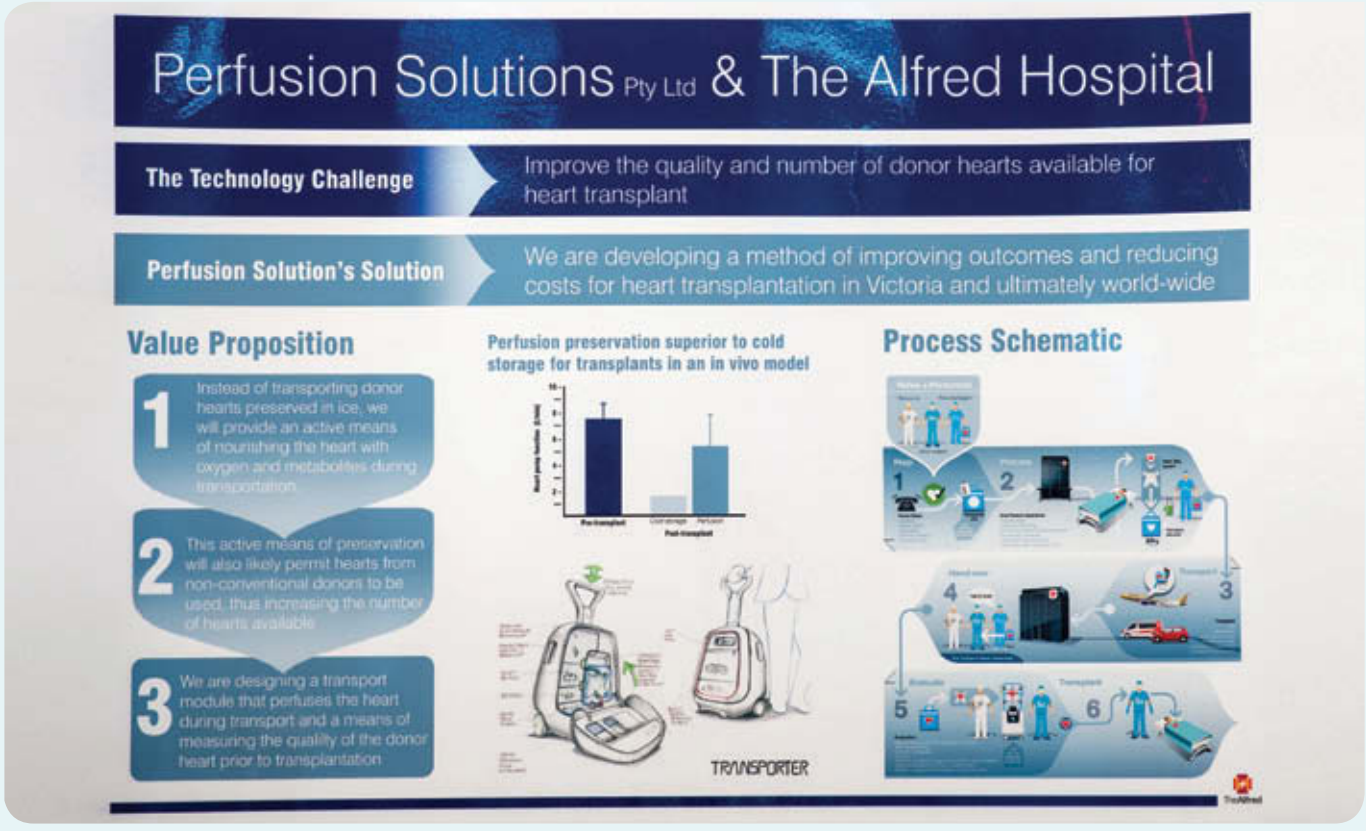
Associate Professor Marasco has also been awarded $1.8 million for the development of an improved cannulation system for peripheral cardiopulmonary bypass and extracorporeal membrane oxygenation (ECMO) circulatory support. The project seeks to develop a bidirectional cannula that will improve leg perfusion and reduce ischaemic complications. A second part of the project aims to develop a percutaneous closure solution to be used with the cannula, avoiding the need for transfer to theatre and formal arterial repair in patients undergoing ECMO. Local company, MTM Medical, as well as international medical device company, Sorin, will be working closely with The Alfred hospital team to develop the cannulation products to the point of commercialisation over the next two years.

Postgraduate Students

4 PhD Students
1 Masters Student

Publications

12 Journal Articles



www.alfredheartcentre.org.au

Cardiovascular Medicine

Director: Professor Anthony Dart BA, BM BCh, DPhil, FRCP, FRACP, FAHA

Interventional Cardiologist Associate Professor Antony Walton (Head of the Structural Heart Program at The Alfred) leads catheter laboratory research in 'structural' heart disease, including percutaneous valve deployment, atrial septal intervention, atrial appendage isolation and renal denervation.

The Department of Cardiovascular Medicine investigates and treats all aspects of adult cardiac disease. It has one right-heart and two full-heart cardiac catheter laboratories, which provide care for acute cardiac patients. Non-invasive investigations include echocardiography (including transoesophageal, 3D and stress) and, in conjunction with the Department of Radiology, cardiac MRI (magnetic resonance imaging) and cardiac CT (computed tomography). In conjunction with the Department of Cardiothoracic Surgery and the Intensive Care Unit, it offers statewide services in mechanical circulatory support and cardiac transplantation.

In addition to the research carried out in the clinical investigation areas, the department has a number of procedural rooms reserved for research use, in which various procedures are undertaken (including microneurography, plethysmography, adipose and muscle biopsy, etc). Many staff members have honorary or conjoint appointments with Monash University and/or Baker IDI Heart and Diabetes Institute. Research is undertaken and promoted throughout the department with funding provided from the NHMRC (Program, Project and Development Grants; a Centre of Research Excellence; and People Support awards), the National Heart Foundation and commercial sources.

In the cardiac catheter laboratory, research has focused on novel non-coronary interventional procedures. Imaging research has focused particularly on cardiac MRI. Cardiac electrophysiological research has been conducted in relation to various aspects of atrial fibrillation (AF), while cardiovascular physiology studies have addressed the important problem of heart failure (HF) with preserved ejection fraction. The department contributes extensively to clinical trials in cardiovascular disease, provides research training opportunities for clinical and non-clinical staff and contributes to interventional cardiology and device registries.

Cardiac Catheter Laboratory

Research in the cardiac catheter laboratory has continued into a number of novel non-coronary interventions and devices. Professor David Kaye and Dr Stephen Duffy recently published the first paper describing a new medical device for reducing the radiographic contrast load experienced by patients during coronary angiography and other procedures (Kaye *et al.*, *Catheter Cardiovasc Interv* 2014;83(5):741-5).

In certain patient groups this can have important and deleterious consequences. The device was developed by Osprey Medical, the company cofounded by Professor Kaye. Promising early results have led to a large-scale multicentre interventional trial that is currently under way.

Associate Professor Antony Walton leads research into a variety of non-coronary devices and interventions and the department has undertaken more than 100 cases of percutaneous aortic valve replacement. Associate Professor Walton and his team have also investigated patent foramen ovale closure and atrial appendage isolation for stroke prevention, interatrial shunt creation for the treatment of HF and percutaneous renal denervation for blood pressure control and improvement of renal and cardiac function. The department is also a major contributor to registry data and is represented by Dr Duffy on the Victorian Cardiac Outcomes Registry (VCOR) steering committee, which will extend the pioneering work conducted in the Melbourne Interventional Group by Dr Duffy and his colleagues.

Non-invasive Cardiac Imaging

Research continues in all aspects of cardiac imaging with a particular focus on cardiac MRI. The ability of cardiac MRI to identify both regional and diffused fibrosis has been further confirmed in studies by Associate Professor Andrew Taylor and his colleagues. Dr Andris Ellims published research as part of his PhD, which identified the role of diffused cardiac fibrosis in determining ventricular stiffness in diastolic functions (Ellims *et al.*, *J Am Coll Cardiol* 2014;63(11):1112-8). In addition to contributing to mechanistic understanding, this finding may have relevance in evaluating the use of anti-fibrotic agents in cases where an accurate and non-invasive method of identification will be a valuable attribute. The ability of cardiac MRI identified fibrosis to predict propensity for serious arrhythmia development has been shown and has potential for clinical utility in stratifying patients likely to benefit or not, from deployment of implantable defibrillators. Dr James Hare is using non-invasive cardiac imaging to identify patients likely to be at risk of developing cardiac complications as a result of therapy to treat cancer. Cardiac MRI has also been valuable in inter-disciplinary studies, in particular with the Electrophysiological Laboratory.

Electrophysiology

Associate Professor Peter Kistler leads an active and productive research program in clinical electrophysiology. In 2013, PhD candidate Dr Alex McLellan presented findings that cardiac fibrosis as identified by MRI can predict the success of AF ablation. Other collaborative studies have provided evidence that restoration of sinus rhythm improves cardiac function in patients with cardiomyopathy. The Electrophysiology Laboratory was also the instigator and a major contributor to a randomised trial investigating the relative benefits of minimal or maximum ablation strategies (the MINIMAX trial) in controlling paroxysmal AF.

Cardiovascular Physiology

Professor David Kaye directed studies to investigate the physiological basis for HF with preserved ejection fraction, increasingly recognised as a common form of HF leading to hospitalisation. This involved studying cardiac performance both at rest and in response to exercise to more closely mimic the conditions under which symptoms can be produced. In closely related work, the performance of the right ventricle in patients with pulmonary hypertension is also being assessed under stressed conditions.

Colleagues from Baker IDI continue to undertake a number of clinical studies within the department in relation to the sympathetic nervous system, involving measurement of sympathetic nerve activity as well as biochemical measures of noradrenaline kinetics. Studies completed during the year identified an important role of the sympathetic system in the production of the metabolic consequences of polycystic ovary syndrome and explored the role of the sympathetic nervous system in explaining some of the metabolic consequences of dietary interventions in overweight subjects.

Biomarkers

The department has an interest in evaluating the role of the novel cardiac biomarker, macrophage migration inhibitory factor (MIF). Studies led by Professor Dart involving collaboration with colleagues in Beijing, showed that early elevation of MIF was a predictor of final infarct size in patients with myocardial infarction (Chan *et al., J Am Heart Assoc* 2013;2(5):e000226). The work also involved close collaboration with colleagues at Baker IDI and resulted from the doctoral studies of Dr William Chan, currently a Neil Hamilton Fairley Fellow and due to return to The Alfred in 2014. Further studies are under way to confirm the predictive value of MIF elevation and to establish commercialisation partners.

A number of other biomarker studies were undertaken during the year, including Dr James Shaw's studies on the relationship between circulating vitamin D levels and the extent of coronary disease as well as the effects of vitamin D supplementation on a range of cardiovascular and biochemical biomarkers. A collaboration with the Lipidomics Laboratory at Baker IDI has investigated the changes in circulating lipid parameters associated with coronary and vascular disease, including at-risk patient groups such as those with rheumatoid arthritis.

Achievements

Grants

- Professors David Kaye (CIA) and Anthony Dart (CID) with colleagues from Baker IDI received a five-year NHMRC Program Grant of $12.4 million commencing in 2013 to carry out 'A program of translational cardiovascular medicine: Identifying new targets for prevention and treatment'.
- Professor David Kaye's NHMRC Research Fellowship was renewed for a five-year term (2013-2017) with promotion to Senior Principal Research Fellow (SPRF) and Professor Anthony Dart continued as an NHMRC SPRF.
- Professor David Kaye received a two-year NHMRC Development Grant of $455,000 to commence in 2013 for the project 'Development of an extended release oral formulation of milrinone for patients with advanced heart failure'.
- Dr Stephen Duffy's collaboration with Baker IDI has resulted in his involvement as CIB on Professor Bronwyn Kingwell's NHMRC Project Grant of $490,468 (2014-2016) entitled 'HDL elevation and glucose metabolism: A mechanistic proof-of-concept intervention trial in pre-diabetes' and CID on Professor Kingwell's (CIA) Heart Foundation Grant-in-Aid of $130,000 (2013-2014) entitled 'The HDL lipidome: Prediction of coronary plaque rupture and monitoring of therapeutic responses'.
- Dr Leah Iles was awarded a co-funded NHMRC / Heart Foundation Early Career Fellowship for her research 'The role of diffuse myocardial fibrosis in myocardial stiffness' to commence in 2014 after submitting her doctoral thesis in 2013 under the supervision of Associate Professor Andrew Taylor.
- Dr Sandeep Prabhu was awarded a co-funded NHMRC / Heart Foundation Postgraduate Scholarship for 2014-2016.

Other Awards and Prizes

- Dr Alex McLellan won the Young Investigator Award at the 2013 Asia Pacific Heart Rhythm Society (APHRS) conference in Hong Kong for his oral presentation 'Diffuse ventricular fibrosis measured by T1 mapping on cardiac MRI predicts success of AF ablation' and was a finalist for the Best Abstract Award for his oral presentation 'A randomised controlled trial of a minimal or maximal ablation strategy to achieve pulmonary vein isolation for paroxysmal AF: Medium term follow-up (the MINIMAX trial)'.
- Dr Tomos Walters won the Best Abstract Award at the 2013 APHRS conference for his oral presentation 'Electrophysiology of the PV-LA junction during acute stretch in humans: Conduction slowing and complex fractionated electrograms'.
- Dr Antony Walton was awarded an Associate Professorship by Monash University.

Dr Alex McLellan (PhD student, Alfred & Baker Medical Unit) won a Young Investigator Award at the 2013 Asia Pacific Heart Rhythm Society conference.

Postgraduate Students

14 PhD Students
1 MD Student

Publications

63 Journal articles

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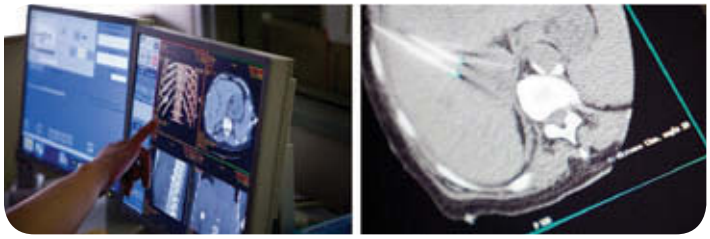
Diagnostic and Interventional Radiology

Director: Professor Kenneth Thomson MD, FRANZCR, FRCR



Radiology carries out targeted, non-thermal tumour ablation with irreversible electroporation. The image depicts procedural treatment planning to identify the size and shape of the tumour (L) and intra-procedural CT image of electrodes inserted into a liver tumour to deliver electric pulses (R).

The Radiology Department delivers diagnostic services and interventional procedures using state-of-the-art facilities. The commitment of our 200 staff is underpinned by excellence and leadership in radiological practice, safety, teaching and academic research. Imaging has an essential role for diagnosis, monitoring of therapy and for performing minimally invasive procedures. Consequently, a broad range of internal, collaborative and commercially sponsored research is conducted in the department. Our research focuses on improving patient care through evidence-based medicine, working with the industry to facilitate and expedite innovation into clinical practice, as well as promoting improvements in health service delivery.

Main areas of research in 2013 were focal tumour ablation with irreversible electroporation (IRE), the effectiveness of balloon angioplasty for patients with multiple sclerosis and reducing the radiation exposure to patients having a computed tomography (CT) scan of the chest-abdomen-pelvis and vascular embolisation.

Collaborative research papers published in 2013 included work on: renal injury at our level-1 trauma centre; the utility of magnetic resonance imaging (MRI) in acute patients with persistent midline cervical tenderness and negative CT scans; cancer risk in 680,000 people exposed to CT in childhood or adolescence; and the accuracy of limb radiograph interpretation by emergency nurse practitioners.

Vascular Embolisation

In a study on pain management for women undergoing uterine artery embolisation for the treatment of symptomatic fibroids, the addition of oral oxycodone (opioid) prior to the procedure did not show any analgesic advantage and the increased adverse effects of nausea and vomiting had possible implications of delayed discharge. We recommended that future studies should explore analgesic therapies that are opioid sparing or avoid opioid altogether (Konstantatos AH, *et al.*, *Cardiovasc Intervent Radiol* 2014; *in press*).

A second study examined spleen immune function preservation after splenic artery embolisation for the management of spleen related internal bleeding after trauma. In the past, traumatic injury of the spleen was treated with splenectomy. This approach has good immediate results in preserving life, but has long-term adverse consequences, in particular loss of immunity and the risk of life threatening infection. Our study supported the theory that splenic artery embolisation allows preservation of splenic immune function and suggested that distal embolisation may better preserve immune function than proximal embolisation.

Irreversible Electroporation for Tumours

Our research on the treatment of inoperable primary liver tumours suggested that IRE is a safe and feasible technique even for tumours located in difficult and/or high-risk locations near essential organs or vital structures. The overall rate of complete response to tumour ablation was 72% and for tumours ≤ 3 cm a complete response was obtained in 93% of tumours. The procedure was well tolerated by patients, with minimal oral analgesia required after the procedure (Cheung W *et al.*, *Technol Cancer Res Treat* 2013).

We completed a study on the assessment of IRE as a salvage therapy for brachytherapy, which is used to manage early stage prostate cancer. IRE delivers electric pulses into a tumour to destabilise the cellular membranes. We found that there was no significant difference in electrical behaviour in tissue containing a grid of expired radiotherapy seeds relative to those without seeds for *in vivo* experiments. Numerical simulations predicted no significant alteration of electric field or thermal effects. We have also commenced a phase 1 study on the effects of IRE on prostate cancer. Our early findings suggest that the procedure is well tolerated by patients and that ablation can be achieved close to the prostate capsule without complications.

Achievements

- Dr Ramesh Chokka and Dr Anoop Madan won the American Institute for Radiologic Pathology Best Case Award in Neuroradiology-Imaging and Pathology for their work on 'Spinal Hemangioblastoma'.
- Professor Thomson was awarded the Monash Comprehensive Cancer Consortium Prize for Best Poster in Cancer Research during 2013 Alfred Week for the presentation 'The effects of metallic implants on electroporation therapies: Feasibility of IRE for prostate cancer brachytherapy salvage (Thomson KR, Neal RE II, Kavnoudias H, Smith R, Rosenfeldt F, Mclean CA, Earl V, Bergman J, Ou R, Millar J, Royce P).

Postgraduate Students	Publications
6 Masters Students	10 Journal Articles

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The Emergency and Trauma Centre relies on team-based research. (L-R: Claire Hatherley, Sarah Cowen, Associate Professor Biswadev Mitra, Dr Tim Phillips and Clare Arbon.

Emergency and Trauma

Director: Dr De Villiers Smit MBChB, FACEM

The Alfred Emergency and Trauma Centre (ETC) is a tertiary referral centre for Victoria and provides a statewide emergency medical service for adult trauma, hyperbaric medicine, burns, HIV medicine, cystic fibrosis, haemophilia, haematological malignancies, heart and lung transplant and critical neurosurgery. Research is concentrated on pre-hospital care, emergency medicine and trauma resuscitation focusing on improving safety, satisfaction and quality. There is an emphasis on research methods education, evidence-based medicine and international development of emergency medicine.

The ETC is a participant in the Monash Partners Academic Health Science Centre under the critical care, trauma and perioperative medicine theme. This involves working with national research networks including the Australian and New Zealand Intensive Care Society Clinical Trials Group, the Australian and New Zealand College of Anaesthetists Clinical Trials Group, the National Trauma Research Institute, Australasian Cochrane Centre and Monash University School of Epidemiology and Preventive Medicine.

Research Highlights

- The Safe Elderly Emergency Discharge (SEED) project, funded by The Alfred Research Trusts, completed patient recruitment and follow-up data collection is ongoing. The study aims to determine whether current models of emergency care ensure safe discharge and facilitate optimal health outcomes for older patients, with a view to developing a tailored evidence-based care framework applicable to Australian and international settings.
- The ETC continued to participate in recruitment of patients for the ARISE, POLAR and CHEER studies. ARISE is a multicentre, randomised, controlled trial (RCT) of the effect of early goal-directed therapy, compared to standard care, in patients with severe sepsis presenting to Australasian Emergency Departments. POLAR is an RCT investigating if early therapeutic cooling of patients with severe (GCS<9) traumatic brain injury is associated with better outcomes at six months. CHEER evaluates the use of extracorporeal membrane oxygenation (ECMO) for patients with 30 minutes or more of CPR post out-of-hospital cardiac arrest.
- The NHMRC funded PATCH (Pre-hospital Antifibrinolytics for Traumatic Coagulopathy and Haemorrhage) study, a world first pre-hospital trial in the use of tranexamic acid for patients with acute traumatic coagulopathy, received Ethics Committee approval to enrol patients.
- A safety study on the safe pre-hospital use of the synthetic blood substitute HBOC-201 was approved by Ethics Committees.
- Dr Francis O'Keeffe continued his work refining chest pain evaluation pathways on a sub-group of patients who form an important and substantial volume of the emergency case-mix.
- The first RCT on quality of care provided by Nurse Practitioners, led by Natasha Jennings commenced recruitment of patients.

Key Publications

- A team led by Professors Peter Cameron and Jamie Cooper identified potential adverse effects associated with the use of aged blood for transfusions, highlighting the need for an RCT to examine the age of blood used in critical transfusions (*Crit Care Resusc*).
- Natasha Jennings published studies evaluating the quality of care provided by ETC nurse practitioners (*Australas Emerg Nurs J* / *J Adv Nurs*) and the ability of nurse practitioners to independently evaluate limb radiographs (*Int J Nurs Stud*).
- Associate Professor Biswadev Mitra published on a variety of topics including: highlighting coagulopathy in patients with severe burns; the effectiveness of massive transfusion protocols; and clinical clearance of the thoracolumbar spine in the journals *Injury* and *ANZ J Surg*.
- Associate Professor Mitra and Dr Gerard O'Reilly were finalists in the Medical Journal of Australia Christmas competition for a publication on patients presenting with church syncope.

Achievements

- An NHMRC Partnership Project Grant of $861,706 was awarded to a team led by Professor Jamie Cooper (CIA) entitled 'Improving outcomes for patients with critical bleeding requiring massive transfusion' to commence in 2014.
- Associate Professor Mitra secured an NHMRC Early Career Fellowship to commence in 2014 to study the molecular basis of acute traumatic coagulopathy.
- PATCH study funding ($NZ60,000) was secured from the New Zealand government for 2014 by New Zealand Investigator Dr Colin McArthur and Australian Investigators Professor Russell Gruen and Associate Professor Mitra.

Postgraduate Students

2 PhD Students
18 Masters Students

Publications

30 Journal Articles

Endocrinology and Diabetes

Head: Professor Duncan Topliss MBBS, MD, FRACP

Miriam Clayfield (L) and Trish Nugent (R) are the Clinical Trial Coordinators for the CANVAS, HOPE, SELECT and TECOS trials.

The Department of Endocrinology and Diabetes performs clinical research in the areas of diabetes and thyroid cancer as well as basic research in the areas of diabetic complications and regulation of growth factor activity.

Mechanisms of Diabetic Complications

Professor Leon Bach

Patients with diabetes develop complications including damage to the kidneys. Although high glucose levels are necessary for the development of these complications, the precise mechanisms remain incompletely understood. Professor Bach's laboratory is studying the role of proteins that are modified by glucose, namely advanced glycation end products (AGEs). In particular, they have identified a novel interaction between AGEs and erzin-radixin-moesin (ERM) 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 2013, the group continued studying this interaction in podocytes, which are cells within the filtering apparatus of the kidney.

Regulation of Growth Factor Activity

Professor Leon Bach

Insulin-like growth factors (IGFs) are important for normal growth and development. The IGF system is perturbed in many diseases, including growth disorders, diabetic complications, and cancer. A family of six IGF binding proteins (IGFBPs) regulates their actions. For many years, the laboratory has studied 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. The group has previously shown that IGFBP-6 promotes migration of cancer cells but decreases blood vessel growth in an IGF-independent manner. In 2013, the group showed a key interaction with another protein that may underlie some of these actions.

New Technologies for Diabetes Treatment

Professor Leon Bach and Dr Kavita Kumareswaran

The pancreas normally senses glucose levels in the blood and secretes appropriate amounts of insulin to keep levels normal. In type 1 diabetes, the pancreas is damaged and insulin secretion is lost. Professor Bach and Dr Kumareswaran are involved in a collaborative project with colleagues at St Vincent's, Royal Melbourne and Royal Perth Hospitals to study an artificial pancreas, which utilises glucose sensors and insulin pumps.

Clinical Trials: Diabetes and Thyroid Care

Professor Duncan Topliss

- **HOPE** is a phase 2 study of the effects of the novel vascular endothelial growth factor (VEGF) / multi-kinase inhibitor lenvatinib, in advanced thyroid cancer. The study concluded in 2011 and suggested benefit. Recent sub-analysis suggests that patients with tumour NRAS or KRAS mutations respond better than those with wild type NRAS / KRAS.
- **SELECT** is a phase 3 randomised placebo-controlled trial of lenvatinib in advanced radioiodine-refractory thyroid cancer, which recruited 392 patients worldwide, including 17 in Australia with 7 of those at The Alfred. The trial was to conclude its randomised phase in early 2014.
- **TECOS** is a randomised, placebo-controlled, international clinical trial designed to assess the impact of sitagliptin therapy on cardiovascular event rates in type 2 diabetes. It will conclude in 2014.
- **CANVAS** is a randomised, placebo-controlled, international study of the effects of canagliflozin on cardiovascular outcomes in type 2 diabetes. Our participation continues.

Diabetes in Lung Transplant Recipients

Dr Kathryn Hackman and Professor Leon Bach

In collaboration with Professor Greg Snell (Head of the Lung Transplant Unit) we have studied the frequency of diabetes in patients before and after transplant. We have further shown that diabetes is associated with worse outcomes in transplant patients.

Achievements

- Professor Bach and Dr Kumareswaran are collaborating with lead investigator Associate Professor David O'Neal (St Vincent's Hospital) on a Juvenile Diabetes Research Foundation funded clinical trial 'Overnight closed-loop in the home: metabolic control' (2013-2015).
- Dr Kathryn Hackman was a winner in the Monash Central Clinical School Three-Minute Thesis Competition.

Postgraduate Students	Publications
2 PhD Students	11 Journal Articles

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Professor Peter Gibson (L) delivered a well attended public lecture on irritable bowel syndrome and the FODMAP diet, which was hosted by Monash Central Clinical School. Professor Gibson and Dr Jaci Barrett (R) (Dietitian and Senior Lecturer, Monash Department of Gastroenterology) respond to questions from the audience.

Gastroenterology

Director: Professor Peter Gibson MBBS(Hons), MD, FRACP

The four main areas of research for the Gastroenterology department are hepatology, endoscopy, inflammatory bowel disease and translational nutritional science. Hepatology research spans the clinical management of viral hepatitis (particularly type C), epidemiology, hepatocellular cancer therapy, non-invasive staging and prognostic markers of liver disease, and management of portal hypertension. Endoscopy focuses on improving the safety and quality of colonoscopic practice and of polypectomy, and colorectal neoplasia in cystic fibrosis. Inflammatory bowel disease (IBD) research includes studies on optimising thiopurine therapy (with a focus on the use of allopurinol to improve efficacy and counteract side effects), the clinical utility of measurement of anti-TNF drug levels, and intestinal ultrasound. The Translational Nutritional Science Group studies diet as a therapy in chronic intestinal disorders, including implementation of new approaches in the community.

Translational Nutritional Science

Two landmark papers on the roles of short-chain carbohydrates (FODMAPs – fermentable oligosaccharides, monosaccharides and polypols) and gluten in the diet of irritable bowel syndrome (IBS) patients have been published in the journal *Gastroenterology*. Both studies involved randomised controlled crossover dietary trials for up to six weeks. One study unequivocally demonstrated the efficacy of reducing the intake of FODMAPs in IBS patients and the other provided evidence against the widespread belief that gluten commonly causes gut symptoms in non-coeliac sufferers.

The low-FODMAP diet story is an example of translational research achieved by a Monash team that spans dietary development, extensive food analysis, definition of mechanisms of action and high quality randomised controlled trials (RCTs). Implementation of the diet as a therapy for IBS has changed treatment paradigms with the development and availability of the Monash University low-FODMAP Diet 'app' for Apple and Android platforms. The 'app' program, devised and led by Dr Jane Muir, has achieved top-downloading status in the medical category since its release in December 2012 with downloads recorded in 60 countries.

Hepatology

A nation-wide, multicentre study conducted by the Australian Liver Association Clinical Research Network, led by Alfred Hepatology researchers, examined the frequency and distribution of IL29B polymorphisms in treatment-naïve patients with chronic hepatitis C genotype 1. Substantial differences were found in the distribution of favourable IL28B alleles according to ethnicity, with a higher frequency among Asians and Māori and Pacific Islanders than Caucasians, Aboriginals and Mediterranean patients.

The Hepatology Division and the Department of Radiology published the first report detailing the safety and efficacy of a novel ablative technique, irreversible electroporation, for the treatment of primary liver cancer in subjects not suitable for conventional treatment with radiofrequency ablation.

Endoscopy

The Endoscopy Division completed the first of a series of RCTs of bowel preparation for colonoscopy that address practical issues in patient compliance and comfort, such as dietary restrictions, timing of the preparation and pro-active hydration techniques. They found traditionally employed dietary restrictions to be unnecessary while The Alfred hospital 'White Diet' was considerably preferred by the patients, without compromising the quality of the bowel cleansing.

Ultrasound Technology

Acquisition of a 'Supersonic Ultrasound' machine and software, via a partnership with the biopharmaceutical company AbbVie, will boost programs in liver disease and IBD. The Alfred's hepatology division was the first in Australia to obtain Fibroscan technology and, led by Dr William Kemp, is the most widely published in this field.

Another first in Australia was the acquisition of a supersonic ultrasound machine that employs shear-wave elastography and this technology is being evaluated as an improved non-invasive marker of liver disease severity. A research program into the clinical utility of intestinal ultrasound in IBD patients, a technique virtually unused in Australia, has also been launched.

Achievements

- Jessica Biesiekierski received the Rome Foundation's 2013 Ken Heaton Award for the Most Cited Paper on functional gastroenterological disorders for her 2011 publication in the *American Journal of Gastroenterology*.
- Emma Halmos and Marina Iacovou won 1st- and 3rd-best student posters prizes, respectively, for presentations at the 2013 Nutrition Society of Australia's Annual Scientific Meeting.

Postgraduate Students

14 PhD Students
1 MD Student
1 Masters Student

Publications

37 Journal Articles
1 Book Chapter

General Surgery

Head: Professor Jonathan Serpell MBBS, MD, MEd, FRACS, FACS

Head of General Surgery Professor Jonathan Serpell (back row, 2nd right) with his team.

The General Surgery Department is committed to clinical and translational research, clinical trials and the development and maintenance of databases and clinical registries.

Breast and Endocrine Surgery Unit

The Breast and Endocrine Surgery Unit undertakes research in the areas of breast cancer, oncoplastic breast surgery, and endocrine surgery including thyroid, parathyroid and adrenal surgery and has a dedicated thyroid cancer registry. These contribute to 20 current clinical research projects.

Recurrent Laryngeal Nerve (RLN): The anatomy and physiology of the RLN is a research focus of the Endocrine Unit. We have shown a significant incidence of bifurcation of the RLN and that the motor fibres to the larynx are in the anterior branch of the nerve. A study of voice following thyroidectomy has shown the usual changes in voice associated with thyroid surgery are temporary. Analysis of RLN palsy rates have shown a low incidence and confirm the increased likelihood in re-operative surgery for benign conditions and for primary malignancy. The incidence of RLN palsy is greater on the right after total thyroidectomy and greater on the left after hemi-thyroidectomy.

Thyroid cancer: Development of a nomogram is under way to predict thyroid cancer in a thyroid nodule based on clinical, ultrasound and cytological features.

Hyperparathyroidism: A recent multicentre study of 5000 parathyroidectomies showed a low persistence rate of 2.2% and a recurrence rate of 0.9% of primary hyperparathyroidism, with a median follow up of 6.5 years, supporting an ongoing minimally invasive approach.

Colorectal Unit

The Colorectal Unit has active research databases in colorectal cancer, trans-anal endoscopic microsurgery (TEMS), anal fistula surgery and surgical outcomes. The Unit has also investigated young colorectal cancer (CRC) patients and is evaluating colonic motility following ileostomy creation. The Unit has an international reputation in TEMS, including the adoption of a video as a formal education tool by the American Society of Colon and Rectal Surgeons (ASCRS).

In 2013, the Colorectal Unit presented nine scientific papers at the Royal Australasian College of Surgeons annual meeting as well as two poster presentations at the ASCRS meeting. The Unit also conducted a prospective study assessing colonic transit following a diverting ileostomy. The investigators were able to show colonic transit is abolished by a diverting loop ileostomy.

Recently published studies include: a retrospective audit assessing the safety of elective abdominal surgery in heart transplant patients (Kras AL *et al., ANZ J Surg* 2013); the management of Distal Intestinal Obstruction Syndrome in Cystic Fibrosis patients at Alfred Health (Subhi R *et al., ANZ J Surg* 2013); a study assessing the quality of our prospectively collected cancer database (McMurrick PJ *et al., Dis Colon Rectum* 2013); TEMS colorectal anastomosis without laparoscopic assistance (Hall DJ *et al., Dis Colon Rectum* 2014); and a epidemiological study comparing CRC incidence over the last decade in Victorians under and over 50, revealing a small non-significant increase in disease incidence over time in those under 50 and a stronger likelihood of those under 50 to have rectal cancer and be node positive (Sia CS *et al., Colorectal Dis* 2014). Bladder sparing exenterations in advanced rectal cancers have also been performed and are reported at Alfred Health.

Achievements

- Professor Jonathan Serpell was The Invited International Lecturer for Endocrine Surgery for the Indian Association of Endocrine Surgeons and delivered The Professor S Vittal Oration in October 2013.
- Dr Mary Theophilus, a Colorectal Unit Trainee, was awarded second prize at the Colorectal Surgical Society of Australia and New Zealand trainee day in 2013.

Perioperative Coordinator Virginia Comerford (L) with a patient.

Postgraduate Students

1 PhD Student

Publications

11 Journal Articles

TheAlfred

Health Informatics Team Members: (L to R) Chris Mac Manus (front), Manager, Business Intelligence Information Systems; Hien Le, Senior Analyst / Programmer; Lucy Nie, Analyst / Programmer; Annie Gilbert, Manager, Information Development and Governance.

Health Informatics

Director: Dr Chris Bain, MBBS, MIT, MACS, FACHI

The Health Informatics (HI) department is responsible for the technical development and maintenance of the corporate informatics environment, namely The REsearch AnalysiS and OperatioNS (REASON) Discovery Platform. We perform this function as part of our role in the Information Development Division (IDD). The platform is a key part of the broader 'Information Grid' managed by the IDD.

We undertake research of our own in support of increasing the power and reach of the platform, which includes data mining, text analysis and mining, intelligent search and data visualisation. The platform has also been created to support the research and evaluation efforts of others, primarily clinicians, at Alfred Health. Clinicians and researchers are able to access data from the platform via the main organisational reporting unit, namely the Clinical Performance Unit (CPU), in order to support their ethics approved research.

REASON Discovery Platform

A substantial amount of work performed on consolidating the REASON Discovery platform has made it possible to provide access to data for research and evaluation in a number of key areas, including nursing indicators. The Point of Care (POC) audit tool was initially developed by Nursing Services, the HI department and the CPU to assist in the National Safety and Quality Healthcare Standards assessment lead up.

Data collected by the tool have subsequently been incorporated into the platform and made available to key stakeholders in several ways, including as both static and dynamic web reports. Research was presented at three international conferences in 2013 and published in the *International Journal of e-Education, e-Business, e-Management and e-Learning**. We intend to extend research on this and other related data in conjunction with the Professor of Nursing Research and the Nursing Services area.

**Bain C, Bucknall T, Weir-Phyland J, Metcalf S, Ingram P, Nie L. Meeting national safety and quality health service standards – the role of the point-of-care (POC) audit application. Int J e-Educ e-Business e-Manag e-Learning 2013;3(6):507-12.*

Health Informatics Visualisation Engine

Continued work on the Health Informatics Visualisation Engine (HIVE) tool, in conjunction with the CSIRO e-health Research Centre in Brisbane, has produced a prototype web-based data visualisation product. Funding is being sought to evaluate the tool and take it from prototype to implemented system. Such a system could be used at most Australian hospitals by drawing on standard data set formats that are increasingly collected across the country.

Text Mining and Analytics

As the REASON platform has matured, and as a core part of its development, millions of text records have been stored, and more are imported onto the platform on a nightly basis. The intention is to increasingly use these records to support clinical research, analysis and hospital operations. Examples of the data include, but are not limited to, radiology requests and reports, and non-atomic pathology results such as microbiology reports. We have partnered with NICTA and other researchers to examine the utility of these text data sources. This has built upon an initial collaboration around case identification for the Victorian Lung Cancer Registry.

Clinical Outcomes Project

The Clinical Outcomes Project remains of interest to the HI department and to Alfred Health more broadly. We are watching closely to see its continued evolution at the primary site (Austin Health), where the prediction model is being tested in the real world. In 2014 we will seek to extend the work and possibly examine other outcomes (beyond the initial outcome variables of death, unplanned Intensive Care Unit admission and the occurrence of medical emergency team calls) that can be predicted using a similar approach. We are forging partnerships to that end with the Monash University Faculty of IT and others.

Postgraduate Students	Publications
1 PhD Student	4 Journal Articles

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Intensive Care and Hyperbaric Medicine

Director: Professor Carlos Scheinkestel MBBS, FRACP, FCICM
Deputy Director and Head of Research: Professor D Jamie Cooper BMBS, MD, FRACP, FCICM

Associate Professors Allen Cheng (Infectious Diseases) and David Pilcher (Intensive Care) discuss a patient in the Intensive Care Unit.

Research areas within The Alfred Department of Intensive Care and Hyperbaric Medicine include traumatic brain injury, trauma, sepsis, resuscitation, acute lung injury, transfusion, sedation, nutrition, renal failure, extracorporeal membrane oxygenation (ECMO) and Intensive Care Unit (ICU) outcomes. The department benefits from the AMREP co-location and linkage with the Australian and New Zealand Intensive Care Research Centre (ANZIC-RC) within the Monash School of Public Health and Preventive Medicine (SPHPM) and with the Monash Central Clinical School through the Monash Partners Academic Health Science Centre.

In 2013, there was one NHMRC Practitioner Fellow and two Alfred-Monash Practitioner Fellows in ICU, with Dr Steve McGloughlin and Dr Josh Ihle joining the research active group of 14 consultants. Many of our consultants hold SPHPM academic appointments, including four Professors and three Associate Professors in 2013. Funding to the department's investigators for active or approved grants in 2013 was over $30 million (for the duration of the grants), with $25 million being from the NHMRC.

Clinical Associate Professor David Pilcher was an author on 21 of publications in 2013. Other contributors included Dr Cécile Aubron (Alfred Senior Research Fellow (SRF) Intensive Care) with seven publications and Dr Carol Hodgson (Alfred Physiotherapist / ANZIC-RC SRF) with five publications, including one in the *American Journal of Respiratory and Critical Care Medicine*. Associate Professor Pilcher led the interrogation of the unique bi-national ICU registry resulting in a 2014 publication in the Journal of the American Medical Association (*JAMA*)*. Dr Maija Kaukonen (ANZIC-RC SRF / Alfred Visiting Intensivist), first author of the JAMA paper, has now returned to Finland where she continues collaborative research with our department.

**Kaukonen KM, Bailey M, Suzuki S, Pilcher D, Bellomo R. Mortality related to severe sepsis and septic shock among critically ill patients in Australia and New Zealand, 2000-2012. JAMA 2014;311(13):1308-16.*

Associate Professor Silvana Marasco (Alfred Cardiothoracic Surgeon) led and completed a randomised controlled trial on a novel rib fixation technique for patients with severe unstable fractured ribs that confirmed the value of the technique and established its place as a valuable treatment in the ICU. Dr Olivier Huet also had a productive year as an Alfred Intensive Care SRF with a research focus on severe sepsis and brain injury.

Our ECMO Team grew substantially in 2013. During the inaugural ANZIC-RC's 2013 Collaborative Clinical Trials in Intensive Care Medicine Conference held at Monash University's Prato Centre in Italy, Dr Vin Pellegrino initiated the establishment of an international ECMO research collaboration. Professor Jamie Cooper and Associate Professor Andrew Davies were co-authors on a research trial led by Sydney clinicians and published in *JAMA*** in 2013, which investigated a method of delivering optimal nutrition to critically ill patients. Finally, the group supported several Alfred Intensive Care clinicians in their post-graduate studies as PhD Scholars, including Dr Dashiell Gantner, Dr Aidan Burrell and senior ICU dietician Emma Ridley.

***Doig GS, Simpson F, Sweetman EA, Finfer SR, Cooper DJ, Heighes PT, Davies AR, O'Leary M, Solano T, Peake S; Early PN Investigators of the ANZICS Clinical Trials Group. Early parenteral nutrition in critically ill patients with short-term relative contraindications to early enteral nutrition: a randomized controlled trial. JAMA 2013;309(20):2130-8.*

Achievements

Selected Awards

- Alfred ICU received the Extracorporeal Life Support Organisation's Award for Excellence in Life Support.
- Dr Cécile Aubron and Dr Olivier Huet received ICU Research Fellowships.
- Annabelle Maclure and Melinda Pacquola won the Wendy Swift Award for best paper presented by Nursing Professionals at the ANZ Burn's Association 36th Annual Scientific Meeting.

Major Project Grants

NHMRC project grants that commenced in 2013 include the studies:

- 'ANTISEPSIS: AspiriN To Inhibit SEPSIS trial: an ASPREE sub-study to measure the benefit of low-dose aspirin in the prevention of severe sepsis', a $391,879 award to Associate Professor Damon Eisen (CIA) with ICU's Associate Professor David Pilcher (CIE) and Associate Professors Karin Leder (CIB), Emma McBryde (CIC), Rory Wolfe R (CID) and Robyn Woods (CIF).
- PATCH (Pre-hospital Antifibrinolytics for Traumatic Coagulopathy and Haemorrhage), a $1.6 million grant to Professor Russell Gruen (CIA) with ICU's Associate Professor Stephen Bernard (CIC) and Associate Professors Biswadev Mitra (CIB), Huyen Tran (CIG), Professors Ian Jacobs (CID), Robert Medcalf (CIE) and Michael Reade (CIF).
- Professor Jamie Cooper was awarded an NHMRC - European Union Collaborative Research Grant of $358,347 to commence in 2014 for OzENTER-TBI (Australia-Europe NeuroTrauma Effectiveness Research in Traumatic Brain Injury), which will support Australian participation in the international €30m program.

Postgraduate Students	Publications
6 PhD Students	90 Journal Articles

TheAlfred

Medical Oncology Research Nurse Marisa Cikos (left) and Research Manager Nikki Cross (right) examining a clinical trial participant.

Medical Oncology

Head: Professor Max Schwarz MBBS(Hons), FRACP, FACP, FAChPM

The Medical Oncology Unit is a clinical service incorporating a research program that provides coordinated multidisciplinary care for patients with a wide range of malignancies. The Unit conducts clinical trials investigating new drug therapies such as targeted systemic treatments and chemotherapy in patients with malignancy. The main areas of research are in malignant melanoma and gastrointestinal malignancies. In 2013 the Unit continued to contribute to both national and international research projects, as well as phase 1, 2 and 3 clinical trials.

Melanoma

Over the last two years there have been more significant therapeutic advances for malignant melanoma than in many other cancers. The Medical Oncology Unit has participated in international clinical trials enabling us to offer cutting edge therapies to our patients earlier in the disease course. Our Unit has been the third highest worldwide recruiter into a large international trial comparing the combination of a B-Raf inhibitor with a MEK inhibitor versus placebo, given for 12 months in patients with resected stage III melanoma. The hope is to increase the possibility of cure for B-Raf mutant stage III malignant melanoma. Other trials in patients with metastatic melanoma are comparing single agent B-Raf inhibition with combination B-Raf and MEK inhibition.

Colorectal Cancer

Dr Andrew Haydon is the Australasian Principal Investigator for the International SCOT study, a trial comparing six months of adjuvant chemotherapy with three months of treatment, for stage III colorectal cancer. If the results demonstrate non-inferiority with the shorter duration of chemotherapy, chemotherapy toxicity experienced by patients will be significantly reduced.

Colorectal cancer research has also explored the prognostic and predictive power of circulating tumour DNA levels detected in the peripheral blood. Preliminary results indicate that the presence of postoperative circulating tumour DNA strongly predicts for recurrence following potentially curative resection in stage II cancers.

Publications

10 Journal Articles

Melanoma Service

Head: Associate Professor John Kelly MBBS, MD, FACD

The Victorian Melanoma Service (VMS) at The Alfred is one of Australia's major multidisciplinary tertiary referral treatment centres. We conduct a clinical trials program for melanoma in surgery, radiation and chemotherapy. Our research aims to understand the presenting characteristics of aggressive and atypical primary melanomas, the factors that drive melanoma growth and the associations and significance of rapid growth.

Nodular Melanoma and Merkel Cell Carcinoma

The VMS found that nodular melanoma is the greatest contributor (45%) to skin cancer deaths in Victoria (Mar V *et al*, *J Am Acad Dermatol* 2013), emphasising the need to understand its unusual presenting features to enable early detection. We participated in an international study on the appearance of nodular melanoma under dermoscopy resulting in the largest study published to date (Menzies SW *et al*, *JAMA Dermatol* 2013). Merkel cell carcinoma looks similar to nodular melanoma and behaves in a similar aggressive manner. We undertook a collaborative study of the dermoscopic features of this rare cancer in a series of 12 cases (Jalilian C *et al*, *Br J Dermatol* 2013).

High Mitotic Rate Melanoma

Desmoplastic melanoma is an unusual melanoma often overlooked and misdiagnosed. We participated in an international collaboration to identify the dermoscopic features of desmoplastic melanoma resulting in the only such published study (Jaimes N *et al*, *JAMA Dermatol* 2013). Two studies were undertaken on the disease associations and prognostic significance of high mitotic rate (rapid cell division) melanoma. Mitotic rate is the major microscopic marker of rapid growth. Nodular and desmoplastic melanomas were strongly associated with high mitotic rate. Prognosis progressively declined with increasing mitotic rate.

Mutations and Sun Damage

Work on the mutations that contribute to melanoma growth led to a publication on the mutations caused by UV light (Mar VJ et al, *Clin Cancer Res* 2013). Further understanding was gained of the kinds of melanomas that are most likely to respond to the new mutation-directed drugs that have proven so successful in advanced melanoma.

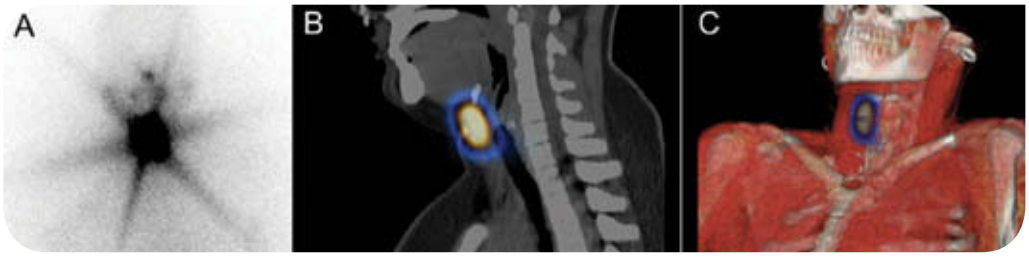
Postgraduate Students

1 PhD Student
1 Masters Student

Publications

4 Journal Articles

TheAlfred



Prevalence of thyroid tissue along the thyroglossal tract (TTTT) as delineated by SPECT/CT following ^{131}I ablation therapy after total thyroidectomy for thyroid cancer. Planar radioactive iodine scan (A), sagittal fused SPECT/CT (B) and volume rendered SPECT/CT in the left anterior oblique projection (C) demonstrating TTTT.

Nuclear Medicine

Head: Associate Professor Victor Kalff BMedSc(Hons), MBBS, FRACP, FACC

Nuclear Medicine provides a comprehensive and timely clinical service with a wide range of clinically relevant studies available including cardiac, ^{18}F-FDG-positron emission tomography (PET), bone and lung scans. As one of the top three busiest accredited training sites for nuclear medicine and the busiest accredited training site for nuclear cardiology in Australia, we train nuclear medicine specialists, radiology registrars and technologists.

Our research includes nuclear medicine and PET, with involvement in other specialties via collaboration with various institutions and hospital departments such as Cardiology, Endocrinology, Transplantation Medicine, Psychiatry, Cancer Care and Surgical Units. The nuclear medicine techniques we employ span conventional to advanced gamma camera and PET imaging technologies.

Selected Research Projects

The prevalence of thyroid tissue along the thyroglossal tract on SPECT/CT following ^{131}I ablation therapy after total thyroidectomy for thyroid cancer.

This study, led by Dr Thomas Barber, demonstrated that thyroglossal tract thyroid tissue (TTTT) was present in 50% of the patients in the study and was better delineated with combined single-photon emission computed tomography / computed tomography (SPECT/CT) than planar imaging. TTTT can contribute to a significant amount of total neck radioiodine activity (NRA); hence NRA on planar imaging may not be a suitable parameter to assess the completeness of thyroid bed surgery (*see image, top right of page).

Comparison of PET/CT and bremsstrahlung imaging following ^{90}yttrium radiation synovectomy

This study, led by Dr Thomas Barber, demonstrated that PET/CT provides superior image quality compared to the more traditional bremsstrahlung imaging techniques when imaging the intra-articular distribution of ^{90}yttrium following radiation synovectomy. PET/CT may play a role in assessing possible extra-articular radiopharmaceutical administrations. A follow-up project is examining the prognostic value of this imaging method.

Optimising surgical outcome in rectal cancer following neoadjuvant therapy: a randomised study

Dr Kenneth Yap is a co-investigator on this collaborative project with the Peter MacCallum Cancer Centre (PMCC). The study looks at non-invasive assessment of myocardial metabolic function / ischaemia with exercise FDG-PET to help determine cardiovascular (CV) risk in patients undergoing major cancer surgery.

Incremental advantage of contemporaneous diagnostic CT over PET/CT in patients for staging or restaging of colorectal carcinoma

Dr Kenneth Yap is the lead AMREP investigator on this collaborative project with PMCC that looks at the benefit, if any, of performing diagnostic CT (dCT) in addition to FDG-PET/CT when assessing for metastatic disease in colorectal cancer patients. Eliminating dCT would streamline patient care and decrease radiation exposure.

ISCHEMIA - International Study of Comparative Health Effectiveness with Medical and Invasive Approaches

Our department is an accredited site for this multicentre international study with Dr Kenneth Yap as the lead investigator. The aim is to determine whether an invasive strategy of routine cardiac catheterisation followed by optimal revascularisation and optimal medical therapy (OMT) in stable ischemic heart disease patients (with at least moderate ischemia on stress imaging) reduces the incidence of CV deaths or myocardial infarction compared with a conservative strategy of OMT alone. The study questions whether cardiac catheterisation and revascularisation should be reserved for patients with acute coronary syndrome or refractory angina.

Other Research Projects

- Pilot study of non-invasive assessment of acute graft versus host disease of the gastrointestinal tract following allogeneic hemopoietic stem cell transplantation using FDG-PET (M Cherk)
- Deep repetitive transcranial magnetic stimulation for autism spectrum disorder (K Yap, M Cherk)
- Enhancement of brown adipose tissue function via chronic pharmacological treatment (M Cherk)
- A comparison of the predictive performance of different methods of kidney function estimation in a lung transplant population (pre- and post-transplantation) (T Barber)
- Investigation of MIF (macrophage migration inhibitory factor) release as a marker of the presence and extent of myocardial ischemia (T Barber)
- Role of end of chemotherapy PET/CT scanning in lymphoma patients who achieve complete metabolic response on an interim chemotherapy PET scan (M Cherk)
- Early assessment of response to chemotherapy / tumour targeted therapy in metastatic breast cancer using sequential ^{18}F-FDG PET (M Cherk)

Publications

7 Journal Articles

Nursing Services

Head: Honorary Professor Janet Weir-Phyland RN, BScN, MBA

Professor Tracey Bucknall holds the Foundation Chair in Nursing at Alfred Health.

Nursing Services continues academic research partnerships with La Trobe, Monash and Deakin Universities. The strategic plan for nursing research encompasses a four pronged approach: (1) building capacity of nursing researchers within Alfred Health; (2) conducting high quality research that improves patient and organisational outcomes; (3) integration of research evidence into clinical practice; and (4) developing partnerships between consumers, staff and researchers to strengthen research, education and the health system. We have achieved an increase in nurse clinicians completing PhDs as well as enrolments in courses with research components. Our profile has also increased at national and international meetings in areas of health service redesign, patient safety, nurse practitioner models of care and nursing education in health services.

In 2013, Alfred Health Nursing Services and Deakin University School of Nursing and Midwifery expanded their research partnership with the appointment of Professor Tracey Bucknall as Foundational Chair in Nursing at Alfred Health. Deakin Alfred Health Nursing Research Centre has three concurrent programs of research focusing on improving patient safety and the quality of patient care: (1) health service evaluation; (2) symptom management; and (3) knowledge translation. Research programs are linked closely with the National Safety and Quality Health Service Standards, either establishing research evidence or assisting clinicians in using evidence in clinical practice to improve patient outcomes.

Patient-Centred Research

Deakin University Professors Tracey Bucknall and Alison Hutchinson are leading an ARC-funded Linkage Project ($93,343; 2012-2014) in partnership with the Australian Commission on Safety and Quality in Health Care, Austin and Cabrini Health, Tasmania's North West Regional Hospital and Northern Ireland's University of Ulster. This project aims to investigate patient perspectives in triggering responses to medical emergencies by looking at patient and families' perceptions and roles in detecting and communicating their deteriorating status. Results will inform the development of strategies to reduce preventable adverse events by improving health service planning and delivery. Case-based scenarios will be developed for medical and nursing students to develop their clinical reasoning skills in detecting and managing deteriorating patients.

Professor Bucknall is collaborating with Griffith University researchers Professor Wendy Chaboyer and Dr Jennifer Whitty on an ARC funded Discovery Project ($278,000; 2013-2015) investigating patient participation in patient safety. The study aims to identify patients and nurses perceptions of barriers, facilitators and strategies to promote patient participation and to elicit patient preferences for participation in safety activities. Results will provide the foundations for health policy, education and practice to promote patient participation that has the potential to decrease adverse events and promote positive outcomes for hospital patients.

Aged Care

The 'Tri Focal Model of Care: Teaching and Research Aged Care Services' is a Department of Health funded project that aims to implement and evaluate an innovative education program comprising developing partnership-centred care; building a positive work environment; and providing evidence-based practice. Led by Professor Hutchinson with involvement from Professor Bucknall, the project is being conducted by a consortium of Deakin researchers and aged care providers. The project is designed to support the development and implementation of strategies and systems to build capacity in the aged care sector, to partner teaching and research, and to promote a learning culture within organisations. The model is being implemented at the Caulfield campus Montgomery and Namarra Aged Care Facilities, with Clinical Nurse Consultant David McMillan seconded to Deakin to assist with the implementation of the model. Staff have positively engaged in the program and initiated several innovative activities and changes in line with the Tri-focal Model's philosophy.

Achievements

Professor Bucknall is a co-investigator (CIB) of an NHMRC Project Grant titled 'INTroducing A Care bundle To prevent pressure injury (INTACT trial)', a $1.1 million multi-institution collaborative study led by Griffith University's Professor Wendy Chaboyer (CIA) for 2014-2016.

An Aged Care resident.

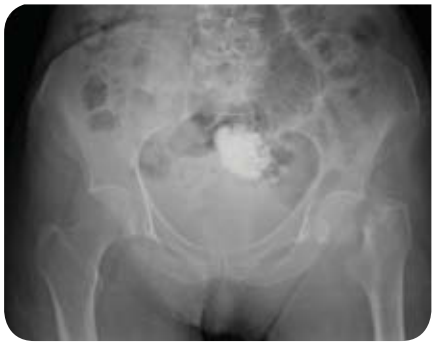
Postgraduate Students

6 PhD Students
59 Masters Students

Publications

11 Journal Articles

TheAlfred



Displaced fracture of the left neck of femur.

Orthopaedic Surgery

Head: Clinical Associate Professor Susan Liew
MBBS(Hons), FRACS (Orth)

The Department of Orthopaedic Surgery provides the full range of general and sub-specialised orthopaedic clinical services across the breadth of the specialty. The Alfred is a level 1 Trauma Centre and, as such, the department has a strong research interest in orthopaedic trauma. We contribute to the Victorian Orthopaedic Trauma Outcome Registry overseen by Monash University. Collaborations across the participating centres have led to several clinical projects. The department also participates in a number of international multicentre randomised controlled trials (RCTs).

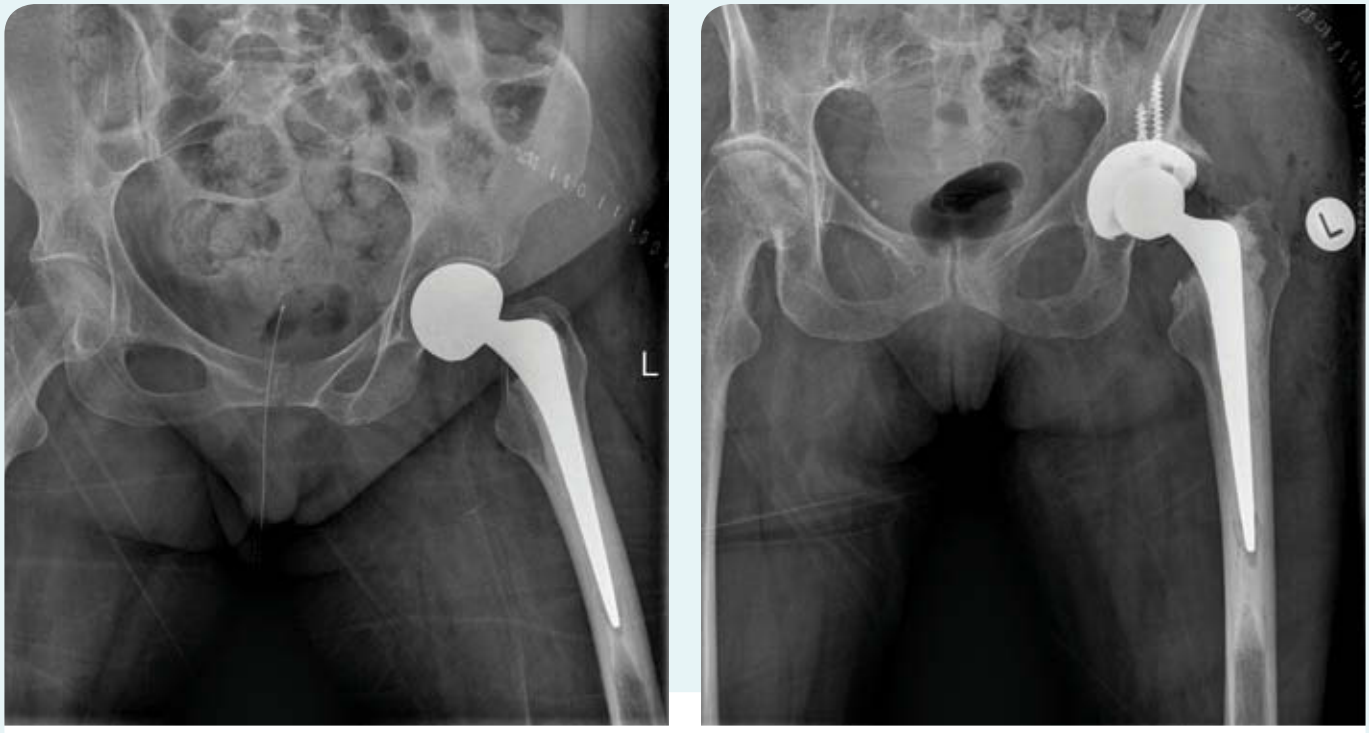
Clinical Trials

In 2013 we continued our strong presence as part of the international multicentre RCTs being run out of McMaster University in Canada with our Research Assistant Zoe Murdoch following up all our trial patients. Recruitment into FLOW (Fluid Lavage of Open Wounds) has now ceased with 2,300 patients recruited worldwide. The analysis will provide evidence on the optimal method of irrigation (normal saline versus saline plus pure soap) and irrigation delivery (high pressure: pulsatile lavage; or low pressure: pulsatile lavage; or gravity feed: bag on an intravenous pole).

We continue to recruit into FAITH (Fixation using Alternative Implants for the Treatment of Hip fractures), which looks at what is better for undisplaced femoral neck fractures – a sliding hip screw or three cancellous screws. We are also now recruiting into the definitive trial of HEALTH (Hip fracture Evaluation using the ALternatives of Total hip arthroplasty versus Hemi-arthroplasty), which looks at what is better for displaced femoral neck fractures – a hemiarthroplasty or total hip replacement (pictured).

Publications

13 Journal Articles



The HEALTH (Hip fracture Evaluation using the ALternatives of Total hip arthroplasty versus Hemi-arthroplasty) trial compares which is better for displaced femoral neck fractures – a hemiarthroplasty (L) or total hip replacement (R).

Pathology Services

Director: Professor Hans Schneider MD, FRACP, FRCPA, FFSC, FACB

Dr Christina Trambas (L) (Registrar) and Thien Tra (R) (Research Assistant), both from Clinical Biochemistry Pathology Services, view an image of isolated rat neo-natal cardiomyocytes.

Alfred Health Pathology Services incorporates Laboratory Haematology, Microbiology and Clinical Biochemistry (also known as Chemical Pathology) and Anatomical Pathology. This year's report focuses on Clinical Biochemistry. Anatomical Pathology, headed by Professor Catriona McLean, is reported on page 49.

Clinical Biochemistry

Improvement in cardiac marker assay design and sensitivity has led to clinical changes at Alfred Health. In collaboration with the Cardiology Department, we evaluated the value of macrophage migration inhibitory factor (MIF) in the diagnosis of acute myocardial infarction (AMI). The study was done in collaboration with the Emergency and Cardiology Departments and showed MIF to be elevated early in patients with large AMI but was not helpful in the majority of patients presenting with chest pain.

At the same time, we collected samples for troponin I measurement utilising a high sensitivity troponin assay and the results of that allowed us to introduce a high sensitivity troponin I assay into routine practice. This has replaced the routine troponin I assay that has been used at The Alfred since 2004. Our Biochemistry Registrar Dr Christina Trambas and medical student Nalin Dayawansa were intimately involved in this study of about 400 consecutive patients presenting with chest pain to the Emergency Department.

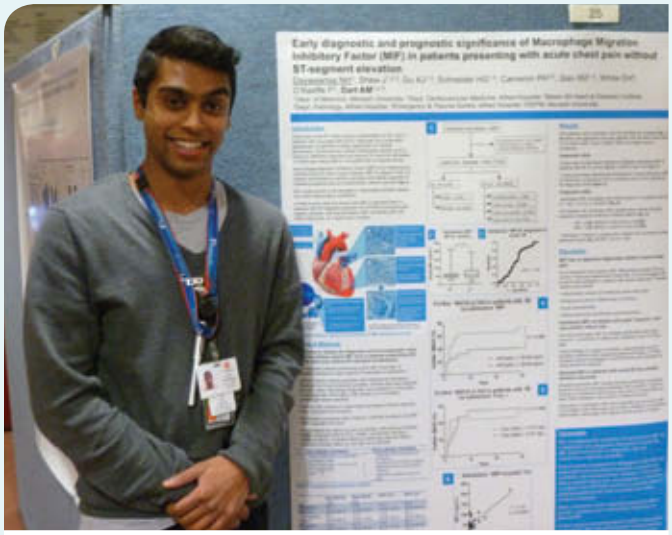
As a consequence of this study we have identified sex specific 99th percentiles of normal troponin and introduced these into clinical practice. It will allow better recognition of women with small AMIs. Our previously used troponin assays could not detect significant levels of troponin in healthy people. However, the highly sensitive troponin I assay gives detectable levels of troponin in healthy adults, a finding confirming a level of troponin release from the heart in healthy people. Previously the troponin assay had a high imprecision at the 99th percentile and we could not differentiate between male and female reference intervals, possibly resulting in under diagnosis of women. We can now define reference intervals in men and women.

Several laboratories in Australia (including PathWest in Perth and Canberra Hospital) have agreed to common reference intervals for men and women using the sensitive troponin assay. Furthermore, we have now been able to investigate peak troponin levels after acute myocardial infarction in males and females and found that males release markedly more troponin than females. The top 25% of male infarcts show three times higher troponin peak levels. This not currently recognised phenomenon might contribute to the reported under treatment of women after AMI.

Further research in the area, largely carried out by Thien Tra, has examined mechanisms of troponin release from cardiomyocytes. We have adapted the routine assay for troponin to measure troponin from mouse myocytes. We identified a significant problem with one of the cell lines commonly used as a cardiomyocyte model. We found that in contrast to primary culture these cultures contain very little cardiac troponin I, which not only differs from primary cardiomyocytes from neonatal mice, but also differs from another mouse cardiomyocyte cell line.

Achievements

- In 2013 the Alfred Pathology Service won the Chairman of the Board Award for Patient Safety and Quality Improvement for the introduction of the Bridge System in Blood Collection and a Health Round Table Innovation Award.
- In the Department of Health 2013 Victorian Public Health Care Awards, Alfred Health won Silver in the Health Care Innovation category of Optimising Healthcare through e-Health and Communications Technology. This was in recognition of Pathology Services introducing the Cerner Bridge system for patient identification in sample collection.



Medical Student Nalin Dayawansa presents research on the diagnostic and prognostic significance of macrphpage migration inhibitory factor (MIF).

Publications

35 Journal Articles

Pharmacy

Director: Professor Michael Dooley BPharm, GradDipHospPharm, FSHPA, FISOPP, FAAQHC

Professor Michael Dooley (Head of Pharmacy) and Susan Poole (Pharmacy Research coordinator) with clinical pharmacy staff, who are undertaking postgraduate research degrees.

The Alfred Health Pharmacy Department is involved in a range of medication and practice-related research activities. The Department provides a research focus on acute health and medication use that contributes to the research activities of the Centre for Medication Use and Safety (CMUS), one of the key research units within the Faculty of Pharmacy and Pharmaceutical Sciences of Monash University.

Research activities come under the broad banner of evaluating the Quality Use of Medicines with the following themes: medication safety; therapeutics; pharmacy practice research; and health-outcomes research. The department is involved in a wide range of studies, from NHMRC and ARC multicentre funded collaborations through to industry partnerships and investigator-initiated practice evaluation programs. Here we report on two key projects completed in 2013.

Chemotherapy Dose and Renal Function Estimates

We published a study in the Annals of Oncology* that examined the appropriateness of using the estimate of glomerular filtration rate (eGFR) for dose determination of renally excreted drugs compared to other existing methods for estimating renal function. A gold standard renal function measure was determined by Tc^{99m}DTPA clearance in adult patients presenting for chemotherapy. Renal function was calculated using the four-variable Modification of Diet in Renal Disease (4v-MDRD), Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI), Cockcroft and Gault (CG), Wright and Martin formulae. Doses for renal excreted cytotoxic drugs, including carboplatin were calculated.

The concordance of the renal function estimates according to CKD classification with measured Tc^{99m}DPTA clearance in 455 adults (median age: 64.0 years; range 17-87 years) for the 4v-MDRD, CKD-EPI, CG, Martin and Wright formula was 47.7%, 56.3%, 46.2%, 56.5% and 60.2%, respectively. Concordance for chemotherapy dose for these formulae was 89.0%, 89.5%, 85.1%, 89.9% and 89.9%, respectively. Concordance for carboplatin dosing was 66.4%, 71.4%, 64.0%, 73.8% and 73.2%. All bedside formulae provide similar levels of concordance in dosage selection for the renally excreted chemotherapy drugs when compared to the use of a direct measure of renal function.

**Dooley MJ, Poole SG, Rischin D. Dosing of cytotoxic chemotherapy: impact of renal function estimates on dose. Annal Oncol 2013;24(11):2746-52.*

Medication Safety: Emergency Department and Beyond

A study conducted at The Alfred hospital and Sandringham hospital examined communication of health professionals and a range of patient related factors that influence the management of medications as patients move across transition points from the Emergency Department to other environments. The study included 646 randomly selected patients presenting to emergency departments across the 12 months from April 2010 to March 2011.

All patients presented for an unplanned presentation and required treatment by an emergency doctor. The variables assessed included: patient factors (age, triage code, number of co-morbidities, language spoken, cognitive and sensory issues); organisational factors (time of day of patient transfer, day and time of admission and discharge); and medication factors (number and class of medications, number of high risk medications, newly initiated or ceased medications and dose changes).

Readmission data at 28 days and 12 months post discharge were collated. One hundred and ninety-nine patients (31%) were discharged directly home while 215 (33%) were sent to the Short Stay Unit and 230 (36%) were admitted to an in-patient unit. Of the admitted patients, 74 (34%) had one transition point prior to discharge, 18 (8%) had two, 48 (21%) had three and 85 (37%) experienced four or more transitions points prior to discharge.

Almost half of the patients with four or more transition points were aged 65 years or over (n = 41; 48%). Approximately half (46%) of the patients aged 65 years or over (109 of 238 patients) had a further unplanned representation within the following 12 months. The study results will also be used to determine the risk factors associated with unplanned readmission to hospital and to develop a risk-screening tool to identify patients at high risk of medication-related unplanned readmission. (Study authors: Manias E, McGuiness J, Gerdtz M, Williams A, Taylor J, Dooley MJ).

Postgraduate Students

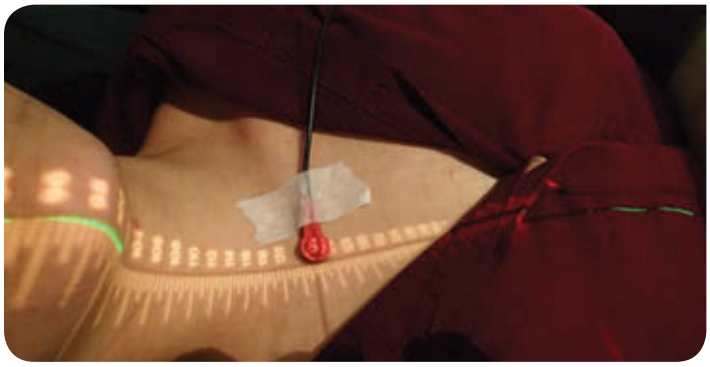
4 PhD Students
11 Masters Students

Publications

33 Journal Articles

TheAlfred

www.wbrc.org.au



William Buckland Radiotherapy Centre's new in vivo dosimetry program is designed to verify the delivered dose for all patients commencing megavoltage external beam radiation therapy. As depicted in the image, this involves placing a diode directly on a patient to measure the delivered dose, which is then compared to the calculated dose to verify treatment.

Radiation Oncology

Head: Associate Professor Jeremy Millar BMedSc, MBChB, FRANZCR, FAChPM, CertHlthEc, CertBiostat

The William Buckland Radiotherapy Centre (WBRC) is a major Alfred Health Oncology Service comprising treatment facilities at The Alfred and the Gippsland regional centre in Traralgon. WBRC is the busiest cancer unit in Alfred Health, seeing almost 2,000 new cases each year. The Unit engages in undergraduate and post-graduate teaching in a number of cancer-related disciplines. A research program exists across the spectrum of Radiation Oncology related areas, from basic biology and physics, through to clinical trials and translation of research outcomes into clinical practice. Areas of particular interest include prostate cancer (especially brachytherapy; BT) and stereotactic (ST) or image-guided external beam radiation techniques.

In 2013, funding continued from Cancer Australia for prostate cancer therapy research and from Cancer Council Victoria for clinical trials management. Led by Associate Professor Jeremy Millar, we participated in the statewide Additional Funding Intervention Trial looking at whether there is a positive relationship between funding allocated to sites and the number of new participants accrued to oncology clinical trials. WBRC is also establishing an *in vivo* dosimetry program aimed at verifying delivered dose for all patients commencing megavoltage external beam radiation therapy. This pilot project, funded by the Department of Health Victoria, evaluates the role and effectiveness of Allied Health assistants in establishing and maintaining such a program.

Radiation Therapy Trials

During 2013 WBRC participated in 12 co-operative group clinical trials. Our research program included:

- Thermo luminescence dosimeter measurements on chest wall and breast patients
- Do catheter bags with inbuilt irrigation pumps reduce the incidence of acute urinary retention in patients undergoing high-dose rate BT to the prostate?
- A retrospective review to determine the treatment outcomes for stereotactic irradiation of recurrent glioblastoma mutiforme
- Management of bladder cancer with radiotherapy at a single Victorian Radiotherapy Department: The 20-year experience
- Hypofractionated linac-based ST radiotherapy (RT) for benign intracranial tumours of the cavernous sinus
- Risk of recurrence after diagnosis of invasive breast cancer by molecular sub-type
- Post-mastectomy RT: The WBRC 20-year experience
- External beam RT in the management of thyroid carcinoma
- Review of high-dose rate BT compared with external beam RT for prostate cancer
- Understanding the experiences and needs of people who care for long-term primary malignant glioma survivors: A mixed methods study
- Fulfilling the vision of youth-friendly cancer care: How well are we meeting the psychosocial needs of adolescent and young adult patients?

Treatment Advances

- WBRC is one of the few centres in Australia that has clinically implemented 4-dimensional CT/ respiratory gated stereotactic body radiotherapy (SBRT).
- New volumetric modulated arc radiation treatment technology was commissioned and put into routine clinical use in Traralgon.
- Intensity-modulated radiosurgery was commissioned and released for use at The Alfred.
- Deep inspiration breath-holding technology was commissioned for our breast cancer patients and planned for clinical release in 2014. This will further decrease radiation dose to coronary arteries and mitigate risk of late coronary artery disease.
- Involvement in the BOLART trial has prompted more regular clinical use of cone beam computed tomography (CT).

Achievements

- Dr Mathew Haynes was awarded a Medical Physicist Education Bursary by the Australasian College of Physical Scientists and Engineers in Medicine to attend the 2013 11th International ST Radiosurgery Society Congress in Toronto.
- Dr Trevor Ackerly, Chief Radiation Oncology Physicist, had his PhD thesis shortlisted by RMIT for two 2013 awards.
- Associate Professor Millar secured an honorary appointment as an Adjunct Professor in the School of Applied Sciences in the College of Science, Engineering and Health of RMIT University.
- Associate Professor Millar was an invited speaker for the Victorian Prostate Cancer Registry at the International Collaboration in Health Outcomes Measurement meeting in Boston, USA and the MD Anderson meeting 'The value and future of prostate BT in a changing healthcare environment'.
- Dr Wee Ong was awarded the Monash Comprehensive Cancer Consortium Prize for Best Poster in Cancer Research during 2013 Alfred Week for the presentation 'Long-term erectile function following permanent seed BT'.

Postgraduate Students

2 PhD Students
2 Masters Students
1 Doctor of Psychology Student

Publications

20 Journal Articles

Caulfield HOSPITAL

Rehabilitation, Aged and Community Care

Head: Associate Professor Peter Hunter MBBS, FRACP, MBL, FANZSGM

Dr Alice Lac with a patient examining the association between religious practice and depression as part of the RACP Geriatric Advanced Trainee program.

Research activity is diverse across Rehabilitation, Aged and Community Care (RACC) as it strives to become a nationally recognised leader in research. Our intention is to contribute significantly to the implementation of effective translational research and interdisciplinary, person-centred models of care, with links to defined clinical outcomes in areas of greatest need. Research growth is being achieved with participation from many of our services and interdisciplinary relationships across our hospital services and departments.

RACC is committed to providing infrastructure and support to enable and facilitate research activity across a number of programs. In 2013, the internal research grants program awarded $20,000 in funding. A focus on research during Caulfield Week remained with the Research Poster display and the Mini Poster Presentation sessions.

Interdisciplinary Research

Interdisciplinary collaboration within and beyond RACC is essential due to the nature of the services provided and the complexity of the patient population. Research projects with a strong interdisciplinary focus in 2013 included:

- Return to work/study in an acquired brain injury (Occupational Therapy (OT), Speech Pathology) and cardiac rehabilitation population (OT, Cardiac Rehabilitation).
- Investigation into the effects of the provision of thickened water on adequacy of intake and hydration in dysphagic patients (Speech Pathology, Nutrition and Dietetics, Nursing and Aged Care Medical).
- Sexuality and Stroke (SOX) project to build the confidence and capacity of clinicians for consistent provision of information addressing sexuality after stroke (Psychology, Patient and Family Services).

Allied Health

Allied Health services offer an intensive and diverse range of services to RACC's rehabilitation and aged care clients. Caulfield Hospital's OT Department conducts research in the areas of patient-centred rehabilitation, home assessment visits and discharge planning, spasticity, acquired brain injury rehabilitation as well as aged care assessment and management. The Physiotherapy Department had a substantial research output with projects related to the management of spasticity and dystonia as well as physical activity and strength training in the stroke and elderly populations within the sub-acute setting.

Aged Care Services

Clinical research in the older population has been a focus of Aged Care Services. Several projects included the evaluation of the impact of mobile DEXA scanning in a residential care setting on the diagnosis and treatment of osteoporosis (Dr Seema Parikh) and the evaluation of the implementation of an electronic interdisciplinary assessment system in a sub-acute setting (Dr Amelia Crabtree).

A major focus within the service is the Advanced Trainee Program, which involves trainees working closely with consultant geriatricians in developing and implementing a research project.

Final Advanced Trainee projects completed and passed in 2013

- Correlation between religious practice and risk of depression in the elderly in the sub-acute setting;
- Relationship between the anti-cholinergic burden of medications and delirium in older post-operative patients;
- Assessment of frailty with the Reported Edmonton Frail Scale (REFS) in a General Medical Unit.

Final Advanced Trainee projects initiated in 2013

- Evaluation of the management of lower respiratory tract infections in residential care facilities;
- Weight bearing status and clinical outcomes and frailty in a geriatric sub-acute population;
- Association between quality of life and functional state in relation to treatment duration in older patients receiving haemodialysis.

Aged Psychiatry

Established in 2009, the research/clinical trials unit within Caulfield Aged Psychiatry has continued to develop throughout 2013. The research strategy since inception has focused on large-scale, industry-sponsored clinical trials within the therapeutic area of Alzheimer's disease.

The Unit's first major piece of investigator-driven research has been an investigation of the neuropsychology of hoarding and squalor. The largest such case series within the world literature is six cases; however, three years of data collection has given us 69 case reports (Lee SM *et al.*, *Int Psychogeriatr* 2014;26(5):837-44).

Community and Ambulatory Services

The Aged Care Assessment Service (ACAS) initiated a research project investigating the uptake of community services by Russian speaking clients. It is hypothesised that the use of a Russian speaking clinician may improve access to services and reduce the waiting time for service provision.

Advance Care Planning continued with the study 'Can community dwelling older adults complete a person based Advance Care Directive to provide useful information to substitute decision makers?' All data for this study have now been collected and analysis has commenced.

Caulfield Community Health Service (CCHS) continued data collection for two projects investigating end-stage renal failure as an independent risk factor for foot ulceration and screening for depression risk utilising the geriatric depression scale.

Cognitive, Dementia and Memory Service (CDAMS) Manager Elizabeth Rand and Neuropsychologist Liz Mullaly, in collaboration with La Trobe University's Professor Glynda Kinsella and Dr Kerryn Pike, have developed and researched a memory strategy program for several years. The La Trobe University and Caulfield Hospital (LaTCH) Australia Memory Management Program is in the final phase of analysis. The research is being translated into practice with roll-out via Alzheimer's Australia Victoria (AAV). AAV staff have been trained as facilitators and trainers, and the research team intend to evaluate the translational process (subject to funding). The program is also being adapted to suit acquired brain injury clients with research proposed in conjunction with Western Health.

Community Rehabilitation Services has been involved in investigating: i) outcome measures for overweight and obese clients; ii) impact of simplified recommendation letters on adherence to falls prevention strategies, iii) benefits from a men's woodwork therapy group; and iv) outcome measures for community rehabilitation.

The Caulfield Pain Management and Research Centre is involved in three NHMRC-funded randomised controlled trials (RCTs) of treatments for chronic pain examining: (i) acupuncture to help reduce reliance on opioid medications; (ii) antidepressant therapy for the management of chronic lower back pain; and (iii) simple analgesics to reduce pain-related agitation and aggression in persons with dementia living in residential aged care facilities. Other activities have included: investigating the role of compensation status on chronic pain and functional outcomes after traumatic injury; the development of better outcome measures for the assessment of chronic pain conditions; and studies into the phenomenology of phantom limb pain, empathy for pain, and disturbance in body representation.

Nursing

Nursing has collaborated in The Tri-Focal Model of Care project, a Deakin University led teaching and research in aged care services project funded by the Department of Health. The project uses an educational approach to implement an innovative model of care to foster a learning environment within the residential aged care setting.

Rehabilitation

The Cardiac Rehabilitation Unit has conducted the following projects in 2013: the SCAR project, an RCT evaluating whether routine application of silicone sheeting to newly-healed median sternotomy scars in post-cardiac surgery patients, over a period of six months, is more effective than usual care (collaboration with OT); return to work following cardiac rehabilitation; and cognitive change following cardiac rehabilitation.

The Spinal Rehabilitation Unit's research activity includes involvement with the World Health Organisation publication on Spinal Cord Injury, lead investigator in a multi-centre rehabilitation outcomes collaboration and participation in a working party with the National Institute of Neurological Disorders and Stroke on Spinal Cord Injury Common Data Elements.

Achievements

- Dr Frances Wise won the People's Choice Award at the 2013 Australian Cardiovascular Health and Rehabilitation Association 23rd Annual Scientific Meeting for the presentation 'Attitudes to obesity among rehabilitation health professionals (Frances Wise, Darren Harris, John Olver);
- The Allied Health Assistant Leadership team received a Highly Commended mention in the Health Leadership category of the 2013 Victoria Public Healthcare Awards for achieving a highly capable and engaged workforce;
- Dr Alice Lac won the Best presentation by an Advanced Trainee at the Victorian Division of the Australian and New Zealand Society for Geriatric Medicine 2013 meeting for her presentation 'Correlation between religious practice and risk of depression in the elderly in the sub-acute setting (Alice Lac, Nicole Austin, Renata Lemke, Suma Poojary and Peter Hunter).

Physiotherapists Natalie Fini (L) and Genevieve Tole (centre) and Social Worker Susie Leech (R) are conducting research into the improvement of outcomes for stroke patients.

Postgraduate Students

7 PhD Students
1 Doctor of Clinical Science (OT) Student
10 Masters Students

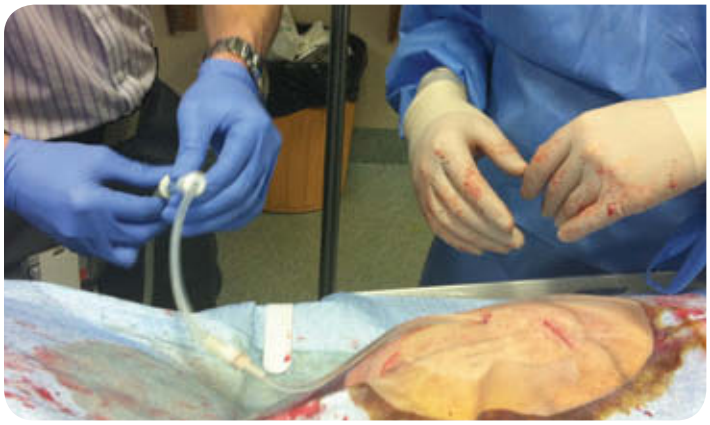
Publications

36 Journal Articles
7 Book Chapters

TheAlfred

Renal Medicine

Head: Professor Rowan Walker MBBS, MD, FRACP, MPH



Radiological Insertion of a Tenckhoff catheter.

Renal Medicine provides clinical services across the full spectrum of chronic kidney disease (CKD) (stages 1 to 5), including maintenance dialysis and kidney transplantation as well as acute kidney injury (AKI). Clinical research is the key focus across several themes.

Detection of kidney disease and AKI

- Proteinuria and kidney function in lung and heart transplant populations
- AKI in orthopaedic patients undergoing elective hip and knee replacement surgery
- Tubulopathy and metabolic syndromes in HIV treated patients

CKD progression

- A health-based needs analysis to develop an improved model of care for patients with diabetes and CKD
- Randomised controlled trials on newer agents for diabetic nephropathy
- Establishment of a registry of Kidney Diseases

End-stage kidney disease population

- Randomised trials of the treatment of CKD anaemia and metabolic bone disease in dialysis- dependent patients
- The impact of radiological insertion of Tenckhoff catheters on home dialysis rates and costs of dialysis

Tenckhoff Catheters: Radiological Insertion

A prospective study of the outcomes for all patients who had Tenckhoff catheters inserted radiologically (percutaneously with the assistance of ultrasound and fluoroscopy) over the 24-month period from initiation until December 2013 has now been completed. Sixty-two patients (42 male and 20 female) of mean age 56.7 years had Tenckhoff catheters inserted radiologically. Peritoneal dialysis was the initial dialysis modality in 48 (77%) patients and 31 (50.0%) had previously undergone extra peritoneal abdominal surgery. Forty-six patients (74.2%) had catheters successfully established as day cases. Catheter migration (6.5%), bleeding (6.5%) and minor pain (9.7%) was observed in a small number of cases. There were no cases of peritonitis or exit site infection associated with the procedure. The catheters were used after a mean of 14.9 days. The peritonitis rates subsequently have been one episode per 39.9 months (2012) and one episode per 50 months (2013).

Establishing Tenckhoff catheters this way has the potential to improve the uptake of this important home-based dialysis modality. The total number of patients on peritoneal dialysis has trebled and the rate of increase of incident patients on home-based dialysis at The Alfred exceeds 60%, which is the highest in the state. The next phase of the study is a formal analysis of the cost benefits of the procedure largely surrounding the lack of need for theatre resources to establish the catheter access.

Analysis of Diabetes and CKD Health Care

Diabetes and CKD as a combination markedly increases cardiovascular morbidity and mortality. An NHMRC project across services in Victoria (including Alfred Health) and New South Wales has been addressing the 'gaps' in healthcare services for such patients by exploring and characterising the needs of patients with diabetes and CKD, as well as the location, capacity and performance of existing health services. The initial qualitative study has been to understand how the healthcare of patients with diabetes and CKD can be improved by examining key issues in the management of these patients.

A total of 36 healthcare professionals (from four major teaching hospitals) including endocrine, renal and allied health personnel were recruited into six focus groups. Group discussions were transcribed verbatim and evaluated using a thematic analysis approach. The key themes that emerged concerning the management of diabetes and CKD were: 1) patient self-management; 2) access to healthcare; 3) communication between various healthcare providers, and between healthcare providers and their patients; 4) coordination and integration of care between health professionals, and between primary and tertiary health care; and 5) prevention and early intervention.

The preliminary findings of this study of hospital-based health professionals indicate that improvements in the healthcare of patients with diabetes and CKD may be achievable by addressing barriers to patient self-management, improving access to hospital and community healthcare, improving communication with patients and between health professionals, and improving coordination and integration of care across hospital and community sectors. An ideal model of care for diabetes and CKD potentially centres on a combination of hospital healthcare, community healthcare and patient self-management.

Publications

7 Journal Articles

TheAlfred

www.mshc.org.au

Professor Christopher (Kit) Fairley.

Sexual Health

Director: Professor Christopher Fairley MBBS, PhD, FRACP, FAFPHM, FACSHP, FAChSHM

The Melbourne Sexual Health Centre (MSHC) is a specialised unit for the diagnosis and treatment of sexually transmissible infections (STIs) including HIV, and is a principal centre for training health professionals in Victoria. The Centre conducts epidemiological, public health and clinical research, primarily aimed at improving the services offered at MSHC.

Bacterial Vaginosis

Bacterial Vaginosis (BV) is a common infection that causes an abnormal vaginal discharge and/or odour in up to 50% of sufferers with reccurrence common in many women following recommended treatment. We conducted a study exploring the impact of reccurring BV on women's self-esteem, sexual relationships and quality-of-life. Thirty-five women with male and/or female partners participated in interviews either face-to-face or by telephone. While some women reported that reoccurring BV had little impact on their lives, most reported that it had a moderate to severe impact.

The degree to which BV impacted on women physically, emotionally, sexually and socially often depended on the frequency of episodes and severity of their symptoms. Women commonly reported that symptoms of BV made them feel embarrassed, ashamed or 'dirty' and they expressed concern that others may notice the strong smell and discharge. The biggest impact of reccurring BV was on women's self-esteem and sex lives, with women regularly avoiding sex, in particular oral sex, as they were too embarrassed and self-conscious of their symptoms to engage in these activities. Women often felt confused about why they were experiencing reccurring BV and frustrated at their lack of control over recurrence.

Home Use HIV Rapid Tests

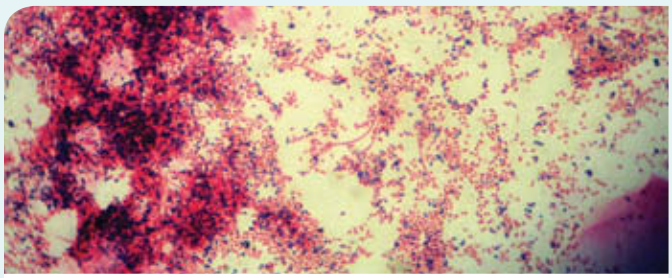
Thirty-one gay and bisexual men were interviewed for their views on HIV rapid tests for home use in Australia. The main reasons men gave for not having more frequent HIV tests were: believing themselves to be at low risk, particularly if they were in a regular relationship; inconvenience and the impractical nature of visiting health services during working hours, particularly given lengthy waiting times and the need for repeat visits for results; or laziness and procrastination. The majority of men supported the introduction of quick and easy, painless self testing home tests; however, most reported they would use them for interim testing rather than as a replacement for health service-based blood testing because they could not detect other sexually transmitted infections or provide the professional expertise and support provided at health services. The frequency with which they would use rapid home tests would largely depend on the cost. Details about the accuracy and reliability of the test and the window period with access to a 24-hour helpline could be useful.

Mycoplasma Genitalium

Mycoplasma genitalium (MG) is an STI that may cause problems in the reproductive tract of women. We conducted a study to estimate MG infection occurrence, treatment failures and the MG organism load in infections among young women. A total of 1,110 women aged 16-25 years were recruited from primary care clinics in Australia and tested for MG at their first visit, six months later, and then again after 12 months. The rate of MG occurrence found was 2% and was more common among women who reported having three or more sex partners in the last 12 months. Three cases were found to be re-infections and a further three cases failed treatment with azithromycin but were successfully treated with moxifloxacin. Those cases that failed treatment with azithromycin had a higher organism load than those who were successfully treated.

Achievements

- Dr Jade Bilardi was awarded the 2013 Advancing Women's Research Success Grant from Monash University for high research achievement and strong potential for career progression.
- Dr Catriona Bradshaw received the 2013 award for Outstanding Contribution to Research in Sexual Health Medicine from the Royal Australasian College of Physicians, Australasian Chapter of Sexual Health Medicine (AChSHM).
- Dr Vinita Rane was awarded the Jan Edwards prize for the best-proffered oral presentation by a trainee of AChSHM at the 2013 Australasian Sexual Health Conference.
- Dr Jason Ong was awarded the Junior Research Award for a trainee of AChSHM at the 2013 Australasian Sexual Health Conference.



A Gram-stained vaginal smear showing the diversity of bacteria in a case of bacterial vaginosis.

Postgraduate Students

8 PhD Students
2 Masters Students

Publications

48 Journal Articles

Major Grants

Listed are the major national and international competitive, peer-reviewed research grants held by AMREP staff in 2013.

AUSTRALIAN GRANTS

Cooperative Research Centres (CRC) Program

CRC for Biomarker Translation. Hogarth PM, Hoogenraad N, Hart D, Zola H, Morris H, Venter D, Warner N, Polverino T. 2007-2014. CRC Program funding: $30,590,000. Total funding: $90,000,000.

National Health and Medical Research Council (NHMRC)

Program Grants

Adams J, Gerondakis S, Bouillet P, Visvader J, Colman P, Strasser A, Cory S, Vaux D, Huang DC, Linderman G, Kluck RM. Apoptosis and stem cells in cancer development and therapy. 2012-2016: $21,322,575. Administering institution: Walter and Eliza Hall Institute.

Cooper D, Beard M, Dore G, Emery S, French M, Kelleher A, Kent S, Lloyd A, Purcell D. HIV and HCV vaccines and immunopathogenesis. 2009-2013: $17,734,213. Administering institution: University of New South Wales.

Goodnow C, MacKay C, MacKay-Fisson F, Tangye S, Sprent J, Cook M, Vinuesa C, Brink R. Molecular and cellular basis of inflammatory and immunodeficiency diseases. 2012-2016: $15,718,075. Administering institution: Australian National University.

Kaldor J, Garland SM, Fairley CK, Law MG, Grulich AE. Sexually transmitted infections: causes, consequences and interventions. 2010-2014: $9,100,000. Administering institution: University of New South Wales.

Kaye D, Jennings G, Esler M, Dart AM, Kingwell B, Chin-Dusting J, Sviridov D. 2013-2017: $12,406,615. Administering institution: Baker IDI.

Krum H, Kelly D, Reid C. Prevention and treatment of chronic heart and kidney disease via epidemiological, pharmacological device and cell-based approaches. 2010-2014: $5,390,000. Administering institution: Monash University.

Owen N, Bauman A, Brown W. Sitting less and moving more: Population health research to understand and influence sedentary behaviour. 2011-2014: $3,773,000. Administering institution: Baker IDI.

Stewart S, Thompson D, Abhayaratna W. Integration of risk evaluation in cardiovascular disease management programs. 2011-2013: $$2,898,607. Administering institution: Baker IDI.

Capacity Building Grants

Sim M, Abramson M, Fritschi L, LaMontagne A. Linking research policy and health services to build a better evidence base for workplace public health. 2009-2013: $1,625,115. Administering institution: Monash University.

Centres of Research Excellence

Abramson M. Centre for Population Health Research on Electromagnetic Energy. 2013-2018: $2,499,157. Administering institution: Monash University.

Cameron P. Australian Resuscitation Outcomes Consortium. 2011-2016: $2,498,523. Administering institution: Monash University.

Carlin J, Forbes A, Gurrin L. The Victorian Centre for Applied Biostatistics (VCAB): Building core methodological capacity for population health. 2011-2016: $2,497,184. Administering institution: Murdoch Children's Research Institute.

Cooper DJ, Phillips L, Bellomo R, Cameron P, Reade M, Isbister J, French C, Myles P, Webb S, McNeil J. Centre of Excellence for Patient Blood Management in Critical Illness and Trauma. 2012-2017: $2,498,407. Administering institution: Monash University.

Dart A, Jennings G, Kaye D, Peter K, Kingwell B, Chin-Dusting J. Centre of Excellence for Clinical Research Training in Translational Cardiology. 2010-2015: $2,500,000. Administering institution: Baker IDI.

Golledge J, Kingwell B, Norman P, Tonkin A, Fitridge R, Reid C, Walker P, Hankey G, Fletcher J, Nelson M. National Centre of Research Excellence to improve management of peripheral arterial disease. 2010-2015: $2,499,250. Administering institution: James Cook University.

Hellard M, Dietze P, Ritter A, Lubman D, Kinner S, Dore G, Maher L, Williams G, Moore D, Power R. Reducing the health, social and economic burden of injecting drug use in Australia. 2010-2015: $2,485,060. Administering institution: Burnet Institute.

Owen N, Salmon J, Trost S, Dunstan D, Eakin E, Healy G, Kingwell B, Lambert G, Timperio A. Centre of Research Excellence on Sedentary Behaviour and Chronic Disease Risk: Mechanisms, Measurement and Research Translation. 2013-2018: $2,499,247. Administering institution: Baker IDI.

Redman S, Jorm L, Green S, D'Este C, Frew D, Shakeshaft A, Sanson-Fisher R, Davies H, Louviere J. Centre for Informing Policy in Health with Evidence from Research (CIPHER). 2011-2015: $2,539,085. Administering institution: University of Western Sydney.

Scott A, Joyce C, Humphreys J, Kalb G. Centre for Research Excellence in Medical Workforce Dynamics. Medicine in Australia: Balancing Employment and Life (MABEL). 2011-2016: $2,496,646. Administering institution: University of Melbourne.

Stewart S, Brown A, Thompson D, Stocks N, Scuffham P, Eades S, Carrington M, Sliwa K, Maguire G. Centre of Research Excellence to Reduce Inequality in Heart Disease. 2012-2017: $2,493,649. Administering institution: Baker IDI.

Development Grants

Berger PJ, Hamilton GS, Naughton MT, Edwards BA, Sands SA, Cooke JR. Development of an effective therapy for Cheyne-Stokes breathing in heart failure. 2012-2014: $584,700. Administering institution: Monash University.

Febbraio M, Cowley M, Adams T. Development of a modified gp130 ligand to treat obesity-induced insulin resistance. 2012-2013: $424,363. Administering institution: Baker IDI.

Hagemeyer C. Site-specific bioconjugation to improve antibody drug conjugate production. 2012-2013: $391,805. Administering institution: Baker IDI.

Kaye D. Development of an extended release oral formulation of milrinone for patients with advanced heart failure. 2013-2014: $455,000. Administering institution: Baker IDI.

Meikle P, Kingwell B, Dart AM, Pekarsky B. Plasma lipid profiling for risk assessment of unstable coronary artery disease. 2012-2013: $499,750. Administering institution: Baker IDI.

Peter K, Hagemeyer C, Krippner G, Adams T. Development of platelet-targeted nanoparticles for magnetic resonance imaging towards the detection of thrombi/emboli and vulnerable atherosclerotic plaques. 2011-2013: $586,996. Administering institution: Baker IDI.

Peter K, Sampson D, Lorenser K. Development of a catheter-based device for the detection of vulnerable atherosclerotic plaques. 2013-2014: $545,507. Administering institution: Baker IDI.

Enabling Grants

Bellomo R, Cooper DJ, Myburgh J, Finfer S. National Centre for Intensive Care Research. 2010-2015: $2,500,000. Administering institution: Monash University.

McLean C. National Network of Brain Banks. 2010-2014: $2,536,000. Administering institution: Mental Health Research Institute.

European Union Collaborative Research Grants

Sim M, Milne E, Benke G, Armstrong B. Risk of brain cancer from exposure to radiofrequency fields in childhood and adolescence. 2009-2013: $693,550. Administering institution: Monash University.

Zimmet P, Curran J, Bozaoglu K. Identification of epigenetic markers underlying increased risk of T2D in South Asians. 2012-2014: $218,078. Administering institution: Baker IDI.

Global Alliance for Chronic Diseases

Thrift A, Oldenburg B, Chow C, Thomas N, Thankappan K, Maulik P, Srikanth V, Mahal A, Evans R, Joshi R. Improving the control of hypertension in rural India: Overcoming the barriers to diagnosis and effective treatment. 2012-2015: $1,033,805. Administering institution: Monash University.

Partnership Projects

Barker AL, Cameron P, Hill K, Flicker L, Haines T, Lowthian J, Waldron N, Arendts G, Redfern J, Forbes A, Morris R. GNT1056802: A multi-centre RCT to prevent secondary falls in older people presenting to the emergency department with a fall. 2013-2015: $1,488,315. Administering institution: Monash University.

Lewin S, Fairley C, Elliott J, Crooks L, Watson J, Kidd M, Battersby M, Akualcin J. HealthMap: a cluster randomised trial of interactive self-care plans to prevent and manage chronic conditions by people living with HIV. 2011-2016: $1,500,000. Administering institution: Monash University.

Middleton J, Cameron P, McClure R, Marshall R, Bowen D, Harrison J, Lyons N, Brown D. Right care, right time, right place: improving outcomes for people with spinal cord injury through early intervention and improved access to specialised care. 2012-2015: $1,068,089. Administering institution: University of Sydney.

Williams A, Manias E, Walker R, Toussaint N, Dooley MJ, Mulley B. Improving medicine adherence in kidney transplantation. 2013-2016: $261,276. Administering institution: Monash University.

Zoungas S, Walker R. The diabetes renal project: better outcomes for patients with diabetes and chronic kidney disease. 2012-2015: $628,148. Administering institution: Monash University.

Project Grants

Abramson M, Dharmage S, Benke G, Thompson B. Third Euro-Australian Respiratory Health Survey. 2011-2013: $343,028. Administering institution: Monash University.

Alderuccio F. Immune tolerance in experimental autoimmune encephalomyelitis following transplant of bone marrow cells genetically encoding autoantigen. 2011-2013: $327,524. Administering institution: Monash University.

Allen T, Chai Z. Modulation of TGF-beta signalling by CDA1 in the diabetic vasculature. 2012-2014: $506,250. Administering institution: Baker IDI.

Allen T, Cooper M. Angiotensin II AT2 receptor in diabetic atherosclerosis. 2012-2014: $488,322. Administering institution: Baker IDI.

Andrews R, Ramshaw H, Cranmer S. A newly identified role for 14-3-3zeta protein in thrombosis and platelet procoagulant activity. 2013-2015: $537,124.77. Administering institution: Monash University.

Barker A, Brand C, Haines T, Hill K, Brauer S, Jolley D, Botti M. Falls prevention in the acute hospital setting: a multi-centre cluster randomised controlled trail of efficacy, cost effectiveness and sustainability of the 6-PACK program. 2011-2014: $1,179,850. Administering institution: Monash University.

Barry A, Reeder J, Tavul L. Var gene diversity and naturally acquired immunity to malaria. 2011-2013: $329,530. Administering institution: Burnet Institute.

Beeson J, Rogerson S. Surface antigens of Plasmodium falciparum-infected erythrocytes and immunity to malaria in humans. 2013-2015: $578,502.60. Administering institution: Burnet Institute.

Bellomo R. The Australasian Resuscitation in Sepsis Evaluation – randomised controlled trial – continuation funding request. 2012-2013: $349,790. Administering institution: Monash University.

Bellomo R, Cooper DJ, Street A, Nichol A, French CJ, Presneill JJ. Erythropoietin in traumatic brain injury (EPO-TBI). 2009-2013: $1,886,655. Administering institution: Monash University.

Bernard S, Cameron P, Jacobs I, Smith K, Finn J. The RINSE Trial: the Rapid Infusion of Cold Normal SalinE by paramedics during CPR. 2011-2014: $677,888. Administering institution: Monash University.

Bobik A, Toh BH, Tipping P. CD4 NKT cells and atherosclerosis: molecular mechanisms and therapeutic strategies for suppression. 2012-2014: $487,260. Administering institution: Baker IDI.

Bobik A, Toh BH, Tipping P. Regulatory T cells and cardiac fibrosis in hypertensive heart disease: cellular and molecular mechanisms of suppression. 2013-2015: $690,627.60. Administering institution: Baker IDI.

Bozaoglu K. Chemerin may be a novel therapeutic target for modulation of adipose tissue mass. 2012-2014: $516,325. Administering institution: Baker IDI.

Bozaoglu K, Blangero J, Nyholt D. Exome sequencing by NGS to identify rare variants affecting Type 2 diabetes. 2012-2014: $553,510. Administering institution: Baker IDI.

Brown A, Carrington M, Eades S, Thompson D, Zeitz C. The Central Australian Heart Protection Study: a randomised trial of nurse-led, family based secondary prevention of acute coronary syndromes. 2011-2015: $1,830,401. Administering institution: Baker IDI.

Buchbinder R. Comparative effectiveness of ultrasound-guided injection with either autologous platelet rich plasma or glucocorticoid for ultrasound-proven lateral epicondylitis: a three-arm randomised placebo-controlled trial. 2013-2015: $510,135. Administering institution: Monash University.

Carey A. Adrenergic activation of brown adipose tissue in humans. 2012-2013: $314,950. Administering institution: Baker IDI.

Cameron P, Lewin S, Chomont N. HIV latency and regulation of HIV life cycle. 2013-2015: $489,927.26. Administering institution: Monash University.

Churchill M, Gorry P, Wesselingh S. Viral determinants of HIV-1 transcriptional latency in the central nervous system. 2013-2015: $610,658.10. Administering institution: Burnet Institute.

Cooper DJ, Bernard S, Rosenfeld J, Cameron P. POLAR - Prophylactic hypothermia trial to lessen traumatic brain injury: a randomised controlled trial. 2009-2013: $ $1,998,578. Administering institution: Monash University.

Cooper DJ, Nichol AD, French C, Street A, Bellomo R. STandaRd Issue TrANsfusion versus Fresher red blood cell Use in intenSive carE (TRANSFUSE): a randomised controlled trial. 2012-2015: $2,761,870. Administering institution: Monash University.

Cooper M, Chai Z, Cao Z. Novel strategy to reduce renal fibrosis. 2011-2013: $558,390. Administering institution: Baker IDI.

Cooper M, El-Osta A, Jandeleit-Dahm K. Role of Set7 in diabetes related end-organ injury. 2012-2014: $864,770. Administering institution: Baker IDI.

Coughlan M. Does excess consumption of dietary advanced glycation end products activate the complement pathway contributing to diabetic nephropathy? 2013-2015: $454,373.89. Administering institution: Baker IDI.

Curtis D, Pimanda J, McCormack M. The bHLH transcription factor LYL1 in normal and leukemic haematopoiesis. 2013-2015: $502,964.28. Administering institution: Monash University.

Dietze P, Aitken C, Jolley D, Hickman M, Kerr T, Stoové M. The natural history of injecting drug use among IDU in Melbourne. 2009-2013: $739,698. Administering institution: Monash University.

Drummer H. Roles of the hepatitis C virus glycoprotein E2 variable regions in virus entry, immunogenicity and immune evasion. 2012-2014: $659,685. Administering institution: Burnet Institute.

Du XJ. Beta-adrenergic activation: a double-edged sword on cardiac angiogenesis. 2011-2013: $352,524. Administering institution: Baker IDI.

Du XJ, Hewitson T, Samuel C. Relaxin therapy reverses large artery remodelling and stiffening in aged and hypertensive models. 2011-2013: $429,615. Administering institution: Baker IDI.

Dunstan D, Healy G, Owen N, Eakin E, LaMontagne A, Moodie M. Reducing prolonged workplace sitting time in office workers: a cluster-randomised controlled trial. 2011-2013: $506,996. Administering institution: Baker IDI.

Eades S, McNamara B, Stanley F, Pearson G, Langridge A. Intergenerational determinants of foetal growth in Aboriginal Western Australians. 2011-2013: $381,605. Administering institution: Baker IDI.

Eades S, Sanson-Fisher R, Paul C, Zimmet P, Carey M, Wenitong M. A cluster randomised trial to test a systems-based collaborative for Type 2 diabetes among Indigenous Australians. 2010-2014: $1,311,000. Administering institution: Baker IDI.

Eisen D, Leder K, McBryde E, Wolfe R, Pilcher D, Woods R. The AspiriN To Inhibit SEPSIS (ANTISEPSIS) trial; an ASPREE substudy to measure the benefit of low dose aspirin in the prevention of severe sepsis. 2013-2016: $391,879.56. Administering institution: Monash University.

El-Osta A, Du XJ. Regulating gene expression changes in cardiac hypertrophy. 2012-2014: $667,350. Administering institution: Baker IDI.

El-Osta A, Thomas M, Tikellis C. Exploring the upstream mediators of metabolic memory. 2013-2015: $614,104.73. Administering institution: Baker IDI.

Esler M, Vaddadi G, Lambert E. Reducing the burden of orthostatic intolerance – delineating mechanisms and improving therapy. 2011-2013: $397,524. Administering institution: Baker IDI.

Febbraio M. An essential role for skeletal muscle FoxO1 in protecting against obesity-induced insulin resistance. 2011-2013: $573,390. Administering institution: Baker IDI.

Febbraio M. Blocking IL-6 trans-signalling: a therapeutic strategy to prevent metabolic disease. 2013-2015: $521,975.03. Administering institution: Baker IDI.

Febbraio M. IC7: a gp130 receptor ligand to treat type 2 diabetes. 2013-2015: $578,169.64. Administering institution: Baker IDI.

Febbraio M, Bruce C, McGee S. Activation of HSP72 in skeletal muscle as a therapeutic target for obesity. 2011-2013: $633,390. Administering institution: Baker IDI.

Fisher J. Banking on the future: Establishing evidence for policy, protocols, and patient care relating to storage of reproductive material before treatment for cancer. 2013-2015: $576,916. Administering institution: Monash University.

Fisher J, Rowe H, Lorgell P, Ranasinha S, Proimos J. A brief couple-focused psychoeducational intervention to prevent postnatal mental health problems in women: a cluster randomised trial. 2012-2014: $679,499. Administering institution: Monash University.

Fitzgerald P, Barton D, Hoy K. A randomised controlled trial of magnetic seizure therapy in major depressive disorder. 2011-2013: $359,208. Administering institution: Monash University.

Fitzgerald P, Hoy K. Accelerated repetitive transcranial magnetic stimulation in the treatment of depression. 2013-2015: $471,252.60. Administering institution: Monash University.

Forbes A, Gurrin L, Hodge A. Mediterranean diet and mortality: analysis of longitudinal dietary patterns using newly developed statistical methods. 2011-2013: $330,058. Administering institution: Monash University.

Fowkes F. Human malarial immunity and risk of malaria post-partum and during infancy. 2013-2015: $254,165.93. Administering institution: Burnet Institute.

Gabbe B. Improving the measurement of non-fatal injury burden – validating the Global Burden of Disease (GBD) project through synthesis and analysis of the six leading injury outcome cohort studies from around the world. 2012-2013: $151,755. Administering institution: Monash University.

Gavin A. The role of NOD proteins in T cell development and function. 2011-2013: $337,524. Administering institution: Burnet Institute.

Gerondakis S. The NF-κB transcription factors c-Rel and RelA control multiple steps in natural CD4 regulatory T cell development. 2012-2014: $548,005. Administering institution: Monash University.

Gibson P, Muir J, Boyd B. Use of oral enzymes to treat carbohydrate intolerance: adjunct therapy to the low FODMAP dietary treatment of irritable bowel syndrome. 2013-2015: $590,365.43. Administering institution: Monash University.

Glass D, Sim M, Dennekamp M, Abramson M. Immunological and respiratory effects among workers exposed to engineered nanoparticles. 2012-2014: $499,222. Administering institution: Monash University.

Gorry P. Elucidating unique molecular mechanisms involved in HIV-1 subtype C pathogenicity. 2012-2014: $686,365. Administering institution: Burnet Institute.

Gorry P, Churchill M, Lewin S. Elucidating the flexibility of co-receptor engagement by HIV-1 important for macrophage tropism and escape from entry inhibitors. 2011-2013: $613,194. Administering institution: Burnet Institute.

Green S, Jeffery J, McDonald S, Lahra M, Laopaiboon M, McKenzie J, Lumbiganon P. SEA-URCHIN: South East Asia - Using Research for Change in Hospital-acquired Infection in Neonates. 2011-2015: $2,219,157. Administering institution: Monash University.

Gregorevic P, Harvey K. Investigating Hippo signalling as a novel cause of muscle disease and as a target for new interventions to combat frailty. 2011-2013: $444,615. Administering institution: Baker IDI.

Gruen R, Mitra B, Bernard S, Jacobs I, Medcalf R, Reade M, Tran H. Pre-hospital Antifibrinolytics for Traumatic Coagulopathy and Haemorrhage (The PATCH Study). 2013-2016: $1,668,152.46. Administering institution: Monash University.

Guthridge M. Dual inhibition of independent cell survival pathways as a new approach for targeting leukaemic stem cells. 2012-2014: $543,675. Administering institution: Monash University.

Guthridge M, Nilsson S. The role of osteopontin in leukaemia. 2011-2013: $585,048. Administering institution: Monash University.

Hagemeyer C, Johnston A, Peter K. Antibody targeted thrombin-activatable µ-plasminogen fusion proteins and nanocapsules for the treatment of acute thrombosis. 2012-2014: $518,675. Administering institution: Baker IDI.

Hamilton J. Defining the function of the thrombin receptor, PAR4, on human platelets. 2013-2015: $522,270.16. Administering institution: Monash University.

Head G, Allen A, Davern P. Importance of the brain renin-angiotensin system for regulating blood pressure and cardiovascular autonomic function. 2011-2013: $588,390. Administering institution: Baker IDI.

Head G, Davern P. Role of the paraventricular hypothalamus in angiotensin induced neurogenic hypertension. 2013-2015: $431,586.68. Administering institution: Baker IDI.

Hibbs M, Anderson G. Defining subpopulations of pathogenic macrophages underlying lung diseases. 2011-2013: $618,390. Administering institution: Monash University.

Hibbs M, Tarlinton D. Defining the cellular and molecular mechanisms underlying autoimmunity using a model of SLE. 2011-2013: $603,390. Administering institution: Monash University.

Hogarth P, Wines B, Powell M, Baker R. Structure and function of receptors for IgG (FcgammaR). 2011-2013: $655,074. Administering institution: Burnet Institute.

Holland A, McDonald C, Mahal A. Benefits and costs of home-based pulmonary rehabilitation in chronic obstructive pulmonary disease. 2013-2015: $364,360.82. Administering institution: La Trobe University.

Jackson S. Investigation of a new leukocyte recruitment mechanism at sites of vascular injury. 2012-2014: $528,675. Administering institution: Monash University.

Jackson S. Investigation of a novel mechanism causing platelet hyperactivity in diabetes. 2013-2015: $562,892.85. Administering institution: Monash University.

Jackson S. Investigation of the proinflammatory function of platelets during ischaemia-reperfusion injury. 2013-2015: $533,642.85. Administering institution: Monash University.

Jackson S, Hamilton J. Investigating the role of type II PI 3-kinases in platelet function. 2011-2013: $429,615. Administering institution: Monash University.

Jackson S, Nesbitt WS. Investigating biomechanical platelet activation mechanisms. 2011-2013: $496,706. Administering institution: Monash University.

Jandeleit-Dahm K, Schmidt H, de Haan J, Wingler K. NOX isoforms in diabetes associated vascular injury: implications for therapeutic strategies. 2011-2013: $426,273. Administering institution: Baker IDI.

Jandeleit-Dahm K, Thomas M, Tikellis C. The role of methylglyoxal and RAGE in diabetes associated atherosclerosis. 2013-2015: $454,375.35. Administering institution: Baker IDI.

Jane S. A novel genetic element controlling adult haemoglobin production. 2012-2014: $477,260. Administering institution: Monash University.

Jane S. Identification of critical factors for the establishment and maintenance of the epidermal barrier. 2012-2014: $648,675. Administering institution: Monash University.

Jane S. The role of the mammalian Grainyhead-like gene family in neural tube closure. 2013-2015: $613,612.35. Administering institution: Monash University.

Jane S, Pearson R, Darido C. Translating molecular insights in squamous cell carcinoma into novel therapeutics. 2013-2016: $823,336.80. Administering institution: Monash University.

Jane SM, Zhao Q, Street I, Parisot J. Identification of novel mechanisms governing stage-specific regulation of the human globin genes. 2011-2013: $551,881. Administering institution: Monash University.

Jaworowski A, Crowe S, Cameron P, Elliott J. A longitudinal study of natural killer cell function in HIV-infected individuals initiating therapy. 2013-2015: $598,938.60. Administering institution: Burnet Institute.

Kinner S, Preen D, Lennox N, Butler T, Power R, Ober C, Ware R. Improving the health of Indigenous and non-Indigenous ex-prisoners: a multi-jurisdictional, mixed-methods study. 2011-2014: $1,386,769. Administering institution: Burnet Institute.

Kulkarni J. Adjunctive hormone therapy for treatment resistant depression in perimenopausal women. 2013-2015: $599,514.44. Administering institution: Monash University.

Kulkarni J, Barton D, Gurvich C. Selective estrogen receptor modulators - a new adjunctive treatment for men with schizophrenia? 2013-2015: $788,419.13. Administering institution: Monash University.

Lahoud M. Molecular characterisation of the dendritic cell receptor Clec9a and its ligand interactions. 2012-2014: $640,405. Administering institution: Burnet Institute.

Lambert G, Barton D. Interactions between the serotonin transporter and sympathetic nervous activation in patients with major depressive disorder - Understanding the link between the brain and the heart. 2012-2014: $509,250. Administering institution: Baker IDI.

Lambert G, Barton D, Dixon J, Straznicky N. A randomised trial examining the effectiveness of sympathetic nervous inhibition in alleviating the metabolic side effects of antipsychotic medications in patients with schizophrenia. 2012-2014: $461,250. Administering institution: Baker IDI.

Lambert G, Teede H, Dixon J, Tilbrook A. Polycystic ovary syndrome - targeting the sympathetic nervous system to improve outcomes. 2012-2014: $341,175. Administering institution: Baker IDI.

Lazarus R, Blangero J, Bozaoglu K. Genetics to function: identifying transcripts mediating the biological effects of GWAS SNPs. 2012-2014: $423,579. Administering institution: Baker IDI.

Lee-Young R. Understanding the metabolic consequences of impaired AMPKα2 and nNOSµ in skeletal muscle: implications for the metabolic syndrome. 2011-2013: $556,706. Administering institution: Baker IDI.

Leslie K, Myles P, Paech M, Story D, Chow C. POISE-2: a large, international, placebo-controlled, factorial trial to assess the impact of clonidine and aspirin in patients undergoing non-cardiac surgery who are at risk of a perioperative cardiovascular event. 2011-2015: $1,136,310. Administering institution: Monash University.

Leslie K, Short T, Chan M, Myles P, Paech M, Corcoran T. GNT1042727: The influence of anaesthetic depth on patient outcome after major surgery. 2013-2017: $2,893,794.64. Administering institution: Monash University.

Lewin S, Cameron P, Jaworowski A, Cunningham A. The role of chemokines in establishing HIV latency. 2011-2013: $359,208. Administering institution: Monash University.

Lewin S, Churchill M, Wesselingh S. Histone deacetylase inhibitors and HIV latency. 2011-2013: $593,416. Administering institution: Monash University.

Lewin S, Matthews G, Torresi J, Crane M. Liver disease in HIV-HBV co-infection. 2012-2015: $682,330. Administering institution: Monash University.

Liu J-P. Studies of novel manganese transporter in lysosomes and its implications in Niemann-Pick type-C disease. 2011-2013: $506,706. Administering institution: Monash University.

Mackay F, Hertzog P. The role of BAFF, its receptor TACI and toll-like receptors in autoimmunity and tolerance. 2011-2013: $470,022. Administering institution: Monash University.

Magliano D, Shaw J, Huxley R, Balkau B, Davis W. The Australian and New Zealand Diabetes and Cancer Collaboration. 2011-2013: $398,591. Administering institution: Baker IDI.

Magliano D, Shaw J, Peeters A, Kookana R, Melzer D, Mueller J. The role of Bisphenol A in the development of chronic disease. 2012-2013: $384,002. Administering institution: Baker IDI.

McMullen J. Manipulating cardiac-selective PI3K targets to reverse heart failure progression. 2011-2013: $514,615. Administering institution: Baker IDI.

McMullen J. PI3K-regulated heat shock proteins and microRNAs as new treatment strategies for atrial fibrillation. 2011-2013: $534,615. Administering institution: Baker IDI.

McMullen J. Targeting PI3K-regulated lipids to treat heart failure. 2013-2015: $472,889.14. Administering institution: Baker IDI.

McMullen J, Lin R. The cardioprotective role of PI3K-regulated small non-coding RNAs. 2013-2015: $589,695.02. Administering institution: Baker IDI.

McNeil J, Guymer R, Robman L, Woods R. Low dose aspirin and age-related macular degeneration: randomised controlled trial. 2013-2017: $991,797.06. Administering institution: Monash University.

Medcalf R, Lawrence D. Proteases and protease-inhibitor complexes as modulators of traumatic brain injury severity. 2013-2015: $592,142.85. Administering institution: Monash University.

Medcalf R, Mitchell A. New approaches to improve thrombolysis in ischaemic stroke. 2013-2015: $565,847.10. Administering institution: Monash University.

Meikle P, Best J. Lipidomic analysis of the FIELD trial: mechanism of action and prediction of response to fenofibrate treatment in type 2 diabetes. 2013-2015: $621,134. Administering institution: University of Sydney.

Meikle P, Tonkin A, Jowett J, Kowalczyk A, Hillis G, Zoungas S, Thompson P. Metabolomic insights into the pathogenesis and risk assessment of unstable coronary artery disease. 2012-2014: $847,185. Administering institution: Baker IDI.

Myles P, Bellomo R, Christophi C, Corcoran T, Forbes A, Peyton P, Story D. Restrictive versus Liberal Fluid Therapy in Major Abdominal Surgery: The RELIEF Trial. 2013-2017: $2,384,173.35. Administering institution: Monash University.

Myles P, Silbert B, Cooper DJ, McNeil J. Completion of the ATACAS trial. 2011-2014: $3,328,614. Administering institution: Monash University.

Nichol A, Davies A, Hodgson C, Fraser J, Bersten A, Cooper DJ. A multi-centre RCT of an open lung strategy including permissive hypercapnia, alveolar recruitment and low airway pressure in patients with ARDS. 2012-2015: $997,535. Administering institution: Monash University.

O'Hehir R, Rolland J. Human CD4+ T cell epitope-based therapeutic for peanut allergy. 2011-2013: $389,208. Administering institution: Monash University.

O'Hehir R, Rolland J, Bruce C, Hardy C. Impaired respiratory tolerance in obesity – the link with asthma? 2012-2014: $644,685. Administering institution: Monash University.

O'Keeffe M, Radford K, Banerjee A. Production of interferon lambda by dendritic cell subsets and role in adjuvant effects of poly I:C. 2011-2013: $383,028. Administering institution: Burnet Institute.

Oldenburg B, Hare D, Taylor C, McKenzie D, Forbes A, Sanderson K, Clarke D, Hollingsworth S. A prospective cohort study investigating the relationships between negative emotions, biomarkers and long term functioning in post-MI patients. 2012-2015: $851,071. Administering institution: Monash University.

Oldenburg B, Thankappan K, Tapp R, Zimmet P, Jolley D, Hollingsworth B, Fisher E. Kerala Diabetes Prevention Program (K-DPP): a cluster RCT of its effectiveness and cost-effectiveness. 2011-2015: $1,046,991. Administering institution: Monash University.

Peeters A. Predicting the impact of current obesity and diabetes trends on future prevalence of cardiovascular disease in Australia. 2012-2013: $217,430. Administering institution: Baker IDI.

Peeters A, Wolfe R, Barendregt J, Backholer K. Implications of the increasing duration of life spent with obesity for population health. 2013-2014: $245,631.65. Administering institution: Baker IDI.

Peleg AY. Characterizing the molecular mechanisms of clinically important bacterial-fungal interactions; the potential to uncover novel therapeutic targets. 2011-2013: $472,438. Administering institution: Monash University.

Peter K. Developing functionalised microbubbles for molecular ultrasound imaging, drug and microRNA delivery. 2013-2015: $653,597.10. Administering institution: Baker IDI.

Peter K, Bobik A. Preventing myocardial infarction: A mouse model of atherosclerotic plaque instability/rupture as unique tool for establishing novel pharmacological strategies and targeted molecular imaging. 2011-2013: $566,706. Administering institution: Baker IDI.

Peter K, Hagemeyer C, Ackermann U, O'Keefe G. Novel 18F and 64Cu labelled targeted nanoparticles for molecular positron emission tomography: A means for early and sensitive detection of thrombosis, inflammation and vulnerable, rupture-prone atherosclerotic plaques. 2012-2014: $553,510. Administering institution: Baker IDI.

Piterman L, Paul CL, Gibberd R, Shaw JE. RCT of continuing medical education and feedback to altering diabetes population outcomes. 2009-2013: $900,825. Administering institution: Monash University.

Plebanski M, O'Hehir R, Hardy C, Friend J, Rolland J. Mechanisms of nanoparticle-mediated inhibition of asthma. 2011-2013: $615,903. Administering institution: Monash University.

Ponsford J, Rajaratnam SW. Efficacy of melatonin for sleep disturbance following traumatic brain injury. 2012-2014: $217,407. Administering institution: Monash University.

Poumbourios P, Drummer H, Yuriev E. Elucidating the activation mechanism of the HIV-1 envelope glycoproteins, gp120-gp41. 2011-2013: $615,074. Administering institution: Burnet Institute.

Reeder J, Barry A, Mueller I, Siba P. Population genomics of *Plasmodium vivax* in Papua New Guinea. 2011-2013: $576,706. Administering institution: Burnet Institute.

Reid C, Liew D, Owen A, Williamson E, Ademi Z. Modelling of clinic and ambulatory blood pressure on cardiovascular risk and outcomes. 2013-2014: $130,480.84. Administering institution: Monash University.

Ritchie R, Gao XM, Yang Y. GNT1045140: Annexin-A1 agonists rescue cardiac contractile function after myocardial infarction. 2013-2015: $599,972.1. Administering institution: Baker IDI.

Schlaich M. Renal denervation to improve outcomes in patients with end-stage renal disease. 2013-2015: $992,544.64. Administering institution: Baker IDI.

Schlaich M, Head G, Denton K. Mechanisms and consequences of renal denervation in chronic kidney disease. 2013-2015: $1,247,960.90. Administering institution: Baker IDI.

Schlaich M, Lambert G. Renal denervation for uncontrolled hypertension. 2012-2016: $2,073,675. Administering institution: Baker IDI.

Schlaich M, May C. Catheter based renal denervation to improve outcomes in congestive heart failure. 2011-2013: $598,533. Administering institution: Baker IDI.

Schoenwaelder S, Jackson S. The role of PI 3-kinase p110beta in regulating thrombus porosity. 2013-2015: $500,502.60. Administering institution: Monash University.

Schoenwaelder S, Josefsson E. Investigating the contribution of distinct mitochondrial cell death pathways to platelet survival and function. 2012-2014: $613,375. Administering institution: Monash University.

Shaw J, Zimmet P, Anstey K, Kavanagh A, Atkins R, Chadban S, Dunstan D, Balkau B. AusDiab 3: emerging risk factors for and long-term incidence of cardio-metabolic diseases. 2011-2014: $2,537,113. Administering institution: Baker IDI.

Shehabi Y, Bellomo R, Reade M, Seppelt I, McArthur C, Bailey M, Howe B. Early goal-directed sedation compared with standard care in mechanically ventilated critically ill patients: a prospective multicentre randomised controlled trial. 2013-2017: $2,752,725.01. Administering institution: Monash University.

Stewart S, Horowitz J, Carrington M, Scuffham P, Wong C, Newton P, Rischbieth A. Which Heart failure Intervention is most Cost effective in reducing Hospital care (WHICH? II) Trial: A multicentre, randomised trial of standard versus intensified management of metropolitan and regional-dwelling patients with heart failure. 2013-2016: $1,817,824.76. Administering institution: Baker IDI.

Storey E. Mechanisms of ataxia in spinocerebellar ataxia type 1 transgenic mice. 2013-2015: $348,864.36. Administering institution: Monash University.

Stoové M, Kinner S, Butler T, Aitken C, Ogloff J, Dietze P. A prospective cohort study of ex-prisoners with a history of injecting drug use: examining health service utilisation, physical and mental health and blood borne virus trajectories. 2012-2016: $956,019. Administering institution: Burnet Institute.

Storey E, Ward S, Woods R, Hamilton G, Janke A, Kawasaki R, Naughton M. The SNORE-ASA study: a study of neurocognitive outcomes, radiological and retinal effects of aspirin in sleep apnoea. 2012-2016: $850,000. Administering institution: Monash University.

Sviridov D, Bukrinsky M, Slobedman B, Mukhamedova N. ABCA1 – an intersection between infection, atherosclerosis and metabolic disorders. 2012-2014: $631,671. Administering institution: Baker IDI.

Sviridov D, Remaley A, Shaw J, Turner S. Novel apolipoprotein A-I mimetic peptides: a research tool and a therapeutic agent to study and treat atherosclerosis. 2011-2013: $389,208. Administering institution: Baker IDI.

Sviridov D, Smyth I, Jowett J, Fu Y, Kelsell D. ABCA12 – a new regulator of cellular lipid metabolism. 2012-2014: $699,685. Administering institution: Baker IDI.

Tachedjian G, Cone R, Perlmutter P. Lactic acid as a natural microbicide for HIV. 2012-2014: $577,350. Administering institution: Burnet Institute.

Tachedjian G, Gorry P, Ramsland P, Aguilar M-I. Elucidating the mechanism of action of dendrimer nanoparticles against HIV. 2011-2013: $540,048. Administering institution: Burnet Institute.

Taylor A. The role of diffuse myocardial fibrosis in myocardial stiffness. 2012-2015: $479,940. Administering institution: Baker IDI.

Teede H, Lombas C, Zoungas S, Keating C. Preventing weight gain in young to mid-aged women living in rural communities: a cluster randomised controlled trial. 2012-2015: $863,888. Administering institution: Monash University.

Ting S, Curtis D. Endocytosis and asymmetric cell division in leukaemia. 2013-2015: $529,419.64. Administering institution: Monash University.

Ting S, Russell S, Savageau G. The role of Ap2a2 in self-renewal of haematopoietic and leukemic stem cells. 2011-2013: $505,942. Administering institution: Monash University.

Thomas M, Tikellis C. Exploring the therapeutic potential of TRAIL in diabetes and the metabolic syndrome. 2012-2014: $431,250. Administering institution: Baker IDI.

Thompson B, Thien F, Douglass J, King G, O'Hehir R. Physiological aetiology of refractory asthma. 2011-2013: $344,208. Administering institution: Monash University.

Urquhart D, Wluka A, Sim M, van Tulder M, Forbes A, Gibson S. Is low dose amitriptyline more effective than placebo in the management of chronic, neuropathic low back pain? A double-blind, randomised, placebo-controlled trial with an economic evaluation. 2012-2014: $296,155. Administering institution: Monash University.

Wang Y, Cicuttini F, Tonkin A, Hill C, Ding C. Does statin use have a disease modifying effect in symptomatic knee osteoarthritis? A multicentre randomised, double-blind, placebo-controlled trial. 2013-2015: $971,019.95. Administering institution: Monash University.

Wei A, Bradstock K, Levis M, Murray M, Roberts A. A randomised study to optimise clinical outcomes in patients with FLT3 mutant AML. 2013-2017: $1,111,891.27. Administering institution: Monash University.

Wilkinson-Berka J, Campbell D, Slattery R, Miler A. Prorenin and the prorenin receptor in diabetic retinopathy: involvement of the Wnt pathway and inflammation. 2011-2013: $560,022. Administering institution: Monash University.

Wilkinson-Berka J, Peti-Peterdi J, Miller A. Evaluating the link between the GPR91 receptor and renin in the pathogenesis of diabetic retinopathy. 2011-2013: $470,022. Administering institution: Monash University.

Woodcock E, Grubb D. SHANK3 as a target to reduce hypertrophy and heart failure. 2011-2013: $530,048. Administering institution: Baker IDI.

Woodcock E, Iismaa S. Identification of novel targets for treatment of heart failure. 2012-2014: $470,286. Administering institution: Baker IDI.

Woodcock E, Kistler P. Phospholipase Cα1b, a target to limit atrial dilatation. 2011-2013: $526,299. Administering institution: Baker IDI.

Wright M. The role of the tetraspanins CD37 and CD82 in leukocyte migration. 2012-2014: $358,510. Administering institution: Monash University.

Australia Fellowships

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

Jackson S. 2010-2014. Administering institution: Monash University.

Research Fellowships

Allen T. 2008-2013. Administering institution: Baker IDI.

Andrews R. 2011-2015. Administering institution: Monash University.

Crowe S. 2013-2017. Administering institution: Burnet Institute.

Davis S. 2013-2017. Administering institution: Monash University.

Dart A. 2010-2014. Administering institution: Baker IDI.

Dietze P. 2011-2015. Administering institution: Burnet Institute.

Dixon J. 2010-2014. Administering institution: Baker IDI.

Drummer H. 2013-2017. Administering institution: Burnet Institute.

Du XJ. 2013-2017. Administering institution: Baker IDI.

El-Osta A. 2009-2014. Administering institution: Baker IDI.

Esler M. 2010-2014. Administering institution: Baker IDI.

Febbraio MA. 2012-2016. Administering institution: Baker IDI.

Gerondakis S. 2011-2015. Administering institution: Monash University.

Head G. 2011-2015. Administering institution: Baker IDI.

Hellard M. 2009-2013. Administering institution: Burnet Institute.

Hibbs M. 2010-2014. Administering institution: Monash University.

Jackson D. 2009-2013. Administering institution: Burnet Institute.

Jandeleit-Dahm K. 2009-2013. Administering institution: Baker IDI.

Kaye D. 2013-2017. Administering institution: Baker IDI.

Kingwell B. 2009-2013. Administering institution: Baker IDI.

Lambert G. 2013-2017. Administering institution: Baker IDI.

Mackay F. 2012-2016. Administering institution: Monash University.

McMullen J. 2010-2014. Administering institution: Baker IDI. (Honorary)

Medcalf R. 2013-2017. Administering institution: Monash University.

Meikle P. 2013-2017. Administering institution: Baker IDI.

Owen N. 2011-2015. Administering institution: Baker IDI.

Plebanski M. 2008-2012. Administering institution: Monash University.

Peter K. 2010-2014. Administering institution: Baker IDI. (Honorary)

Reid C. 2013-2017. Administering institution: Monash University.

Reeder J. 2009-2013. Administering institution: Burnet Institute.

Ritchie R. 2008-2013. Administering institution: Baker IDI.

Schlaich M. 2010-2014. Administering institution: Baker IDI.

Shaw J. 2010-2014. Administering institution: Baker IDI.

Stewart S. 2013-2017. Administering institution: Baker IDI.

Sviridov D. 2010-2014. Administering institution: Baker IDI.

Tachedjian G. 2009-2014. Administering institution: Burnet Institute.

Thomas M. 2010-2014. Administering institution: Baker IDI.

Wilkinson-Berka. 2011-2015. Administering institution: Monash University.

Woodcock E. 2010-2014. Administering institution: Baker IDI.

Practitioner Fellowships

Buchbinder R. 2010-2014. Administering institution: Monash University.

Cooper DJ. 2013-2017. Administering institution: Monash University.

Cameron P. 2009-2013. Administering institution: Monash University.

Fitzgerald P. 2010-2014. Administering institution: Monash University.

Gruen R. 2012-2016. Administering institution: Monash University.

Kistler P. 2012-2016. Administering institution: Baker IDI.

Krum H. 2012-2016. Administering institution: Monash University.

Lewin S. 2013-2017. Administering institution: Monash University.

Maguire G. 2013-2017. Administering institution: Baker IDI.

Myles P. 2013-2017. Administering institution: Monash University.

Career Development Fellowships

Carrington M. 2012-2015. Administering institution: Baker IDI.

Cheng A. 2011-2014. Administering institution: Monash University.

Enticott P. 2013-2017. Administering institution: Monash University.

Gabbe B. 2013-2016. Administering institution: Monash University.

Gregorevic P. 2013-2016. Administering institution: Baker IDI.

Kinner S. 2011-2014. Administering institution: Burnet Institute.

Lee-Young R. 2013-2016. Administering institution: Baker IDI.

Leder K. 2011-2014. Administering institution: Monash University.

Maller J. 2011-2014. Administering institution: Monash University.

O'Keeffe M. 2011-2014. Administering institution: Burnet Institute.

Peeters A. 2013-2016. Administering institution: Baker IDI.

Peleg A. 2013-2016. Administering institution: Monash University.

Ting S. 2013-2016. Administering institution: Monash University.

Urquhart D. 2011-2014. Administering institution: Monash University.

Early Career Fellowships

Agostino M. 2013-2016. Administering institution: Burnet Institute.

Audsley J. 2009-2013. Administering institution: Monash University.

Bilardi J. 2011-2014. Administering institution: Monash University.

Boyle J. 2011-2014. Administering institution: Monash University.

Binger K. 2012-2015. Administering institution: Baker IDI.

Chan W. 2013-2016. Administering institution: Baker IDI.

Chang J. 2008-2013. Administering institution: Monash University.

Davern P. 2011-2014. Administering institution: Baker IDI.

Drew B. 2009-2013. Administering institution: Baker IDI.

Elliott J. 2012-2015. Administering institution: Monash University.

Fowkes F. 2011-2013. Administering institution: Burnet Institute.

Freak-Poli R. 2013-2016. Administering institution: Monash University.

Giles M. 2009-2013. Administering institution: Alfred Health.

Gray L. 2010-2013. Administering institution: Monash University.

Hodgson C. 2012-2015. Administering institution: Monash University.

Jenkinson R. 2013- 2016. Administering institution: Burnet Institute.

Lim K. 2013- 2016. Administering institution: Baker IDI.

Lim M. 2009-2013. Administering institution: Burnet Institute.

Lowthian J. 2013-2016. Administering institution: Monash University.

Lynch B. 2010-2015. Administering institution: Baker IDI.

McNamara B. 2010-2015. Administering institution: Baker IDI.

O'Connor D. 2010-2013. Administering institution: Monash University

O'Toole J. 2011-2014. Administering institution: Monash University.

Panjari M. 2012-2015. Administering institution: Monash University.

Peleg AY. 2010-2013. Administering institution: Monash University.

Richards J. 2012-2015. Administering institution: Burnet Institute.

Sands S. 2013-2017. Administering institution: Monash University.

Segrave R. 2012-2015. Administering institution: Monash University.

Smith MZ. 2008-2013. Administering institution: Monash University.

Watson A. 2008-2014. Administering institution: Baker IDI.

Weiss G. 2013- 2016. Administering institution: Burnet Institute.

Westein E. 2012-2014. Administering institution: Baker IDI.

Wright E. 2011-2014. Administering institution: Burnet Institute.

Zatta A. 2010-2013. Administering institution: Monash University.

Other Australian Grants

AusAID – Bilateral Program Grant

Morgan C. China-Australia health facility. 2007-2013: $39,127,119. Administering institution: Burnet Institute.

AusAID – NGO Cooperation Program

Dorning K. Improving community demand for timely maternal & child health services in four rural townships located near Yangon, Burma - 4 townships near Yangon: Teikkyi, Thonegwa, Kayan, Mawbi. 2012-2013: $65,885. Administering institution: Burnet Institute.

Toole M. HIV Prevention in Lhasa - Lhasa Municipality, Tibet Autonomous Region. 2012-2013: $64,490. Administering institution: Burnet Institute.

AusAID – NGO Project Grants

Dorning K. Periodic Fund for Humanitarian Assistance to Burma (PFHAB). 2011-2013: $379,342. Administering institution: Burnet Institute.

Toole M. Tibet Health Capacity Building Program. 2013: $1,643,847. Administering institution: Burnet Institute.

Toole M. Women's and Children's Health Knowledge Hub. 2008-2013: $7,055,484. Administering institution: Burnet Institute.

Power R. Asia Regional HIV/AIDS Project; Indonesian HIV/AIDS Prevention and Care Project; Indonesian-Australian Specialised Training Program; Xinjiang HIV/AIDS Prevention and Care Project; HAARP. 2007-2015: $3,451,850. Administering institution: Burnet Institute.

Whitney R, Otto B, Toole M, Morgan D, Kwarteng T, Vaughan C, Holmes W. Community based HIV programs for youth and vulnerable populations. 2001-2013: $3,263,244. Administering institution: Burnet Institute.

Australian and New Zealand College of Anaesthetists – Research Grants

Myles P, Leslie K, Chan M, Peyton P. ENIGMA-II trial long-term follow-up study. 2012-2014: $180,000. Administering institution: Alfred Health.

Myles P, Wallace S, McIlroy D, Shulman M, Ponsford J. Recovery and wellbeing after major surgery: complications, functional recovery and the measurement of disability-free survival. 2013: $30,000. Administering institution: Alfred Health.

Australian National Preventive Health Agency – Research Fellowship

Lim M. 2013-2014. Administering institution: Burnet Institute.

Australian Research Council – Discovery Projects

Enticott P. What is the functional significance of mirror neurons? Contrasting the adaptation and association models of the mirror neuron system. 2012-2013: $155,000. Monash University.

Febbraio M. Discovery of novel myokines by innovative proteomic analyses. 2013-2015: $345,000. Monash University.

Renzaho AM, Swinburn BA, Lo SK, Mellor DJ, Green JB. African youth and obesity: The role of the intergenerational acculturation gap. 2012-2013: $73,680. Monash University.

Australian Research Council – Discovery Early Career Researcher Awards

Jeffrey KL. 2012-2014. Administering institution: Monash University.

Smith PM. 2012-2014. Administering institution: Monash University.

Australian Research Council – Future Fellowships

Beeson J. 2011-2013. Administering institution: Burnet Institute.

Dietze P. 2010-2014. Administering institution: Burnet Institute.

Dunstan D. 2010-2014. Administering institution: Baker IDI.

Gavin AL. 2009-2013. Administering institution: Burnet Institute.

Gorry PR. 2012-2016. Administering institution: Burnet Institute.

Karagiannis T. 2012-2016. Administering institution: Baker IDI.

McMullen J. 2009-2013. Administering institution: Baker IDI.

Peter K. 2009-2013. Administering institution: Baker IDI.

Renzaho AM. 2012-2015. Administering institution: Monash University.

Australian Research Council – Linkage Grants

Bucknall T, Hutchinson AM. Listen to me, I really am sick! Understanding patient and family perspectives in triggering responses to medical emergencies. 2012-2015: $197,293. Administering institution: Deakin University.

Fitzgerald PB, Fifield W. The development and testing of a device to enhance the application of repetitive transcranial magnetic stimulation. 2013-2016: $581,643. Administering institution: Monash University.

George J, Abramson M, Bonesvki B, Dooley M, Taylor S, Poole S, Weeks G. Smoking cessation program for smokers admitted to public hospitals. 2011-2014: $271,854. Administering institution: Monash University.

Kirkman M, Fisher J, Souter K, Dobson A, Butera R, Casper G, Dally G, Farrell E, L'Huillier E, Malone J, Michelmore J, Tomlinson J, Vollenhoven B. Elucidating the increasing demand for genital cosmetic surgery among girls and women in Australia. 2013-2016: $327,220. Administering institution: Monash University.

Muir J, Gibson P, Bekes F, Suter D. Development of novel cereal grain products for wheat and gluten intolerant Australians. 2010-2014: $519,000. Administering institution: Monash University.

Renzaho A, Polonsky M, Mellor DJ, Green JB, Nicholson J, Oldenburg B, Horton K. Community capacity building for healthy lifestyles (CBHL) initiative: engaging communities in childhood obesity prevention in disadvantaged areas. 2013-2016: $252,000. Administering institution: Monash University.

Stevenson C, Peeters A, Magliano D, Martin J, Ball K, Beauchamp A. What will it take to decrease socio-economic inequalities in obesity? 2012-2014: $140,208. Administering institution: Deakin University.

Ward J, Worth H, Smith A, Thiele D, Kaldor J, Bryant J, Pitts M. Sexual health and relationships in young Indigenous people. 2009-2014: $755,000. University of New South Wales.

Australian Research Council – Research in Bionic Vision Science and Technology

Lowery A, Rosa M, Rosenfeld JV, Rajan R, Smith-Miles K, Kleeman L, Forsythe J, Adler B, Rood J, Hall A, Karmakar NC, Li WH, Harvey E. Direct stimulation of the visual cortex: a flexible strategy for resorting high-acuity pattern vision. 2010-2013: $8,000,000. Administering institution: Monash University.

beyondblue National Priority Drive Research Grant Program – Research Grants

Fitzgerald P. A randomised controlled trial of magnetic seizure therapy in major depressive disorder. 2012-2014: $121,890. Administering institution: Monash University.

Fitzgerald P, Miller R, Riley J. The F.A.D study: Facebook use in affective disorders. 2013-2014: $38,550. Administering institution: Monash University.

Segrave R. Cognitive control training for treatment resistant depression: application, evaluation and augmentation. 2013-2015: $97,598. Administering institution: Monash University.

BUPA Health Foundation – Project Grants

Davis S, Bell R. Life after breast cancer study. 2010-2013: $778,911. Administering institution: Monash University.

Davis S. Improving the health of Australian women at midlife. 2013: $100,000. Administering institution: Monash University.

Cancer Australia – Priority-driven Collaborative Cancer Research Scheme

Evans S, Bolton D, Costello A, David I, Frauman A, Frydenberg M, Giles G, Jolley D, McNeil J, Millar J. Determining the causes of

observed variation in survival after diagnosis of prostate cancer. 2011-2013: $570,552. Administering institution: Monash University.

Georgy S. The role of mammalian transcription factor Grainyhead-like 3 in oesophageal cancer. 2013: $95,000. Administering institution: Monash University.

Millar J, Davis I, Bolton D, Giles G, Costello T, McNeil J, Evans S. Pilot of a population-based prostate cancer clinical registry. 2010-2013: $592,875. Administering institution: Monash University.

Cancer Council Victoria – Grant-in-Aid

Bach LA, Rice G. Insulin-like growth factor binding protein-6 & ovarian cancer. 2011-2013: $292,524. Administering institution: Monash University.

CASS Foundation – Science and Medicine Grants

Chin-Dusting J. Causative mechanisms underlying hypertension induced coronary artery disease. 2013: $50,000. Administering institution: Baker IDI.

Drummer H. Proof of concept study for the development of a hepatitis C vaccine. 2013: $52,000. Administering institution: Burnet Institute.

Gugasyan R. Developing a diagnostic tool for early detection of blood cancer. 2013: $47,500. Administering institution: Burnet Institute.

Hagemeyer C. Targeted delivery of novel MMP inhibitors to atheroma to prevent unstable plaque rupture. 2013: $50,000. Administering institution: Baker IDI.

Hovarth A. Development of a new therapeutic agent to dissolve pathological blood clots. 2013: $35,000. Administering institution: Monash University.

Peleg AY. Developing novel strategies to treat and prevent infection with golden staph. 2013: $55,000. Administering institution: Monash University.

CSIRO – Flagship Cluster

McNeil J, Burgess A, Masters C, Nelson M. ASPREE Healthy Ageing Biobank. 2010-2013: $3,076,000. Administering institution: Monash University

Dairy Innovation Australia – Dairy Innovation Research Grant

Meikle P. The relationship between dairy food, insulin resistance and the risk of type 2 diabetes. 2011-2013: $155,000. Administering institution: Baker IDI.

Diabetes Australia Research Trust – General Grants

Bach L. The role of ezrin in podocyte damage due to glycated proteins. 2013: $60,000. Administering institution: Monash University.

Allen T, Kantharidis P, Agrotis A. Targeting a new microRNA in diabetes associated atherosclerosis and restenosis. 2013: $59,162. Administering institution: Baker IDI.

Cooper M, Thomas M, El-Osta A. Persisting effects of transient exposure to hyperglycemia in vivo. 2013: $60,000. Administering institution: Baker IDI.

Coughlan M, Cooper M. Does Bax drive mitochondrial dysfunction in diabetic nephropathy? 2013: $60,000. Administering institution: Baker IDI.

Jandeleit-Dahm K, Chai Z. Role of CDA1BP1 in diabetic nephropathy and atherosclerosis in ApoE KO mice. 2013: $60,000. Administering institution: Baker IDI.

Kantharidis P, Wang B. MicroRNAs as master regulators of renal fibrosis. 2013: $59,613. Administering institution: Baker IDI.

Watson A. The role of renal sympathetic nerves in diabetic nephropathy. 2013: $59,920. Administering institution: Baker IDI.

Diabetes Australia Research Trust – Millennium Awards

Ritchie R, Kemp-Harper B. Nitroxyl (HNO) donors as novel pharmacotherapy specifically for the cardiac complications of type 1 diabetes. 2013-2014: $150,000. Administering institution: Baker IDI.

Straznicky N. Neuroadrenergic dysfunction along the diabetic continuum: Benefits of weight loss within different strata of metabolic risk. 2013-2014: $150,000. Administering institution: Baker IDI.

Diabetes Australia Research Trust – Viertel Fellowships

Murphy A. 2013-2014. Administering institution: Baker IDI.

Sourris K. 2012-2013. Administering institution: Baker IDI.

Department of Health and Ageing (Federal Government)

Dietze P, Hellard M. Illicit Drug Reporting System (IDRS). 2010-2013: $284,600. Administering institution: University of New South Wales.

Hellard M. Ecstasy and Related Drug Reporting System (EDRS). 2010-2013: $180,264. Administering institution: University of New South Wales.

Department of Health (Victorian Government)

Avery S. Positive Change for Life – Improving health, wellbeing and quality of life for survivors of blood cancer following stem cell transplantation by promoting a healthy lifestyle through diet and physical activity. 2011-2013: $259,315. Administering institution: Monash University.

Haskett M. Melanoma shared care, a tripartite approach for survival! The patient, their GP and their specialist. 2012-2013: $150,000. Administering institution: Alfred Health.

McNeil J, Reid C, Tonkin A. Australian Cardiac Procedures Registry. 2011-2013: $200,000. Administering institution: Monash University.

Nicholes M, Billing S, Gill L, Austin N, Hunter P. Can community dwelling in older adults complete a person based Advanced Care Directive to provide useful information to substitute decision makers? 2011-2013: $22,868. Administering institution: Alfred Health.

Ilhan Food Allergy Foundation – Research Grant

O'Hehir RE, Rolland JM, Prickett S. Induction of regulatory T-cell responses to inhibit 'anaphylactic'-type immune responses to nut allergens. 2011-2013: $300,000. Administering institution: Monash University.

Institute for Safety, Compensation and Recovery Research – Program Grant

Lannin N, Hunter P, Bragge P, Gabbe B, Tate R, Cameron I, Holland A, Ratcliffe J. Severe acquired brain injury slow stream rehabilitation research framework. 2012-2014: $765,164. Administering institution: La Trobe University.

Leukaemia Foundation – Clinical Trial Grant

Wei A, Spencer A. Investigating the role of targeted therapy with the FLT3 inhibitor for AML patients with FLT3 mutations (AML). 2011-2013: $315,500. Administering institution: Monash University.

Leukaemia Foundation – Grant-in-Aid

Wei A, Huang DC. Targeting survival pathways in acute myeloid leukaemia for therapeutic benefit. 2013: $100,000. Administering institution: Monash University.

Multiple Sclerosis Research Australia – Incubator Grant

Peter K. Platelets as targets for molecular imaging of subclinical multiple sclerosis. 2013-2014: $25,000. Administering institution: Baker IDI.

National Heart Foundation of Australia – Career Development Fellowship

Hagemeyer C. 2012-2016. Administering institution: Baker IDI.

National Heart Foundation of Australia – Grants-in-Aid

Byrne M, Kaye D. Molecular mechanisms of atrial fibrillation induced heart failure. 2013-2014: $126,041. Administering institution: Baker IDI.

Gardiner E, Andrews RK. Platelet receptor modulation. 2013-2014: $130,000. Administering institution: Monash University.

Jandeleit-Dahm K, Kantharidis P, Agrotis A. The role of microRNA Let7b in proliferation and vascular disease in diabetes. 2012-2013: $129,725. Administering institution: Baker IDI.

Kaye D. Nerve growth factor mediated cardiac regeneration. 2012-2013: $129,956. Administering institution: Baker IDI.

Kaye D, Mackay F. Immune mechanisms in cardiac fibrosis. 2013-2014: $130,000. Administering institution: Baker IDI.

Kingwell B, Meikle P, Chapman J, Duffy S, Ahimastos A, Montalescot G. The HDL lipidome: prediction of coronary plaque rupture & monitoring of therapeutic responses. 2013-2014: $130,000. Administering institution: Baker IDI.

Krum H. Renal denervation in diabetes. 2013-2014: $32,474. Administering institution: Monash University.

McMullen J. Significance of ER alpha in the normal and failing heart of females and males. 2012-2013: $130,000. Administering institution: Baker IDI.

Peter K. A novel embryo-derived peptide, preimplantation factor (PIF), as a new therapeutic agent protecting against inflammatory diseases. 2013-2014: $130,000. Administering institution: Baker IDI.

Peter K. Novel single-chain antibody targeted microbubbles for molecular ultrasound imaging of thrombosis and inflammation. 2012-2013: $130,000. Administering institution: Baker IDI.

Ritchie R. Annexin-A1 mimetics as targets for cardioprotection. 2012-2013: $130,000. Administering institution: Baker IDI.

Ritchie R, McMullen J, Novel approaches to preserving cardiac function in diabetes. 2013-2014: $130,000. Administering institution: Baker IDI.

Siebel A, Kingwell B, Ritchie R, Vernardos K. Improving cardiac function and metabolism: Is HDL the missing link? 2012-2013: $129,125. Administering institution: Baker IDI.

Straznicky N, Lambert E. Novel treatments to improve nutritional sympathetic and thermogenic responsiveness in metabolic syndrome obesity. 2012-2013: $130,000. Administering institution: Baker IDI.

Thomas M, El-Osta A, Tikellis C, Allen T. The persisting vascular effects arising from activation of the renin angiotensin system. 2013-2014: $129,340. Administering institution: Baker IDI.

National Heart Foundation of Australia – Overseas Research Fellowships

Calkin A. 2009-2013. Administering institution: Baker IDI.

Weeks K. 2013-2016: Administering institution: Baker IDI.

National Heart Foundation of Australia – Postdoctoral Fellowships

Backholer K. 2013-2015. Administering institution: Baker IDI.

Irvine J. 2013-2014. Administering institution: Baker IDI.

Sampson A. 2013-2014. Administering institution: Baker IDI.

Prostate Cancer Foundation of Australia – Project Grant

Tachedjian G. Xenotropic murine leukaemia virus-related virus (XMRV) in Australian prostate cancer. 2011-2013: $225,000. Administering institution: Burnet Institute.

Sylvia and Charles Viertel Charitable Foundation – Senior Medical Research Fellowship

Curtis D. Using mouse models to identify improved therapies for hematologic malignancies. 2010-2014. Administering institution: Monash University.

Transport Accident Commission – Grants

Cameron P. Victorian Orthopaedic Trauma Outcomes Registry (VOTOR). 2011-2013: $765,872. Administering institution: Monash University.

Gruen R, Rosenfeld J, Cooper DJ, Bernard S, Cameron P, Fitzgerald M, Ponsford J, Morganti-Kossmann C. Centre of Excellence in Traumatic Brain Injury Research. 2012-2014: $3,340,000. Administering institution: Monash University.

Morganti-Kossmann C, Bye N. Enhancing the production of new neurons to promote neurological recovery following traumatic brain injury. 2011-2013: $506,996. Administering institution: Monash University.

Victorian Cancer Agency – Research Fellowships

Darido C. Clare Oliver Memorial Fellowship in Skin Cancer. 2012-2013. Administering institution: Monash University.

Victorian Cancer Agency – Research Grant

Watkins N, Brown T, Millar J, Stirling R, Solomon B, Ashley D, Fox S, Irving L, Wright G, Mitchell P, MacManus M, Waring P, John T, Ganju V. The Victorian lung cancer initiative. 2011-2013: $1,671,672. Administering institution: Monash University.

Victorian Cancer Agency – Translational Cancer Research Grant

McNeil J, Reid C, Burton R, Woods R. Building translational clinical research capacity in regional Victoria through ASPREE and the Healthy Ageing Biobank. 2010-2013: $3,692,700. Administering institution: Monash University.

Victorian Neurotrauma Initiative – Program Grant

Gruen R, Green S. Improving evidence-based care and the outcomes of patients with traumatic brain injury through a program to facilitate knowledge transfer and exchange. 2009-2014: $4,399,539. Administering institution: Monash University.

Victorian Neurotrauma Initiative – Project Grant

Cooper DJ, Bellomo R, Bernard S. Multi-centre randomised controlled trials of early acute interventions (hypothermia, and erythropoietin) to improve outcomes after traumatic brain injury. 2010-2014: $2,100,000. Administering institution: Monash University.

INTERNATIONAL GRANTS

Association for International Cancer Research – Project Grant

Jane SM, Darido C. Identification of novel therapeutic targets in squamous cell carcinoma. 2011-2013: $294,806. Administering institution: Monash University.

Bill and Melinda Gates Foundation – Grand Challenges Explorations

Beeson J, Drew D. Accelerating vaccine development against P. vivax malaria. 2012-2013: US$96,268. Administering institution: Burnet Institute.

International AIDS Society and National Institutes of Health – Creative and Novel Ideas in HIV Research Grant Program

Palmer C. Leucocyte metabolic and T cell specific immune dysfunction in HIV infection. 2011-2014: US$600,000. Administering institution: Burnet Institute.

Juvenile Diabetes Research Foundation International – Career Development Award

Tikellis C. ACE2 in the vascular complications of Type 1 diabetes. 2010-2014. Administering institution: Baker IDI.

Juvenile Diabetes Research Foundation International – Postdoctoral Fellowship

Tan SM. The effects of novel GPx1-mimetics in diabetic nephropathy. 2011-2013: Administering institution: Baker IDI.

Juvenile Diabetes Research Foundation International – Multi-project Grants

Cooper M. NOX isoforms in diabetic nephropathy. 2010-2013: US$135,465. Administering institution: Baker IDI.

Jandeleit-Dahm K. NOX isoforms in diabetes-associated atherosclerosis. 2010-2013: US$271,200. Administering institution: Baker IDI.

Juvenile Diabetes Research Foundation International – Project Grants

Cooper M. Set 7: a novel target for diabetic vascular complications. 2008-2013: US$1,250,000. Administering institution: Baker IDI.

Thallas-Bonke V. Synergistic actions of NADPH oxidase and PKC in diabetic nephropathy. 2012-2014: US$269,820. Administering institution: Baker IDI.

Wilkinson-Berka J. NOX-derived ROS: renal and vascular complications of type 1 diabetes. 2010-2013: US$245,234. Administering institution: Monash University.

National Institutes of Health (USA)

Bukrinsky M, Sviridov D. Mechanisms of virus-induced impairment in reverse cholesterol transport. 2009-2014: US$641,399. Administering institution: George Washington University.

Chaikof E, Peter K. Site-specific therapies to prevent intimal hyperplasia. 2011-2014: US$50,000. Administering institution: Beth Israel Deaconess Medical Centre.

Churchill M. Transcriptional HIV-1 latency in astrocyte and macrophage reservoirs of the central nervous system. 2013-2015: US$296,944. Administering institution: Burnet Institute.

Grimm R, McNeil J. ASPirin in Reducing Events in the Elderly (ASPREE). 2010-2015: US$23,372,347. Administering institution: Monash University.

Deeks S, McCune M, Seklay R, Lewin SR, Palmer S, Hazuda D, Stevenson M. DARE: Delaney AIDS Research Enterprise to Find a Cure. 2011-2013: US$19,826,794. Administering institution: University of California, San Francisco.

Lewin S. The role of chemokines in the establishment of HIV latency. 2012-2013: US$259,990. Administering institution: Monash University.

Meikle P, Blangero J, Zimmet P, Shaw J, Haviv I, Kowalczyk A, Jowett J. Metabolomic studies into the pathogenesis and risk assessment of Type 2 diabetes. 2010-2013: US$929,809. Administering institution: Baker IDI.

Wright E. International Network for Strategic Initiatives in Global HIV Trials (INSIGHT). 2010-2013: US$45,000. Administering institution: Monash University.

NIH Fogarty International Centre – Millennium Promise Award

Oldenburg B, Fisher E, Kadir K, Thankappan K. Building the Asian non-communicable disease research network for regional research capacity. 2010-2015: US$1,178,773. Administering institution: Monash University.

Stanley Medical Research Institute (USA)

Kulkarni J, Rossell SL, Lee S, de Castella A, Fitzgerald P. Double blind, placebo controlled, randomized investigation of ondansetron in chronic residual schizophrenia. 2010-2013: US$899,029. Administering institution: Monash University.

NHMRC GRANTS COMMENCING IN 2014

Program Grant

Stewart S, Thompson D, Scuffham P. GNT1055214: Optimising the cost-benefits of multidisciplinary, heart disease prevention and management programs. 2014-2018: $4,647,175. Administering institution: Baker IDI.

EU Collaborative Research Grants

Cooper DJ. GNT1074181: OZENTER-TBI_Australia-Europe NeuroTrauma Effectiveness Research in TBI collaboration. 2014-2016: $358,347. Administering institution: Monash University.

El-Osta A. GNT1075563: Development and epilepsy – strategies for innovative research to improve diagnosis, prevention and treatment in children and difficult to treat epilepsy. 2014-2016: $444,126. Administering institution: Baker IDI.

Partnership Project

Cooper DJ. GNT1074654: Improving outcomes for patients with critical bleeding requiring massive transfusion. 2014-2016: $861,706. Administering institution: Monash University.

Project Grants

Barker A, McNeil J, Ward S, Sanders K, Khosla S. GNT1067242: The ASPREE-fracture sub-study: does daily low-dose aspirin reduce fracture risk in healthy older adults? 2014-2018: $1,290,628. Administering institution: Monash University.

Bobik A, Toh BH, Tipping P. GNT1068500: Natural killer (NK) cells and development of atherosclerosis: cellular and molecular mechanisms. 2014-2016: $705,558. Administering institution: Baker IDI.

Cameron P, Mallal S, Vatakis D. GNT1058891: The impact of HIV integration sites on eliminating HIV latency. 2014-2016: $752,950. Administering institution: Monash University.

Caminschi I, Heath W, Mueller S. GNT1060519: Enhancing vaccine efficacy by harnessing dendritic cell receptors and their unique properties. 2014-2016: $664,890. Administering institution: Burnet Institute.

Caminschi I, O'Keeffe M. GNT1060522: The identification and characterisation of a new DNA receptor. 2014-2016: $634,890. Administering institution: Burnet Institute.

Carrington M, Zimmet P, Furler D. GNT1069043: The Management to Optimise Diabetes and mEtabolic syndrome Risk reduction via Nurse-led intervention (MODERN) study. 2014-2017: $1,290,716. Administering institution: Baker IDI.

Cooper M, Chai Z. GNT1060450: Targeting the CDA1 axis to confer renoprotection. 2014-2016: $641,226. Administering institution: Baker IDI.

Cooper M, Kantharidis P. GNT1060448: Role of microRNA-21 in diabetic kidney disease. 2014-2016: $729,623. Administering institution: Baker IDI.

Crabb B, Beddoe T, de Koning-Ward T, Gilson P. GNT1068287: The structural resolution of PTEX, the translocon of virulence proteins and malaria parasites. 2014-2016: $542,562. Administering institution: Burnet Institute.

Davis S, Brown K, Bell R. GNT1061800: Investigating the use of metformin for the prevention of endometrial cancer. 2014-2016: $655,321. Administering institution: Monash University.

Dunstan D, Green D, Ellis K, Cerin E. GNT1062338: Taking a break for brain health: interacting effects of exercise bouts with breaks in sitting time on cognitive and cerebrovascular function in overweight adults. 2014-2016: $748,285. Administering institution: Baker IDI.

Dworkin S, Jane S, Anderson P. GNT1063837: Identifying the critical pathways which regulate vertebrate craniofacial development. 2014-2016: $534,033. Administering institution: Monash University.

Esler M, Lambert E. GNT1070386: Neural mechanisms of recurrent postural syncope. 2014-2016: $589,569. Administering institution: Baker IDI.

Febbraio M, Whitham M. GNT1062436: Is the role of IL6 in metabolism dependent on its cellular origin? 2014-2016: $690,558. Administering institution: Baker IDI.

Fowkes F, Simpson J, Nosten F. GNT1060785: Human malarial immunity and assessment of emerging artemisinin resistance. 2014-2016: $302,647. Administering institution: Burnet Institute.

Gabbe B, Cameron P, Harrison J, Lyons R, Ponsford J, Collie A, Ameratunga S. GNT1061786: Outcomes after serious injury: what is the recovery trajectory and how do the priorities for treatment and disability services change over time? 2014-2017: $738,450. Administering institution: Monash University.

Gorry P, Lee B, Payne R, Ramsland P. GNT1059394: Elucidating the mechanisms and consequences of clinical HIV-1 resistance to the CCR5 antagonist maraviroc. 2014-2016: $602,670. Administering institution: Burnet Institute.

Guthridge M, Wei A. GNT1066711: Targeting the apoptosis machinery in cancer. 2014-2016: $527,948. Administering institution: Monash University.

Head G, Davern P, Marques F, Charchar F. GNT1065714: Mechanisms responsible for neurogenic hypertension: role of a novel interaction between amygdale-hypothalamic GABA pathways and the microRNA regulation of rennin. 2014-2016: $557,562. Administering institution: Baker IDI.

Hogarth M, Pietersz G, Baker R, Powell M. GNT1067484: Human Fc receptors in antibody mediated inflammation. 2014-2016: $619,890. Administering institution: Burnet Institute.

Jackson S. GNT1066957: Identification of a novel adhesion mechanism regulating platelet-endothelial interactions. 2014-2016: $485,179. Administering institution: Monash University.

Jackson S, Schoenwaelder S. GNT1066956: Investigating a novel role for the haemopoietic growth factor receptor, c-Mpl, in regulating shear-dependent platelet adhesive function. 2014-2016: $551,524. Administering institution: Monash University.

Jandeleit-Dahm K, Kantharidis P. GNT1062370: The role of the microRNA let 7 in diabetic proliferative vascular disease. 2014-2016: $651,896. Administering institution: Baker IDI.

Jane S. GNT1069813: Towards a cure for the beta-hemoglobinopathies. 2014-2016: $617,562. Administering institution: Monash University.

Kingwell B, Duffy S, Siebel A. GNT1065462: HDL elevation and glucose metabolism: a mechanistic proof-of-concept intervention trial in pre-diabetes. 2014-2016: $490,468. Administering institution: Baker IDI.

Kyaw T. GNT1066896: B1a B cells: atheroprotective mechanisms and therapeutic application. 2014-2016: $529,169. Administering institution: Baker IDI.

Luchters S, Crowe S, Stoové M, Anderson D, Markby J, Ryan C, Kelly A, Chen XS, Kelso D, Vallely A. GNT1063725: Reduced HIV infection and increased survival among HIV-exposed infants using two newly developed point-of-care tests in Papua New Guinea and China. 2014-2016: $923,691. Administering institution: Burnet Institute.

Mackay F, Ting S. GNT1067561: Restoration of immune competency in CLL. 2014-2016: $557,565. Administering institution: Monash University.

Maguire G, Ward J. GNT1069039: Preventing hospital readmission in a regional Australian hospital setting. 2014-2016: $546,862. Administering institution: Baker IDI.

McMullen J, Ritchie R. GNT1062120: Identification of a microRNA-based therapy for the diabetic heart. 2014-2016: $510,505. Administering institution: Baker IDI.

Peter K. GNT1070860: Defining 'therapeutic' cells as well as establishing cell targeting and tracking technology for the treatment of myocardial infarction and atherosclerosis. 2014-2016: $642,952. Administering institution: Baker IDI.

Peter K. GNT1069492: Nanoparticle and virus assisted targeting of microRNA and DNA for the treatment of atherosclerosis, myocardial infarction and other inflammatory diseases. 2014-2016: $640,853. Administering institution: Baker IDI.

Peter K. GNT1067214: The role of C reactive protein (CRP) in localising inflammation to misfolded proteins and stressed cells: a basis for the development of new anti-inflammatory reagents. 2014-2016: $700,465. Administering institution: Baker IDI.

Poumbourios P, Drummer H. GNT1070890: Studies on the activation and immunogenicity of the HIV-1 glycoproteins, gp120-gp41. 2014-2016: $615,558. Administering institution: Burnet Institute.

Tachedjian G, Chalmers D, Sluis-Cremer N, Arnold E, Simpson J. GNT1064900: Towards a new class of reverse transcriptase inhibitor for HIV prevention. 2014-2016: $663,918. Administering institution: Burnet Institute.

Weller C, Haines T, Ward S, Darby I, Barker A, Underwood M. GNT1069329: Clinical effectiveness of aspirin in healing chronic venous leg ulcers: a randomised double-blinded placebo-controlled trial. 2014-2017: $766,311. Administering institution: Monash University.

Development Grant

Rosenfeld J. GNT1075773: Restoring vision with a wireless multi-electrode cortical device: towards commercialisation. 2014-2018: $1,463,682. Administering institution: Monash University.

Research Fellowships

Guthridge M. SRFA. 2014-2018. Administering institution: Monash University.

Hellard M. SRFA. 2014-2018. Administering institution: Burnet Institute.

Jandeleit-Dahm K. SRFB. 2014-2018. Administering institution: Baker IDI.

Kingwell B. SPRF. 2014-2018. Administering institution: Baker IDI.

Plebanski M. SRFA. 2014-2018. Administering institution: Monash University.

Ritchie R. SRFA. 2014-2018. Administering institution: Baker IDI.

Career Development Fellowships

Barker A. Level 1. 2014-2017. Administering institution: Monash University.

Cheng A. Level 2. 2014-2017. Administering institution: Monash University.

Wang Y. Level 1. 2014-2017. Administering institution: Monash University.

Wluka A. Level 2. 2014-2017. Administering institution: Monash University.

Early Career Fellowships

Boyle M. 2014-2017. Administering institution: Burnet Institute.

Bray J. 2014-2017. Administering institution: Monash University.

Duncan R. 2014-2017. Administering institution: Burnet Institute.

Howell J. 2014-2017. Administering institution: Burnet Institute.

Iles L. 2014-2017. Administering institution: Baker IDI.

McKenzie J. 2014-2017. Administering institution: Monash University.

Mitra B. 2014-2017. Administering institution: Monash University

Pedrana A. 2014-2017. Administering institution: Burnet Institute.

Roche M. 2014-2017. Administering institution: Monash University.

Sacre J. 2014-2017. Administering institution: Baker IDI.

Teichtahl A. 2014-2017. Administering institution: Baker IDI.

Doctoral Degrees Completed and Passed 2013

PhD

Al-Daher S. Studying platelet prothrombotic mechanisms in diabetes mellitus. Monash University. *Australian Centre for Blood Diseases, Monash.*

Ayton D. The local church and health promotion in Victoria. Monash University. *Department of Epidemiology and Preventive Medicine, Monash.*

Brennan S. Developing a research framework to improve our ability to understand and measure the effect of continuous quality improvement (CQI) in primary care. *Australasian Cochrane Centre / Department of Epidemiology and Preventive Medicine, Monash.*

Brown F. The analysis of erythropoiesis through ENU mutagenesis. Monash University. *Australian Centre for Blood Diseases, Monash.*

Buchanan B. Neurobiology of body dysmorphic disorder. Monash University. *Monash Alfred Psychiatry Research Centre.*

Burch M. A novel link between G protein copied and serine/threonine kinase receptors regulating proteoglycan synthesis in vascular smooth muscle: relationship to lipid binding and atherosclerosis. Monash University. *Department of Medicine, Monash / Baker IDI.*

Chan C. Mechanisms of NK cell mediated tumour immunosurveillance. Monash University. *Department of Immunology, Monash.*

Diehl P. New diagnostic and therapeutic strategies in thrombosis, atherothrombosis and inflammation - selecting of new designed ankyrin repeat protein (DARPins) from a phage library. Monash University. *Department of Medicine, Monash / Baker IDI.*

Diug B. How do social risk factors affect warfarin therapy? What are the social responsibilities and strategies in place to deal with these risk factors? Monash University. *Department of Epidemiology and Preventive Medicine, Monash.*

Feil J. Substance dependence: the inability to inhibit compulsive patterns of drug use. Monash University. *Monash Alfred Psychiatry Research Centre.*

Freak-Poli R. Global corporate challenge evaluation: the evaluation of a low-cost, low-impact physical-activity workplace intervention. Monash University. *Department of Epidemiology and Preventive Medicine, Monash.*

Gosling C. Incidence, risk factors and outcomes of injuries in tri-athletes. Monash University. *Department of Epidemiology and Preventive Medicine, Monash / National Trauma Research Institute, Alfred.*

Hellewell S. Pathophysiology and therapeutic strategies for the treatment of traumatic brain injury. Monash University. *Department of Medicine, Monash / National Trauma Research Institute, Alfred.*

Hills D. Workplace aggression in Australian clinical medical practice. Monash University. *Department of Epidemiology and Preventive Medicine, Monash.*

Hoe V. The CUPID study: risk factors for musculoskeletal and somatic symptoms and associated disability in workers. Monash University. *Department of Epidemiology and Preventive Medicine, Monash.*

Jeganskanda S. Immunity to influenza. University of Melbourne. *Infectious Diseases Unit, Alfred.*

Kaplan R Somatoperception in body dysmorphic disorder. Monash University. *Monash Alfred Psychiatry Research Centre.*

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

Kure C. An observation study to examine the physiological mechanisms associated with cognitive impairment in heart failure patients. Swinburne University. *Department of Cardiothoracic Surgery, Alfred.*

Lee C. Longitudinal study of cognitive changes in progressive supranuclear palsy and Parkinson's disease. University of Melbourne. *Department of Neurology, Alfred.*

Lu B. Structural and functional analysis of the interaction of plasmin lysine binding sites with antiplasmin C-terminus. Monash University. *Australian Centre for Blood Diseases, Monash.*

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

McMahon J. Social, behavioural and clinical factors associated with poor outcomes in patients living with HIV on antiretroviral therapy. Monash University. *Department of Medicine, Monash / Infectious Diseases Unit, Alfred.*

McTier L. Defining patient participation in treatment in acute care context. Deakin University. *Nursing, Alfred.*

Mond H. Cardiac pacing and implantable cardioverter-defibrillator surveys: long term Australian and international experience. Monash University. *Department of Epidemiology and Preventive Medicine, Monash.*

Neill E. Investigating the neural basis of memory impairments in schizophrenia. Monash University. *Monash Alfred Psychiatry Research Centre.*

Nguyen HT. Development of a mouse model of chronic asthma and allergic inflammation. Monash University. *Department of Immunology, Monash / Department of Allergy, Immunology and Respiratory Medicine, Alfred.*

Niego B. Effects of tissue-type plasminogen activator on the structure and function of the blood-brain barrier in health and disease. Monash University. *Australian Centre for Blood Diseases, Monash.*

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

Osadnik C. Airway clearance techniques for chronic obstructive pulmonary disease. La Trobe University. *Physiotherapy Department, Alfred.*

Read T. Sexually transmitted viruses in men who have sex with men. University of Melbourne. *Melbourne Sexual Health Centre, Alfred.*

Reece J. HIV pathogenesis. University of Melbourne. *Infectious Diseases Unit, Alfred.*

Strange G. Seeing the invisible: the impediments of timely diagnosis of pulmonary hypertension. Monash University. *Department of Epidemiology and Preventive Medicine, Monash.*

Stub D. Improving prognosis in out of hospital cardiac arrest utilising circulatory support. Monash University. *Department of Medicine, Monash / Intensive Care Unit / Department of Cardiovascular Medicine, Alfred / Bake IDI.*

Thom O. Preventative aspects of non invasive haemodynamic monitoring in severely ill patients in the Emergency Department. Monash University. *Department of Epidemiology and Preventive Medicine, Monash / Department of Anaesthesia and Perioperative Medicine, Alfred.*

Van Rheenen T. Cognition and genetics in bipolar. Swinburne University. *Monash Alfred Psychiatry Research Centre.*

Watson C. Use of oral garlic (*Allium sativum*) in recurrent thrush (*vulvovaginal candidiasis*). University of Melbourne. *Melbourne Sexual Health Centre, Alfred.*

Wren L Vaccine-induced ADCC immunity. University of Melbourne. *Infectious Disease Unit, Alfred.*

Zou H. Human papilloma virus in men who have sex with men. University of Melbourne. *Melbourne Sexual Health Centre, Alfred.*

Other Doctorates

Chipperfield K. The protective role of physical activity against psychological distress in men undergoing Androgen Deprivation Therapy (ADT) for prostate cancer. Doctor of Psychology (Clinical Psychology). Monash University. *William Buckland Radiotherapy Centre, Alfred.*

Gibson K. Developing WHO guidance on viral hepatitis B and C for people who use drugs. Doctor of Public Health. Monash University. *Department of Epidemiology and Preventive Medicine, Monash.*

Tee JW. Predictors of functional outcomes of patients with traumatic spine fractures. Doctor of Medicine. Monash University. *Department of Surgery, Monash / National Trauma Research Institute / Department of Neurosurgery, Alfred.*

For a list of current postgraduate students, go to www.amrep.org.au

Caption: PhD Students Nitasha Kumar (L) (Infectious Diseases, Monash Central Clinical School) and Hannah Pearce (R) (Baker IDI Heart and Diabetes Institute) at the 2013 Central Clinical School Postgraduate Symposium.

HIGH IMPACT JOURNAL ARTICLES 2013

2012 impact factors > 10

ORIGINAL RESEARCH

Le T, Wright EJ, Smith DM, He W, Catano G, Okulicz JF, Young JA, Clark RA, Richman DD, Little SJ, Ahuja SK. Enhanced CD4+ T-cell recovery with earlier HIV-1 antiretroviral therapy. *N Engl J Med* 2013;368(3):218-30. **[IF: 51.658]**

Meier B, Kalesan B, Mattle HP, Khattab AA, Hildick-Smith D, Dudek D, Andersen G, Ibrahim R, Schuler G, Walton AS, Wahl A, Windecker S, Jüni P; PC Trial Investigators. Percutaneous closure of patent foramen ovale in cryptogenic embolism. *N Engl J Med* 2013;368(12):1083-91. **[IF: 51.658]**

Ruschitzka F, Abraham WT, Singh JP, Bax JJ, Borer JS, Brugada J, Dickstein K, Ford I, Gorcsan J 3rd, Gras D, Krum H, Sogaard P, Holzmeister J; EchoCRT Study Group. Cardiac-resynchronization therapy in heart failure with a narrow QRS complex. *N Engl J Med* 2013;369(15):1395-405. **[IF: 51.658]**

Stanworth SJ, Estcourt LJ, Powter G, Kahan BC, Dyer C, Choo L, Bakrania L, Llewelyn C, Littlewood T, Soutar R, Norfolk D, Copplestone A, Smith N, Kerr P, Jones G, Raj K, Westerman DA, Szer J, Jackson N, Bardy PG, Plews D, Lyons S, Bielby L, Wood EM, Murphy MF; TOPPS Investigators. A no-prophylaxis platelet-transfusion strategy for hematologic cancers. *N Engl J Med* 2013;368(19):1771-80. **[IF: 51.658]**

Davies C, Pan H, Godwin J, Gray R, Arriagada R, Raina V, Abraham M, Medeiros Alencar VH, Badran A, Bonfill X, Bradbury J, Clarke M, Collins R, Davis SR, Delmestri A, Forbes JF, Haddad P, Hou MF, Inbar M, Khaled H, Kielanowska J, Kwan WH, Mathew BS, Mittra I, Müller B, Nicolucci A, Peralta O, Pernas F, Petruzelka L, Pienkowski T, Radhika R, Rajan B, Rubach MT, Tort S, Urrútia G, Valentini M, Wang Y, Peto R; Adjuvant Tamoxifen: Longer Against Shorter (ATLAS) Collaborative Group. Long-term effects of continuing adjuvant tamoxifen to 10 years versus stopping at 5 years after diagnosis of oestrogen receptor-positive breast cancer: ATLAS, a randomised trial. *Lancet* 2013;381(9869):805-16. **[IF: 39.060]**

GBD 2010 Country Collaboration. GBD 2010 country results: a global public good. *Lancet* 2013;381(9871):965-70. **[IF: 39.060]**

Bojesen SE, Pooley KA, Johnatty SE, Beesley J, Michailidou K, Tyrer JP, Edwards SL, Pickett HA, Shen HC, Smart CE *et al.*, Multiple independent variants at the TERT locus are associated with telomere length and risks of breast and ovarian cancer. *Nat Genet* 2013;45(4):371-8. **[IF: 35.209]**

Bønnelykke K, Matheson MC, Pers TH, Granell R, Strachan DP, Alves AC, Linneberg A, Curtin JA, Warrington NM, Standl M, *et al.*, Australian Asthma Genetics Consortium (AAGC); Early Genetics and Lifecourse Epidemiology (EAGLE) Consortium. Meta-analysis of genome-wide association studies identifies ten loci influencing allergic sensitization. Nat Genet 2013;45(8):902-6. **[IF: 35.209]**

Garcia-Closas M, Couch FJ, Lindstrom S, Michailidou K, Schmidt MK, Brook MN, Orr N, Rhie SK, Riboli E, Feigelson HS *et al.*, Genome-wide association studies identify four ER negative-specific breast cancer risk loci. *Nat Genet* 2013;45(4):392-8. **[IF: 35.209]**

Pharoah PD, Tsai YY, Ramus SJ, Phelan CM, Goode EL, Lawrenson K, Buckley M, Fridley BL, Tyrer JP, Shen H *et al.*, GWAS meta-analysis and replication identifies three new susceptibility loci for ovarian cancer. *Nat Genet* 2013;45(4):362-70. **[IF: 35.209]**

Ahimastos AA, Walker PJ, Askew C, Leicht A, Pappas E, Blombery P, Reid CM, Golledge J, Kingwell BA. Effect of ramipril on walking times and quality of life among patients with peripheral artery disease and intermittent claudication: a randomized controlled trial. *JAMA* 2013;309(5):453-60. **[IF: 29.978]**

Doig GS, Simpson F, Sweetman EA, Finfer SR, Cooper DJ, Heighes PT, Davies AR, O'Leary M, Solano T, Peake S; Early PN Investigators of the ANZICS Clinical Trials Group. Early parenteral nutrition in critically ill patients with short-term relative contraindications to early enteral nutrition: a randomized controlled trial. *JAMA* 2013;309(20):2130-8. **[IF: 29.978]**

Gatto D, Wood K, Caminschi I, Murphy-Durland D, Schofield P, Christ D, Karupiah G, Brink R. The chemotactic receptor EBI2 regulates the homeostasis, localization and immunological function of splenic dendritic cells. *Nat Immunol* 2013;14(5):446-53. **[IF: 26.199]**

Man K, Miasari M, Shi W, Xin A, Henstridge DC, Preston S, Pellegrini M, Belz GT, Smyth GK, Febbraio MA, Nutt SL, Kallies A. The transcription factor IRF4 is essential for TCR affinity-mediated metabolic programming and clonal expansion of T cells. *Nat Immunol* 2013;14(11):1155-65. **[IF: 26.199]**

Choudhury S, Almendro V, Merino VF, Wu Z, Maruyama R, Su Y, Martins FC, Fackler MJ, Bessarabova M, Kowalczyk A, Conway T, Beresford-Smith B, Macintyre G, Cheng YK, Lopez-Bujanda Z, Kaspi A, Hu R, Robens J, Nikolskaya T, Haakensen VD, Schnitt SJ, Argani P, Ethington G, Panos L, Grant M, Clark J, Herlihy W, Lin SJ, Chew G, Thompson EW, Greene-Colozzi A, Richardson AL, Rosson GD, Pike M, Garber JE, Nikolsky Y, Blum JL, Au A, Hwang ES, Tamimi RM, Michor F, Haviv I, Liu XS, Sukumar S, Polyak K. Molecular profiling of human mammary gland links breast cancer risk to a p27(+) cell population with progenitor characteristics. *Cell Stem Cell* 2013;13(1):117-30. **[IF: 25.315]**

Dimopoulos M, Siegel DS, Lonial S, Qi J, Hajek R, Facon T, Rosinol L, Williams C, Blacklock H, Goldschmidt H, Hungria V, Spencer A, Palumbo A, Graef T, Eid JE, Houp J, Sun L, Vuocolo S, Anderson KC. Vorinostat or placebo in combination with bortezomib in patients with multiple myeloma (VANTAGE 088): a multicentre, randomised, double-blind study. *Lancet Oncol* 2013;14(11):1129-40. **[IF: 25.117]**

Murphy AJ, Bijl N, Yvan-Charvet L, Welch CB, Bhagwat N, Reheman A, Wang Y, Shaw JA, Levine RL, Ni H, Tall AR, Wang N. Cholesterol efflux in megakaryocyte progenitors suppresses platelet production and thrombocytosis. *Nat Med* 2013;19(5):586-94. **[IF: 24.302]**

Morrissey CO, Chen SC, Sorrell TC, Milliken S, Bardy PG, Bradstock KF, Szer J, Halliday CL, Gilroy NM, Moore J, Schwarer AP, Guy S, Bajel A, Tramontana AR, Spelman T, Slavin MA; Australasian Leukaemia Lymphoma Group and the Australia and New Zealand Mycology Interest Group. Galactomannan and PCR versus culture and histology for directing use of antifungal treatment for invasive aspergillosis in high-risk haematology patients: a randomised controlled trial. *Lancet Infect Dis* 2013;13(6):519-28. **[IF: 19.966]**

Figgett WA, Fairfax K, Vincent FB, Le Page MA, Katik I, Deliyanti D, Quah PS, Verma P, Grumont R, Gerondakis S, Hertzog P, O'Reilly LA, Strasser A, Mackay F. The TACI receptor regulates T-cell-independent marginal zone B cell responses through innate activation-induced cell death. *Immunity* 2013;39(3):573-83. **[IF: 19.795]**

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Hawkes AL, Chambers SK, Pakenham KI, Patrao TA, Baade PD, Lynch BM, Aitken JF, Meng X, Courneya KS. Effects of a telephone-delivered multiple health behavior change intervention (CanChange) on health and behavioral outcomes in survivors of colorectal cancer: a randomized controlled trial. *J Clin Oncol* 2013;31(18):2313-21. **[IF: 18.038]**

Mesa RA, Gotlib J, Gupta V, Catalano JV, Deininger MW, Shields AL, Miller CB, Silver RT, Talpaz M, Winton EF, Harvey JH, Hare T, Erickson-Viitanen S, Sun W, Sandor V, Levy RS, Kantarjian HM, Verstovsek S. Effect of ruxolitinib therapy on myelofibrosis-related symptoms and other patient-reported outcomes in COMFORT-I: a randomized, double-blind, placebo-controlled trial. *J Clin Oncol* 2013;31(10):1285-92. **[IF: 18.038]**

Neal RE 2nd, Kavnoudias H, Cheung W, Golebiowski B, McLean CA, Thomson KR. Hepatic epithelioid hemangioendothelioma treated with irreversible electroporation and antibiotics. *J Clin Oncol* 2013;31(27):e422-6. [**IF: 18.038]**

Siu LL, Shapiro JD, Jonker DJ, Karapetis CS, Zalcberg JR, Simes J, Couture F, Moore MJ, Price TJ, Siddiqui J, Nott LM, Charpentier D, Liauw W, Sawyer MB, Jefford M, Magoski NM, Haydon A, Walters I, Ringash J, Tu D, O'Callaghan CJ. Phase III randomized, placebo-controlled study of cetuximab plus brivanib alaninate versus cetuximab plus placebo in patients with metastatic, chemotherapy-refractory, wild-type K-RAS colorectal carcinoma: the NCIC Clinical Trials Group and AGITG CO.20 Tr. *J Clin Oncol* 2013;31(19):2477-84. **[IF: 18.038]**

Ali H, Donovan B, Wand H, Read TR, Regan DG, Grulich AE, Fairley CK, Guy RJ. Genital warts in young Australians five years into the National Human Papillomavrius Vaccination Program: national surveillance data. *Br Med J* 2013;346:f2032. **[IF: 17.215]**

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Shen L, Shah BR, Reyes EM, Thomas L, Wojdyla D, Diem P, Leiter LA, Charbonnel B, Mareev V, Horton ES, Haffner SM, Soska V, Holman R, Bethel MA, Schaper F, Sun JL, McMurray JJ, Califf RM, Krum H. Role of diuretics, β blockers, and statins in increasing the risk of diabetes in patients with impaired glucose tolerance: reanalysis of data from the NAVIGATOR study. *Br Med J* 2013;347:f6745. **[IF: 17.215]**

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Hanieh S, Ha TT, Simpson JA, Casey GJ, Khuong NC, Thoang DD, Thuy TT, Pasricha SR, Tran TD, Tuan T, Dwyer T, Fisher J, Biggs BA. The effect of intermittent antenatal iron supplementation on maternal and infant outcomes in rural Viet Nam: a cluster randomised trial. *PLoS Med* 2013;10(6):e1001470. **[IF: 15.253]**

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P, Mosimann T, Flaws DF, Reiter M, Lamanna A, Haaf P, Pemberton CJ, Richards AM, Chu K, Reid CM, Peacock WF, Jaffe AS, Florkowski C, Deely JM, Than M. Validation of high-sensitivity troponin I in a 2-hour diagnostic strategy to assess 30-day outcomes in emergency department patients with possible acute coronary syndrome. *J Am Coll Cardiol* 2013;62(14):1242-9. **[IF: 14.086]**

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Head of Anaesthesia and Peripoerative Medicine, Professor Paul Myles (L) with Anaethesia Fellow Dr Stefan Dieleman in the Ian Potter library at AMREP.

AMREP Committee Membership 2013/2014

AMREP Council

Membership

Professor Brendan Crabb, Burnet Institute (Chair)
Professor Mark Hogarth, Burnet Institute
Associate Professor Andrew Way, Alfred Health
Professor Stephen Jane, Alfred Health
Professor Garry Jennings, Baker IDI Heart and Diabetes Institute
Hilary Bolton, Baker IDI Heart and Diabetes Institute
Professor Christina Mitchell, Monash University
Professor Fabienne Mackay, Monash University
Professor Karen Dodd, La Trobe University (to March 2014)
Professor Emma Whitelaw, La Trobe University (from June 2014)
Professor Tracey Bucknall, Deakin University
Dr Lee Hamley, Chief Medical Officer, Alfred Health
Professor Janet Weir-Phyland, Chief Nursing Officer, Alfred Health
Professor John McNeil, Chair, Alfred Health Human Ethics Committee
Professor Colin Johnston, Chair, AMREP Animal Ethics Governance and Policy Committee
Professor Mark Cooper, Chair, AMREP Scientific Advisory Committee

In attendance

Bill O'Shea, Alfred Health Corporate Counsel
John Breguet, Director, Capital and Infrastructure, Alfred Health
Heather Gallichio General Manager, Alfred and Baker IDI Research Office (Secretary)

Alfred Hospital Ethics Committee

Professor John McNeil (Chair)
Professor Colin Johnston (Deputy Chair, Drugs and Interventions Group; member with knowledge of relevant research areas)
Roy Olliff (Chair, Health and Social Science Group; Deputy Chair, Ethics Committee)
Professor Mari Botti (Deputy Chair, Health and Social Science Group; Nursing representative - to December 2013)
Reverend Sam Goodes (Deputy Chair, Health and Social Science Group - from Jan 2014)

Lay-members

Annette Bennet
Dr Chris Booth
Elizabeth Burns
Aurel Dessewffy
Dr Peter Douglas (experience of analysing ethical decision-making - leave of absence June to August 2013)
Peter Gallagher (leave of absence January to June 2013)
Bill Karanatsios (from May 2014)
Jenny Martin
Stefanie Rizzo (leave of absence March to August 2013)

Members with Knowledge of Professional Care and Treatment

Dr Catherine Cherry
Dr Judith Frayne (non-sitting member from January 2014)
Dr Michael Ward

Lawyers

Simon Cohen (leave of absence from January 2014)
Jim Mahoney
Stephen Moloney (leave of absence 2013 - left December 2013)
Linda Murdoch (non-sitting member from June 2013)
Dr Arthur Rallis (from August 2013)
Nicola Taylor (from August 2013)

Members with Knowledge of Relevant Research Areas

Professor Tracey Bucknall
(Nursing representative from October 2013)
Professor Richard Gerraty
Associate Professor David Hunt
Associate Professor Peter Hunter
Professor David Kaye (from August 2013)
Professor Henry Krum
Maria McKenzie
Shefton Parker

Ministers of Religion

Reverend Sam Goodes
Reverend Val Henderson (February to December 2013)
Professor Anthony Kelly (from April 2014)
Fr Ian Morrison (left December 2013)

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Kordula Dunscombe (Health and Social Science Group, Secretary General Ethical Issues Sub-committee)
Kath Frowen (Low Risk Review Process)
Dr Angela Henjak (Drugs and Interventions Group)
Katja Loewe (Drugs and Interventions Group)
Kevin Mittelstaedt (Health and Social Science Group)

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Professor Paul Komesaroff (Deputy Chair)
Dr Dylan Barber (from March 2013)
Simon Cohen (leave of absence from January 2014)
Reverend Sam Goodes (from May 2013)
Associate Professor Peter Hunter (Caulfield Hospital representative)
Peter Gallagher (leave of absence January to June 2013)
Dr Cate Kelly (Medical Administration representative, leave of absence May to Sep 2013)

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Roy Olliff
Janine Roney
Dr Susan Sdrinis (Medical Administration representative, from May to September 2013)
Michelle Wright
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Rowan Frew (Manager, Ethics and Research Governance)

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Professor Leon Bach
Peta Bretag (from January 2014)
Dr Catherine Cherry
Professor Flavia Cicuttini
Dr Andrew Davies (to February 2013)
Dr Amanda Davis
Dr Judith Frayne
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Professor David Kaye (non-sitting member from August 2013)
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Anne Mak
Dr David McIlroy (from June 2014)
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Associate Professor Jeremy Millar (from April 2014)
Associate Professor Matthew Naughton (from June 2014)
Dr James Shaw
Marina Skiba (from April 2013)
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Low Risk Sub-committee

Ms Maria McKenzie (Chair)

AMREP Animal Ethics Governance and Policy (Gap) Committee

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Associate Professor David Anderson
Dr Dylan Barber
Dr Fenella Long (from September 2013)
Heather Gallichio
Professor Fabienne Mackay
Associate Professor Julie McMullen
Associate Professor David Curtis (from June 2014)
Dr Alana Mitchell
Debbie Ramsey
Robyn Sullivan
Ashley Wolff (to December 2013)
Jim Gigas (from June 2014)
Judy Nash (Acting Secretary - to September 2013)
Leia Demtschyna (Secretary - from September 2013)

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Dr Alana Mitchell (Chair, Committee B)
Associate Professor David Curtis (Chair, Committee A - from April 2014 / Scientist - to November 2013)
Dr Mandy Errington (Animal Welfare Officer / Veterinarian - to June 2013)
Dr Fenella Long (Animal Welfare Officer / Veterinarian – from July 2013)
Dr Kay Juliff (Veterinarian)
Dr Lucy Uren (Veterinarian)
Dr Irina Caminschi (Scientist)
Dr Paul Gregorevic (Scientist)
Dr Christoph Hagemeyer (Scientist)
Dr Margaret Hibbs (Scientist)
Dr Ian Burns (Animal welfare)
Dr Alan Sherlock (Animal welfare)
Robyn Sullivan (Animal welfare)
Donald Ward (Animal welfare - to April 2014)
Rebecca Irvine (Animal welfare - to April 2014)
Noel Ancell (Lay member - to December 2013)
Jim Gigas (Lay member)
Cormac McMahon (Lay member - to April 2014)
Ashley Wolff (Lay member - to April 2014)
Kaye Fox (Lay member - from April 2014)
Simon Clarke (Lay member - from April 2014)
Debbie Ramsey (Animal Care / Facility Manager)
David Spiteri (Animal Care)
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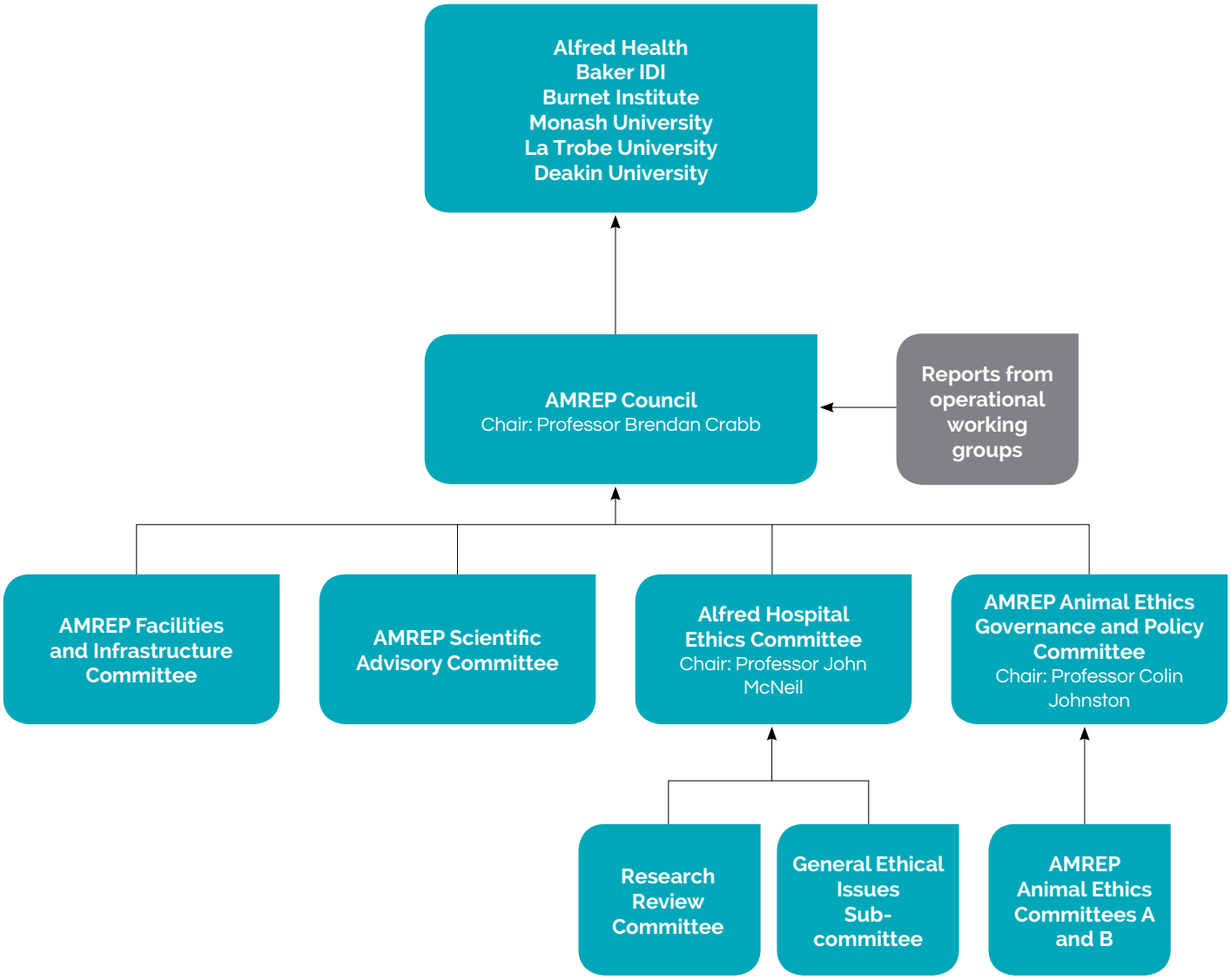

Alfred Medical Research and Education Precinct

Commercial Road
Melbourne, Victoria 3004
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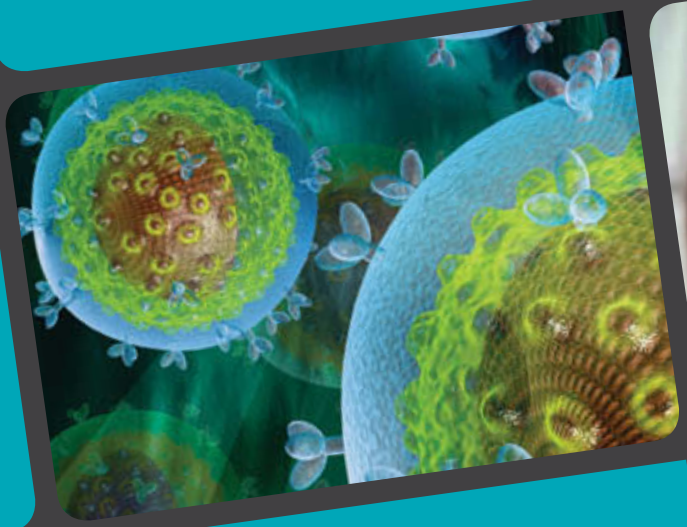

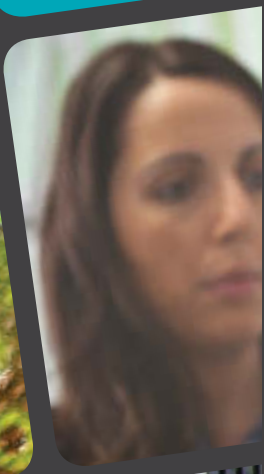

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