Inspired Research

Medical researchers at the University of Sydney and its affiliated hospitals and institutes form the largest and most comprehensive coordinated group of medical researchers in the Asia Pacific region.

Research leaders are distributed across more than 20 campuses and cover the spectrum of research from fundamental biology through to population health research and leadership of major international clinical trials.

Through established networks, both national and international, the Faculty of Medicine has a major leadership position in many of the challenges facing Australia’s ageing population and the health care needs of our neighbours in the Asia Pacific area.

Over the past three years medical researchers have received over $200 million in competitive research funding with more than a doubling in Australian competitive research grant income.

Research publications have doubled over the last four years to exceed 1,500 per year, and for two years running, the University of Sydney has been ranked in the top 20 biomedical universities in the world by the Times Higher Education Supplement.
Researchers of World Renown

Professor Tony Cunningham
Westmead Millennium Institute

Professor Cunningham is Director of the Westmead Millennium Institute and Research Centres at Westmead Hospital and of the Centre for Virus Research, Professor of Research Medicine and Sub-Dean (Research) Western Clinical School, the University of Sydney.

His research interests focus on viral medicine, especially basic biology, pathogenesis, seroepidemiology, diagnosis and anti-viral treatment of HIV, herpes virus infections. The Centre for Virus Research uses the latest technologies of genomics, molecular and cell biology and protein chemistry to investigate HIV, and herpes viruses which infect neurons, epidermal and bone marrow/blood cells. The Centre’s research on the immunology of Herpes simplex virus has assisted in the development of the first partially successful vaccine for genital herpes. Its researchers have successfully defined two new receptors for HIV on epithelial dendritic cells. These are potential targets for blocking entry of HIV into the body.

Professor Max Bennett and Professor Ian Hickie
Brain and Mind Institute

Professor Bennett is the scientific director of the Brain and Mind Institute which is a unique enterprise in Australia to integrate clinical and basic neurosciences research. It aims to be a world-leading centre for research into debilitating forms of psychiatric and neurological illnesses. It consolidates the expertise of 62 independent neuroscience laboratories across the campus of Sydney University and in its teaching hospitals. The BMRI acts as a hub for Sydney University Neuroscience, and as a linkage point for cross-disciplinary research into major psychiatric and neurological disorders. By supplying new technologies and expert research staff it will enable a synergistic effort with the neuroscience laboratories to ameliorate mental illness.

Professor Ian Hickie is the BMRI executive director and clinical adviser to the national depression initiative BeyondBlue. He has a strong clinical background in the area of mood disorders, with particular reference to treatment resistance and social and interpersonal risk factors. He also has research expertise in neuroimaging (of mood disorders), physical health consequences of depression and somatic presentations of mood disorders and chronic fatigue states.

The institute also plays an important role in policy development and community advocacy for people with mental illness.
**Professor Rick Kefford**

Sydney Melanoma Unit

Professor Kefford's major clinical interests are the medical management of advanced breast cancer and melanoma. His reputation in the field has been recently recognized with the awarding of a National Health and Medical Research Council Program Grant of nearly A$8 million.

Sustained by this grant and together with his team of researchers from the Sydney Melanoma Unit and the University of Sydney, Professor Kefford’s aim is to investigate the molecular determinates of the risk, progression and treatment response in melanoma. His research team has recruited a large number of people who are at high risk of developing melanoma. By investigating these people thoroughly, and by careful treatment of those who develop melanoma Professor Kefford and colleagues aim to better predict who is likely to develop the disease and in whom it is likely to spread. With this information, they aim to improve the care of people at risk of the disease and improve treatment.

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**Professor Kathy North**

Children’s Hospital Westmead

Professor North’s laboratory research interests focus on the molecular basis of inherited muscle disorders - particularly muscular dystrophies and congenital myopathies - as well as genes which influence normal skeletal muscle function and elite athletic performance.

Neuromuscular disorders are major causes of ongoing disability in childhood. They cause progressive and disabling weakness and often an affected child will lose the ability to walk. In children whose breathing and swallowing muscles are affected respiratory failure and early death may result.

While some of these disorders are treatable, for many children there is currently no cure. Most neuromuscular disorders of childhood are genetic and more than one person in a family may be affected, eg the muscular dystrophies are a group of hereditary muscle diseases which can result in severe and often-progressive muscle weakness.

At the Children’s Hospital, Professor North has established the Clinical Neurogenetics Service which currently cares for more than 1,500 patients and their families. Professor North’s clinical research focuses on clinical trials of therapies for muscular dystrophy as well as the development of interventions for children with learning disabilities.
Research Highlights Update

Researchers awarded grants for Avian Influenza

University of Sydney researchers have been awarded National Health and Medical Research Council grants focusing on urgent research into a potential Avian Influenza.

The research project which will run over eighteen months will focus on the following outcomes, detection and identification of the virus, vaccine development and evaluation, anti-viral medication use and effectiveness, public health interventions, understanding behavioural responses and areas of direct relevance to the national response to the risk of avian influenza.

Associate Professor Jonathan Iredell (Westmead Millennium Institute) will research in the area of detection and identification of the Virus, Dr Bin Wang, (Westmead Millennium Institute) anti-viral medication use and effectiveness and Dr Euan Tovey, (Woolcock Institute of Medical Research) Understanding Behavioural Responses.

Brand new hearts and bionic limbs

The University of Sydney is establishing a Bio3 research and teaching facility that will develop and commercialise replacement body parts, electronic health surveillance systems and new forms of drug delivery. The ambitious project is the joint brainchild of Professors Richmond Jeremy, Associate Dean in the Faculty of Medicine, Hans Coster and Tony Weiss. This initiative has been described as a unique interaction between the physical and life sciences. It is envisaged as a “research motel”, a place where biological researchers, clinicians, scientists, chemists, engineers and mathematicians can come together to exchange ideas and research in shared labs.

Sydney takes leading role in new health research projects

University of Sydney Researchers were among several recipients of a $10 million government grant to boost health research into chronic diseases, Indigenous health and the recovery process of older Australians who have been hospitalised.

Four substantial projects have been funded, with grants ranging from $600,000 to $3.5 million. The grants have been awarded under the National Health and Medical Research Council’s (NHMRC) Health Services Research Program.

Professor Stephen Leeder will lead a team researching cardiovascular disease, diabetes and chronic obstructive pulmonary disease. The aim is to implement strategies for better prevention, management and care for Australians with, or at serious risk of contracting these chronic illnesses.

Professor Ian Cameron’s team will investigate the impact on older Australians and their carers of the transition from hospital care to community and residential care. The team will develop new models for high quality and cost effective systems of care.

Dr Alan Cass and his team will use a $2.8 million grant over five years to research ways to improve health outcomes for Aboriginal Australians with chronic disease. The study will focus on identifying existing health system barriers and developing ways to overcome them.
**Anti tobacco campaigner recognised**

The Thoracic Society of Australia and New Zealand has awarded Professor Simon Chapman the 2006 President’s Award.

This is awarded to individuals who have demonstrated a strong track record aimed at controlling tobacco use and thereby promoting respiratory health. Professor’s Chapman’s contribution and research interests in tobacco control, the semiotics of cigarette advertising and media discourses on health and illness makes him a worthy recipient of this award.

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**University of Sydney researchers join UK Biobank**

Professor Michael Kidd has accepted an invitation to join a 10 member International Scientific Advisory Board for UK Biobank. Joining him on the team is Professor Stephen MacMahon who will take on the role of chair. The International Scientific Board is an advisory committee established jointly by the Wellcome Trust and the UK Medical Research Council. UK Biobank aims to recruit 500,000 people aged 40-69 from around the UK during 2006 - 2010. At an initial baseline survey, blood and urine samples will be collected for long-term storage, along with a detailed questionnaire about lifestyle and health and various measurements (e.g. blood pressure, body size and impedance, spirometry, grip strength). All participants are to be followed through their medical and other health-related records, with regular re-surveys in a substantial sample of participants. The UK Biobank resource is to be made available for all researchers to conduct investigations that have appropriate scientific and ethics approval.
Faculty Honours

2006 Highlights to date

Faculty staff awarded in Australia Day Honours List

In our 150th anniversary year several members of the Faculty of Medicine have been mentioned in the 2006 Australia Day Honours list.

Emeritus Professor Charles Blackburn was awarded with an AC for his service to the development of academic medicine and medical education in Australia, particularly in relation to the evolving relationship between research and clinical practice, and as a mentor influencing professional development of a generation of leading health care professionals. Professor Blackburn was a member of the Faculty of Medicine from 1957 to 1978, during which he played a most important role in the development and expansion of the Medical School, where he initiated many new developments.

Professor David Henderson-Smart, Director of the NSW Pregnancy and Newborn Services Network and Centre for Perinatal Health Services Research, received an AO for his service to medicine, particularly in the fields of paediatrics and neonatal and perinatal care as a clinician, researcher, administrator and educator.

Associate Professor Antony Breslin, Clinical Associate Professor at Concord Hospital, was awarded an AM for his service to thoracic medicine, particularly in the area of respiratory diseases through education, research, clinical practice and professional organisations.

Professor Ian Hickie, Executive Director of the Brain & Mind Research Institute, received an AM for his service to medicine in the development of key national mental health initiatives and general practice services in both the public and non-government sectors.

Clinical Associate Lecturer at Nepean Hospital, Dr Michael Noel, was awarded a Medal in the Order of Australia (OAM) for service to medicine, particularly in the field of palliative care.

New Fellows of the Australian Academy of Science

Professor David Allen (Professor of Physiology) and Professor David Celermajer (chairman, Research Executive Committee (RPAH) have been elected to the prestigious position of Fellows of the Australian Academy of Science.
University of Sydney top in NHMRC 10 of the Best Awards

Researchers in the Faculty of Medicine are world leaders in groundbreaking medical research. This was recognised in 2005 by the Health Minister Tony Abbott in the NHMRC “10 of the Best” awards.

Mr Abbott presented Professor Tania Sorrell and colleagues with the award for their work to reduce the need for diagnostic surgery in brain disease. They showed that magnetic resonance spectroscopy (MRS) could easily distinguish between brain tumours and brain infection and as a result those patients with abscesses could avoid the risk of a general anaesthesia and surgery.

A second “10 of the Best” award went to Professor Simon Chapman’s research team. They were jointly funded by the NHMRC and the US National Cancer Institute to research over 40 million pages of previously internal tobacco industry documents on Australia and Asia. They documented how the tobacco industry sought to “reassure” smokers that they need not be concerned about the health risks of smoking, how they denied that nicotine is addictive, confirmed that they were interested in selling cigarettes to teenagers, and generally how the industry opposed all effective forms of tobacco control.

New research shows importance of cholesterol drugs

Professor Anthony Keech coordinated the Sydney team for the highly significant international study into the class of drugs known as the “statins”. This trial was coordinated by scientists from the Clinical Trials Centre at the University of Sydney and the Clinical Trial Service Unit at the University of Oxford and was funded by the NHMRC, National Heart Foundation, Medical Research Council and the British Heart Foundation. Result published in The Lancet in 2005 will have significant impact on the prescribing of these drugs to people with diseased arteries.

An important contribution to medical research is the work of Associate Professor Barbara Fazekas de St. Groth and colleagues who have developed a new blood test to detect a rare but important subset of white cells, known as regulatory T cells. These protect against the development of autoimmune and inflammatory diseases such as type 1 diabetes, multiple sclerosis, Crohn’s disease and ulcerative colitis and the test will open the way to a better understanding of why these diseases are increasing in Australia and the developed world.

Melanoma research

Significant new research is being undertaken in 2005 by a number of research groups including Professor Rick Kefford and colleagues who are investigating the molecular determinants of risk, progression and treatment response in melanoma; and Associate Professor Graham Mann and others have teamed with Westmead Millennium Institute to discover how gene and protein profiling in melanoma can be used to assist patient care.
Significance funds for Public Health researchers

Contributions to the Faculty’s research effort are also being made by Professor Les Irwig and colleagues in the School of Public Health who have been granted over $6m to study the under-researched area of medical tests; and Professor John Simes of the NHMRC Clinical Trials Centre who has been granted over $1m to develop a national resource which will provide resources in clinical trials expertise and web-based trials systems to enable investigator-initiated clinical trials of public good.

Cancer Institute Fellowships

Prestigious Cancer Institute Fellowships have been awarded Dr Sue Firth who will investigate regulators of growth in breast cancer cells; Dr Janet Martin who will look at insulin-like growth factor binding proteins as growth factors in cancer; and Dr Carolyn Scott who will examine the mechanisms of action of a growth suppressing protein.

Health outcomes for Aboriginal children

Faculty members are also making a significant contribution to research into Aboriginal health research with Professor Jonathan Craig's long term study to describe the links between the environment, resilience and health outcomes in Aboriginal children.

As well as success in attracting record levels of research funding in 2005, making some exiting discoveries and embarking on new research projects previous recognition for long term contributions to medical research made by researchers in the Faculty of Medicine has also received recognition.

Prestigious awards to University of Sydney researchers

Professor Bruce Armstrong, Head of the School of Public Health was honoured with a lifetime achievement award for basic science in the field of melanoma research at the 6th World Congress on Melanoma in Vancouver. His peers recognised that, in a career spanning over 30 years, his research has made a major contribution to knowledge about the epidemiology and control of melanoma and the understanding of the relationship between sun exposure and the risk of melanoma in humans.

The 2005 Howard Williams Medal has been awarded to Professor David Henderson-Smart for his contribution to paediatrics. The Medal is presented each year by the Royal Australasian College of Physicians (RACP) in recognition of a person who has made an outstanding contribution to paediatrics and child health in Australia or New Zealand.
Professors recognised in Australia Day Honours

Australia Day 2005 saw four Professors of the Faculty of Medicine, University of Sydney, recognised for their outstanding contributions to medical education and research.

Professor John Pollard has received an AO for services to medicine in the field of neurology, in particular the study of peripheral nerve disease and multiple sclerosis. Professor Pollard is Bushell Professor of Neurology in the Faculty of Medicine.

Professor Douglas Joshua, Clinical Professor at Royal Prince Alfred Hospital, was honoured for his work in the field of haematology and multiple myeloma research and for his services to postgraduate education and professional organizations.

Professor John Morris, Clinical Professor at Westmead Hospital, was recognized for his services to neurology and neurological education, particularly for his work on Parkinson’s disease and movement disorders.

Professor Chris O’Brien, also at Royal Prince Alfred Hospital, received his honours for his work in head and neck surgery and through his leadership as a clinical researcher and teacher.
Research Units

The Faculty of Medicine at the University of Sydney is associated with an impressive array of over 40 centres, institutes and foundations all working at the cutting edge of medical research. Led by the medical faculty, these organizations are pushing the boundaries of medical knowledge, providing the community with the latest developments in a huge range of disciplines and providing our students with first hand access to top researchers and current research findings.

- Ageing and Alzheimer’s Research Foundation
- ANZAC Research Institute
- Australian Centre for Agricultural Health & Safety
- Australian Centre for Health Promotion
- Australian Health Policy Institute
- Australian Red Cross Blood Service Research Unit of Transfusion Medicine and Immunogenetics
- A W Morrow Gastroenterology and Liver Centre
- Bosch Institute
- Brain and Mind Research Institute
- Centenary Institute of Cancer Medicine and Cell Biology
- Centre for Behavioural Sciences in Medicine
- Centre for Developmental Disability Studies
- Centre for Education and Research on Ageing
- Centre for Infectious Diseases and Microbiology
- Centre for Perinatal Health Services Research
- Centre for Values, Ethics and the Law in Medicine
- Children’s Medical Research Institute
- Department of Endocrinology at Royal Prince Alfred Hospital
- Family Medicine Research Centre
- George Institute for International Health
- Heart Research Institute
- Institute of Anatomical Pathology at Royal Prince Alfred Hospital
- Institute of Bone & Joint Research
- Institute of Clinical Neurosciences at Royal Prince Alfred Hospital
- Institute of Clinical Pathology and Medical Research
- Institute of Endocrinology and Diabetes
- Institute for Immunology and Allergy Research
- Institute for Magnetic Resonance Research
- Kanematsu Laboratories
- Kolling Institute of Medical Research
- National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases
- Nepean Hospital Gastroenterology Research Unit
- NHMRC Clinical Trials Centre
- NSW Breast Cancer Institute
- Pain Management Research Institute
- The Pam McLean Cancer Communications Centre
- Save Sight Institute
- Sutton Arthritis Research Laboratories
- Sydney Melanoma Unit
- Sydney South West Area Health Service Drug and Alcohol Unit
- Sydney South West Laboratory Service: Department of Forensic Medicine
- Sydney University Biological Informatics & Technology Centre
- Westmead Millennium Institute of Health Research
- Woolcock Institute of Medical Research

Link to research units at: www.medfac.usyd.edu.au/research/units/index.php
Research Facts and Figures

Research Income 2000 onwards

The University of Sydney is the leading Australia institution in attracting funding from the National Health and Medical Research Council (NHMRC) competitive grant schemes.

The Faculty of Medicine has steadily increased its value of NHMRC research income over the last 5 years. Our 25% success rate with project grants is above the national average and is reflected in obtaining between 40 - 45 Project grants each year.

NHMRC income for 2005 is estimated at approximately $33.5 million, up from $28.7 million in 2004.

We have submitted a record 382 NHMRC Project Grants in 2006 (for funding commencing in 2007). This is more than any other University in the country.
Research Publications

The University of Sydney has one of the highest levels of research publications output nationally and has increased its publications output by 70% since 1996.

The Faculty of Medicine has seen a steady increase in research publications by its members since 2000, almost doubling its publications output in this time.

The relative value of these publications was calculated by the weighting system applied by the Australian Federal Government has increased over the same time. Between 2003 and 2004 the value of the publications has increased 24%.
The Future

The University of Sydney is building world class research capability. Australia’s leading research intense University (based on research grants and funding received in 2006) is in the early planning stages of a 50,000m² (538,000sq ft) interdisciplinary Bio-technology precinct including 10,000m² (108,000sq ft) of clinical trials building.

This significant development will create a world class multi-disciplinary Bio Medical precinct that provides the University and its associated research Institutes and Partners:

- A clear Physical identity with International recognition - an ‘Iconic Building’
- Improved operational efficiencies by increasing capability through shared core support services and specialist equipment, and
- Potential to grow

This Bio-technology precinct will create a sense of place, community and purpose. It is designed to embrace and promote functional and communicative space as an integral part of the operating environment it creates.

The precinct will promote and create physical and academic linkages between all stakeholders, internal and external, including one of the Universities major teaching hospitals, The Royal Prince Alfred Hospital based on the main campus. It will be an example of the best in workplace design facilitating training and research activities while embracing ecological sustainable development principal’s.

This precinct will set standards in research facilities in Australia and abroad.
**at a glance...**

50000 m² multidisciplinary research space and 10000m² clinical trials and applied clinical research space

- Vivarium
- Heart research
- Cancer research
- Respiratory medical research
- Bosch tissue engineering
- Bio² (applied biomedical engineering and organ replacement)

**Space for –**
- 800 researchers
- Linkage to expanded Medical Foundation precinct
- Postgenomic and molecular biological research
- NH&MRC Clinical Trials Centre
- Coherent translational research – basic scientific research to experimental application to clinical trial and clinical care

**Key core facilities -**
- 5000m² vivarium
- Clean rooms for nanotechnology
- Tissue and organ culture
- Bio-molecular modelling and super computing
- Advanced imaging (for example, atomic force microscopy)

**Building –**
- Iconic
- Landmark research building for the city of Sydney
- Advanced energy efficiency
- Environmental sensitivity
- Green space

**The most exciting medical and advanced scientific research building in Australia**

- Open for business in 2010