

# AMREP Research Report

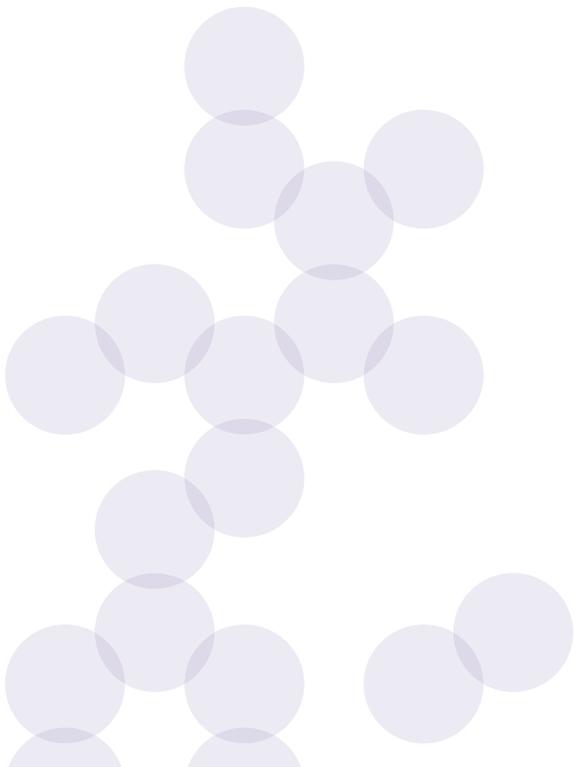
2016-2017

Precinct Partners



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# About AMREP

The Alfred Medical Research and Education Precinct (AMREP) is a vibrant partnership of organisations based at The Alfred hospital campus in Melbourne, integrating biomedical, translational, clinical and public health research with education and healthcare.

Bringing together more than 8,000 leading health professionals, researchers and support staff, the precinct provides a collaborative environment to translate the latest advances in medical research into the best possible clinical care and health outcomes for the community.

**Established in 2002, AMREP's partners include:**

- > Alfred Health (The Alfred hospital)
- > Monash University (Central Clinical School and School of Public Health and Preventive Medicine)
- > Baker Heart and Diabetes Institute
- > Burnet Institute
- > La Trobe University (Alfred Health Clinical School)
- > Deakin University.



**1**  
hospital



**3**  
universities



**2**  
medical  
research  
institutes



**8,000+**  
health  
professionals,  
researchers  
and support  
staff including  
1,500+  
researchers

## Training Tomorrow's Leading Health Professionals

The Alfred is one of Australia's busiest hospitals, with a comprehensive range of specialist acute health services spanning every specialist medical and surgical discipline other than paediatrics and obstetrics. This provides a rich training environment for tomorrow's leading health professionals.

The hospital partners with three universities that provide undergraduate and postgraduate training opportunities, including Monash University's Central Clinical School and School of Public Health and Preventive Medicine, Deakin University and the La Trobe University – Alfred Health Clinical School. The precinct partners also host more than 1,000 postgraduate students.

## Translating World-Class Research into Innovative Healthcare

Collectively, there are more than 1,500 health and medical researchers across the precinct. Each AMREP partner contributes to a vibrant research environment that fosters the cross-fertilisation of ideas and expertise to tackle some of the community's greatest health challenges.

The Alfred acts as a central pillar for research across the precinct, providing a thriving and innovative clinical setting that supports patient-centred research. This powerful link between clinical care and research underpins AMREP's unique strength in clinical, translational and health services research.

The precinct's strength in clinical research is also bolstered by Nucleus Network, Australia's largest facility for commercially sponsored phase 1 clinical trials. The precinct is also renowned for its extensive expertise in public health and health services research, and hosts the nation's largest concentration of clinical registries pertaining to healthcare and health status.

## State-of-the-Art Research Platforms and Clinical Facilities

AMREP is built on a foundation of shared resources. Partners have access to state-of-the-art research platforms and clinical facilities, as well as shared infrastructure and services, such as the AMREP Education Centre, Ian Potter Library and consolidated animal and human research ethics services.

The latest in research techniques and findings is shared through weekly seminar programs, together with Alfred Health Week, an annual research symposium that shares and celebrates the latest research across the precinct.

“The precinct is renowned for its public health and health services research, and hosts the nation's largest concentration of clinical registries.”



## Research Strengths



Blood Diseases and Cancer



Cardiovascular Disease



Diabetes and Obesity



Epidemiology and Public Health



Infection and Immunity



Mental Health and Neuroscience



Nursing and Allied Health



Trauma, Critical Care and Perioperative Medicine

## Research Themes



Biomedical Discovery



Applied Research



Clinical Research



Public Health / Health Services Research

Research Translation



### Biomedical Discovery

Generation of new knowledge about the human body in health and disease through exploration of fundamental biological mechanisms

### Applied Research

Development of new drugs, devices, diagnostics and treatments for ultimate clinical application

### Clinical Research

Advancement of medical knowledge by studying people either through direct interaction or collection and use of human biospecimens (e.g. clinical trials)

### Public Health Research

Examining the health and prevalence of disease in communities and the associated factors, including the complex link between social, environmental and biological factors, with a view to disease prevention, intervention and treatment

### Health Services Research

Examining methods of effective delivery, quality, cost, access to, and outcomes of health services

“The strong research performance of AMREP is reflected in its success in attracting \$106 million in research income to the precinct in 2016.”

# Chair's Report



**Professor Andrew Way**  
CEO Alfred Health

Conceived in the last century, the collaboration of the AMREP partners remains one of the strongest and most enduring precinct-based health research partnerships in Australia.

The strong research performance of AMREP is reflected in its success in attracting \$106 million in research income to the precinct in 2016. Our reputation as a state leader in the areas of Cardiovascular, Public Health and Health Services Research was confirmed in the latest round of National Health and Medical Research Council (NHMRC) funding.

AMREP is well-positioned to create benefit for the community from the Medical Research Future Fund, the first tranche of which was announced in the 2017-2018 federal budget. We are primed to respond to the fund's focus on translating research into health benefits.

In 2016, the Alfred Research Trusts awarded \$2.5 million in competitive grants to researchers across the precinct in areas ranging from technology development in the trauma setting, anaemia in the elderly, respiratory and cardiovascular research, HIV, sexual health, acute myeloid leukaemia and diabetes.

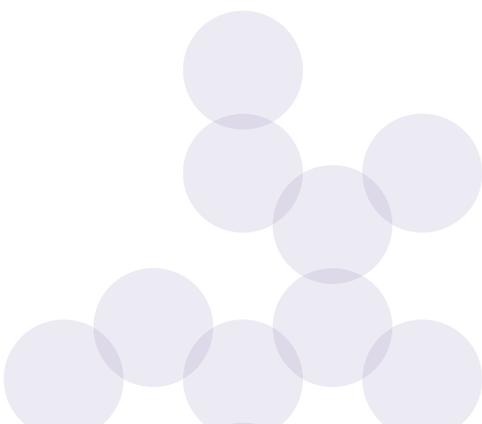
The past year also saw important developments in the precinct's research platforms, including the establishment of Australia's first dedicated blood cancer therapeutics centre, made possible by a \$1.2 million grant from the Australian Cancer Research Foundation. The flagship centre will collect samples from across the country, and includes a state-of-the-art sequencing platform.

The AMREP campus prides itself on providing an environment for clinician researchers to flourish, and for the third time in five years it was home to the winner of the Commonwealth Health Minister's Award for Excellence in Health and Medical Research. Alfred Health HIV physician Associate Professor Julian Elliott was the 2017 winner of this prestigious medal.

Among the many other academic awards received by AMREP researchers, Professor Paul Myles, The Alfred's Director of Anaesthesia and Perioperative Medicine, and his team were awarded the Australian Clinical Trial of the Year, and Professor Rinaldo Bellomo, Co-Director of the Australian and New Zealand Intensive Care Research Centre (ANZIC-RC), was named in the 2016 Thomson Reuters list of Highly Cited Researchers.

Five of our people were recognised by the Order of Australia for their enduring commitment and impact: Professor Jamie Cooper AO, Professor Mark Cooper AO, Emeritus Professor Paul O'Brien AO, Associate Professor Ken Harvey AM and Catherine Beaufort OAM.

As the landscape within which AMREP operates continues to change, I am grateful for the leadership the AMREP Council provides. I look forward to the outcome from the precinct's current strategic review and its impact on AMREP's contribution to research, healthcare and the community.

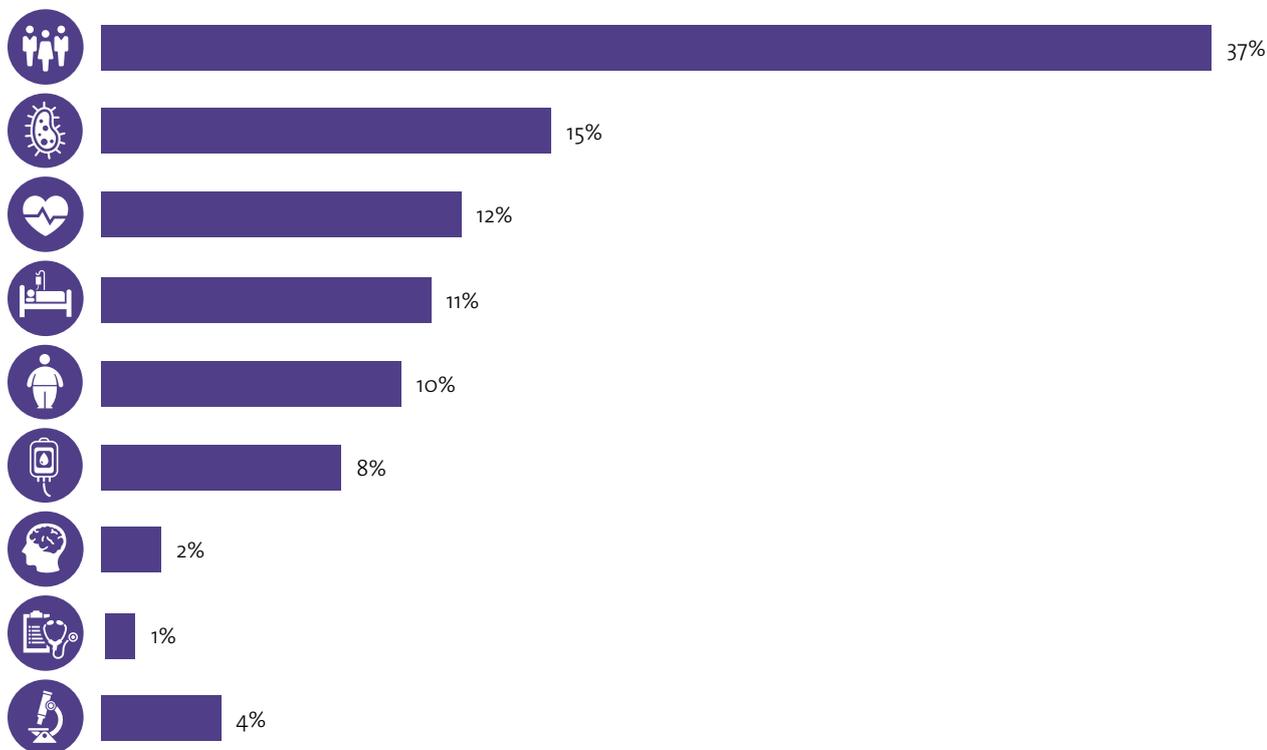


# Research Performance

## External research funding by source – 2016

Australian competitive grants	\$57M
Other public sector research income	\$15M
Other competitive research grants	\$19M
Industry income	\$9M
Other research income	\$6M
<b>Total</b>	<b>\$106M</b>

## External research funding by research area – 2016



  
Epidemiology and Public Health

  
Infection and Immunity

  
Cardiovascular Disease

  
Trauma, Critical Care and Perioperative Medicine

  
Diabetes and Obesity

  
Blood Diseases and Cancer

  
Mental Health and Neuroscience

  
Nursing and Allied Health

  
Other

## 2016 funding secured for health and medical research



**\$20M+**

in Philanthropy and Fundraising Revenue



**\$106M**

in External Research Funding

## NHMRC funding commitments secured by AMREP commencing 2017

**\$49M**

Total

**60%**

of NHMRC funding to Victoria for Cardiovascular Medicine & Haematology research went to AMREP

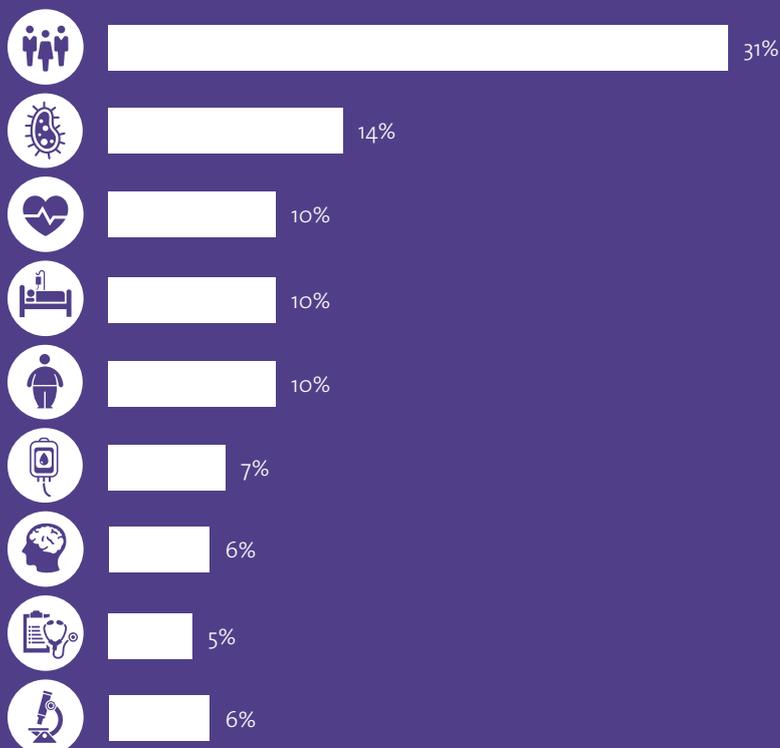


**1/3**

of NHMRC funding to Victoria for Public Health & Health Services Research went to AMREP



## Original research publications by research area – 2016



## Students 2016



**1,175** Postgraduate Degree Students Enrolled

**185** Masters Student Completions

**52** PhD / Doctoral Student Completions

## Commercial Impact



In past five years:

**5** Spin-out Companies

**4** Licences, Options & Assignments of Inventions

**9** PCT Patent Applications

# AlfredHealth

## Departments and Affiliated Centres Conducting Research

### Medical and Surgical Departments

#### Anaesthesia and Perioperative Medicine

Head: Prof Paul Myles

#### Allergy Immunology and Respiratory Medicine

Head: Prof Robyn O'Hehir AO

#### 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

#### Infectious Disease

Head: Prof Anton Peleg

#### Intensive Care and Hyperbaric Medicine

Head: Dr Steve McGloughlin

#### Medical Oncology

Head: Prof Max Schwarz

#### Melanoma (Victorian Melanoma Service)

Head: Prof John Kelly

#### Melbourne Sexual Health Centre

Head: Prof Christopher Fairley

#### Neurosurgery

Head: Mr Martin Hunn

#### Orthopaedic Surgery

Head: Assoc Prof Susan Liew

#### Radiation Oncology

Head: Prof Jeremy Millar

#### Rehabilitation, Aged Care and Community Care

Head: Assoc Prof Peter Hunter

#### Renal Medicine

Head: Prof Rowan Walker



### Medical Services

#### Executive Director Medical Services & Chief Medical Officer

Dr Lee Hamley

#### Anatomical Pathology

Head: Prof Catriona McLean

#### Diagnostic and Interventional Radiology

Head: Assoc Prof Dinesh Varma

#### Nuclear Medicine

Head: Dr Kenneth Yap

#### Pathology Services

Head: Prof Hans Schneider

#### Pharmacy

Head: Prof Michael Dooley



### Chief Executive Officer

Prof Andrew Way

### Director of Research

Prof Stephen Jane

### Nursing

#### Executive Director Nursing Services & Chief Nursing Officer

Janet Weir Phyland

#### Foundation Chair in Nursing

Prof Tracey Bucknall

#### Director, Alfred Clinical School

Assoc Prof Bill McGuinness



### Allied Health

#### Director

Lisa Somerville

#### Nutrition and Dietetics

Head: Assoc Prof Ibolya Nyulasi

#### Occupational Therapy

Head of Research: Assoc Prof Natasha Lannin

#### Physiotherapy

Head of Research: Prof Anne Holland



# Alfred Health

The Alfred is one of three Melbourne hospitals (The Alfred, Caulfield Hospital and Sandringham Hospital) that together constitute the major metropolitan health service Alfred Health.

[alfredhealth.org.au](http://alfredhealth.org.au)

The Alfred, at the epicentre of AMREP, is a major tertiary referral hospital providing one of the most comprehensive ranges of specialist acute health services in Victoria. The hospital is home to multiple state-wide services such as Victoria's only heart and lung transplant service, the Victorian Adult Burns Service and the Victorian Melanoma Service, as well as having one of Australia's busiest Emergency and Trauma centres and one of the largest and most advanced Intensive Care Units in the region. Patients come to The Alfred for services such as comprehensive cancer care, respiratory medicine, cardiology and cardiovascular services, and in-patient and community psychiatry care.

**The Alfred's mission is to discover and deliver the next generation of healthcare through:**

- > **Research:** Translating medical research into clinical practice
- > **Education:** Developing and fostering our staff as a teaching hospital committed to excellence with patients placed at the centre of all that we do
- > **Replication:** Striving for new and improved practices and remaining at the forefront of healthcare developments and medical research. Other hospitals in Australia and overseas have followed our lead and adopted our innovative approach.

## The Alfred



**6,600+**  
employees



**65,000+**  
emergency  
presentations  
per year



**~3,000**  
ICU patients  
per year



# Clinical Research through Partnership

The Alfred acts as the epicentre of the AMREP partnership, providing the clinical environment for medical, allied health and nursing education, and an expedited pathway for bench-to-bedside research. Clinical research is integral to many Alfred departments and is enhanced both by collaboration between Alfred departments and through long-established relationships between The Alfred and AMREP partners. Many co-appointments of clinician researchers between The Alfred and other AMREP partners strengthen ties across the precinct. Various Alfred departments also contribute to clinical registries managed by the Monash School of Public Health and Preventive Medicine in order to improve evidence-based practice and identify factors that predict prognosis and outcomes of disease.

## Inaugural Tony Charlton Chair of Oncology

In 2016, The Alfred announced Professor John Zalcberg OAM (Head of Monash School of Public Health and Preventive Medicine's Cancer Research Program and a Gastrointestinal Oncology Physician) as the inaugural Tony Charlton Chair of Oncology. This Monash / Alfred leadership position will steer The Alfred's oncology program into the future, cultivating innovative new treatments and transferring research findings into clinical practice.

## Advancing Medical Technology

A strategic partnership between Alfred Health and the Monash Institute of Medical Engineering (MIME) is enabling the development of leading-edge engineering and IT solutions (including medical devices, diagnostics, surgical tools and digital health) in areas of unmet clinical need. More than \$1.3 million in joint funding has been committed by Monash University and Alfred philanthropic sources for this purpose.

“The Alfred has one of Australia's busiest Emergency and Trauma centres and one of the largest and most advanced Intensive Care Units in the region.”



# Research Highlights 2016-2017



## PrEPX: Preventing HIV Transmission

Pre-Exposure Prophylaxis (PrEP) is a medication containing two anti-retrovirals used to reduce the risk of HIV infection. Associate Professor Edwina Wright (Monash and Alfred Department of Infectious Diseases / Burnet Institute) is leading the PrEPX study, which has expanded the provision of PrEP to 3,200 Victorians. The study is sponsored by the Victorian Department of Health and Human Services and co-sponsored by Alfred Health and the Victorian AIDS Council. The study aims to examine the impact of expanding the use of PrEP on the rates of new HIV infections in Victoria with a view to PrEP becoming a routine option for preventing HIV infection.

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**Research Themes:**  
*Public Health / Health Services Research*

**Research Strengths:**  
*Epidemiology and Public Health;  
Infection and Immunity*

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## World-First Peanut Vaccine Trial

Human clinical trials of a world-first peanut allergy treatment commenced in Melbourne in 2017. The technology, which is being developed by Australian biotechnology company Aravax, is underpinned by more than 15 years of research led by respiratory physician Professor Robyn O’Hehir and her team at The Alfred and Monash University. The treatment uses new technology that resets the immune system to tolerate peanut without causing an allergic reaction. The trial is being conducted at Nucleus Network at AMREP and CMAX Clinical Research in Adelaide.

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**Research Themes:**  
*Applied Research; Clinical Research*

**Research Strength:**  
*Infection and Immunity*

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## Alfred Trauma Software Saves Lives Abroad

The Alfred has developed software that provides real-time computer-aided decision support to guide trauma care during the first hour of a patient’s arrival. The Alfred became the first trauma centre in the world to deploy real-time decision-support software as part of routine patient care. Today, the technology is being adapted for use in the United States, India, Saudi Arabia and China. The software, known as Trauma Reception and Resuscitation (TRR), uses algorithms to generate real-time prompts that are triggered by patient physiological signs, diagnoses and clinical interventions.

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**Research Theme:**  
*Health Services Research*

**Research Strength:**  
*Trauma, Critical Care and  
Perioperative Medicine*

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“The Alfred acts as a central pillar for research across the precinct, providing a thriving and innovative clinical setting that supports patient-centred research.”



## Monash Central Clinical School at AMREP

### Head

Prof Stephen Jane

### Division of Clinical Sciences

Head: Prof Paul Myles

#### Department of Anaesthesia and Perioperative Medicine

Head: Prof Paul Myles

#### Department of Medicine

Head: Prof Stephen Jane

#### National Trauma Research Institute (NTRI)

Head: Prof Mark Fitzgerald

#### Department of Surgery

Head: Prof Wendy Brown

#### Centre for Obesity Research and Education

Head: Prof Wendy Brown

#### Department of Neuroscience

Head: Prof Terence O'Brien

#### Department of Allergy, Immunology and Respiratory Medicine

Head: Prof Robyn O'Hehir AO

#### Department of Diabetes

Head: Prof Mark Cooper AO

#### Department of Infectious Diseases

Head: Prof Anton Peleg

#### Department of Gastroenterology

Head: Prof Peter Gibson

#### Department of Immunology and Pathology

Head: Prof David Tarlinton

#### Melbourne Sexual Health Centre

Head: Prof Christopher Fairley

#### Monash Alfred Psychiatry Research Centre

Head: Prof Jayashri Kulkarni

#### Australian Centre for Blood Diseases

Head: Prof Harshal Nandurkar

### Medical Student Education

Head: Assoc Prof Anne Powell

# Monash Central Clinical School

Monash University's Central Clinical School (CCS) is a key Melbourne centre for clinical and biomedical research and education, offering undergraduate and postgraduate study programs.



**Head**  
Prof Stephen Jane  
[monash.edu/medicine/ccs](http://monash.edu/medicine/ccs)

CCS together with its sister school at AMREP, the School of Public Health and Preventive Medicine, has been affiliated with Alfred Health as a provider of medical teaching for more than 50 years. The reputation and well-equipped research laboratories and facilities of CCS attract elite students, researchers and teachers to the precinct.

## Research Strengths

CCS has developed into a hub for translational research and medicine, covering a breadth of disciplines reflected throughout the School's departments and specialist centres. Multidisciplinary research is encouraged, leading to a highly collaborative research environment with networks spanning across AMREP, as well as nationally and internationally. Its close links to healthcare providers allow CCS to rapidly progress research towards health outcomes and improved patient care.

## Medical Education and Undergraduate Science

CCS coordinates the teaching of Monash University's medical students at the Monash-affiliated teaching hospitals of Alfred Health, Cabrini Health Australia and Peninsula Health. An extensive lecture and tutorial program is presented by senior clinicians, and students have access to the latest in research and development advances in medicine. The CCS undergraduate teaching program in immunology and human pathology facilitates recruitment of students into a substantial Honours cohort.

## Graduate Research

Graduate research students benefit from two recently launched initiatives: the translational research-themed PhD, run through Monash University's clinical schools, and the accelerated milestone PhD for medical education students. The translational research-themed PhD delivers the skills needed to bring research from bench-to-bedside. Students enjoy access to experts who are part of Monash University's rich network of industry, clinical and research partnerships, as well as high-quality data sources and research platforms.

“The Monash Central Clinical School is a hub for translational research and medicine, with world leaders in biomedical and clinical research.”

# Research Highlights 2016-2017



## Perioperative Medicine: Clinical Trial of the Year

The Australian and New Zealand College of Anaesthetists Clinical Trials Network (ANZCA CTN) investigators, led by Professor Paul Myles (Head of The Alfred and Monash CCS Department of Anaesthesia and Perioperative Medicine), coordinated two multi-centre clinical trials exploring the risks associated with aspirin and the anti-bleeding agent tranexamic acid (TXA) in cardiac surgery patients.

Groundbreaking results of these trials, encompassing more than 4,600 participants in 31 hospitals across seven countries, have been published in *The New England Journal of Medicine* (2016 and 2017) and collectively recognised by the Australian Clinical Trials Alliance as the 2017 Trial of the Year.

The aspirin study found that patients who take aspirin before heart surgery are at no greater risk of bleeding or complications, meaning that aspirin need not be stopped prior to surgery. The global TXA study showed that TXA reduces the risk of serious bleeding complications in cardiac surgical patients by 40%, resulting in fewer blood transfusions and emergency re-operations. The findings mean that most heart surgery patients can be treated with TXA at a higher dose than previously thought to be safe.

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**Research Theme:**  
*Clinical Research*

**Research Strengths:**  
*Cardiovascular Disease; Trauma,  
Critical Care and Perioperative Medicine*

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## New Blood Cancer Research Centre

A substantial body of research spearheaded by the clinician researchers Associate Professor Andrew Wei and Professor Andrew Spencer from The Alfred and CCS's Australian Centre for Blood Diseases has led to a \$1.2 million grant from the Australian Cancer Research Foundation (ACRF) to establish Australia's first dedicated blood cancer therapeutics centre. The Alfred / Monash Blood Cancer Therapeutics Centre will equip researchers with the latest technology to explore the variable responses to treatments among patient groups and to develop better treatments, particularly for those who do not respond to existing therapies.

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**Research Theme:**  
*Applied Research*

**Research Strength:**  
*Blood Diseases and Cancer*

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“Heart surgery patients worldwide stand to benefit from results of groundbreaking international clinical trials led by AMREP clinician researcher Prof Paul Myles.”



>

Prof Paul Myles, Head of Department of Anaesthesia and Perioperative Medicine





## Monash School of Public Health and Preventive Medicine at AMREP

### Head

Prof John McNeil AM

### Health Services

Head: Prof Peter Cameron

#### Health Services Research

Head: Assoc Prof Anna Barker

#### Registry Sciences Unit

Head: Dr Susannah Ahern

#### Transfusion Research

Head: Assoc Prof Erica Wood

#### Prostate Cancer Registry

Head: Assoc Prof Sue Evans

#### Bariatric Surgery Registry

Head: Prof Wendy Brown

#### Monash Ageing Research Centre

Head: Prof Barbara Workman

#### Australian Breast Device Registry

Head: Dr Ingrid Hopper

### Social Sciences

Head: Prof Jane Fisher

#### Jean Hailes Research

Head: Prof Jane Fisher

#### Michael Kirby Centre

Head: Assoc Prof Bebe Loff

#### Health Services Management

Head: Prof Just Stoelwinder

#### Gambling and Social Determinants

Head: Dr Charles Livingstone

### Director of Teaching and Learning

Head: Assoc Prof Dragan Ilic

#### Postgraduate Courses

Head: Prof Flavia Cicuttini

#### Undergraduate Courses

Head: Dr Basia Diug

#### Medical Education Research and Quality

Head: Assoc Prof Dragan Ilic

### Aspree

Head: Assoc Prof Robyn Woods

### Clinical Epidemiology

Head: Prof Danny Liew

#### CCRE Therapeutics

Co-Heads: Prof Chris Reid / Prof Danny Liew

#### Musculoskeletal Epidemiology

Head: Prof Flavia Cicuttini

#### Infectious Disease Epidemiology

Co-Heads: Prof Karin Leder /

Prof Allen Cheng

#### Women's Health Research Program

Head: Prof Susan Davis

#### Behavioural Science Prevention Unit

Head: Assoc Prof Ben Smith

### Research Methodology

Head: Prof Andrew Forbes

#### Biostatistics

Head: Prof Andrew Forbes

#### Epidemiology Modelling

Head: Dr James Trauer (Acting Head)

#### Cochrane Australia

Co-Heads: Prof Sally Greene /

Steve McDonald

### Critical Care Research

Head: Prof Jamie Cooper AO

#### Intensive Care

Head: Prof Jamie Cooper AO

#### ANZCA Research

Head: Prof Paul Myles

#### Pre-hospital, Emergency and Trauma

Head: Prof Belinda Gabbe

### Staree

Head: Prof Sophia Zoungas

### Occupational and Environmental Health

Head: Prof Malcolm Sim

#### Monash Centre for Occupational and Environmental Health

Head: Prof Malcolm Sim

#### Australian Centre for Human Health Risk Assessment

Head: Prof Brian Priestly

#### Aviation Medicine

Head: Assoc Prof David Newman

#### Hazelwood Health Study

Head: Prof Michael Abramson

### Cancer Research

Head: Prof John Zalcberg OAM

#### Cancer Research

Head: Prof John Zalcberg OAM

#### Australian Clinical Trials Alliance

Head: Prof John Zalcberg OAM

### Research Coordinator

Prof Susan Davis

#### Research Governance

Prof Sophia Zoungas

# Monash School of Public Health and Preventive Medicine

Monash University's School of Public Health and Preventive Medicine (SPHPM) is both research intensive and a leader in public health-oriented education.



**Head**  
Prof John McNeil AM  
[monash.edu/medicine/sphpm](http://monash.edu/medicine/sphpm)

The school's flagship study program is the Master of Public Health. This is complemented by a suite of other postgraduate degrees, undergraduate courses and short courses. The school is an ideal choice for those wishing to learn from or collaborate with key opinion leaders in the Australian public health scene, and attracts students and researchers from across the globe.

## Research Strengths

SPHPM academics have broad expertise in applied clinical and public health research, with many staff having co-appointments with The Alfred. Core strengths in epidemiology, biostatistics and data management support extensive research programs aimed at reducing suffering, preventing illness and improving quality of life. In 2016, SPHPM secured \$40 million of funding to support its diverse research program.

The School manages 30 clinical registries, making it Australia's largest manager of these biobanks and databanks. These are a significant source of benchmarking information for clinical care nationally and provide a wealth of data for public health researchers.

## Education

SPHPM has responsibility for teaching units across a range of undergraduate courses, as well as running Honours programs for health science and medical students. Postgraduate study is offered at Graduate Diploma, Graduate Certificate and Masters level, and students may also enrol for a PhD via the Monash Doctoral Program. The School also offers a regular program of short courses for public health professionals wishing to enhance their skills or knowledge in public health research, aviation medicine, statistics and ethics.

“The Monash School of Public Health and Preventive Medicine is an ideal choice for those wishing to learn from or collaborate with key opinion leaders in the Australian public health scene, and attracts students and researchers from across the globe.”



^  
Researchers collect samples from an ASPREE participant

# Research Highlights 2016-2017



## World's Largest Falls Prevention Study

Patient falls in acute hospitals is a major and increasing source of harm to patients globally. SPHPM researchers Associate Professor Anna Barker and Renata Morello's review of a falls prevention program called 6-PACK was published in the *British Medical Journal* in early 2016. Twenty-four wards across six Australian hospitals were randomly assigned to provide the 6-PACK program or standard care models.

The team found that despite evidence of good compliance among nursing staff, the program did not translate into a reduction in the number of falls or injuries sustained. The results raise questions about expenditure of staffing resources on ineffective interventions and highlight the urgent need for evidence-based solutions.

**Research Theme:**  
*Health Services Research*

**Research Strengths:**  
*Epidemiology and Public Health;  
Nursing and Allied Health*



## Healthy Ageing

SPHPM is working towards improving health outcomes for Australians through large-scale disease prevention studies, such as ASPREE (ASpirin in Reducing Events in the Elderly), SPHPM's flagship clinical trial assessing the benefits of daily low-dose aspirin in the elderly, and a pilot clinical quality registry to improve clinical care for dementia. National Health and Medical Research Council (NHMRC) funding secured by SPHPM for 2017 included a \$4.8 million Project Grant to complete the ASPREE study and a \$1.7 million Boosting Dementia Research Grant towards the pilot dementia registry.

**Research Themes:**  
*Clinical Research;  
Public Health / Health Services Research*

**Research Strengths:**  
*Epidemiology and Public Health;  
Mental Health and Neuroscience*



## Undiagnosed Menopause

In 2016, Professor Susan Davis, Director of SPHPM's Women's Health Research Program, was awarded the North American Menopause Society's Best Paper of the Year Award for her cross-sectional study of Australian women. The study involved 2,020 women aged 40 to 65 years living in Australia between October 2012 and March 2014. The research revealed a high prevalence of untreated menopausal symptoms with potentially significant impacts on the quality of life of women.

**Research Theme:**  
*Public Health / Health Services*

**Research Strength:**  
*Epidemiology and Public Health*



Prof Susan Davis, Director of the Women's Health Research Program, Monash School of Public Health and Preventive Medicine





**Director**

Prof Tom Marwick

**Deputy Directors**

**Basic and Translational**

Prof Karlheinz Peter

**Clinical and Population Health**

Prof Jonathan Shaw

**Programs**

**Hypertension and Cardiac Disease**

Head: Prof David Kaye

**Physical Activity**

Co-Heads: Assoc Prof André La Gerche / Prof Bronwyn Kingwell

**Obesity and Diabetes**

Head: Assoc Prof Peter Meikle

**Bioinformatics**

Co-Heads: Assoc Prof Peter Meikle / Dr Anna Calkin / Dr Brian Drew

**Atherothrombosis**

Head: Prof Karlheinz Peter

**Diabetes Complications**

Head: Prof Jonathan Shaw

**Domains**

**Basic**

Head: Prof Julie McMullen

**Cardiac Hypertrophy**

Head: Assoc Prof Julie McMullen

**Lipid Metabolism and  
Cardiometabolic Disease**

Head: Dr Anna Calkin

**Molecular Metabolism and Ageing**

Head: Dr Brian Drew

**Experimental Cardiology**

Head: Assoc Prof Xiao-Jun Du

**Muscle Research Therapeutics**

Head: Dr Paul Gregorevic

**System Genomics**

Head: Assoc Prof Michael Inouye

**Haematopoiesis and Leukocyte Biology**

Head: Assoc Prof Andrew Murphy

**Heart Failure Pharmacology**

Head: Assoc Prof Rebecca Ritchie

**Translational**

Head: Prof Bronwyn Kingwell

**Heart Failure Research**

Head: Prof David Kaye

**Vascular Biology and Atherothrombosis**

Head: Prof Alex Bobik

**Human Neurotransmitters**

Head: Prof Murray Esler

**Neuropharmacology**

Head: Prof Geoff Head

**Metabolic and Vascular Physiology**

Head: Prof Bronwyn Kingwell

**Metabolomics**

Head: Assoc Prof Peter Meikle

**Atherothrombosis and Vascular**

Head: Prof Karlheinz Peter

**Lipoproteins and Atherosclerosis**

Head: Prof Dmitri Sviridov

**Clinical**

Head: Prof Graeme Maguire

**Health Services**

Head: Prof Graeme Maguire

**Healthy Hearts**

Head: Prof Graeme Maguire

**Diabetes Clinics**

Head: Head: Assoc Prof Neale Cohen

**Sports Cardiology**

Head: Assoc Prof André La Gerche

**Clinical Electrophysiology**

Head: Prof Peter Kistler

**Imaging Research**

Head: Prof Tom Marwick

**Allied Health and Education Services**

Head: Sonia Middleton

**Population Health**

Head (Acting): Prof Jonathan Shaw

**Clinical Diabetes**

Head: Prof Jonathan Shaw

**Preclinical Disease and Prevention**

Head: Assoc Prof Melinda Carrington

**Physical Activity**

Head: Prof David Dunstan

**Diabetes and Population Health**

Head: Assoc Prof Dianna Magliano

**Behavioural Epidemiology**

Head: Prof Neville Owen

**Aboriginal Health**

Head: Prof Sandra Eades

**Aboriginal Health**

Head: Prof Sandra Eades

**Infection and Chronic Disease**

Head: Dr Lloyd Einsiedel

# Baker Heart and Diabetes Institute

Baker Heart and Diabetes Institute is an independent medical research institute that has been pioneering advances in cardiovascular and diabetes research for more than 90 years.



**Director**  
Prof Tom Marwick  
[baker.edu.au](http://baker.edu.au)

The Institute's work extends from laboratory-based research to clinical trials and large-scale national and international community health studies.

The Institute's mission is to reduce death and disability from cardiovascular disease, diabetes and related disorders. More than 3.7 million Australians are affected by cardiovascular disease and about 1.2 million are affected by diabetes. The Institute's focus is on translating research findings into new approaches to prevention, treatment and care.

The Institute's scientific laboratories and specialist clinics located at AMREP are complemented by a research facility in Alice Springs, which is part of the national Aboriginal Health program dedicated to addressing the significant health disadvantage in Aboriginal communities.

“The Baker Institute's mission is to reduce death and disability from cardiovascular disease, diabetes and related disorders.”

## Research Strengths

The organisation is structured around five research domains (Basic, Translational, Clinical, Population Health and Aboriginal Health) and five research programs in key areas of strategic importance and research strength that facilitate collaboration across these domains.

### The Five Programs

- > **Physical Activity:** Explores the impact of exercise on cardiovascular disease management from prevention to treatment of advanced disease
- > **Diabetes Complications:** Aims to identify novel predictors of a broad range of advanced complications of diabetes
- > **Obesity and Diabetes:** Investigates strategies to elucidate and combat the metabolic underpinnings of chronic disease
- > **Atherothrombosis:** Examines how to identify and treat blockages in the vascular system that can lead to heart attack and stroke
- > **Hypertension and Cardiac Disease:** Investigates how to reverse chronic heart disease and prevent structural damage to the heart from hypertension, heart disease and associated rhythm disturbances.

In 2017, the Institute welcomed Associate Professor Melinda Carrington and Associate Professor Michael Inouye and their teams, who will respectively strengthen the Institute's research activities in the areas of disease prevention and bioinformatics, and systems genomics.

# Research Highlights 2016-2017



## Lipidomic Technologies and Markers of Disease Risk

Type 2 diabetes represents a growing health burden globally, while cardiovascular disease is a major complication of type 2 diabetes and the leading cause of death worldwide. The increasing incidence of type 2 diabetes is placing pressure on healthcare systems, and managing the risk of cardiovascular disease in those with type 2 diabetes is a major concern. New approaches are required to effectively target limited health resources to those people with type 2 diabetes at highest risk of cardiovascular disease.

Researchers from Associate Professor Peter Meikle's Metabolomics Laboratory highlighted the potential of plasma lipid species as biomarkers, some of which demonstrate an improvement over traditional risk factors, in the prediction of cardiovascular events. Findings published in a paper in *Circulation* in November 2016, demonstrate how recent developments in lipidomic technologies are enabling the assessment of hundreds of lipid species as potential markers for disease risk.

**Research Theme:**  
*Applied Research*

**Research Strengths:**  
*Cardiovascular Disease;  
Diabetes and Obesity*



## Implantable Device for Untreatable Heart Condition

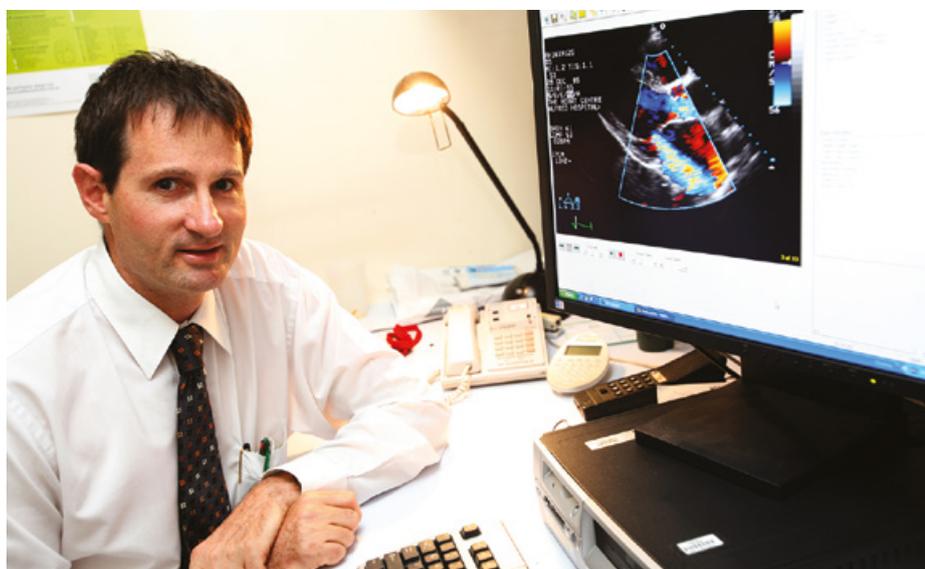
Heart failure with preserved ejection fraction (HFpEF) is a common form of heart failure, characterised by increased left atrial pressure, especially during exertion. No treatment has been shown to improve symptoms or prognosis of HFpEF.

An international multi-centre study, led at the Baker by Head of the Heart Failure Research Laboratory Professor David Kaye, assessed a mechanical approach to reducing left arterial pressure as an effective treatment for this type of heart failure. The study, published in *The Lancet* in March 2016, showed that implantation of an inter-atrial shunt device was feasible and safe, reduced left atrial pressure during exercise, and could be a new strategy for treating this form of heart failure.

**Research Theme:**  
*Clinical Research*

**Research Strength:**  
*Cardiovascular Disease*

“The Institute’s work extends from laboratory-based research to clinical trials and large-scale national and international community health studies.”



< Prof David Kaye, Head of the Baker's Heart Failure Research Laboratory, led a study showing that a novel inter-atrial shunt device could be the first effective strategy for treating a common form of heart failure, HFpEF.



^  
Assoc Prof Xiao-Jun Du (R), Head of Baker Heart and Diabetes Institute's Experimental Cardiology Group with a student (L)



## Programs

### Maternal and Child Health

Director: Dr Elissa Kennedy

### Disease Elimination

Director: Prof Heidi Drummer

### Behaviours and Health Risks

Director: Prof Paul Dietze

### Health Security (Expansion Program)

Director: Dr Ben Coghlan

### Healthy Ageing (Expansion Program)

Director: Prof Suzanne Crowe AM

## Working Groups

### Anderson / Garcia Group

Global Health Diagnostics

### Beeson Group

Malarial Immunity & Vaccines

### Crowe Group

International Clinical Research

### Drummer / Poumbourios Group

Viral Entry & Vaccines

### Fowkes Group

Malaria & Infectious Disease Immunology

### Gilson / Crabb Group

Malaria Virulence & Drug Discovery

### Gugasyan Group

Diagnostic Markers in  
Chronic Immune Disorders

### Hogarth Group

Inflammation, Cancer & Infection

### Jaworowski Group

Infection, Inflammation & Innate  
Immunity

### Palmer Group

Immunometabolism in HIV  
& Inflammatory Diseases

### Richards Group

Malaria and Tropical Diseases

### Robinson Group

Vector-Borne Diseases &  
Tropical Public Health

### Tachedjian Group

HIV, Retroviruses and Antivirals

### Tannock Group

Influenza

### Wright Group

Strategies for HIV Prevention /  
Management of Acute &  
Chronic HIV Infection

### Director

Prof Brendan Crabb AC

### Deputy Directors

Prof Margaret Hellard (Programs)

Prof James Beeson (People)

Assoc Prof David Anderson (Partnerships)

### Alcohol & Other Drugs

Head: Prof Paul Dietze

### Blood Borne Viruses & Global Health Group

Head: Chad Hughes

### Global Adolescent Health

Co-Heads: Dr Peter Azzopardi /  
Dr Elissa Kennedy

### Health Emergencies

Head: Dr Ben Coghlan

### Healthy Mothers, Healthy Babies

Head: Prof James Beeson

### HIV Prevention

Head: Assoc Prof Mark Stoové

### Surveillance and Evaluation

Manager: Carol El-Hayek

### International Women's & Children's Health Research

Head: Assoc Prof Stanley Luchters

### Justice Health Research

Head: Assoc Prof Mark Stoové

### Maternal, Newborn, Child Health & Nutrition

Co-Heads: Dr Chris Morgan /  
Lisa Davidson

### Modelling & Biostatistics

Head: Prof David Wilson

### Myanmar

Head: Prof Robert Power  
Country Program Manager: Lia Burns

### Other International

Head: Prof Robert Power

### PNG Program

Interim Heads: Prof Robert Power /  
Prof James Beeson  
Country Program Manager: James Lawson

### Young People's Health

Co-Heads: Dr Megan Lim /  
Prof Margaret Hellard

### Tuberculosis Elimination & Implementation Science

Co-Heads: Dr Suman Majumdar /  
Prof Steve Graham

### Viral Hepatitis Elimination Group

Co-Heads: Prof Margaret Hellard /  
Dr Joseph Doyle

# Burnet Institute

The Burnet Institute brings together a highly diverse group of medical researchers, public health professionals and international development experts to help solve significant global health problems.



**Director**  
Prof Brendan Crabb AC  
[burnet.edu.au](http://burnet.edu.au)

Burnet is unique in Australia as the only medical research institute to have dual accreditation with the National Health and Medical Research Council (NHMRC) and as a Non-Government Organisation with the Australian Department of Foreign Affairs and Trade. In addition to its presence at AMREP, the Institute has offices and representatives in Myanmar, Papua New Guinea (PNG) and Lao PDR, and significant program activities across Asia, the Pacific and eastern Africa.

Burnet launched a new strategic plan – *Burnet 2020* – in October 2016, which describes the Institute’s vision of “equity through better health”, and its mission of “achieving better health for vulnerable communities in Australia and internationally through accelerating the translation of research, discovery and evidence into sustainable health solutions”.

## Research Strengths

Central to maximising its breadth of expertise, the Institute has also restructured to form a ‘new Burnet’, built around key programs:

- > **Maternal and Child Health**
- > **Disease Elimination** (HIV, malaria, hepatitis viruses and tuberculosis)
- > **Behaviours and Health Risk**
- > **Healthy Ageing**
- > **Health Security.**

Activities are led by teams of laboratory-based researchers, public health practitioners and international development experts, bringing a broad perspective to each area. The new structure is building a stronger translational and commercialisation capacity, especially in the areas of rapid diagnostics, vaccines and new drug discovery.

The capacity to translate research findings into tangible products for vulnerable communities is critical to the Institute’s success. This has been significantly enhanced through the establishment of 360biolabs, supporting the development of new vaccines, therapies and diagnostics, and through rapid diagnostic test development facilities in China at Nanjing BioPoint Diagnostics. Both companies are generating significant commercial interest and contributing to Burnet’s strategy of growing business development opportunities.

“The Burnet Institute’s mission is to achieve better health for vulnerable communities in Australia and internationally by accelerating the translation of research, discovery and evidence into sustainable health solutions.”



^  
Women wait at an antenatal clinic in  
East New Britain Province, Papua New Guinea

# Research Highlights 2016-2017



## Healthy Mothers, Healthy Babies

By the end of 2016, more than 500 women had been enrolled in the first phase of the Healthy Mothers, Healthy Babies program in PNG, more than 400 of whom followed through to the delivery of their baby. Preliminary data analyses have revealed alarmingly high rates of serious preventable health conditions such as anaemia, malnutrition, malaria and genital tract infections among East New Britain Province's mothers and babies.

**Research Themes:**

*Public Health / Health Services Research*

**Research Strength:**

*Epidemiology and Public Health*



## Anti-Malarial Medicines

Malaria, which kills almost half a million people a year, has become resistant to almost all current drugs, necessitating drug combinations for efficacy. To combat resistance, Burnet has developed novel anti-malarial drugs with two different mechanisms of action. It is improving the efficiency of these new drugs to develop them as future medicines. In addition, the Home Management of Malaria project in East New Britain, PNG has seen community-based staff bring new rapid diagnostic tests and modern anti-malarial medicines to families in rural villages to fast-track diagnosis and treatment.

**Research Themes:**

*Applied Research;  
Public Health / Health Services Research*

**Research Strengths:**

*Infection and Immunity;  
Epidemiology and Public Health*



## Managing Tuberculosis

The Institute expanded its reach in PNG through new partnerships and through a presence in new provinces, including the Autonomous Region of Bougainville. Burnet responded to the major tuberculosis (TB) outbreak in Western Province with a TB peer counselling team for TB patients, and the Institute continues to support the PNG Government through the RID-TB project to address both drug-sensitive and drug-resistant TB.

**Research Themes:**

*Public Health / Health Services Research*

**Research Strengths:**

*Infection and Immunity;  
Epidemiology and Public Health*



^  
HIV researcher Dr Clovis Palmer and PhD student Hugh Billings



## HIV and Drug Resistance

Drug-resistant HIV threatens to thwart achieving the target of eliminating AIDS by 2030. Burnet previously reported that 'silent' mutations altering the genetic code (but not the amino acid composition) of the key HIV drug target could raise the 'fitness' of drug-resistant virus. It found that the prevalence of these mutations decreased in drug-treated individuals from 1997-2014, but increased in drug-naïve individuals. This suggests that drug-resistant HIV harbouring silent mutations has the potential to be transmitted and to persist in treatment-naïve individuals.

**Research Theme:**

*Clinical Research*

**Research Strengths:**

*Infection and Immunity;  
Epidemiology and Public Health*

# La Trobe Alfred Clinical School

La Trobe University's Clinical School at Alfred Health integrates research, teaching and clinical practice in allied health and nursing.



## Director

Assoc Prof Bill McGuinness

[latrobe.edu.au/she/business-and-industry/academic-and-research-network/alfred-health](http://latrobe.edu.au/she/business-and-industry/academic-and-research-network/alfred-health)



**AlfredHealth**

The broad objectives of the Clinical School are to:

- > Provide national and international research leadership in allied health and nursing
- > Conduct clinical research that makes a difference to patient outcomes
- > Promote interdisciplinary and inter-institutional collaboration in healthcare delivery and research
- > Provide a centre of excellence for undergraduate and postgraduate education in nursing and allied health
- > Lead the translation of best evidence into clinical practice.

La Trobe Nursing and Allied Health undergraduates undertake placements at The Alfred, with nursing students attending the Clinical School for part of year two and all of year three of a Bachelor of Nursing degree.

Under the leadership of professorial staff in Physiotherapy (Professor Anne Holland), Occupational Therapy (Associate Professor Natasha Lannin) and Nursing (Associate Professor Bill McGuinness), the La Trobe Clinical School provides allied health and nursing clinicians with Honours and postgraduate research opportunities and supervision on-site at Alfred Health.

## Research Strengths

Research programs include:

- > **Rehabilitation for Chronic Lung Disease:** Professor Anne Holland leads a research program that aims to optimise health and wellbeing for people with cardiorespiratory disease, including new models for pulmonary rehabilitation.
- > **Neurological Rehabilitation:** Associate Professor Natasha Lannin's research program is focussed on neurological rehabilitation as a means to improve quality of life.
- > **Time-Critical Interventions:** Associate Professor Bill McGuinness leads a research program that aims to optimise the delivery of time-critical interventions in acute care, including new methods for preventing and treating pressure injuries and for facilitating wound healing.

“The La Trobe Alfred Clinical School translates evidence gathered from allied health and nursing research studies into best clinical practice.”

# Research Highlights 2016-2017



## A Novel Home-Based Pulmonary Rehabilitation Program

Pulmonary rehabilitation programs result in significantly improved quality of life and reduced hospitalisation for people with chronic lung disease; however, availability is restricted to less than 10% of those who would benefit across the world.

A study led by Professor Anne Holland demonstrated that a novel method of delivering pulmonary rehabilitation directly into the home (the HomeBase model) was equally effective as a traditional centre-based program, with similar costs and much higher completion rates. Importantly, those who completed pulmonary rehabilitation were 56% less likely to be hospitalised in the following 12 months.

This study, published in *Thorax* in 2016, was nominated by the American College of Physicians as one of the most influential 2016 publications in respiratory medicine, and the paper was highlighted in the *Annals of Internal Medicine* annual update of the most important internal medicine papers of 2016. Alfred Health has adopted the HomeBase model into standard clinical care.

**Research Theme:**  
*Health Services Research*

**Research Strengths:**  
*Nursing and Allied Health;  
Epidemiology and Public Health*



## Knowledge Translation Research: Acquired Brain Injury Service

In 2016, the Acquired Brain Injury (ABI) Rehabilitation Service, based at Alfred Health's Caulfield Hospital, partnered with La Trobe University researcher Associate Professor Natasha Lannin to embed evidence-based practice in the everyday rehabilitation of adults with significant brain injury.

The research team delivered a multifaceted program of knowledge translation, including education, skills training, point-of-care access to clinical practice guidelines, qualitative focus groups with both clinicians and patients, and fortnightly audits with feedback on adherence to clinical practice guideline recommendations in the area of stroke and ABI.

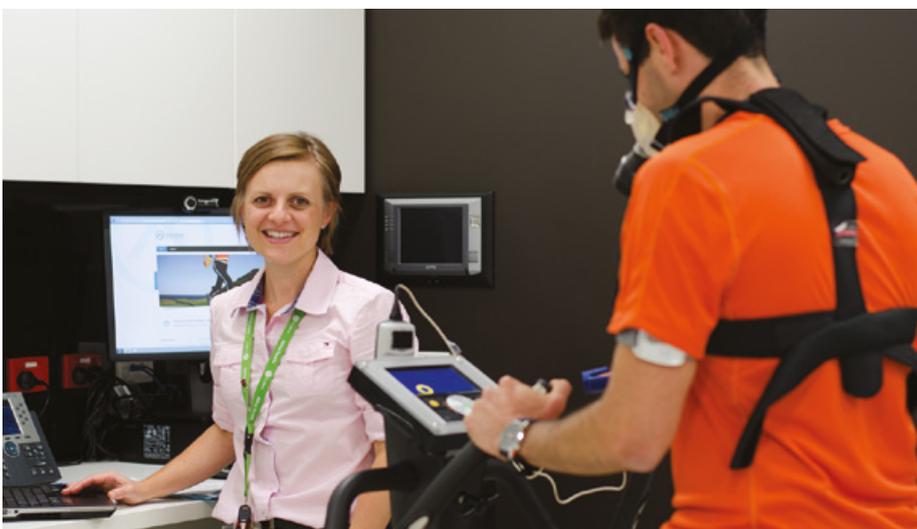
In the first-ever sustained knowledge translation project in ABI rehabilitation, Alfred Health staff significantly increased in clinical adherence to guideline recommendations. These findings support the use of audit and feedback as a behaviour change strategy within rehabilitation.

**Research Theme:**  
*Health Services Research*

**Research Strengths:**  
*Nursing and Allied Health; Trauma,  
Critical Care and Perioperative Medicine*



^  
La Trobe researcher Prof Anne Holland's study of a novel method of delivering pulmonary rehabilitation directly into the home was nominated by the American College of Physicians as one of the most influential studies in respiratory medicine in 2016.



<  
Dr Narelle Cox, Cardiorespiratory Physiotherapist, with a patient in a pulmonary rehabilitation trial

# Deakin University

Deakin University's School of Nursing and Midwifery and Alfred Health Nursing Services expanded their long-established research and education partnership in 2013 with the appointment of Professor Tracey Bucknall as the Foundation Chair in Nursing at Alfred Health.



Photography: Simon Fox, Deakin University

## Foundation Chair in Nursing (Alfred Health)

Prof Tracey Bucknall

[deakin.edu.au/qps/partnerships/  
alfred-health](http://deakin.edu.au/qps/partnerships/alfred-health)



**AlfredHealth**

Under the leadership of Professor Bucknall, staff at the Deakin Centre for Quality and Patient Safety Research / Alfred Health Partnership conduct high-quality research that makes a substantive contribution to scientific knowledge, clinical nursing practice and the quality of patient care.

### Strategic objectives include:

- > Conducting high-quality research that improves patient and organisational outcomes
- > Strengthening research training and support for nursing staff within Alfred Health
- > Facilitating the integration of research evidence into clinical practice
- > Developing partnerships between consumers, staff and researchers to strengthen research, education and health service delivery.

Deakin University also has undergraduate and postgraduate coursework students completing clinical placements in their nursing, allied health and health science degrees across numerous departments at Alfred Health.

## Research Strengths

Research programs include:

- > **Patient Safety:** This program focusses on high-risk areas for the health service, including recognition and management of deterioration in hospitalised patients, pressure injury prevention, medication management and clinical communication. The research program makes a substantive contribution to evaluating Alfred Health services and testing interventions to improve the quality of care and patient safety.
- > **Knowledge Translation:** This program of research uses an integrated knowledge translation approach to ensure that clinicians use the best available evidence in their practice to promote a safe and quality system. In understanding problem areas of the service, researchers, administrators and clinicians work together to implement new evidence and de-implement out-of-date practices.

Research programs are linked closely with the National Safety and Quality Health Service (NSQHS) Standards. Centre staff include research fellows and assistants, research students and interdisciplinary research associates. Active international and national research collaborations are a strength of the program.

“The Deakin Centre for Quality and Patient Safety Research helps evaluate Alfred Health services and test interventions to improve the quality of care and patient safety.”

# Research Highlights 2016-2017



## Patient Perspectives: Responses to Medical Emergencies

In some circumstances, hospital systems fail to meet a patient's expectation of safe care, with episodes of missed warning signs potentially resulting in admission to intensive care, death or severe disability.

Professor Tracey Bucknall led an international study into patients' and families' perceptions and roles in detecting and communicating a patient's deteriorating status, and the impact on prevention of serious adverse events in both public and private health systems. Unique insights into patient and family member interpretations of events preceding and during medical emergencies have been incorporated into recommendations to improve health service planning and delivery. Narratives derived from patients and families will be used in medical and nursing education to develop clinical reasoning skills in detecting and managing deteriorating patients.

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**Research Theme:**  
*Health Services Research*

**Research Strengths:**  
*Nursing and Allied Health;  
Trauma, Critical care and Perioperative  
Medicine*

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## Engaging Patients During Transitions of Care

The Australian Commission on Safety and Quality in Health Care awarded funding to Professor Tracey Bucknall and colleagues to review and report on tools and strategies that facilitate the engagement of patients in communication during transitions of healthcare. The aim of the review was to inform the future development of resources to assist health professionals, patients and their families to improve communication at transitions of care in acute health facilities.

Guiding principles and recommendations for the Commission were developed to raise awareness of patient engagement, stimulate discussion and inform decision-making at all levels of the health and education sectors. Recommendations from this study have been incorporated into national policy and advice for health services.

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**Research Theme:**  
*Health Services Research*

**Research Strengths:**  
*Nursing and Allied Health;  
Trauma, Critical care and Perioperative  
Medicine*

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“Deakin-led research studies investigating patients' perspectives during medical emergencies and transitions of care are positively impacting health service planning and delivery.”



# Contract Research Organisations

## Nucleus Network

**Managing Director**  
Cameron Johnson

[nucleusnetwork.com.au](http://nucleusnetwork.com.au)



Nucleus Network, Australia's largest phase 1 clinical trials facility, is located within the AMREP premises. Established in 2003 through a Science Technology and Innovation Grant, Nucleus Network became a wholly owned subsidiary of Baker Heart and Diabetes Institute in 2006. The company has an international reputation for excellence and is the preferred Australian provider for large-scale, phase 1 healthy volunteer and first-in-human clinical trials. In addition, the company's AMREP location allows strong collaborative links with hospital-based investigators and clinical researchers. Nucleus Network's status as a subsidiary of the Baker Institute also allows it to re-invest earnings into Australia's medical research sector.

Nucleus Network conducts approximately 50 phase 1 clinical trials per year, with about 20-25 of these being first-in-human. This is a critical step in ensuring the safety and efficacy of new therapeutics headed for the marketplace and important for bringing new medicines to the community. The company services global pharmaceutical and biotechnology companies (80% biotech; 20% pharma), with the majority of customers based in the US (76%) and others spread throughout Asia, Europe and Australia. In 2017, the facility expanded its capacity to 80 beds and added an internal pharmacy with a view to expanding the customer base, particularly in China and South Korea.

The senior management team of Nucleus Network brings together professionals who have diverse experience working in the clinical trials industry in Europe and the US. Overall, the company employs more than 100 permanent and 80 casual staff. The company's trials experience includes:

- > Bioequivalence / bioavailability
- > Biosimilars, cytochromes P450, genotype metabolism
- > Drug-drug interactions
- > Ethnopharmacology
- > First-in-human / pharmacokinetic / pharmacodynamics
- > Food interaction
- > TQTc monitoring
- > Vaccines.

### Nucleus Network: Australia's largest phase 1 clinical trials facility



**~50**  
phase 1 clinical trials per year



**80**  
bed capacity



**180+**  
employees

“360biolabs: Cutting-edge thinking and technology to support the development of therapeutics, vaccines and diagnostics.”

## 360biolabs

Chief Executive Officer  
Dr Simon Tucker  
[360biolabs.com](http://360biolabs.com)



360biolabs is a contract service organisation providing speciality expertise and laboratory services in the development of new therapeutics, vaccines and diagnostics in a quality-assured environment based within laboratories at the Burnet Institute. The company has particular expertise in virology, immunology and analytical chemistry, with broad assay capabilities. These capabilities include assays and biomarker endpoints for clinical trials and preclinical studies in a range of therapeutic areas including infectious diseases, inflammation and oncology. Clients range from small biotechs to large multinational pharmaceutical companies.

360biolabs is an accredited facility with systems that comply with strict regulatory and industry standards, offering:

- > ISO / IEC 17025 and ISO / IEC 15189 accreditation in accordance with the requirements of the OECD Principles of Good Laboratory Practice
- > ICH / FDA / EMA compliant assay validation process
- > Industry standard studies and reports to support global regulatory submissions
- > World-class facilities including BSL-2 and BSL-3 laboratories secured with continuity fail-safes.



# Platform Technologies

## AMREP Flow Cytometry Core Facility: AMREPFLOW

AMREP Flow is a state-of-the-art cell sorting and cell analysis laboratory, catering for the research community based at AMREP and broader Melbourne. The facility has capacity for animal and human cell sorting in a PC2 environment, as well as infectious sample sorting in a dedicated PC3 environment. The facility is equipped with three cell sorting platforms, nine cell analysis platforms and an imaging flow cytometer that is unique to Melbourne.

Contact [geza.paukovics@burnet.edu.au](mailto:geza.paukovics@burnet.edu.au) or visit [amrepflow.org.au](http://amrepflow.org.au)

### **Collaborative Partners**

Monash University  
Burnet Institute  
Baker Heart and Diabetes Institute  
Alfred Health

## In vivo Imaging

A new state-of-the-art, purpose-built animal imaging facility for use by AMREP researchers will open in early 2018. The facility will include a new 9.4T MRI scanner capable of a range of imaging, including brain, abdominal, cardiovascular, muscular and articular. The facility will also house the existing Bioscan NanoPET-CT, capable of high-resolution, high-efficiency PET and X-Ray CT scanning, and the FLECT. Future plans include the addition of a magnetic particle imaging (MPI) scanner. The new facility is in addition to existing IVIS Lumina XR Series III equipment, which can be used for multi-modal fluorescent, bioluminescent and X-ray imaging *in vivo*.

### **Collaborative Partners**

Monash University  
Baker Heart and Diabetes Institute

## Monash Micro Imaging at AMREP (MMI@AMREP)

MMI@AMREP manages core imaging resources within the Baker Heart and Diabetes Institute, Monash Central Clinical School and the Burnet Institute. Resources include three confocal and several conventional fluorescence microscopes within PC2 laboratories and a dedicated deconvolution microscope within a PC3 laboratory. Recently added super resolution technologies allow imaging beyond the capability of conventional microscopes.

Contact [stephen.cody@monash.edu](mailto:stephen.cody@monash.edu) or visit [platforms.monash.edu/mmi](http://platforms.monash.edu/mmi)

### **Collaborative Partners**

Monash University  
Burnet Institute  
Baker Heart and Diabetes Institute

## Genomics Capability

The new Australian Cancer Research Foundation Blood Cancer Therapeutics Centre includes state-of-the-art sequencing facilities, including: Illumina NextSeq 500 and MiniSeq Next Generation Sequencer; Bio-Rad QX200 ddPCR system with AutoDG and ddSeq (single cell) capability; Covaris M220; MultiNA Fragment Analysis (Shimadzu); EpMotion liquid handler; microarray analysis using the Affymetrix GeneChip System 3000Dx v.2; and Intellicyt iQue high content screener. Access to the equipment is through collaboration and/or cost recovery.

Contact [andrew.wei@monash.edu](mailto:andrew.wei@monash.edu)

### **Collaborative Partners**

Monash University  
Alfred Health

## Monash Histology at AMREP

A node of the Monash histology platform has been set up at AMREP, offering both a professional histology service as well as access to equipment for do-it-yourself (DIY) histology for AMREP and external researchers. Equipment includes a dissection and cassetting area, tissue processor, paraffin embedding units, microtomes, H&E staining and a cryostat for frozen sectioning.

Visit [platforms.monash.edu/histology](http://platforms.monash.edu/histology)

The Monash Central Clinical School provides next-generation sequencing expertise and training on a collaborative basis, including experimental design, sample preparation (transcriptome, whole genome and epigenome profiling), single-cell transcriptome (Drop Seq) sample preparation, sequencing and basic bioinformatics. Equipment includes a DolomiteBio platform (Drop-Seq) and Illumina MiSeq and Oxford Nanopore MinION sequencing systems.

Contact [mark.ziemann@monash.edu](mailto:mark.ziemann@monash.edu)

## Baker Clinical Research Domain

The Clinical Research Domain focusses on imaging and other diagnostic tools to better understand disease development and treatment, clinical trials and health services research. The Domain incorporates the Baker Institute's clinical services, including specialised heart, diabetes, lung, eye and weight reduction clinics, as well as a range of allied health and health education services. Equipment includes state-of-the-art MRI, transthoracic and stress echocardiography and body composition (DEXA) scanning.

The MRI scanner is capable of detailed morphologic and functional cardiac imaging, including the ability to acquire real-time data during exercise. Research and investigational services include ECG, Holter and ambulatory BP monitoring, ankle:brachial indices and cardiopulmonary exercise testing, as well as the Alfred Centre clinical research facilities comprising a clinical and research gymnasium and dedicated clinical research rooms.

Contact [graeme.maguire@baker.edu.au](mailto:graeme.maguire@baker.edu.au) or [deb.dean@baker.edu.au](mailto:deb.dean@baker.edu.au)

## Mouse Cardiology Platform

The Experimental Cardiology Laboratory at the Baker Institute has established facilities and techniques specialising in mouse microsurgery and cardiac physiology, enabling scientists to conduct mouse echocardiography (non-invasive), micromanometry (invasive hemodynamic assessment) and microsurgery to induce heart disease. The platform allows scientists to closely determine cardiac function of specific genes in basal and diseased conditions and to trial new therapies of cardiovascular and metabolic disease.

Contact [xiao-jun.du@baker.edu.au](mailto:xiao-jun.du@baker.edu.au) or [julie.mcmullen@baker.edu.au](mailto:julie.mcmullen@baker.edu.au)

## Mouse Metabolic Phenotyping / Bioenergetics Facility

The Mouse Metabolic Phenotyping Facility enables high-quality metabolic and physiologic phenotyping of rodents to study animal models of obesity, diabetes, cardiovascular disease and other metabolic diseases. The Bioenergetics Facility equipment allows the measurement of mitochondrial and glycolytic functionality, the two main energy pathways of the cell.

Contact [darren.henstridge@baker.edu.au](mailto:darren.henstridge@baker.edu.au)

## Metabolomics Platform

The Metabolomics Laboratory uses state-of-the-art tandem mass spectrometry to obtain metabolic profiles (primarily lipids and fats) from cell and animal models, in addition to clinically relevant human samples. The platform has developed a targeted lipidomics approach that enables quantification of more than 600 lipid species across 25 lipid classes and subclasses. The analysis is performed by liquid chromatography tandem mass spectrometry.

Contact [peter.meikle@baker.edu.au](mailto:peter.meikle@baker.edu.au)

## Recombinant Viral Vectors Platform

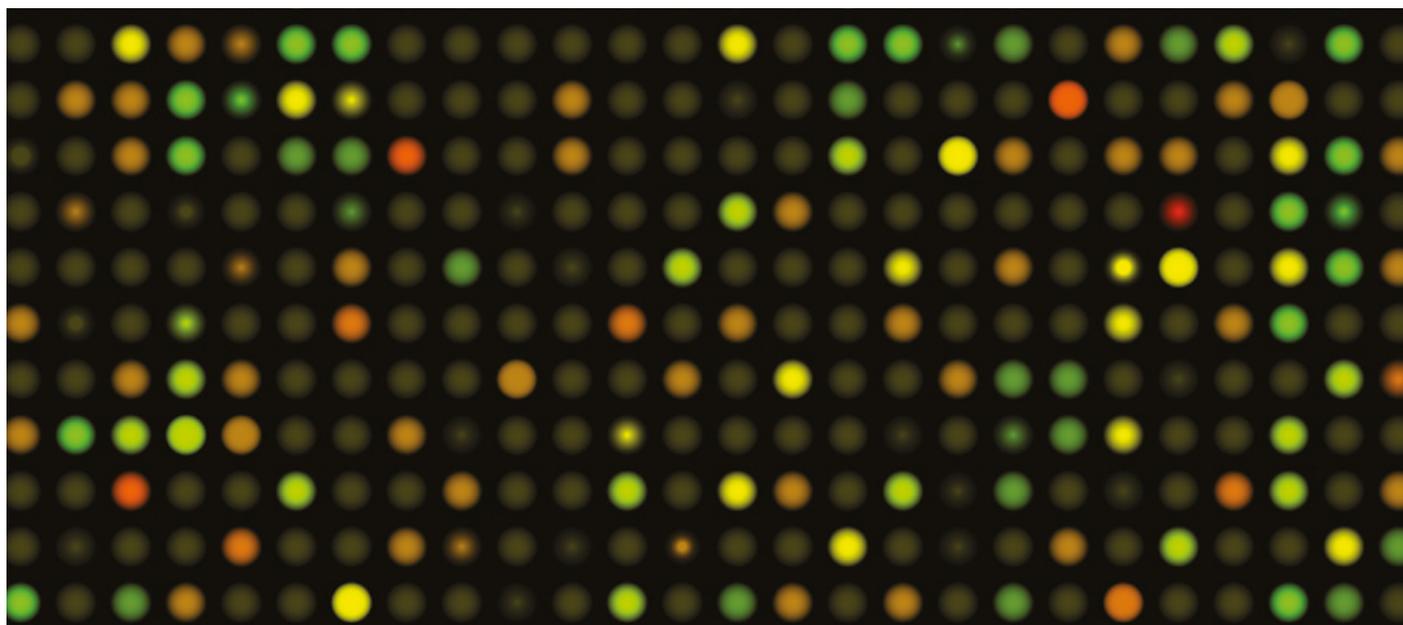
This platform specialises in the production and purification of custom viral vectors based on adeno-associated virus (AAV) and lentivirus designs. Typical vector preparations consist of recombinant AAV vectors at purified, concentrated yields of  $1E+12vg$  -  $1E+13vg$  scale, and LV vectors typically of  $1E+9vg$  or greater.

Contact [paul.gregorevic@baker.edu.au](mailto:paul.gregorevic@baker.edu.au)

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Assoc Prof André La Gerche, Head of Sports Cardiology Laboratory, Baker Clinical Research Domain, with an athlete undergoing cardiac magnetic resonance imaging





## Global Health Diagnostics Laboratory

The diagnostic development team in Burnet's Global Health Diagnostics Laboratory focusses on the development of prototype rapid, point-of-care tests for infectious diseases and other priority global health conditions. The team's innovations have enabled the development of products for diagnosis of infections (hepatitis E, active syphilis), measurement of CD4 T-cells, and plasma separation for HIV viral load, which have been successfully out-licensed for manufacture.

More recently, the laboratory has had a primary focus on collaborative research and development with Burnet's spin-off company, Nanjing BioPoint Diagnostics. The laboratory works with organisations to assist them in the development of novel rapid point-of-care diagnostics, either as fee-for-service contract work, or as collaborative projects in areas of interest for the Institute.

Contact [david.anderson@burnet.edu.au](mailto:david.anderson@burnet.edu.au)

## Antiviral Testing Facility

The Burnet Antiviral Testing Facility has the capacity to evaluate chemical agents for inhibitory activity against HIV and herpes simplex (HSV) type 1 and 2 viruses in cell culture assays. This enables the development of new molecules that may lead to better treatments and/or prophylactics for these chronic infections. All work undertaken by the facility uses principles outlined in the FDA guidelines for Antiviral Product Development.

Contact [gilda.tachedjian@burnet.edu.au](mailto:gilda.tachedjian@burnet.edu.au)

## PhenoSeq

The principal obstacle to the anti-HIV drug maraviroc from being more widely used is that the pre-treatment *in silico* tests to determine virus susceptibility to maraviroc have been developed primarily for HIV subtype B strains, which account for only 10% of infections worldwide. The Burnet has developed PhenoSeq, a suite of highly accurate *in silico* tests for all of the major HIV subtypes, which together account for 95% of HIV-1 infections worldwide.

Contact [paul.gorry@burnet.edu.au](mailto:paul.gorry@burnet.edu.au)

## OPTIMA

Optima is a sophisticated tool to help decision-makers choose the best public health investments in areas such as tuberculosis, HIV, nutrition and maternal and child health. Developed by the Optima Consortium for Decision Science, in partnership with the World Bank, the Optima software is open-access and available via a web-based interface. It consists of a mathematical model of disease transmission and progression integrated with an economic analysis framework and a formal mathematical optimisation routine.

The Optima structure is highly flexible and can accommodate public health programs and sub-populations that are country specific. The tools have been used by more than 40 countries across Eastern Europe, Asia, South America and Africa to guide resource allocation towards the most cost-effective mix of programs and to assist with national strategic and operational planning.

Further information: [optimamodel.com/about.html](http://optimamodel.com/about.html)



# Bioinformatics and Biostatistics

## Biostatistics Consulting Platform

The Biostatistics Consulting Platform (BCP), located within the Monash School of Public Health and Preventive Medicine, provides high-quality biostatistical support to AMREP-based Monash researchers and researchers at The Alfred. BCP biostatisticians can provide consulting and collaborative assistance with:

- > Design of experiments, clinical trials and other studies, including sample size calculations and the development of proposals and protocols
- > Statistical analysis, statistical analysis plans and reporting of results
- > Biostatistical appraisal of protocols and manuscripts
- > Research into new or specialised biostatistical methods
- > Statistical software advice and guidance.

BCP biostatisticians have experience with a wide range of statistical methods and specialist software.

Visit [monash.edu/medicine/sphpm/depts-centres-units/biostats-consulting](http://monash.edu/medicine/sphpm/depts-centres-units/biostats-consulting)

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### **Collaborative Partners**

Monash University  
Alfred Health

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## Monash Bioinformatics Platform at AMREP

Monash Central Clinical School (CCS) appointed Dr Nick Wong in June 2017 to liaise between CCS, The Alfred and the main Monash bioinformatics platform team located at Clayton. Dr Wong offers advice, consultancy and training around genomic analysis with next-generation sequencing (NGS) and nucleic acid (RNA / DNA) platforms to Monash and Alfred Health staff. This includes access to computing infrastructure for data analysis, bringing together the existing bioinformatics expertise on the precinct and coordinating specialty seminars and training workshops.

Contact [nick.wong@monash.edu](mailto:nick.wong@monash.edu)

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### **Collaborative Partners**

Monash University  
Alfred Health

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## Baker Bioinformatics Program

The Baker Bioinformatics Program aims to build bioinformatics capacity through collaboration (internal and external), support and training. Capabilities include the analysis of data from diverse technologies, including genomics, epigenomics, transcriptomics, proteomics, metabolomics and metagenomics / microbiota, and the cross-omic integration thereof. A diverse set of analytical techniques are employed, including statistical analysis, machine learning, network analysis and high-dimensional data visualisation, as well as the design of computational algorithms. This enables the identification of genetic variants, genes and other biomolecular / organismal entities that differ between conditions, as well as the use of these differences to make disease predictions, infer pathogenesis and identify targets for intervention.

Contact [michael.inouye@baker.edu.au](mailto:michael.inouye@baker.edu.au)



# Clinical Registries and Biobanks

## Monash Clinical Registries

Monash School of Public Health and Preventive Medicine is the largest manager of clinical registries in Australia, with about 30 registries. Data is used to benchmark quality of care and monitor outcomes, providing insights into variance among service providers as well as drug, device and procedural safety. The School manages state-wide, national and Australia/New Zealand registries.

Diseases, conditions and clinical procedures captured in the registries include:

- > Trauma, transfusions and blood disorders
- > Cardiac and thoracic surgery
- > Bariatric surgery
- > Rheumatology
- > Spine and orthopaedic trauma
- > Burns
- > Cardiovascular conditions
- > Kidney diseases
- > Various cancers, including lung, gastrointestinal, prostate, lymphoma, myeloma
- > Cystic fibrosis
- > Breast devices.

To discuss establishing a new registry, contact [Med-ClinicalRegistries@monash.edu](mailto:Med-ClinicalRegistries@monash.edu)

Visit [monash.edu/medicine/sphpm/registries](http://monash.edu/medicine/sphpm/registries)

## The Healthy Ageing Biobank – ASPREE

The Monash Public Health Biorepository houses biospecimens from a diverse range of studies undertaken by researchers from the Monash School of Public Health and Preventive Medicine, including blood and urine specimens collected from Australian participants of the US National Institutes of Health (NIH) / National Health and Medical Research Council (NHMRC)-funded ASPREE (ASpirin in Reducing Events in the Elderly) clinical trial.

ASPREE is an international double-blinded, randomised placebo-controlled trial examining the effect of daily low-dose aspirin on the prevention of dementia, cardiovascular disease, depression and some cancers in more than 19,000 healthy older adults. Biospecimens from ASPREE participants constitute The Healthy Ageing Biobank, and, together with clinical data from the participants, represent a unique global resource for genetic and biomarker discoveries in older Australians. The biorepository also houses tumour tissue samples collected from ACES (ASPREE Cancer Endpoints Study), an ASPREE sub-study designed to look at the effect on cancer of taking aspirin.

Visit [aspree.org/aus/sub-studies/ive-been-everywhere-the-aspree-biobus-story](http://aspree.org/aus/sub-studies/ive-been-everywhere-the-aspree-biobus-story)



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Prof Wendy Brown (L), Clinical Lead for the National Bariatric Surgery Registry and the Victorian Upper Gastrointestinal Cancer Registry



## AusDiab

Coordinated by Baker Heart and Diabetes Institute, the AusDiab study is the largest Australian longitudinal population-based study examining the natural history of diabetes, pre-diabetes, heart disease and kidney disease in Australians over 25 years of age. The baseline study of 11,247 participants provided benchmark national data on the prevalence of diabetes, obesity, hypertension and kidney disease in Australia. Five-year and 12-year follow-ups of the participants have also been completed. Two AusDiab sister studies have examined the impact of diabetes and other non-communicable diseases among the Australian urban Indigenous population (the DRUID study), and a rural Victorian population (the Crossroads study).

Researchers and potential collaborators wishing to access the AusDiab datasets or biological samples are able to do so via a completing a data access form.

Visit [baker.edu.au/impact/ausdiab](http://baker.edu.au/impact/ausdiab)

## Victorian HIV Blood and Tissue Storage Bank

Established in the 1990s, the Victorian HIV Blood and Tissue Storage Bank is an initiative of the state-wide Victorian HIV Service at The Alfred and the Burnet Institute. It has prospectively stored leftover serum samples from requested HIV viral load tests for patients managed at The Alfred. The biobank holds nearly 60,000 samples linked with relevant clinical information from just less than 5,000 HIV patients. The biobank is available as a research tool for AMREP researchers as well as the wider research community.

Contact [j.roney@alfred.org.au](mailto:j.roney@alfred.org.au) or [jennifer.hoy@monash.edu](mailto:jennifer.hoy@monash.edu)

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### **Collaborative Partners**

*Burnet Institute  
Alfred Health  
Monash University*

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# Other AMREP Facilities and Services

## Ian Potter Library and AMREP Education Centre

The Ian Potter Library provides an integrated library and information service to staff and students of AMREP. The library organises its information resources to support patient care, educational training and research activities of the institutions across the precinct.

The AMREP Education Centre is a unique conference, workshop and seminar venue with a range of meeting and seminar rooms, including the 200-seat AMREP Lecture Theatre with state-of-the-art technology. The AMREP Lecture Theatre and rooms are available to both AMREP partners and external clients.

Visit [amrep.org.au/resources/ian-potter-library](http://amrep.org.au/resources/ian-potter-library) and [amrep.org.au/edcentre](http://amrep.org.au/edcentre)

## Human Research Ethics

The Alfred Hospital Ethics Committee is a National Health and Medical Research Council (NHMRC)-registered and certified Human Research Ethics Committee, which undertakes ethical review of human research for all AMREP partners and can also review applications for any site participating in the Victorian or National 'single ethical review' (or 'streamlined') scheme. The Ethics Committee is supported by two sub-committees: the Research Review Committee, which undertakes a preliminary specialised scientific / medical and safety review of drug, device and risky interventions; and the General Ethical Issues Sub-committee, which considers more general ethical issues (including but not restricted to human research) of relevance to Alfred Health and the wider community.

Visit [alfredhealth.org.au/research/ethics-research-governance](http://alfredhealth.org.au/research/ethics-research-governance)

## Animal Ethics

The AMREP Animal Ethics Committees (AECs) undertake the ethical review of proposals for the use and breeding of animals for scientific purposes for AMREP-based institutions. There are two AECs in operation, each meeting on a monthly basis, resulting in the ethical review of proposals on a fortnightly basis. The AECs are supported by the AMREP AEC Secretariat, which also coordinates post-approval monitoring of research projects and annual reporting to state government on behalf of AMREP institutions licensed for the use of animals for scientific purposes.

Visit [amrepaec.baker.edu.au](http://amrepaec.baker.edu.au)



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Commercial Road  
Melbourne, Victoria 3004  
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