Our Vision
To be a world renowned medical research institution

Our Mission
Better health through medical research

Our Philosophy
QIMR supports scientists who perform world-class medical research aimed at improving the health and well-being of all people

Our Logo
The QIMR logo is comprised of superimposed benzene rings which symbolise one of the fundamental molecular arrangements of the chemicals which make up living things

Our Diamond Jubilee
This year, QIMR celebrates 60 years of medical research for Queensland.

To commemorate this Diamond Jubilee year, QIMR has adopted a motif which transforms the benzenes of our official logo into gemstones
## Contents

Chairman’s Report
Council members
From the Director
A Celebration of 60 Years
Research
  - *Infectious Diseases and Immunology*
  - *Cancer and Cell Biology*
  - *Population Studies and Human Genetics*
  - *Indigenous Health Research Program*
  - *Therapeutic Development and Clinical Trials*
  - *Joint Programs*
Spin-Off Companies
Corporate Division
Committees
Development and Marketing
Postgraduate Training
Education Program
Awards
Grants and Funding
Publications
Invited Lectures and Presentations
Trust Report
  - Trust Members
  - Donors to the Institute
Staff
Research Students at QIMR
Chairman’s Report

Sir Bruce Watson, BE (Elec) B Com

QIMR has become a household name in Queensland as an internationally recognised centre of distinction for medical research. It has achieved this recognition by promoting excellence in the conduct and support of its medical research projects. The Institute also portrays the essential features of innovation, risk taking and discovery which excites all who are associated with the organisation.

QIMR is a statutory body with a tradition that has been developed under the umbrella of the QIMR Act (1945). The Act has been amended many times since it was initially passed by parliament but despite these amendments, it no longer provides an appropriate framework for the operation of a modern medical research institute. Recently, the Minister for Health announced a review of the Act and this has been embraced by the QIMR Council who look forward to working under revised or new legislation.

QIMR is part of the Queensland Government’s Smart State strategy. It is a tangible and successful example of the benefits that may ensue from the bipartisan support that QIMR has received over many years from the Queensland Government. In 2004-2005, QIMR received $5.35 million from the Queensland Government which partly paid for the support services that enabled QIMR’s world-class scientists to successfully compete for $30 million in grants for research into cancer, infectious diseases and other diseases that affect the developed and developing world. We are very grateful for the support of the Queensland Government. However, their contribution has been static for the past few years whereas the costs of doing medical research have risen dramatically. Now the Queensland Government contribution only covers approximately 50% of the total cost of accommodating QIMR’s research scientists and students. Medical research is expensive and to achieve the breakthroughs that Queenslanders expect, scientists require the latest in equipment, facilities and support. QIMR Council and the QIMR Trust are challenged by our scientists’ needs and recognise the importance of providing world-class facilities, which will underpin their research.

To that end, QIMR Council and the QIMR Trust have funded the expansion of scientific support services at QIMR at a cost of $11.35 million, which includes the fit out of a floor of the Clive Berghofer Cancer Research Centre. The development will accommodate a new proteomics and glycomics facility and the Institute is most grateful to the Federal Government for funding of $5 million to enable the purchase of state-of-the-art equipment for this facility.

QIMR also recognises the need to convert results into knowledge and experimental therapies that have an impact on the prevention and treatment of disease. In most cases, this is a painstakingly slow and expensive process, but one that is being addressed by ensuring that QIMR has the programs, staff and facilities to translate research results into practical solutions for doctors. Thus QIMR accommodates clean manufacturing and clinical trial facilities that enable the preparation and testing of new experimental therapies.

As the cost of accommodating medical research projects increases, QIMR is increasingly dependent upon the support of people who donate or bequeath to the cause. The enthusiasm and commitment of QIMR supporters is truly humbling and the Institute will always strive to commit all that is received to the research effort at QIMR.

QIMR also acknowledges and thanks the many members of its committees. It is particularly indebted to the members of QIMR’s Council and Trust and would like to particularly acknowledge Dr Paul Bartley (1999-2005), Ms Clare Endicott (2000-2005) and Dr Brandon Wainwright (2000-2005) whose terms have concluded for their participation and commitment to the QIMR Council.
Sir Bruce Watson  
AC BE (Elec)BCom

Sir Bruce Watson was born in Queensland in 1928. He became General Manager of the Agnew Nickel Mining Joint Venture in Western Australia in 1975. In 1977, he returned to Brisbane as a Director and later as CEO and Chairman of MIM Holdings Limited. Sir Bruce has been a Member of the Supervisory Board of Metallgesellschaft AG, a Director of Boral Limited, ASARCO Inc, National Australia Bank Limited and Chairman of the Gas Corporation of Queensland Limited. From 1992 to 1995 Sir Bruce served as National President of the Australian Institute of Company Directors and in 1992 as President of the Australasian Institute of Mining and Metallurgy. In June 1985 he was knighted in recognition of his most distinguished service to Queensland industry and in 2004 Sir Bruce was made a Companion of the Order of Australia.

Dr Gerry FitzGerald  
MD BS BHA FACEM FRACMA FACHSE

Dr FitzGerald is the Chief Health Officer for Queensland. He graduated from The University of Queensland in 1976 and after two years at the Mater Hospital, worked as Medical Registrar and subsequently Director of the Emergency Department at Ipswich hospital for over ten years. He joined the Queensland Ambulance Services as Medical Director in 1990 and subsequently became Commissioner for almost ten years. Having held numerous positions within the College for Emergency Medicine and the Journal Emergency Medicine, part of his current position represents the Department of Health on numerous Councils and Boards including the NHMRC and ACHS.

Dr Paul Bartley  
MB BS (Hons) (Qld) FRACP FSEP FACE SIA (Aff) (To 1 June 2005)

Dr Bartley is a Clinical Associate Professor of Medicine, University of Queensland, consultant endocrinologist, and Past President of the Australian Diabetes Society (1994-1996). Dr Bartley was also a Councillor of AMAQ (1997-1999) and a USPHS Research Fellow, NIH in 1975-1976.

Mr Paul Wright  
FAIM FAIBF FAICD

Mr Wright is a widely experienced businessman with over 25 years in senior executive corporate roles encompassing the banking, construction, health insurance and hospitality industries. A company director for over 20 years, he has served as President/Chairman of the Australian Institute of Management and the Royal Flying Doctor Service Queensland Division. He is currently Chairman of the Queensland Institute of Medical Research Trust and The CyberInstitute Pty Ltd. His current board appointments include QIMR, RFDS, The CyberInstitute Pty Ltd and PQ Lifestyles Pty Ltd.

Professor Judith Clements  
BAppSc MAppSc PhD

Professor Clements has over 20 years experience as a basic researcher in biomedical research, primarily in the general field of molecular endocrinology. Her current research seeks understanding of the molecular basis of hormone dependent and urogenital cancers such as prostate, breast, ovarian and endometrial carcinoma. She is currently Program Leader of the Hormone-Dependent Cancer Program within the Science Research Centre at the Queensland University of Technology and also an NHMRC Principal Research Fellow.

Professor Brandon Wainwright  
BSc (Hons) PhD (To 1 June 2005)

Professor Wainwright is a Program Leader at the Institute for Molecular Bioscience at The University of Queensland. Recently his laboratory was amongst those which isolated the gene defective in the most common form of cancer, basal cell carcinoma. Professor Wainwright is a Founding Member of the Asia-Pacific International Molecular Biology Network, Chairman of the Grants Committee of the National Health and Medical Research Council of Australia and was awarded the Gottschalk Medal by the Australian Academy of Science in 1998.

Ms Clare Endicott  
BA LLM (To 1 June 2005)

Ms Endicott was admitted as a Solicitor in 1978 and has practised as a litigation lawyer since her admission. She is a partner of...
Macrossans Lawyers, Chair of the Solicitors Complaints Tribunal, a Senior Counsellor with the Queensland Law Society, a Director of Guide Dogs for the Blind Association Queensland and a Director of Queensland Rail.

**Professor Lyn Griffiths**
BSc(Hons) PhD

Professor Griffiths is Director of the Genomics Research Centre at Griffith University Gold Coast, Head of the GU School of Health Science, and past Director of the Australian Society of Medical Research (ASMR) from 1999 to 2001. She has authored over 90 peer-reviewed publications in molecular genetics international journals, and is Chair of the Scientific Program Committee for the next International Congress of Human Genetics. She was awarded the Centenary Medal for Distinguished Service to Education and Medical Research.

**Professor Peter Brooks**
MD FRACP FRCP Edin FAFRM FAFPHM MD Lund (Hon Causa)

Professor Brooks was Foundation Professor of Rheumatology at the University of Sydney prior to becoming Professor of Medicine at St Vincent’s Hospital, Sydney in 1992. He was appointed Executive Dean of Health Sciences at the University of Queensland in 1998, has extensive research experience in basic inflammation and treatment of rheumatic diseases and has been a member of the Fellowships Committee and Partnerships Committee of the NHMRC.

**Mr Paul Fennelly**
BA LLB

Mr Fennelly is Director-General of the Department of State Development and Innovation and has wide experience in financial management, business and public administration.

**Professor Bryan Campbell**
AM MD BS FRACP FRACMA

Professor Campbell was formerly Chief Health Officer and Head of The University of Queensland Medical School. He has been a Councillor of the Royal Australasian College of Physicians, the Royal Australian College of Medical Administrators and a member of the National Health and Medical Research Council. He is currently Deputy Chair of the Australian Health Ethics Committee and a member of the NHMRC Embryo Research Licensing Committee.

**Professor Alan Lopez**
BSc (Hons) MS Phd
(From 2 June 2005)

Professor Lopez is Professor of Medical Statistics and Population Health at the University of Queensland and a consultant to the World Health Organisation. He has published widely on mortality analysis and causes of death, and is co-author of the seminal Global Burden of Disease Study (1996) which has greatly influenced debates about priority setting and resource allocation in health. He has been awarded major research grants in population health in recognition of his research competence and is a member of Australia’s NHMRC Program Grants Committee.

**Mr Christopher Coyne**
LLB (From 2 June 2005)

Christopher Coyne is a solicitor practising insurance law, health services, corporate governance and risk management. He was admitted as a solicitor in 1979 and was a partner in the national legal firm Clayton Utz from 1984-2004. Adjunct Professor at the T.C. Beirne School of Law, he has been a long serving member of the Mater Health Services Human Research Committee, the Queensland Health Research Ethics Committee, the Australian Health Ethics Committee and the NHMRC Gene and Related Therapy Research Advisory Panel. He is Board Chairman of the Queensland Law Society, Singapore Captive Insurer and is also a Director of the Heart Research Institute (Queensland) and the Makim Pastoral Group.
From the Director

Professor Michael Good, B Sc(Med) MBBS(Hons) PhD MD DSc

This year QIMR celebrates its Diamond Jubilee. Enacted in 1945, the Queensland Institute of Medical Research Act established an institute dedicated to the betterment of the health and well-being of the people of Queensland. From an original staff of seven, housed in temporary quarters in Victoria Park 60 years ago, QIMR has expanded to occupy two multi-story buildings with scientific and support staff exceeding 700 today in 2005.

The Institute’s history is steeped in exceptional people and exceptional research, traditions established early by its Founding Father, Dr Edward Derrick, and Dr Ian Mackerras, first Director. Each year, QIMR contributes to the global bank of medical knowledge and each year, QIMR scientists are recognised and awarded for their discoveries and achievements. The 2004-2005 year is no exception.

Some Research Highlights
In the international arena, QIMR scientists in the EBV Biology Laboratory are helping to combat nasopharyngeal carcinoma, a virulent cancer of the nose and throat which over 100,000 people, mainly Chinese and those of Chinese descent, develop each year. An immunotherapy treatment for this cancer is being developed at QIMR, the only centre in Australia to research the disease.

Each year, there are more than 12,000 deaths related to dengue and in Vietnam it is one of the biggest killers of children under the age of five. Mosquito control researchers have enlisted the aid of copepods, microcrustaceans that prey on the dengue-carrying Aedes aegypti mosquito larvae, to completely eliminate the breeding of these mosquitoes, and consequently dengue, in 42 Vietnamese communities.

Researchers in the Helminth Biology Laboratory form part of an international research consortium, funded by the Gates Foundation, that has developed and initiated clinical trials for recombinant vaccines to combat infection by the human hookworm, a blood-feeding nematode that infects 740 million people throughout the developing world.

Findings from the Clinical Tropical Medicine Laboratory, that a group of HIV drugs known as antiretroviral protease inhibitors may also be effective for treating malaria, hold extremely positive implications for improved health in poorer nations of the world where there are high rates of HIV and malaria co-infection.

Molecular Geneticists have genotyped and mapped the Trichomonas vaginalis genome, a sexually transmitted organism that infects around a billion people worldwide and Molecular Parasitologists have completed successful pilot vaccine trials against canine echinococcosis, which causes hydatid disease in China. In the Molecular Immunology Laboratory, scientists have demonstrated that attenuated infection with an ultra-low dose of parasites can induce immunity to multiple strains of malaria and that cell-mediated immunity appears to be a major component of protection.

Scientists researching women’s cancers discovered that having twins reduces the risk of many types of women’s cancer and that starting a family later in life increases the risk of breast cancer and melanoma, but reduces the risk of ovarian, cervical and uterine cancer. An Australia-first study to find the causes of the poorly understood endometrial cancer was also initiated during the year.

In the Genetic Epidemiology Laboratory, collaborative research with the Royal Prince Alfred Hospital on the influence of genes on alcohol consumption and dependence revealed that although these two factors are closely related, variation in long-term alcohol intake is almost entirely due to genetic differences, indicating that some people are born with an increased risk of developing alcohol-related
problems. The laboratory has also identified a major gene for migraine on chromosome 5 and regions for IQ on chromosomes 2 and 6.

In the Cancer and Population Studies Laboratory, evidence has been found that non-steroidal anti-inflammatory drugs reduce the risk of skin cancer and that smoking and obesity greatly increase the effects of acid reflux in the development of Barrett's oesophagus.

In experimental models, the Immunoregulation Laboratory has shown that IL-4 secretion by tumour cells alters the tumour specific CD8+ T cell response and leads to increased frequencies of secondary tumours. This suggests that production of immunoregulatory hormones is one way that tumour cells can escape elimination by the immune system.

Previous success in treating advanced metastatic melanoma with an autologous dendritic cell-based vaccine in the Cancer Immunotherapy Laboratory has led to a new clinical trial for prostate cancer with Dr Frank Gardiner from The University of Queensland, and the Northern section of the Urological Society of Australia. Other clinical trials currently underway or being planned include immunotherapeutic treatments for human cytomegalovirus, glioma and early stage melanoma.

Two new laboratories were welcomed into the Institute during the year. Dr Qin Cheng, a long-term collaborator in the Infectious Diseases and Immunology Division, now heads the Malaria Drug Resistance and Chemotherapy laboratory, based at the Army Malaria Institute at Enogerra. In October 2004, Professor Sunil Lakhani took up an appointment with The University of Queensland and is now head of the Molecular Pathology Laboratory at QIMR. The Population Studies and Human Genetics Division also welcomed Professor Peter Visscher into its ranks this year, an internationally renowned quantitative geneticist from the University of Edinburgh.

Awards and Achievements
In June 2005, Dr Geoff Hill, head of the Bone Marrow Transplantation Laboratory, was named Queenslander of the Year for advances in his field that may significantly improve patient survival after transplantation. His research may ultimately lead to improvements in cure rates by limiting life-threatening transplant complications whilst enhancing the eradication of leukaemia during the transplant procedure.

Professor Brian Kay became a Member of the Order of Australia (AM) in the Queen's Birthday Honours List for service to medical science and public health, particularly through research into the control and elimination of mosquito-borne arbovirus diseases in northern Australia and Asia.

In May 2005, Daniel Wallace won the Queensland Premier's Award for Medical Research in the Senior Postdoc category for novel research into both anaemia and haemochromatosis – two seemingly opposite conditions in which the same hormone, hepcidin, may hold the key. Kathy Andrews was a finalist for the same Award.

The Derrick-Mackerras Memorial Lecture represents a highlight in QIMR's academic year. This year, the lecture was presented by Dr James Watson, Chief Executive of Genesis Research and Development Corporation. In his lecture entitled B2B – From Bone to B Cells, Dr Watson outlined a new pathway that influenced both B cell and bone development and discussed the implications for new therapeutics to treat disorders such as lupus and osteoporosis.

The Institute's high achievement awards were presented to QIMR staff and supporters following the lecture. Professor Nick Martin, head of Genetic Epidemiology, won the 2004 Ralph Doherty Prize for Excellence and Leadership in Medical Research. The Institute was delighted to make Mr Peter Wills a QIMR Fellow, and to award a Bancroft Medal to Ms Sue Cassidy for her outstanding support to researchers as Animal House Manager. Long Service Awards were presented to two scientists who have given over 25 years service to the Institute, Dr Greg Lawrence and Dr Ihor Misko, both of whom joined the Institute in 1978.

The Indigenous Program celebrated its third anniversary with a Seminar in June 2005. Mr Michael Gooda, CEO for the CRC for Aboriginal Health, gave an enlightening address sharing his insights on contradictions, confusion and ironies in Aboriginal affairs. QIMR is committed to improving Indigenous health through research and this year attracted a new Honours student Simõne Smith and the Program's first cadet, Lisa Whop. A new Project Officer, Vanessa Clements was...
also engaged during the year, in a position funded by the Australian Centre for International and Tropical Health and Nutrition.

**Grants and Funding Success**

NHMRC grants awarded during the 2004-2005 year included eight new project and two program grants, bringing total NHMRC funding to over $17 million in total. For the same period, Institute scientists received three Research Fellowships, three Career Development Awards, five training fellowships and five postgraduate scholarships.

Two NIH grants, totalling over $4 million, were received from the United States, one to develop a global Group A Streptococcus vaccine based on the M-protein, and the other to further explore the genetic epidemiology of alcoholism and comorbidity. Total competitive grants received for the year were almost $31 m.

Eight grants were received from the Queensland Cancer Fund during the year to cover a range of different cancer research areas and the Leukaemia Foundation continues to provide significant funding for the Leukaemia Foundation laboratory headed by Dr Professor Andrew Boyd from The University of Queensland.

QIMR also benefits from other sources, and in December 2004, the Development Department negotiated a sponsorship contract with Suncorp to combat skin cancer in Queensland. Suncorp organised a fund-raising Ride for Research in June 2005 in which over 100 cyclists rode from Rockhampton to Brisbane over seven days, with much publicity. QIMR speakers gave skin cancer seminars in all the major centres along the route and the event raised significant funds for skin cancer research.

The Development Department also performs important functions in providing guided tours of the Institute and organising speakers for external engagements which promote QIMR’s research to the community. During this year, more than 8,000 people learned about the Institute’s work through these tours and engagements. The Department also publishes a quarterly newsletter *Life Lab*, which features our latest research. It has a circulation of 22,000.

The Institute is extremely grateful for the continuing support of Atlantic Philanthropies, Mr Clive Berghofer and the very many other donors, both large and small, whose generous contributions to QIMR progress the cause of medical research in Queensland by no small measure.
The First Laboratory
In the mid 1930s, the Queensland Department of Health established a Laboratory of Microbiology and Pathology, headed by Dr Edward Derrick, with the task of creating a quality forensic pathology service for Queensland. Early discoveries in this laboratory included collaborative work with virologist Dr Macfarlane Burnet from the Walter and Eliza Hall Institute which identified Q Fever, new forms of leptospirosis, and native animals as carriers of various diseases.

War Triggers Change
During World War II, the laboratory’s research activities virtually ceased with the loss of staff into the armed forces and a heavy routine workload. This compelled Derrick to include in his 1944 Annual Report to the Minister of Health that an independent research facility was crucial to solving the state’s disease problems, and should be included in post-war plans for the Queensland. State Cabinet set up a committee chaired by Derrick to consider the proposal and the outcome of their report was the Queensland Institute of Medical Research Act of 1945.

Leading and Housing the New Institute
Dr Ian Murray Mackerras, with extensive experience in malaria control for the Australian Army in New Guinea, was appointed Director on 13 March 1947. Derrick elected to serve as Deputy Director instead, so he could continue running the Laboratory of Microbiology and Pathology whilst setting up QIMR to officially commence operations in 1947.

Dr Josephine Mackerras, granddaughter of esteemed Queensland scientist and physician, Dr Joseph Bancroft, was appointed Senior Parasitologist in 1947. QIMR’s first accommodation was Shed 8, a building in Victoria Park, originally a temporary supply headquarters for the US Army but one which housed the Institute for 30 years.

The Innisfail Field Station
The fevers of north Queensland were a research target stipulated in the QIMR Act, and from 1951 to 1965, a QIMR Field Station based at Innisfail Hospital investigated outbreaks of leptospirosis, scrub typhus, dengue and other tropical fevers. In 1954, an outbreak of dengue fever in north Queensland heightened the need for knowledge of arboviral diseases and as a result, QIMR researchers carried out extensive surveys of mosquito type and distribution across the state during the 1960’s.

Native Animal Vectors
Scientists also studied native animals for rickettsia and other viruses, finding Toxoplasma gondii in Queensland rodents and small marsupials, the murine leukaemia virus in a mouse caught in Derrick’s pantry, and also discovered rodents carried strains of brucellosis. An enterovirus epidemic in 1961-1962 prompted collaborative studies with the Commonwealth Serum Laboratories.

A Change of Leadership
When Ian and Josephine Mackerras retired in 1961, Derrick finally assumed Directorship of the Institute until his own retirement in 1966 when Professor Ralph Doherty was appointed in his place. Having started at QIMR in 1953, Doherty had risen to the position via successive appointments as Senior Epidemiologist and Deputy Director.
He discovered the Ross River virus which caused epidemic polyarthritis and was responsible for QIMR’s first outreach into southeast Asia.

**Research Expands into New Areas**
Throughout the next decade, the Institute's high standard of research continued and expanded into other areas including asthma and longitudinal studies in birth, growth and death trends in the north Queensland Aboriginal population. An Oncology section was formed to address the emerging field of tumour viruses with early success in establishing cancer cell lines, two from Burkitt's lymphoma patients in PNG in which the Epstein-Barr virus was detected, and others in leukaemia. Research into melanoma began in 1970.

**Change of Address and Director**
In 1977, QIMR relocated to new laboratories in the grounds of the Royal Brisbane Hospital. The following year, the Institute also had a new Director, Professor Chev Kidson, who had been Foundation Professor of Medical Biochemistry at The University of Queensland and whose vision for QIMR committed the Institute to a global contribution to medical research with a new focus on major world disease problems.

**An Exciting New Era of Research**
Initiatives during this time included a 5 year malaria vaccine project funded by NHMRC, a major factor in the internationalisation of QIMR, placing it at the forefront globally in the use of monoclonal antibody technology in parasitology. In 1979 a Joint Experimental Oncology Program began with the University of Queensland and the Queensland Cancer Fund as partners. Professor Kay Ellem was appointed as Senior Research Fellow in 1980 to become Deputy Director in 1985 and Acting Director from 1989 to 1990. His interests lay in DNA function and metabolism and the regulation of cell growth and differentiation in various cell states including malignancy.

**New Partners, New Programs**
In late 1985 a federal review of research and education requirements for public and tropical health in Australia prompted the establishment of a Public Health Education and Research Program. Nine centres participated including QIMR, with the outcome of 5 new research programs established as joint initiatives of QIMR and The University of Queensland. These were: Tropical Health, Experimental Oncology, Liver Research, Transplantation Biology and Experimental Haematology. Epidemiology was introduced as a discipline into QIMR during the 1980s, particularly through the methodology of twin studies. Work on the Epstein-Barr Virus began in 1989 and by 1993, this was the principal focus in four QIMR laboratories.

**External Funding Promotes Expansion**
With further expansion only possible through additional funding, Kidson inspired researchers to seek external grants from a range of national and international sources, with such success that QIMR won the Top State Business Achievement Award in 1990 for its contribution to Queensland’s economic development. Added to the administrative independence it had already won in March 1988 when amendments to the QIMR Act converted the Institute to a statutory
authority, QIMR became highly competitive with other academic institutions in attracting world-class researchers to its laboratories.

The Bancroft Centre
Kidson’s final legacy to QIMR was to lobby state government to invest in a new building to house staff numbers which had grown from 50 to 200 under his Directorship. $30 million was committed in the 1988 budget and construction on an eleven storey facility adjacent to the Royal Brisbane Hospital began in 1989. The building was officially opened in 1991 and named The Bancroft Centre as a memorial to the family with whose history QIMR is inextricably linked.

An Era of Collaboration and Partnerships
Professor Lawrie Powell became fifth Director of QIMR in 1990 and led the Institute strategically into an era of collaborative and translational research. The proximity of QIMR to the Royal Brisbane Hospital promoted interactions between researchers and clinicians and provided ready access to the Queensland Radium Institute, the Bone Marrow Transplantation Unit, hospital wards, operating theatres and out-patient clinics for the establishment of clinical trials.

A partnership with The University of Queensland established a new Transplantation Biology Program, combining expertise in basic immunology with surgical skills to study immune tolerance and the cellular mechanisms involved in graft rejection. QIMR research into nutrition became internationally recognised for shifting clinical assessment into the laboratory to result in a substantial improvement in liver transplantation outcomes for children.

In 1993, the Institute was appointed coordinating partner for the Cooperative Research Centre (CRC) for Vaccine Technology, with QIMR scientist Professor Michael Good as Director. It was also a supporting organisation during the setting up of the CRC for Diagnostic Technologies in 1995 and a major partner in the CRC for Human Gene Discovery and the CRC for Aboriginal Health, both of which started work in 1997. The Australian Centre for International and Tropical Health and Nutrition was established in 1995 as a joint venture of The University of Queensland and QIMR with affiliation to the Australian Army Malaria Institute.

Communicating with the World
With the new conference and seminar facilities in the Bancroft Centre, QIMR became a centre for discussion and dissemination of research, attracting renowned national and international speakers in the medical field. Successful international symposia promoted important interactions and the number of visiting international scientists spending extended periods in QIMR laboratories increased markedly. The Derrick Mackerras Memorial Lecture was established as an Institute tradition in 1991.

A Public Relations and Development Department was established in 1994 to increase the awareness and heighten the profile of QIMR amongst community and corporate sectors and to raise vital funds for ongoing research. In 1997, funds of $60 million dollars were made available to QIMR for the construction and operation of a comprehensive

From top: , Members of the Joint Oncology Experimental Program, Members of the Tropical Health Program, The Bancroft Centre and Professor Lawrie Powell, fifth Director of QIMR.
cancer research centre unparalleled in Australian History. $20 million came from an anonymous donor and a further $20 million each from both the Queensland and Federal Governments.

By the end of the 20th Century, QIMR staff numbers had reached 440 with an annual budget that had trebled in just 9 years. Two independent scientific reviews had highly commended the Institute which had also received prestigious Block Funding by the NHMRC. With the new Cancer Centre about to allow for a significant increase in staff numbers, QIMR stood at the threshold of the new millennium in a position to contribute substantially to the new biotechnology and knowledge-based industry being fostered in Queensland.

The New Millennium
The year 2000 saw the retirement of Professor Powell after 10 years and the Directorship assumed by Professor Michael Good, with Professor Adèle Green as Deputy Director.

The Clive Berghofer Cancer Research Centre
The new CBCRC building was officially opened in August 2001 by the Queensland Premier, the Honourable Mr Peter Beattie MP and the Federal Minister for Health and Aged Care, the Honourable Dr Michael Wooldridge MP. The new building enabled QIMR to perform early stage clinical trials alongside molecular biology and epidemiological research, thus greatly accelerating the development of new therapeutics and vaccines.

Commercialisation and the Business of Biotechnology
A Business Development Executive was appointed in 2001 to lead the Institute’s commercial agenda by identifying and protecting the intellectual property generated by QIMR research and actively seeking partners and/or funding for commercialisation of its discoveries. A facility to produce clinical material to a GMP standard for clinical trials of cell-based therapeutics began manufacture in 2002. In the same year, Q-Pharm Pty Ltd, a joint venture between QIMR, The University of Queensland and Professors Hooper and Dickenson, became operational as a Phase 1 Clinical Trials Facility to test potential new therapeutic products on humans.

Indigenous Health
An Indigenous Health Research Program began operations in 2002 with the goal of finding ways to improve the health and well-being of Aboriginal and Torres Strait Islander peoples. The program has built collaborative projects with the cancer and populations studies, malaria and scabies, molecular genetics, molecular immunology and bacterial pathogenesis laboratories.

Now, in 2005, QIMR celebrates it’s 60th year with pride and looks forward to continuing its proven tradition of achievement in cutting edge medical science for another 60 years.
Research at QIMR takes place in 40 different laboratories under four separate Divisions, each with a major focus. A number of important research collaborations within and between the laboratories take place, as well as with external entities.

The Infectious Diseases and Immunology Division focuses on improved understanding of viruses, bacteria and parasites, and how they interact with the immune system with the aim of developing new tools to diagnose, treat and prevent infection.

The Cancer and Cell Biology Division integrates research on the cellular, molecular and genetic basis of a wide range of cancers, including melanoma, leukaemia, breast, ovarian, endometrial and colorectal cancer to develop screening tools for early detection and devise strategies for the treatment and prevention of cancer.

The Population Studies and Human Genetics Division utilises a wide range of contemporary epidemiological, genetic and molecular techniques to investigate a spectrum of diseases relevant to the Australian population aimed at understanding the mechanisms of disease and identifying potential therapeutic targets. This Division includes the Indigenous Health Research Program which carries out collaborative research projects for the improvement of the health and well-being of Aboriginal and Torres Strait Islander peoples.

The Therapeutic Development and Clinical Research Division develops and tests immunotherapeutics manufactured within the Q-Gen laboratory at QIMR. Currently, it oversees clinical trials using cell-based therapeutics that target post-transplant lymphoma, malignant melanoma, prostate cancer and cytomegalovirus infection.
Infectious Diseases and Immunology Division

The focus of the Infectious Diseases and Immunology Division is improved understanding of viruses, bacteria and parasites and how they interact with the immune system. Through such increase in knowledge, it will then be possible to develop:

• new tools to diagnose infection
• new treatments for infection
• new vaccines to prevent infection

Work undertaken by the Division ranges from detailed studies of how the immune system operates, including how it responds to challenge by a variety of infectious agents, to study of the biology of a number of pathogens ranging from viruses to worms – to the development and testing of vaccines.

Highlights of this year have included the appointment of longstanding collaborator, Dr Qin Cheng from the Army Malaria Institute, Enoggera QLD as a Lab Head, awards to Dr Geoff Hill of Queenslander of the Year, and to Professor Brian Kay of an AM for his work in mosquito control. Brian was also a key partner in one of two successful applications to the Gates Foundation from the Division for work on Infectious diseases, the other going to Alex Loukas. Michael Good’s Molecular Immunology laboratory received a significant International Grant from the NIH for vaccine-related research on Group A streptococcus.

Bacterial Pathogenesis
Bone Marrow Transplantation
Cellular Immunology
Clinical Tropical Medicine
EBV Biology
EBV Immunology
EBV Molecular Biology
Helminth Biology
HIV Molecular Virology
Immunology and Infection
Immunoregulation
Immunovirology
Malaria and Scabies
Malaria Biology
Malaria Drug Resistance and Chemotherapy
Molecular Genetics
Molecular Immunology
Molecular Parasitology
Mosquito Control
Tumor Immunology
Infectious Diseases and Immunology Division

Bacterial Pathogenesis

Associate Professor Kadaba Sriprakash

David McMillan, Michael Binks, Catherine Denham
Josephine Shera, Mark Davies, Melina Georgousakis
Karen Taylor, Thanh Tran

This laboratory investigates how Group A streptococcus (GAS) is able to overcome host defense and cause disease. Research is undertaken on characterising novel GAS vaccine antigens, and on the role and extent of horizontal gene transfers between different streptococcal species and how this can turn normally harmless commensal bacteria into potential disease causing bacteria.

Biofilms are communities of bacteria that grow together for their mutual benefit. The bacteria in biofilms have different properties to individual free-living bacteria. Group A streptococci also form biofilms, and this is probably their natural state during a throat infection. Researching how GAS behave in Biofilms gives a greater understanding of how they cause disease.

Research towards effective vaccine against GAS infection
Recent work confirmed the high diversity of circulating types in the northwest part of India, similar to isolates from Australia. However, the composition of the types may differ in these two countries, thus any vaccine based on the highly variable antigen would have to be specifically tailored for the region where it is targeted. The search for other vaccine antigens that will provide broad spectrum protection continues. It has been suggested streptococcal adhesins such as SfbI can offer protection against GAS infection but the laboratory has now shown that although mucosal antibodies to this protein prevents GAS adherence, it does not elicit opsonic antibodies and does not prevent systemic bacterial growth and dissemination to internal organs after subcutaneous GAS challenge.

Fibronectin binding and GAS adherence
GAS expresses a large number of fibronectin binding proteins which promote adherence to host cells. While fibronectin binding is important in adherence, the first event in the process of colonisation, it has now been shown that the extent of fibronectin binding is not a critical determinant of adherence. A collaborative study on phylogenetic analysis of two subtypes of PrtF2, another fibronectin binding adhesin, revealed that one subtype is more variable than the other.

GAS and host innate immunity
Some GAS strains express Streptococcal Inhibitor of Complement (SIC). SIC is a multifunctional protein with distinct structural domains. Molecular dissection of SIC to determine association between its structural and functional domains was undertaken in a collaborative study.

Highlights

Found that Group G streptococcus acquires group A streptococcal genes frequently among populations in whom GAS diseases are endemic.

Discovered that many different sub-types of GAS are circulating in Northern India, similar to observations seen in Indigenous Australians living in the Northern Territory of Australia.

Biofilms are communities of bacteria that grow together for their mutual benefit. The bacteria in biofilms have different properties to individual free-living bacteria. Group A streptococci also form biofilms, and this is probably their natural state during a throat infection. Researching how GAS behave in Biofilms gives a greater understanding of how they cause disease.
Allogeneic stem cell transplantation (SCT) remains the curative treatment of choice for the majority of haematological malignancies but is limited by its serious complications, notably graft-versus-host disease (GVHD). The mobilisation of stem cells by cytokines such as G-CSF has become standard therapy in haematology practise for the purpose of transplantation and has largely replaced bone marrow as a stem cell source. Allogeneic SCT has improved patient outcome relative to traditional bone marrow transplantation. This laboratory has previously determined that G-CSF alters the ability of donor T cells to induce GvHD, although the mechanisms remain unclear.

In the last year the way in which these growth factors influence NKT cells and leukaemia clearance after transplantation has been identified and these findings are now the basis of a clinical trial at The Royal Brisbane Hospital.
Mammalian cells have developed complex mechanisms to alert the body’s immune defence mechanisms to virus infection. After a virus enters a cell, short peptide epitopes of viral origin are processed by the infected cell and presented on the cell surface to flag a population of white blood cells called CTLs to kill the virus-infected cells.

This year, the Cellular Immunology laboratory has conducted studies to determine how long individual antiviral T cell clonal expansions survive in the blood, and made the surprising discovery that a single T cell clone can play a major role in controlling a persistent viral infection for at least 18 years of a person’s life. This study provided an important advance in understanding the longevity and stability of the T cell repertoire towards a persistent pathogen.

Many thousands of potentially antigenic peptides are encoded by an infecting pathogen, however only a small proportion induce measurable T cell responses. A variety of factors can influence the strength of the T cell response to a foreign peptide. Another project conducted this year has revealed that minor changes in the conformation of a foreign peptide, when presented on the surface of an infected cell, can have a major impact on whether T cells are raised against the peptide, as illustrated at left. These data indicate that the immunogenicity of an antigenic peptide is influenced, not only by how well the peptide binds to MHC molecules, but also its bound conformation.

The main focus of the Cellular Immunology Laboratory is the cytotoxic T lymphocyte (CTL) and factors controlling its primary function in killing virus-infected cells, foreign transplanted cells and tumour cells.

**Highlights**

Discovered that large clonal expansions of virus-specific T cells can dominate in the peripheral circulation for at least 18 years

Found that the strength of a cytotoxic T cell response can be influenced by the conformation of the target MHC-bound peptide

Discovered that unusually long cytotoxic T cell epitopes are recognised by a highly restricted repertoire of T cell receptors

Found that T cell receptors can bind MHC-class-I-bound peptides by adopting an orthogonal binding mode

The immunogenicity of a viral cytotoxic T cell epitope is controlled by its MHC-bound conformation.

A. Immunogenic peptide conformation (side view)

B. Non-immunogenic peptide conformation (side view)

C. Blue: Immunogenic conformation

Green: Non-immunogenic conformation (top view)
The Clinical Tropical Medicine Laboratory investigates how malaria and other parasites cause disease, and on developing new and improved tests both to diagnose these parasite infections, and to detect drug resistance.

The discovery that a number of antiretroviral protease inhibitors (ARPI) already in use for treating HIV infection show activity against the malaria parasite has led to further in vitro work and to studies in a rodent model of malaria.

Drug resistance in human scabies is a growing threat to community-based control programs currently underway in Indigenous communities across northern Australia. A joint project with Dr Shelley Walton and others from the Menzies School of Health Research to discover the mechanisms of drug resistance in human scabies has developed a genotyping test that may assist in detecting drug resistance in this condition.

In collaboration with Dr Andrew Kotze from CSIRO and Dr Moses Bockarie from the PNG Institute for Medical Research, further progress has been made in studies of drug resistance in human intestinal worms. Molecular and in vitro diagnostic tests for detection of drug resistance have been developed and applied in the field, and a third annual field study was carried out in Madang Province, PNG in November 2004. This work is supported by a Grant from the World Health Organisation (TDR).

Also funded by the World Health Organisation is a collaborative study with Dr Qin Cheng of the Australian Army Malaria Institute, which explores why so-called rapid diagnostic tests for malaria sometimes do not work. This has led to the identification of significant polymorphism in the HRP-II protein which is now the target of rapid diagnostic tests, as it may help explain why the tests are sometimes unreliable. Studies to identify the epitopes recognised by the antibodies used in these tests are underway.

Following an outbreak of severe infections due to a drug-resistant strain of *Staphylococcus aureus* in a southeast Queensland Indigenous community, a project has been undertaken to investigate the epidemiology of this important pathogen. This work is in collaboration with investigators at the Indigenous Health Unit at the School for Population Health, UQ, the CRC for Diagnostics at QUT, and is funded in part by Queensland Health.

Also funded by the World Health Organisation is a collaborative study with Dr Qin Cheng of the Australian Army Malaria Institute, which explores why so-called rapid diagnostic tests for malaria sometimes do not work. This has led to the identification of significant polymorphism in the HRP-II protein which is now the target of rapid diagnostic tests, as it may help explain why the tests are sometimes unreliable. Studies to identify the epitopes recognised by the antibodies used in these tests are underway.

Highlights

- Found that clinically used antiretroviral protease inhibitors, such as ritonavir-lopinavir, saquinavir and atazanavir, inhibit the in vitro growth of *P. falciparum* at or below concentrations found in human plasma after oral drug administration.
- Identified a cellulose sulphate derivative (CS10) with potential as an anti-adhesive agent targeting the major receptor associated with pregnancy malaria.
- Found that adherence of *P. falciparum*-infected erythrocytes to novel receptor on CHO-745 cells is inhibited by protein A in the presence of human serum.
- Further field testing undertaken in PNG of an in vitro test to measure how sensitive intestinal worms are to antiparasitic drugs.
- Identified immunogenic antigens with the potential for diagnosis of strongyloidiasis.
EBV Biology

The EBV Biology Laboratory is committed to understanding the biology and immunology of two clinically important human pathogens, Epstein-Barr virus (EBV) and vaccinia virus (VACV) with the ultimate aim of capturing laboratory findings and using them in human clinical trials.

Evaluating a formulation designed to control nasopharyngeal carcinoma (NPC)

The laboratory is testing the protective capacity of a vaccine formulation that consists of a series of minimal EBV-specific CTL epitopes encoded in a replication-deficient form of adenovirus. Results show that this formulation can protect immunocompromised mice in which human nasopharyngeal carcinoma (NPC) cells are growing, as illustrated at left.

A peptide-based protocol for activating an immune response in human cells suitable for adoptive transfer

Conditions required to stimulate components of the EBV-specific cytotoxic T cell response that will be used in adoptive transfer into patients with end-stage have been defined. The protocol involves the use of defined peptides bound to an EBV-transformed cell of the patients under defined conditions.

Mapping immune responses to vaccinia virus (VACV)

Collaborative projects to map and characterise the CD8+ T cell responses to vaccinia virus VACV in humans and mice have been undertaken this year. This work is important for understanding VACV as a vaccine vector and also for understanding immunity to poxviruses such as monkeypox and smallpox, the emergence or re-emergence of which is a current cause for concern.

A major achievement during the year has been mapping of the CD8+ T cell epitopes of VACV in mice, and using this new information to show that the route of vaccination can affect the parts of a virus or vaccine to which the immune system directs its response. These findings were published in the prestigious Journal of Experimental Medicine in January 2005.
The memory response to EBV involves killer T cells that possess antiviral and anti-self capabilities. The priority is to discover how these cross-reactive immune cells discriminate self and viral signals in generating protective immunity without inciting harmful autoimmunity.

Over several years, this laboratory has built a robust human model system to probe the regulatory mechanisms that maintain peripheral self tolerance without compromising T cell responses against pathogens. This model is based on an earlier finding that auto-reactive cytotoxic T cells can be induced in culture by molecular mimicry involving cross-reactive T cells that corecognise closely homologous self and viral peptides.

The stage has now been reached in these research endeavours where cross-reactive memory T cells can readily be manipulated in culture so that they still respond to viral peptide but no longer respond to self peptides. This split molecular mimicry model provides an exciting opportunity to identify novel biomarkers associated with self-tolerance, autoimmunity and antiviral immunity.

So far, the search for these biomarkers has predominantly targeted signalling proteins associated with T cell receptor activation and proteins involved in the lytic machinery of cytolytic T cells. Interesting differences have been found between memory T cells reactivated by normal means or by simple manipulation to justify a full-scale search for candidate genes and proteins involved in split molecular mimicry. Outcomes from this approach will result in the design of novel strategies to deactivate harmful T cell behaviour in autoimmune disease or bolster T cell responses to overcome tolerance resistance in tumour regression.

Antiviral CD8 T cells coexpress granzyme A, granzyme B and perforin proteins.

Highlights

Discovered a novel procedure to switch off auto-reactivity in cross-reactive T cells without affecting the response to pathogen

Demonstrated that activated antiviral T cells express abundant transcripts for recombination activating gene (RAG1) and RAG2, suggesting that T cell receptor revision may occur in the periphery.
The Epstein-Barr virus (EBV) is a herpes virus that is the causative agent of infectious mononucleosis and is also associated with several human malignancies. The major area of research in this laboratory involves the study of how the virus is able to transform normal cells into cancer cells.

The Epstein-Barr virus nuclear antigen (EBNA) 3B is a hydrophilic, proline rich, charged protein which is thought to be involved in transcriptional regulation of both viral and cellular genes. EBNA3B is targeted exclusively to the cell nucleus and studies have shown that it localises to discrete sub-nuclear granules within the nucleus. Colocalisation studies utilising a fusion protein between enhanced green fluorescent protein (EGFP) and EBNA3B with FLAG-tagged EBNA3A and EBNA3C proteins demonstrated that EBNA3B colocalised with both EBNA3A and EBNA3C in the nucleus of cells.

Computer analyses identified four potential nuclear localisation signals (NLS) in the EBNA3B amino acid sequence. Utilising fusion proteins between EGFP and deletion constructs of EBNA3B, and also site-directed mutagenesis, three of the four NLS (aa160-166; aa430-434; aa867-873) were shown to be functional, while an additional NLS (aa243-246) was identified within the N-terminal region of EBNA3B.

The Epstein-Barr virus nuclear antigen (EBNA) 3B is a hydrophilic, proline rich, charged protein which is thought to be involved in transcriptional regulation of both viral and cellular genes. EBNA3B is targeted exclusively to the cell nucleus and studies have shown that it localises to discrete sub-nuclear granules within the nucleus. Colocalisation studies utilising a fusion protein between enhanced green fluorescent protein (EGFP) and EBNA3B with FLAG-tagged EBNA3A and EBNA3C proteins demonstrated that EBNA3B colocalised with both EBNA3A and EBNA3C in the nucleus of cells.

Computer analyses identified four potential nuclear localisation signals (NLS) in the EBNA3B amino acid sequence. Utilising fusion proteins between EGFP and deletion constructs of EBNA3B, and also site-directed mutagenesis, three of the four NLS (aa160-166; aa430-434; aa867-873) were shown to be functional, while an additional NLS (aa243-246) was identified within the N-terminal region of EBNA3B.

Completed definition of nuclear targeting sequences in the EBNA3B protein

Characterised the Human Sin1 Gene

Showed that the Human Sin1 Gene encodes a JNK-binding Protein

This laboratory also has an interest in the human Sin1 protein and has investigated the function of the full-length human Sin1 protein and a C-terminally truncated isoform, Sin1α, which is produced by alternative splicing. Immunoblot analysis using an anti-Sin1 polyclonal antibody showed that full-length Sin1 and several smaller isoforms are widely expressed. Sin1 was demonstrated to bind to c-Jun N-terminal kinase (JNK) in vitro and in vivo, while no interaction with p38- or ERK1/2-family MAPKs was observed. The Sin1α isoform also could also form a complex with JNK in vivo. Despite localising in distinct compartments within the cell, both Sin1 and Sin1α, colocalised with JNK, suggesting that the Sin1 proteins could recruit JNK. Over-expression of full-length Sin1 inhibited the activation of JNK by UV-C in DG75 cells, as well as basal JNK-activity in HEK293 cells. These data suggest that the human Sin1 proteins may act as scaffold molecules in the regulation of signalling by JNK.
The Helminth Laboratory studies the molecular interactions between blood-feeding helminth parasites and their vertebrate hosts, and seeks avenues for exploiting this information to develop vaccines against these parasites.

In the past 12 months significant progress has been made in the development of recombinant vaccines for the two most important helminth parasites of humans – schistosomes and hookworms.

A recombinant vaccine against hookworm disease has been developed using a canine model to develop and test the efficacy of an aspartic haemoglobinase vaccine against the dog hookworm, _Ancylostoma caninum_. The vaccine causes significant reductions in adult worm burdens and egg counts in vaccinated animals. Antibodies against the recombinant haemoglobinase inhibit blood-feeding, depriving hookworms of nutrients required for growth and reproduction.

Families of receptors on the surface of the intravascular schistosome blood flukes have been identified using a novel signal sequence trap methodology. Families of four-transmembrane (tetraspanins) and seven-transmembrane proteins have been identified from the tegument, the outermost layer of the parasite that is in direct contact with host blood. Three of these proteins provide varying levels of vaccine efficacy in a murine model of schistosomiasis. The most promising of these antigens is the tetraspanin, TSP-2. This vaccine reduces worm burdens and liver egg counts by 65-70% and holds great promise as a schistosomiasis vaccine.

Funding has recently been obtained for a new project exploring the secretome of the carcinogenic liver fluke, _Opisthorchis viverrini_, a parasite endemic throughout SE Asia where it is a major cause of liver cancer (cholangiocarcinoma). Secretions of the parasite cause cells to hyperproliferate with unchecked DNA damage, providing a likely mechanism by which this helminth causes cancer. The mitogenic secretions from _O. viverrini_ are being identified and the molecular pathways associated with cancer development characterised.

---

**Highlights**

- Developed and initiated clinical trials for recombinant hookworm vaccines
- Developed novel, efficacious recombinant vaccines against schistosomiasis
- Identified genes associated with the transition to parasitism in parasitic nematodes
The focus of the HIV Molecular Virology Laboratory is the discovery of key viral or cellular molecules required for HIV to grow, and to target their action so that HIV growth can be effectively blocked.

This laboratory studies the HIV-1 life cycle focusing on entry into human cells and the process of reverse transcription. Reverse transcription is the process by which the HIV-1 RNA genome is converted into a double strand of DNA by the viral enzyme reverse transcriptase (RT). Although this enzyme is targeted by current anti-HIV-1 drugs such as AZT and nevirapine, virus drug-resistance is a continuing problem that will require alternative therapeutic options. The HIV laboratory has discovered new complexities in reverse transcription that have revealed possible new drug targets.

It was found that a viral protein called Tat enhanced reverse transcription and that its function is essential for HIV-1 replication. It has also been determined that Tat acts directly with RT to increase its activity. Experiments are in progress to discover exactly how Tat achieves this effect. Once this is determined it should be possible to identify compounds that can block Tat: RT interaction and prevent HIV-1 replication and AIDS.

Although HIV-1 contains all the necessary machinery to initiate reverse transcription directly inside the virus, the process does not begin until HIV-1 infects a cell. However, HIV-1 can be induced to reverse transcribe in a test tube. This process is called natural endogenous reverse transcription (NERT) and detailed analysis shows that NERT differs from reverse transcription following infection of human cells. This suggests that cellular factors play a critical role. Recent research showed that the cellular enzyme PKC influences an early step during infection that affects either entry into the cell and possible reverse transcription.

Virus-like particles (VLP) made by acute lymphocytic leukaemia cells and cultured cell lines have also been investigated. These VLP are found in a cellular compartment called a multivesiculuar body (MVB). Other RNA viruses such as Ebola and HIV-1 are known to traffic through MVB suggesting this VLP contains RNA. Identification of these VLP using UCSF Virochip technology is being undertaken in collaboration with Professor Joe DeRisi from the University of California, San Francisco. During the year, the HIV laboratory also co-organised the inaugural Australian Centre for Hepatitis Virology and HIV Virology Interest Group.
The Immunology and Infection Laboratory studies the host immune response during malaria and leishmaniasis, two important human parasitic diseases. In particular, researchers distinguish responses to parasites that lead to control of disease and those that contribute to tissue pathology.

The parasites causing malaria and visceral leishmaniasis can stimulate the host immunity to control infection and/or cause tissue pathology. Work on experimental models of cerebral malaria caused by *Plasmodium berghei* and visceral leishmaniasis caused by *Leishmania donovani* has identified several key molecules and cells that cause tissue pathology associated with infection. Interestingly, these molecules and cells also play important roles in protection against infection, indicating they are either produced in excessive amounts or in inappropriate tissue locations.

Studies on experimental cerebral malaria using microarray analysis have identified several distinct immunological pathways that contribute to the pathogenesis associated with cerebral malaria. Members of these pathways are potential targets for blockade to prevent cerebral malaria. Work on experimental cerebral malaria has confirmed that distinct mechanisms of cerebral malaria pathogenesis exist and tests are currently underway to see if cerebral malaria can be prevented by blocking candidate molecules identified in the microarray analysis.

Research on visceral leishmaniasis has revealed important, but distinct, roles for lymphotoxin α and tumour necrosis factor in the host immune response during experimental visceral leishmaniasis. It has been discovered that lymphotoxin α plays an important role in stimulating the expression of an important cellular adhesion molecule called VCAM-1 in the liver following infection with *Leishmania donovani*. VCAM-1 expression in the liver is a critical event in the recruitment of immune cells to control parasite growth in this organ.

Important molecules that contribute to pathology during infectious diseases have been identified and strategies are being devised to limit the negative consequences of these molecules while retaining the activities that are important for controlling parasitic infection.

Leishmania donovani amastigotes in the liver (small cells with 2 purple spots) around a host macrophage (large purple nuclei). Parasites grow inside host macrophages before bursting out and re-infecting other cells.

Highlights

- Discovered distinct roles for lymphotoxin α and tumor necrosis factor in the host response during visceral leishmaniasis
- Identified distinct immunological pathways contributing to the pathogenesis associated with cerebral malaria
Found that IL-2 regulates perforin and granzyme gene expression in primary CD8+ T cells independently of its effects on survival and proliferation.

Showed that IL-4 secretion by tumour cells alters the tumour-specific CD8+ T cell response and leads to increased frequencies of secondary tumors in experimental models.

The goal of the Immunoregulation Laboratory is to understand how CD8+ T lymphocytes acquire the ability to kill infected cells and tumours so that these processes can be controlled through improved vaccine design or immunotherapy.

When CD8+ cytolytic T lymphocytes (CTL) interact with pathogen-infected or tumour cells, they release perforin and several enzymes known as granzymes. Perforin enables delivery of the granzymes into the target cell cytoplasm where they cause cell death. CTL also secrete cytokines, such as interferon-γ, that act on target cells and cells of the immune system to enhance pathogen or tumour elimination. The Immunoregulation laboratory is investigating ways to control activation and inhibition of CTL so that they express functions needed for host protection.

A core project seeks to understand how expression of the genes encoding perforin and three granzymes (A, B and C) is controlled during development of CTL from their non-cytolytic precursors. Certain cytokines are known to be powerful regulators of CTL activity. It was recently found that the T cell growth factor interleukin 2 (IL-2) enhances expression of perforin and granzymes A, B and C independently of its effects on survival or proliferation. By using bcl-2-transgenic CD8+ T cells that survive without IL-2, it was further shown that primary induction of granzymes A, B and C requires both IL-2 and T cell receptor cross-linking, whereas perforin and IFN-γ can be induced by T cell receptor cross-linking alone.

Studies of the effect of IL-4 on tumour immunity continue. Tumour cells engineered to secrete IL-4 were cleared more slowly and gave rise to secondary tumours more frequently than control tumour cells. The laboratory has now shown that CD8+ T cells are required for tumour clearance in this model and that IL-4 secretion by the tumour alters the functional profiles of responding CD8+ T cells, inducing IL-4 and enhancing granzyme A and B expression. Further work is needed to determine whether these effects account for impaired tumour clearance. The work suggests that IL-4 favours immune escape by tumours but might also be used to limit host-damaging CTL responses.
The Immunovirology Laboratory is exploiting new knowledge about interactions between viruses and the immune system to develop novel antiviral and anti-cancer strategies.

The Kunjin replicon vector technology, developed by Associate Professor Alexander Khromykh from The University of Queensland, has formed the basis of a new company Replikun Biotech Pty Limited which is seeking to explore the application of this technology for vaccine, gene therapy and protein production applications. Several joint patents have been filed and the new company has received funding from Start-Up Australia. HIV/SIV vaccine trials in monkeys are envisaged for the end of 2005 in collaboration with Associate Professor Stephen Kent from the University of Melbourne.

CBio Ltd has developed a novel anti-inflammatory compound, Cpn10, and under a contract R&D agreement, the Immunovirology laboratory was involved in establishing how this biological agent mediates its activity. Cpn10 appears to be able to limit the induction of inflammatory signals by agonists to some Toll-like receptors. CBio Ltd has recently initiated a series of Phase II clinical trials in inflammatory conditions including rheumatoid arthritis, psoriasis and multiple sclerosis.

In collaboration with Dr T Antalis of the University of Maryland, USA, the laboratory discovered that SerpinB2 (PAI-2) is a retinoblastoma protein (Rb) binding protein. It has also been shown that SerpinB2 is able to protect Rb from the accelerated degradation mediated by human papillomavirus (HPV) E7, and that the rescued Rb silences HPV oncoprotein transcription in cervical cancer cells.

Continued efforts to understand the immunopathology of Ross River virus (RRV) disease have led to the discovery that this virus uses \( \alpha_1\beta_1 \) integrin, a collagen IV receptor, as a receptor to infect mammalian cells. The use of this receptor may explain how RRV can persist in synovial macrophages, since these cells upregulate \( \alpha_1\beta_1 \) integrin expression upon entry into an inflammatory environment.

The Kunjin replicon vector technology, developed by Associate Professor Alexander Khromykh from The University of Queensland, has formed the basis of a new company Replikun Biotech Pty Limited which is seeking to explore the application of this technology for vaccine, gene therapy and protein production applications. Several joint patents have been filed and the new company has received funding from Start-Up Australia. HIV/SIV vaccine trials in monkeys are envisaged for the end of 2005 in collaboration with Associate Professor Stephen Kent from the University of Melbourne.

CBio Ltd has developed a novel anti-inflammatory compound, Cpn10, and under a contract R&D agreement, the Immunovirology laboratory was involved in establishing how this biological agent mediates its activity. Cpn10 appears to be able to limit the induction of inflammatory signals by agonists to some Toll-like receptors. CBio Ltd has recently initiated a series of Phase II clinical trials in inflammatory conditions including rheumatoid arthritis, psoriasis and multiple sclerosis.

In collaboration with Dr T Antalis of the University of Maryland, USA, the laboratory discovered that SerpinB2 (PAI-2) is a retinoblastoma protein (Rb) binding protein. It has also been shown that SerpinB2 is able to protect Rb from the accelerated degradation mediated by human papillomavirus (HPV) E7, and that the rescued Rb silences HPV oncoprotein transcription in cervical cancer cells.

Continued efforts to understand the immunopathology of Ross River virus (RRV) disease have led to the discovery that this virus uses \( \alpha_1\beta_1 \) integrin, a collagen IV receptor, as a receptor to infect mammalian cells. The use of this receptor may explain how RRV can persist in synovial macrophages, since these cells upregulate \( \alpha_1\beta_1 \) integrin expression upon entry into an inflammatory environment.
Malaria and Scabies

Malaria and scabies are infectious diseases which affect mainly Indigenous people, and for which there are no vaccines. Identification of vaccine candidates and understanding of host immunity and evasion of this by the parasites are the major research activities undertaken in this laboratory.

Scabies is a major problem among Aboriginal people and new control measures against the causative agent, the mite *Sarcoptes scabiei*, are clearly needed. Work last year identified homologues of a number of house dust mite allergens in the laboratory’s cDNA sequence library. A multigene family of homologues of the group 3 allergen gene, a serine protease was found. Surprisingly all except one of these had the triad of amino acids essential for catalysis mutated so they cannot be functional proteases and have been termed scabies mite inactivated protease paralogues (SMIPPs). The major advance this year is the expression of SMIPPs in *Pichia pastoris*, with the demonstration that a SMIPP can act as a competitive inhibitor of the protease chymotrypsin. This confirms the hypothesis that SMIPPs most likely mediate an immune evasion strategy that the parasite has evolved as an adaptation to parasitism, and this may present an unanticipated target for protective control measures.

Vaccine studies are being carried out with CLAG 9 which was previously identified in this laboratory. One member of a gene family of rhoptry protein(s), it may be involved in erythrocyte invasion by merozoites and has been implicated in cytoadherence, making it an attractive vaccine candidate molecule. Parasite invasion into the erythrocytes which differ in their ABO blood group are under investigation, and also a family of proteins called ETRAMPs located in the parasitophorous vacuole membrane. This membrane represents the interface between the intracellular malaria parasite and its host cell and plays a key role in parasite development. This research has revealed a surprising organisation of ETRAMP proteins in the parasitophorous vacuole membrane and, for the first time, shed light on the molecular architecture of this compartment.

**Highlights**

- Demonstrated that a SMIPP is a competitive inhibitor of a protease
- Found that CLAG 9 peptides are immunogenic in humans
- Determined that merozoites preferentially invade group A1 erythrocytes confirming the presence of a parasite lectin on the merozoite surface
- Developed a method for measuring commitment to gametocytogenesis in *P. falciparum* cultures
- Discovered a surprising spatial organisation of ETRAMPs at the malaria host-parasite interface
Malaria due to the parasite *Plasmodium falciparum*, remains the third leading cause of death due to an infectious disease worldwide. The Malaria Biology Laboratory is focused on understanding the biology of this complex organism to eventually develop new vaccines and therapeutic agents in malaria cells. Because of their central role in protein turnover and synthesis in parasites they each represent a target at which novel anti-malaria drugs could be directed.

Prevention and treatment of malaria has become increasingly difficult due to drug resistance. Anti-malarial agents are now required to combat multi-drug resistant (MDR) malaria. Drug combinations, including agents that have different targets, complimentary pharmacokinetic parameters and synergistic interactions are particularly important in the fight against MDR parasites as they can prevent the propagation of drug resistant parasite populations. Preliminary studies indicate that anti-retroviral protease inhibitors (ARPIs) may be useful in the treatment of malaria, particularly in individuals coinfected with HIV-1 – exciting results that suggest a novel group of drugs already available for clinical use may be useful against MDR malaria.

Completion of both the human and parasite genomes offers unprecedented opportunities for new insights, particularly in rationale drug design. In collaboration with Professor John Dalton of the University of Technology in Sydney, other potential targets for new anti-malarial drugs are being investigated, specifically four amino peptidases believed to be involved in releasing amino acids from protein substrates.

Above: Connolly surface of the active site of plasmepsin II: Crystal structure of the complex between plasmepsin II and Rs370, a 30 nM inhibitor (left panel). Result of docking saquinavir to the active site of plasmepsinII using the program GOLD (right panel).

Below: Cytoadherence of *P.falciparum* infected human red cells to a melanoma cell

**Highlights**

- Identified antiretroviral agents as potential anti-malarial drugs
- Identified which *P. falciparum* aminopeptidase is targeted by the anti-cancer drug Bestatin
- Identified a lectin like protein on the surface of merozoites
This laboratory investigates mechanisms and processes involved in the development of drug resistance in malaria parasites and factors influencing the survival and spread of drug resistance in ex vivo cultured parasites and parasite clones using conventional molecular analysis. Recombinant fusion proteins of several dominant variants in *E. coli* have been expressed and used to examine the presence and specificity of antibodies in volunteers infected with 3D7. The extent of genetic diversity in *P. falciparum* Histidine Rich Protein 2 (PfHRP2) and its affect on the performance of PfHRP2-based malaria Rapid Diagnostic Tests (RDTs) has also been investigated.
This laboratory works on the two most common protozoan parasites of medical importance, the sexually transmitted *Trichomonas vaginalis* and the intestinal parasite *Giardia duodenalis*. Research areas include: determinants of drug resistance, virulence and pathogenesis, the sequencing, structure and plasticity of their genomes in relation to these traits, the development of new drugs and treatments, and their epidemiology.

*Trichomonas vaginalis* is an anaerobic, amitochondrial protozoan parasite of man. It is the most common sexually transmitted infection worldwide and infects about one billion people. *T. vaginalis* causes vaginitis, preterm delivery, low birth weight and increased infant mortality. It also predisposes to increased incidence of HIV/AIDS and is strongly associated with cervical cancer. The recommended treatment for this infection is metronidazole, but treatment failures and drug resistance are common.

Objectives in this laboratory are to understand mechanisms of drug resistance, pathogenicity and virulence, and find improved treatment strategies with novel drugs and targets. In the last year the focus has been on identifying mechanisms of clinical resistance in *T. vaginalis* and to this end, drug resistance lines against novel drugs have been generated.

Syngeneic lines (the parent susceptible strain and the drug-resistant line derived from it) uniquely allow the identification of proteins expressed or over-expressed in the drug resistant line in comparison with the parent strain. Membrane proteins over-expressed in a multidrug-resistant line are being targeted. Two unrelated drugs which are approved for human use are also currently being investigated. Furazolidone was used successfully intravaginally to treat a patient with highly metronidazole-resistant parasites, and the second drug is an antiviral agent. A study was undertaken of antenatal patients in Port Moresby which used culture methods to determine a 70% prevalence for *T. vaginalis*. A study of antenatal patients in Colombo is currently being planned to verify low prevalence found by a colleague and the laboratory is also involved in a study of *T. vaginalis* among male AIDS patients in Los Angeles.

Completion of the sequencing of the *T. vaginalis* genome has greatly assisted studies identifying drug resistance genes, mapping studies, and studies on the great diversity and plasticity among different isolates collected from around the world. This work parallels studies on genome plasticity and drug resistance in *Giardia*, particularly in regard to the subtelomeric regions.
Infectious Diseases and Immunology Division

Molecular Immunology

Professor Michael Good
Colleen Olive, Michelle Wykes, Huji Xu
Michael Batzloff, Manisha Pandey, Lynette Beattie
Joanne Dyer, Jon Hartas, Jay Heise-Seabrook

The focus of this laboratory is the development of vaccines for diseases that affect some of the world’s most impoverished people.

Malaria kills over one million children each year, mostly in Africa. The parasite evades immunity by rapidly changing its coat proteins and by destroying immunological memory. The coat proteins are recognised by antibodies which are able to kill parasites and inhibit their growth using a variety of mechanisms. However, by rapidly changing antigen expression and via allelic polymorphism, the parasite can enhance its survival.

The approach in this laboratory has been to enhance cell-mediated immunity (CMI) to target antigens which vary much less. Some of these antigens have been identified and approaches developed to boost CMI by administering attenuated or killed parasites in extremely low dose. At the same time, the mechanism by which the parasite ablates immunological memory is being studied. Once these are understood, the objective is to design approaches to counter this and prolong immunity.

Group A streptococcus is an organism responsible for over 500,000 deaths per year, mostly due to rheumatic heart disease. Streptococcal research in this laboratory is focusing on a 12 amino acid peptide that has been identified in the carboxyterminal region of the M protein, a surface protein and major virulence factor for the organism. Antibodies to the peptide can opsonise and destroy the organism. A method to fold this peptide (referred to as J8) into the α-helical form that the peptide adopts when present in its native configuration has been developed. This was critical to inducing an immunogenic response. J8 has been linked to diphtheria toxoid and it has been shown that this conjugate vaccine is immunogenic and protective in an outbred mouse strain. The laboratory has received funding from NIH to conduct a clinical trial of a vaccine it has been developing for over 10 years. The phase I trial will occur at QIMR and a phase II trial is planned for Fiji, a country with a very high incidence of rheumatic fever and streptococcal pyoderma.

Highlights
Demonstrated that different lipopeptide constructs can induce self-adjuvanting immune responses to group A streptococcus
Demonstrated that malaria infection causes apoptosis of parasite-specific memory B cells and plasma cells
Demonstrated that attenuated infection with an ultra-low dose of parasites can induce immunity to multiple strains of malaria and that CMI appears to be a major component of protection
Schistosomiasis and echinococcosis are two of the major diseases caused by parasitic worms. Work on schistosomiasis in this laboratory includes large immunogenetic surveys in China where environmental and genetic factors involved in predisposition to infection are being dissected. The molecular and cellular mechanisms leading to formation of fibrotic hepatic lesions, the major contributing source of the chronic disease are also being analysed. An intervention study was completed to show that buffalo infections are responsible for the persistence of human schistosomiasis transmission in China, work that has implications for future integrated schistosomiasis control directly influencing future health care policy there. This includes the use of chemotherapy for bovines and underpins the rationale for development and implementation of a veterinary-based vaccine for use in buffalo.

The characterisation of nuclear and mitochondrial genomes continues, along with investigation of molecular variation both in the genomes and in key molecules that may be the targets of new drugs and vaccines. Molecular markers are being used to investigate genetic diversity. The population structure of parasitic worm infections in Vietnam and the complete genome of *Schistosoma japonicum* is being sequenced, due to be finalised in late 2005. A microarray has been constructed that contains the majority of the schistosome transcriptome. This, along with proteomics analysis, is being used to investigate differential gene expression during different stages of the schistosome lifecycle, strain variation and the effect of drugs and vaccines on schistosome worms. The laboratory also focuses on schistosome iron metabolism, dyneins, secreted enzymes and surface molecules, including receptors, which are potential novel targets for drugs and vaccines.

A highly sensitive and specific blood test for diagnosis of patients infected with hydatid disease is being developed and researchers are determining whether the method (based on a recombinant antigen, EpC1) can be applied for detection of the disease in sheep and marsupials. Successful pilot vaccination trials against canine echinococcosis have been undertaken in China using recombinant antigens expressed by the mature adult worm and, with new NIH funding, these trials will soon be repeated.
Mosquito Control

The Mosquito Control Laboratory, designated by the World Health Organisation as an official global Collaborating Centre for Environmental Management for Vector Control, specialises in designing new mosquito surveillance and control strategies.

This laboratory is part of the Australian Centre for International and Tropical Health and Nutrition linked to The University of Queensland and the School of Population Health. With the global resurgence in dengue and dengue haemorrhagic fever, collaborative research projects on surveillance and control of the global vector, *Aedes aegypti* have been extended.

Community based dengue control projects in collaboration with the Vietnam Ministry of Health and the National Institute of Hygiene and Epidemiology in Hanoi, have now successfully eradicated *Aedes aegypti* mosquitoes from 40 communes in northern and central Vietnam. To compliment this program, contemporary surveillance methods for dengue mosquitoes in a range of different water storage containers have been evaluated to help prioritise control efforts in other dengue endemic areas.

Research on age-grading methods for Australian mosquito vectors has continued in collaboration with Scott O’Neill at the University of Queensland and the Mosquito and Arbovirus Research Committee Inc. (MARC). Field evaluations of a cuticular hydrocarbon based method were conducted to determine the age of *Aedes aegypti* mosquitoes and thereby define dengue transmission risk. A PCR-based gene expression assay to aid better understanding of the relationship between insect age and the transmission of a range of pathogens to humans, livestock or plants is also being developed.

The Mosquito Control Laboratory has worked closely with MARC, an independent organisation made up of representatives from Local Governments from Queensland, New South Wales and Victoria, and Queensland Health and industry. Research projects have included: development of contemporary control strategies using microbial based insecticides, biology and ecology of *Ochlerotatus procax* and other freshwater arbovirus vectors in south-east Queensland, and Population genetics and vector competence of *Ochlerotatus notoscriptus*. Another project is developing practical control options for freshwater arbovirus vectors in Australia and will define the relative importance of different habitat types in terms and production of medically important vectors and evaluation of sustained release formulations of insecticides for control of freshwater species.
The major goal of the Tumour Immunology Laboratory is to obtain a deeper understanding of the mechanisms by which an immune response to tumors may be generated, augmented and applied to the inhibition of tumor growth.

The research interests of the Tumour Immunology laboratory are focused on understanding the role of virus-specific cellular immunity in the control of Epstein-Barr virus (EBV) and human cytomegalovirus-associated diseases. An important contribution of this work relates to research on EBV-associated tumours such as nasopharyngeal carcinoma and Hodgkin’s lymphoma.

Preclinical work on the development of a therapeutic vaccine for these cancers has recently been published. Based on these successful studies, the laboratory has been awarded a large grant from the National Institutes of Health (USA) to further refine this technology.

Further research in this laboratory focuses on human cytomegalovirus (HCMV) which causes birth defects in new born babies as well as serious clinical complications in transplant patients. Extensive studies have been carried out to delineate the mechanisms by which our immune system controls this virus. Based on these studies, a novel vaccine formulation has been developed which is aimed at preventing cytomegalovirus disease in both new born babies and transplant patients. Preliminary testing has shown that this vaccine formulation is highly effective in inducing a protective immune response.

Highlights

- Developed and commercially licensed therapeutic vaccine for nasopharyngeal carcinoma and Hodgkin’s lymphoma
- Preclinical testing of HCMV prophylactic vaccine showed promising results
- Developed HCMV immune monitoring diagnostic kit for transplant patients
- Demonstrated EBNA1 as a target for T-cell based immunotherapies for EBV-associated malignancies
The Cancer and Cell Biology Division consists of 12 laboratories located in both the Bancroft Centre and the Clive Berghofer Cancer Research Centre. Research carried out in the Division covers a variety of topics to integrate investigations of the cellular, molecular and genetic basis of a wide range of cancers, including melanoma, leukaemia, breast, ovarian and colorectal cancer. Research themes include the normal mechanisms that control cell growth and stable inheritance of genetic information, identification of cancer susceptibility genes, development of mouse models to study in vitro functions of cancer genes, developing screening tools for early detection and devising normal strategies for the treatment and prevention of cancer. The Division also collaborates in an important program with QIMR’s Population Studies and Human Genetics Division aimed at understanding environmental and lifestyle factors that contribute to cancer susceptibility. In addition, there are research interactions with the University of Queensland and various hospitals that have helped translation of research findings into patient care.

The acquisition of a Live Cell Imaging system this year gives researchers faster access to high quality fluorescence microscopy and the ability to image protein localisation, functions, molecular interactions, and signalling networks in real-time in living cells. The investment in high-throughput technologies such as Illumina BeadStation will enable our scientists to generate genome-wide expression profiles for multiple samples on a single BeadChip. The Illumina BeadStation is also designed to generate reproducible profiles from degraded RNAs such as those derived from formalin-fixed, paraffin-embedded tissues – a feat not possible with cDNA microarray. The machine also supports analysis of differences in single nucleotide polymorphism (SNP) allele frequencies between cancer cases and controls in large numbers of samples. This technology ensures the Division maintains an internationally competitive edge.

Cancer Genetics
Cancer Immunotherapy
Dendritic Cells and Cancer
Human Genetics
Leukaemia Foundation
Membrane Transport
Molecular Cancer Epidemiology
Molecular Pathology
QCF Transgenics
Radiation Biology and Oncology
RBWH Conjoint Gastroenterology
Signal Transduction
The Cancer Genetics Laboratory aims to understand why some people get cancer and how cancer develops from a normal cell. Of particular interest are breast and ovarian cancer which are often found together in the same families and share many similar characteristics.

The majority of research in the Cancer Genetics laboratory is focused around two major Australian resources, the Kathleen Cuningham Foundation for Research into Familial Breast Cancer (kConFab) and the Australian Ovarian Cancer Study.

In collaboration with Dr Khanna of the Tumour Immunology laboratory, researchers have evaluated the function of the CHEK2 1100delC truncating SNP and found it associated with a two-fold increased risk of breast cancer. Analyses of expression and phosphorylation suggest that the truncating variant is likely to act by haploinsufficiency, but that some compensation occurs to allow normal degradation of Cdc25A which might explain the low risk associated with the variant.

Collaborations with overseas researchers have helped identify a group of more than 1800 BRCA1 and BRCA2 carriers to look for modifier genes that might help to explain the variable expression and penetrance of mutations in these genes. Analysis carried out by Dr Spurdle of the Molecular Cancer Epidemiology laboratory suggests that, in contrast to previous reports, the repeat polymorphism in the AIB1 gene does not modify the breast cancer risk in BRCA1 or BRCA2 carriers.

Work with Dr Berchuck from Duke University in North Carolina, USA, has shown that a variant in the promoter of the progesterone receptor gene appears to reduce the risk of endometrioid and clear cell ovarian cancer. This finding has been replicated by two other groups and is possibly the first bone fide ovarian cancer susceptibility gene to be described.

In conjunction with researchers at the Sanger Centre in the UK, the laboratory reported the existence in mutations in the ERBB2 gene in lung cancers and a borderline ovarian cancer. That about 10% borderline serous ovarian tumours carry mutations in this gene has since been confirmed, and the functional consequences of this mutation, and others in BRAF and KRAS are now being evaluated.
The immune system has the power and specificity to eradicate cancers, with few side-effects. This laboratory develops treatments for solid tumours, based on boosting the anti-tumour immune response in patients.

Melanoma has been a particular focus of tumour immunotherapy research, having a long history of response to treatments based on the vaccine approach. In conjunction with Prof Michael O’Rourke from Mater Hospital, an autologous dendritic cell-based vaccine has been used to treat patients with advanced metastatic melanoma. Several patients had complete remission of their melanomas, durable to date with an average of over 4 years. The success of these trials led to a new trial for prostate cancer with Dr Frank Gardiner from the University of Queensland, and the Northern section of the Urological Society of Australia. Critical goals for the next year are establishment of more efficient methods to generate dendritic cells from the blood of patients, testing of these cells in a clinical trial, and continuing research into the characteristics of a successful anti-tumour T cell response.

The Depot Cytokine Group (KE, MH, XH) have successfully developed novel technologies for the encapsulation in an inert, biocompatible matrix, of a highly selected subline of HEK293 cells capable of resisting the intratumoural environment. Once transfected with any of several relevant cytokines, the encapsulated cells can be injected into tumours, initiating combined anti-angiogenic and cell-mediated immune responses.

In murine cancer models, this approach is capable of complete eradication of cancers that resist other forms of immunotherapy. Encapsulation confines the cytokines to the tumour, thus avoiding the toxic effects of many cytokines when they enter the systemic circulation. Due to its generic nature, the depot cytokine strategy will advance the speed with which this potential therapeutic intervention in cancer can be given. Now that the proof-of-principle has been established in mouse models, the first clinical trial of this approach is being planned, initially with canine patients.
Dendritic cells (DC) are potent initiators of the immune response currently used in novel therapies for melanoma, prostate and glioblastoma at the QIMR. This laboratory explores the function of DC in patients with cancer and healthy donors, and studies the mechanisms responsible for the success achieved with DC-based immunotherapy clinical trials.

A completed evaluation of 120 women with various stages of breast cancer established the presence of high numbers of immature/dysfunctional cells occupying the DC compartment. Although sharing some properties of bona fide DC, their capacity to efficiently present antigen is significantly reduced. Of interest, this population was also observed in patients with advanced prostate cancer (10) and glioblastoma (6). While present in very small numbers, the functional characterisation of these cells in healthy individuals has been completed to show that they behave as the same cells from patients with cancer, and a direct correlation between the severity of the clinical status and cell numbers was also found. Although this immature population is poorly responsive to most maturation stimuli, CD40 ligand renders them mature and activated. This finding opens the possibility for clinical intervention when DC are required from patients with advanced cancer. The increased number of these immature cells (DR+IC) is now proposed to play an important role in disease development.

The laboratory studies the requirements for antigen loading using RNA as an antigen source and this year, in collaboration with Professors Vassil Apostolopoulos and Geoffrey Pietersz from the Austin Research Institute in Melbourne, investigated novel strategies improving RNA loading into DC. This project was funded by the QCF and developed together with Associate Professor Michael McGuckin.

In collaboration with Dr Giampietro Corradin from the Université de Lausanne Switzerland, the analysis of pathways of antigen presentation by DC using a synthetic protein model has now been completed and results using specific drug inhibitors show that various pathways of intracellular presentation are involved in the process. Another project which investigated the benefits for DC culture derived from using a novel synthetic support, providing an environment resembling the extracellular matrix, was undertaken in collaboration with Tissue Therapies, Brisbane.

Identified immature cells (DR+IC) in advanced cases of glioma, breast and prostate cancers

Completed detailed characterisation of DR+IC in healthy individuals

Found that DR+IC are responsive to CD40 ligand

Discovered that antigen presentation of a synthetic protein by DC requires endosome-cytosol transport and vacuolar acidification and protease activity in the lysosome
Cancer and Cell Biology Division

Human Genetics

Dr Nicholas Hayward
Graeme Walker, Sandra Pavey, Derek Nancarrow
Jane Palmer, Mitchell Stark, Herlina Handoko
Heather Smith, Cheryl Filipich

The major focus of this group is to identify novel cancer genes and study the way in which defects in these genes are associated with cancer predisposition or development. Key approaches include genome-wide linkage analysis, candidate gene mutation screening, gene expression profiling, cellular profiling and transgenics.

Gene expression profiling was used to identify a molecular signature characteristic of PTEN mutation status in a panel of 60 melanoma cell lines. Using siRNA and drug inhibitors, a number of the differentially expressed genes are currently being investigated to determine whether they are downstream effectors of the PI3K pathway and could be useful targets for therapeutic intervention to treat melanoma.

Using strains of transgenic mice, it has been demonstrated that combined activation of the Hras and Cdk4 oncogenes predisposes mice to melanoma. These tumours can arise spontaneously and are often highly metastatic, thus providing a useful model of the human disease.

In other studies of melanoma and oesophageal cancer, a number of promising chromosomal regions showing copy number variation have been found. These are potential sites at which novel tumour suppressor genes and oncogenes reside. Studies to identify some of these genes are ongoing.

Highlights

- Showed that mice carrying simultaneous activating mutations in the Hras and Cdk4 oncogenes spontaneously develop metastatic melanoma
- Showed that cutaneous melanoma predisposition was not associated with variants of the EGF gene
- Identified a gene expression profile associated with mutation of the PTEN gene
- Identified novel regions of chromosomal gain or loss in cutaneous melanoma using array-based comparative genomic hybridisation (aCGH)
- Identified novel regions of chromosomal gain or loss in oesophageal cancer using (aCGH)
- Reported that activation of the MAPK pathway is a common event in uveal melanomas although it rarely occurs through mutation of BRAF or RAS

Above: Melanocytes cultured from Hras transgenic mice.
Below: Pancreatic islet tumours staining for insulin in mice lacking the Men1 gene
Eph and ephrin membrane proteins in cancer
When Eph and ephrin proteins on adjacent cells bind together they initiate bidirectional signals which affect the cytoskeleton and adhesion proteins generally resulting in de-adhesion and contact repulsion. Paradoxically, in certain situations these interactions can lead to increased adhesion to other cells or to extracellular matrix proteins. These interactions have critical roles during embryonic development and in pathological states, notably in cancer. Recent work on the structural basis of Eph-ephrin interaction has shed light on the determinants of the outcome of Eph-ephrin signalling. These studies have also paved the way for the development of antibodies and antagonists for EphA3, a protein expressed on a high proportion of metastatic melanomas and other human tumours, as potential cancer therapeutics.

Fat protocadherin
Fat is an adhesion molecule which is involved in normal development and in kidney function. An abnormal form of this protein is expressed in some forms of T cell leukaemia and lymphoma. This abnormal form inhibits the normal fat protein and may thus contribute to tumour spread.

CD44
A group headed by Professor David Gotley, from The University of Queensland, is studying the role of the CD44 protein in tumours. A spliced form of CD44 normally seen only during development is re-expressed in cancers. This form of CD44 confers metastatic properties on tumours.

Apoptosis inhibitors
Another group, headed by Dr Jason Lickliter, studies the over-expression in tumours of proteins which inhibit programmed cell death. One example is the causative role of increased expression of bcl-2 in follicular lymphoma. A novel anti-bcl-2 drug has been shown to induce cell death in tumours. Another project explores ways of circumventing resistance to Glivec, a therapeutic molecule targeted against the Bcr-Abl oncoprotein in chronic myeloid leukaemia.

The Leukaemia Foundation of Queensland Laboratory is seeking to understand the role of critical cellular proteins in the causation and evolution of leukaemia and other cancers. Funding for this laboratory is provided largely by the Leukaemia Foundation

A. Fat expression in 26 hours post fertilisation (hpf) zebrafish embryo (vz – ventricles, ov-optic vesicle, L-lens)
B. 33 hpf embryo showing expression in the intestinal bulb (ib)
C. 50 hpf embryo showing expression in branchial arches (ba)
The liver plays a major role in the regulation of iron metabolism. The main focus of this laboratory is understanding how liver-expressed proteins sense iron levels and how they regulate the absorption and distribution of iron within the body.

The appropriate level of iron in the body is maintained through the regulation of its absorption in the duodenum. It is now clear that the liver plays a very important role in regulating the level of iron in the body. This laboratory has been studying the role of several liver expressed proteins, HFE, transferrin receptor 2, ferroportin, hemojuvelin and hepcidin in this very important pathway.

Mutations in all of these genes are associated with various forms of the iron overload disorder hereditary haemochromatosis. This laboratory was first to identify the basis of juvenile haemochromatosis in Australian patients and has recently shown that mutations in hemojuvelin in these patients result in this disease, a form of iron overload which presents early in life and can cause severe organ dysfunction if not detected and treated. It also found that coinheritance of HFE and hemojuvelin mutations does not cause increased iron loading.

An initial characterisation of a new mouse model of type 3 haemochromatosis, the transferrin receptor 2 knockout mouse, has been performed to show that it develops significant iron overload even when fed a normal diet. Future research is aimed at its complete characterisation and identifying the role of this protein in regulating iron metabolism. These and other studies in the laboratory will give further insight into the biology of these iron-related disorders with a view to developing therapeutics for their treatment.
Both environment and genetics contribute to the genesis of common cancers such as those of the endometrium, breast, ovary and colon. This laboratory seeks a comprehensive understanding of how these factors interact in the population in order to develop avenues for prevention.

Work assessing the cancer-causing potential of subtle variants of the known breast cancer predisposition genes BRCA1 and BRCA2 has continued. Application of a mathematical model has formally classified 13/29 variants as being of low clinical significance, based on genetic and tumour histopathology. Functional studies on two variants have supported their classification from non-functional approaches. Radiosensitivity analysis on lymphoblastoid cell lines from individuals with known BRCA1 mutations, and normal controls, have been completed to show that great variation in assay responses across the groups will confound classification of variants based on these assays.

From studies assessing proteins that interact with BRCA1 as potential breast cancer genes, it has been shown that there are no gene mutations and no significantly altered expression of the gene transcript for the novel genome maintenance protein BIX in normal cells from familial breast cancer patients, and that the double-strand break repair gene Rad51 gene is not mutated in familial breast cancer patients.

In collaborative work with Drs Chenevix-Trench and Webb, no significant breast cancer or ovarian cancer risk associated with several double-strand break repair gene common variants previously suggested to be associated with increased cancer risk have been found.

Research led by Dr Joanne Young has shown that, in addition to the traditional model of cancer development from adenomatous polyps, colorectal cancers may develop from serrated polyps. Studies of this ‘serrated pathway’ have been extended to describe a novel familial syndrome of colorectal cancer predisposition which evolves through serrated precursor lesions, termed the serrated pathway syndrome or SPS. Further studies have lead to the mapping of two genomic regions of linkage, and candidate genes within these regions are currently being identified. The potential key outcome of this project will be the definition of the underlying genetic predisposition to develop serrated neoplasia. Recognition of this syndrome, with possible presymptomatic testing, will allow families to be monitored for the lesions that act as aggressive precursors to their colorectal cancers, thereby preventing cancer and potential deaths.

Highlights

- Formally classified a significant proportion of BRCA1 and BRCA2 variants previously of unknown clinical significance
- Developed and applied assays to assess the function of variants of BRCA1 and BRCA2
- Described a novel syndrome of familial colorectal cancer (SPS)
- Established areas of linkage to two genomic regions in SPS kindreds
The Molecular Pathology Laboratory studies the genetics and cell biology of breast cancer to improve the classification and diagnosis of the disease.

The Molecular Pathology laboratory arrived at QIMR as a group in Oct 2004, directly from London. Since then, the laboratory has been established, and in particular, ethical clearance has been obtained from the Royal Brisbane and Women's Hospital to collect surgical specimens of breast tissue from consented patients.

This bank of frozen normal and tumour tissue will be used by the laboratory, and through a collaboration with the Australian Biospecimens Network (ABN), is available to other researchers with ethical approval across Australia.

Tissue microarrays (TMA) of familial breast cancers have been created for the KConFab organisation with whom the laboratory collaborates and creation of a series of TMAs of >1000 cases of sporadic breast tumours has also begun. These TMAs will be invaluable in future studies for screening novel markers of breast tumour subclassification and correlating with patient survival.

Establishment of the new laboratory at QIMR
Tissue microarrays of familial breast cancers created

Highlights

Top left: Triple immunofluorescent labelling of normal breast epithelium for CK5/6, CK8/18 and SMA
Top right: Immunohistochemistry for known (S100A2, TP63) and novel (14-3-3s, SPARC) myoepithelial cell markers which aid diagnostic practice and characterisation of breast carcinomas with myoepithelial/basal phenotype
Below: Comparative genomic hybridisation of a breast pleomorphic lobular carcinoma in situ
The Queensland Cancer Fund (QCF) Transgenic Laboratory studies cell and developmental biology with particular emphasis on using transgenic and knockout mice. Major areas of research are epigenetic control of gene expression during development, angiogenesis or new blood vessel growth as a target for treatment in cancer, and cellular control of growth and differentiation.

X chromosome inactivation (XCI) is a developmental process operating in female mammals to compensate for X-linked gene dosage differences between males and females. XCI is a model system for studying the epigenetic control of gene expression both in normal (e.g., during embryonic development and adult tissue maintenance) and disease states such as cancer. This laboratory studies the role that the *Xist* and *Tsix* genes play in XCI by controlling chromosome counting and choice, the initiation and spread of gene inactivation, and its stable maintenance. These master genes orchestrate the epigenetic mechanisms that ultimately control gene expression by changing chromatin ultrastructure.

Other research studies the involvement of Vegf-B, a member of the vascular endothelial growth factor family, in developmental and pathological angiogenesis (new blood vessel growth). While angiogenesis is essential during development and in normal processes such as wound healing, it is detrimental in cancer and arthritis where it facilitates disease progression. Understanding the precise function of angiogenic factors is essential for designing anti-angiogenic treatment strategies.

The laboratory also investigates the pocket protein family as a major axis of control for cell cycle progression and cellular differentiation during development and in cancer. This project concentrates particularly on the role of pocket proteins in melanocyte homeostasis and in preventing their progression to melanoma.

Found that the *Xist* knockout forces primary non-random X inactivation which indicates that the 5′-repeat is uniquely involved in chromosome choice during X inactivation.

Demonstrated that transgenic over-expression of VEGF-B isoforms by endothelial cells potentiates postnatal vessel growth both *in vivo* and *in vitro*.

Showed that melanocytes in conditional Rb−/− mice are normal *in vivo* but exhibit proliferation and pigmentation defects *in vitro*.
The major focus in this laboratory is the recognition of damage in DNA employing human and animal models to investigate genome instability, cancer predisposition and neurodegeneration. Research is also directed toward isolating novel therapeutic compounds from snake venom and early detection of prostate cancer.

The gene defective in the human genetic disorder ataxia-telangiectasia (A-T), ATM, plays a central role in recognising double strand breaks in DNA and signalling these breaks to slow the passage of cells through the cell cycle so the DNA damage can be repaired. Failure to recognise and repair this damage in A-T patients results in increased frequency of cancer and progressive neurodegeneration. Being able to slow or halt the progress of this neurodegeneration would be of great benefit to A-T patients. This laboratory previously showed that a novel isoindoline nitroxide was capable of preventing some of the neurological features in ATM mutant mice and studies are in currently in progress to determine whether this compound protects against neurodegeneration.

Investigations are continuing on a novel downstream substrate for ATM called Mre11 which also plays a key role in maintaining the integrity of the genome. The functional consequences of the phosphorylation reaction involved are being delineated. It has been demonstrated that autophosphorylation and activation of ATM involves several separate phosphorylation sites on the molecule. Since A-T is one of several related syndromes characterised by ataxia, investigations are underway on whether other related human ataxia’s might also feature a reduced capacity to deal with different forms of damage in DNA. It has also been shown that the protein Aprataxin, defective in ataxia with oculomotor apraxia type 1 (AOA1), is involved in the recognition and repair of single strand breaks in DNA. Work is currently underway on the gene product Senataxin, defective in a related syndrome AOA2, and on other novel forms of AOA with a view to determining whether the proteins involved participate in the DNA damage response.

Other projects in the laboratory include the isolation of genes and proteins from Australian snakes with a view to developing human therapeutics, the establishment of multiple markers for early detection and prognosis of prostate cancer and delineation of pathways of development in lower eukaryotes.
The Royal Brisbane and Women’s Hospital (RBWH) Gastroenterology Laboratory is characterising the genetic changes underlying the progression of a pre-cancerous colonic polyp to colon cancer to increase understanding of this disease and improve treatment options. Both polyps and cancers are studied in an effort to identify genetic markers for progression, prognosis and response to therapy.

Unlike most other internal cancers, bowel cancer can be prevented by examination of the bowel by a procedure called colonoscopy. During colonoscopy the small polypoid growths in which bowel cancer develops can be removed. The Gastroenterology laboratory focuses on better understanding the different types of polypoid growths that occur in the bowel, who is most likely to have these and which polyp types are most likely to turn into cancers. Genetic changes in different types of polyps and a wide range of bowel cancers are studied. Access to a large number of polyps and cancers collected from patients treated at the Royal Brisbane and Women’s Hospital over many years is crucial in this work. The laboratory is extremely grateful to these patients who have kindly consented to have excess tissue from removed polyps and cancers used for research.

The subset of cancers that have frequent gene methylation and often a high level of microsatellite instability have been of particular interest this year. These tumours frequently have oncogenic mutations in a growth regulatory gene called BRAF and seem to evolve from large, proximal hyperplastic polyps. This finding is changing clinical practice by making colonoscopists more aware of the importance of removing this type of polyp and of following up such patients in case they develop further polyps. Cancers which arise from these polyps have quite different genetic alterations when compared to other bowel cancers, as well as different clinical features. Despite responding less well to conventional chemotherapy, these cancers usually result in a more favourable prognosis. Because of the importance of more fully understanding the genetic basis of these differences, methylation changes in important cell growth regulatory genes such as BMP-3, THBS4 and KLF4 are being examined. A better understanding of these genetic changes may lead to improved therapy for patients.

**Highlights**

- Demonstrated which subset of polyps most frequently bear BRAF mutations and therefore are the likely precursors of heavily methylated cancers
- Identified specific genes heavily methylated and down regulated in some bowel cancers
The goal in this laboratory is to understand signal transduction pathways involved in the detection, signalling, or repair of DNA damage, an area of critical importance to cancer research.

Several genes are involved in the DNA damage response pathways. ATM, BRCA1, BRCA2, CHK2 and p53 contribute to breast cancers. Research in this laboratory attempts to identify other known or novel genes in these pathways which might have similar involvement in cancer susceptibility by preventing the generation of mutations in human DNA. Evidence has been provided that the protein truncating variant of CHEK2, 1100delC, is associated with a moderate increase in breast cancer risk, although the variant is rare in Australia. Analyses of expression and phosphorylation of wild type CHK2 in lymphoblastoid cell lines established from heterozygous carriers, suggested that the variant is likely to act by haploinsufficiency and analysis of CDC25A degradation, a downstream target of CHK2, suggests that some compensation occurs to allow normal degradation of CDC25A. Such compensation of the 1100delC defect in CHEK2 might explain the rather low breast cancer risk associated with the CHEK2 variant.

A novel protein implicated in breast cancer progression, Cep55, has been functionally characterised. CEP55 silencing by siRNA induces several cytokinesis defects including multinucleation, cells arresting at the midbody stage, and multipolar spindle formation, changes which are characteristic of cancer cells. A nuclear localisation signal (NLS), 385KRKK388, has been mapped within the amino terminus of ATM and it has been demonstrated that ATM is imported in the nucleus by conventional import receptor, importin α/β heterodimer. Analyses of various ATM deletion constructs uncovered a requirement for the amino terminus of ATM for its association with chromatin and for optimal kinase activity. Protein phosphatase 2A has been identified as an important regulator of ATM activation.

In collaboration with Dr Pandita, Washington University School of Medicine, USA, the regulation of ATM activity by histone acetyltransferase, MOF was studied to show that expression of a dominant negative mutant hMOF or by RNAi-mediated hMOF knockdown, results in decreased ATM autophosphorylation, ATM kinase activity, phosphorylation of downstream effectors of ATM and DNA repair while increasing cell killing. In addition, decreased hMOF activity is associated with loss of the cell cycle checkpoint response to DNA double strand breaks (DSBs). These results suggest that hMOF influences the function of ATM.
The Population Studies and Human Genetics Division utilises a wide range of contemporary epidemiological, genetic and molecular techniques to investigate a spectrum of diseases relevant to the Australian population. The Division has a particular strength in cancer research with broad programs in skin, ovarian, oesophageal, head and neck and liver cancer. Scientists in the Division also make extensive use of twins to analyse the relative importance of genes and environment in a variety of important health problems and traits including endometriosis, drug and alcohol dependence, asthma, pigmentation, fertility and cognitive ability. Another long term research initiative has been in the area of gastrointestinal disease, with studies on liver fibrosis, paediatric cholestasis, alcoholic liver disease and disorders associated with body iron overload such as hemochromatosis. Together, these conditions place an enormous burden on the Australian health care system and it is only by understanding their prevalence, aetiology and basic biology that we can move towards prevention and more effective therapies.

Many of the Division’s projects make extensive use of large population studies to investigate patterns of disease and the Division is indebted to the public for their continued goodwill in helping to make so much of this research possible. The collection of epidemiological and clinical data allows researchers to correlate patterns of disease with environmental factors, and blood and tissue samples enable a variety of genetic and basic molecular analyses to be carried out. The need to conduct large-scale studies means that and the Division possesses extensive resources for high throughput genotyping and gene expression analysis. These population and genetic approaches are complemented by detailed biochemical and cellular studies to investigate mechanisms of disease and identify potential therapeutic targets.

The Division’s scientists are its greatest resource and our staff continue to make key contributions to the scientific community locally, nationally and internationally. It is through the combined efforts of epidemiologists, clinicians, nurses, molecular biologists and chemists that significant health problems can be addressed in a comprehensive, efficient and highly effective manner.

- Cancer and Population Studies
- Genetic Epidemiology
- Hepatic Fibrosis
- Iron Metabolism
- Melanoma Genomics
- Molecular Epidemiology
The Cancer and Population Studies Group investigates the causes of cancer and other chronic diseases to develop avenues for their prevention.

Over the past five years the Cancer and Population Studies Group has conducted nationwide studies of cancers of the ovary and oesophagus, using a combination of epidemiological methodology and genetic analyses of blood and tumour tissue to identify their causes. Clinical and research collaborations across Australia have enabled recruitment of several thousand people with these cancers and related conditions, along with cancer-free people with whom to compare environmental exposures and expression of various relevant genes.

A separate study examines the premalignant condition, Barrett’s oesophagus, which is strongly related to adenocarcinoma of the oesophagus. In another project related to ovarian cancer, the quality of life of women with ovarian cancer is being examined in relation to receiving palliative chemotherapy for very advanced disease.

Follow-up on the occurrence of skin cancers in some 1,000 residents of the Queensland township of Nambour who were participants in the Nambour Skin Cancer Prevention Trial (1992-1996) is now in its nineteenth year. Information relevant to sun exposure, general lifestyle, other sun-related disease, and occurrence of other cancers and serious diseases as well has been collected. A major project funded by the World Cancer Research Fund is dedicated to clarifying the role of diet in skin cancer through these same residents. Researchers are also collaborating with a European consortium to study links between skin cancer and human papilloma virus skin infections.

Collaborative research into Indigenous health and related training and education continues to increase and diversify. Projects include asthma, bronchiectasis, diabetes in youth, diagnosis of obstetric and paediatric infectious disease and management of cancer in adults.

Obtained first evidence that non-steroidal anti-inflammatory drugs (NSAIDs) reduce a person’s risk of skin cancer
Found that smoking and obesity greatly increase the effects of acid reflux in the development of Barrett’s oesophagus
On-going Nambour residents skin cancer study reached its 19th year of data collection
Recruitment of cases for national study of ovarian and oesophageal cancer neared completion with over 3000 cases recruited to date
Data collection continued from participants via questionnaires, interviews, tumour blocks, blood and tissue samples
The Genetic Epidemiology Group investigates the pattern of disease in families, particularly identical and non-identical twins, to assess the relative importance of genes and environment in a variety of important health problems and locate the genes responsible using genetic linkage and association analysis.

Alcohol consumption is associated with many medical and social variables. With support from both NHMRC and four large new grants from the U.S. National Institute of Alcoholism and Alcohol Abuse, 5,000 pairs of twins plus their relatives have been surveyed, and telephone interviews conducted with over 11,000 twins and 4000 spouses. Genetic factors account for about two thirds of the susceptibility to alcoholism in both women and men in Australia. A major finding is that the aldehyde dehydrogenase gene complex on chromosome 12 has a significant effect on risk of alcoholism and detailed fine mapping of this region will be used to identify causal variants.

In the women’s health area, one project is underway to find the major genes influencing endometriosis and another on super-fertility, as manifested in familial dizygotic twinning. 213 pairs of sisters who each have DZ twins have been genotyped to date with an ultimate sample of 500 planned.

Another focus is the way melanoma runs in families. All familial cases and twins with melanoma diagnosed in Queensland and NSW from 1982-1990 have been identified and are now being followed up in a major NIH funded project which compiles details on sun exposure, natural coloration and moliness in index cases and their relatives.

Much of this year was spent investigating the role of the *BRAF* gene as a melanoma risk factor. Moles (melanocytic naevi) are a major risk factor for melanoma and an NHMRC/QCF-funded study is counting and mapping moles in over 1000 pairs of Brisbane 12 year old twins and following them up at their fourteenth birthday. Individual differences in moliness in this sample have been shown to be largely genetic and a recently completed genome scan indicates a number of chromosomal regions of major effect.

Professor Peter Visscher, a leading quantitative geneticist from the University of Edinburgh, and 3 of his PhD students joined the group during the year.

Examples of naevi from a mole study which is contributing to a better understanding of the role of genetic factors in melanoma. Since 1992, 1220 twins and their siblings have been genotyped in the study.
Identified a panel of serological markers of early hepatic fibrogenesis in patients with cystic fibrosis liver disease

Joined a team of investigators awarded an NHMRC Program Grant to study the pathobiological mechanisms of iron-induced cellular and tissue injury in the liver

Revealed that the protective bile acid ursodeoxycholic acid is significantly elevated in patients with CF in the absence of liver disease, suggesting the possible existence of an inducible protective mechanism, which fails in some CF patients

Investigations in the Hepatic Fibrosis Group centre around the role of liver cells called hepatic stellate cells, in the fibrosis and cirrhosis (liver scar tissue formation), which accompanies serious liver diseases such as the paediatric cholestatic liver diseases biliary atresia and cystic fibrosis and the hereditary iron overload condition, haemochromatosis

Haemochromatosis and iron-induced hepatic injury
This laboratory has a long history of researching the mechanisms of cellular and tissue injury in the liver in the iron overload disease haemochromatosis. The hepatic stellate cell is the principal cell of interest as it is responsible for excess collagen deposition causing scarring of the liver, or fibrosis, in chronic liver diseases. Recently, the laboratory has identified a number of signalling molecules within these stellate cells, which respond to iron-binding proteins interacting with specific binding sites on the cell surface. These signalling molecules appear to be responsible for activating genes involved in inflammation and fibrosis, therefore the current hypothesis is that either iron, or the iron-binding proteins ferritin or transferrin, induce a cascade of signalling events that regulate the phenotype of stellate cells in haemochromatosis. Research is now focused on identifying both external and internal signalling receptor sites in hepatic stellate cells in an attempt to knock out the effects of ferritin and transferrin on stellate cell genes involved in fibrogenesis.

Paediatric Cholestatic Liver Disease
Researchers are also working on the potential mechanisms responsible for paediatric cholestatic liver diseases, such as cystic fibrosis and extrahepatic biliary atresia. In work currently funded by a National Institutes of Health (NIH) grant, a clinical research consortium has been formed with Prof Ross Shepherd, Pediatric Gastroenterology, Washington University, St Louis. This group recently reported that there are clear differences in the serum and biliary bile acid profile in children with liver disease due to cystic fibrosis compared to those children with cystic fibrosis, but no liver disease. Of great interest was the revelation that the protective bile acid ursodeoxycholic acid is significantly elevated in patients with CF in the absence of liver disease, suggesting the possible existence of an inducible protective mechanism, which fails in some CF patients. Current research is now focused on investigating the genetic predisposition of certain patients with CF to develop serious liver disease, well before lung function is diminished.
Iron Metabolism

Associate Professor Greg Anderson
Professor Lawrie Powell, Jeanette Dixon, David Frazer
Emily Hay, Kirstin Millard, Therese Murphy
Sarah Wilkins

The Iron Metabolism Laboratory focuses on understanding how the essential element iron is transported into and out of cells and how disruption of these processes can lead to human diseases such as haemochromatosis.

Iron is essential for a large number of critical cellular processes but its concentration in the body must be kept within defined limits. Too little iron can result in anaemia while too much can cause damage to vital organs such as the liver and heart. A central goal of the Iron Metabolism Laboratory is to understand the mechanisms of cellular iron transport and the way in which these processes are regulated. A particular theme is to describe the pathways of intestinal iron absorption and to understand how absorption is altered in disorders of iron metabolism such as haemochromatosis and thalassaemia.

Recent research has been directed towards understanding physiological variations in iron absorption at the molecular level. Situations studied include the modulation of body iron stores, changes in the rate of red cell production, and the acute phase response which is associated with infection and pregnancy. This work has helped define the mechanism by which the liver-derived regulatory peptide hepcidin alters the expression of key iron transport molecules in the intestine, and thus iron absorption, and also how the body directs hepcidin to bring about these effects.

A major recent finding of the laboratory is that the enhanced iron absorption associated with the common iron overload disease haemochromatosis results from decreased expression of hepcidin. However, the anaemia that accompanies inflammation and chronic disease is independent of HFE, indicating that hepcidin expression can be influenced by at least two separate pathways. Convincing evidence has also been found that hepcidin ultimately responds to the level of differric transferrin in the plasma, the major blood iron transport protein. The Iron Metabolism group maintains a strong interest in iron status in populations with studies on the penetrance of mutations in the gene mutated in haemochromatosis and on the frequency and causes of iron deficiency.

Some pathways of mammalian iron homeostasis

Highlights

- Showed that hepcidin can be regulated by both HFE dependent and independent pathways
- Demonstrated that the diferric transferrin in plasma is a major factor regulating hepcidin expression
- Provided evidence that the increased iron found in patients with advanced liver disease is derived from elevated iron absorption
Melanoma Genomics

This group combines expertise in cancer biology with genomics to research communication networks in sun-induced, head, neck and ovarian cancers to address important issues of prevention and treatment.

The overall theme in this laboratory is to identify and study the function of genes that are important in the development and treatment of certain cancers. Experience gained in melanoma has this year been extended to other tumours such as ovarian cancer, squamous cell carcinoma and breast cancer in respect of genes of interest, and the mechanism of action of a particular class of anti-cancer drug.

Extensive gene expression profiling within a collaborative NHMRC program has reached the stage of validating gene candidates for the prognosis of ovarian cancer and head and neck cancer. This has entailed extensive laboratory work such as immunohistochemical analysis of tumour sections and data analysis in order to establish correlations between molecular markers and clinical responses. Several genes are emerging with the potential to predict long term survival after treatment of these serious cancers, a group of patients who cannot otherwise be identified. This information might also establish gene expression pathways of fundamental significance in tumour development.

In researching genes important in the development of melanoma, several genes in cultured cells have been “knocked out” for the first time and shown that they are no longer tumourigenic in a mouse model. Anti-cancer compounds from a variety of natural sources are being detected by primary screening, purified and further developed, for several Australian companies.

Highlights

- Discovered that ablated expression of genes in human melanoma cells with siRNA technology caused loss of tumourigenicity
- Identified candidate genes for the prognosis of ovarian cancer from gene expression profiling of tumours and normal tissue
- Found that human breast and colon cancer cells with high sensitivity to protein kinase C activators are growth-arrested by senescence which may be a novel and non-toxic approach to treatment

Above: Expression profiling of ovarian tumors and response to chemotherapy.
(a) Dendrogram of chemotherapy response grouping of 737 genes selected using Kruskal-Wallis test (p<0.05) following hierarchical clustering for visualisation.
(b) The expression profiles of the 34 most significantly different genes between non-responders and those that responded with no relapse at 12 months. Blue, non-responders; Green, responders with relapse less than 12 months; Red, responders with no relapse at 12 months.
The Molecular Epidemiology Group investigates the pattern of disease in families using high throughput genomic platforms for DNA analysis. This group combines research on major projects such as the genetics of endometriosis, dizygotic twins, melanoma, alcohol and drug dependence, with provision of genotyping services such as zygosity testing, microsatellite and SNP genotyping, sample processing and management of the extensive collection of samples held by the Genetic Epidemiology and Molecular Epidemiology Laboratories.

One of the aims of the laboratory is to identify genes that influence women's susceptibility to endometriosis and understand the pathways to the disease. In collaboration with Dr Sue Treloar and Professor Nick Martin, the largest international collection of affected sister pair families and triad families has been assembled, including 3,900 women with clinically diagnosed endometriosis. Significant linkage to one chromosomal region has been identified. The Sequenom MassARRAY genomics platform is being used to genotype markers in genes under the linkage peak to find the gene or genes predisposing to endometriosis.

The tendency to conceive spontaneous dizygotic twins is a complex trait influenced by genetic and environmental factors with contributions from family history and maternal age. Finding the gene/s responsible for twinning is likely to provide fundamental insights into mechanisms of female fertility and may have practical implications for controlling fertility and infertility. One study is recruiting five hundred pairs of sisters from Australia and five hundred pairs of sisters from the Netherlands to undertake a genome scan in these families.

The laboratory supports a range of studies in the Genetic Epidemiology laboratory by processing blood samples and extracting DNA. A large inventory of samples is maintained, and samples for genome scans at a variety of sites and for SNP genotyping on the Sequenom MassARRAY genomics platform are prepared and dispatched. Microsatellite marker analysis are also conducted on an ABI 377 to confirm the zygosity of twins in a range of studies.

During the year, Dr Penelope Lind joined the group as a Research Officer from the University of North Carolina at Chapel Hill. With a primary interest in alcohol addiction, Dr Lind will coordinate candidate gene SNP typing for our alcohol-related Interactive Research Project Grants.

Identified a heterozygous deletion in GDF9 in sisters with dizygotic twins. GDF9 is an important intra-ovarian growth factor and mutations in GDF9 increase twinning in other species.

Completed genome scans in adolescent and adults twin cohorts and analysed these to locate gene regions predisposing to melanoma, blood cell phenotypes and smoking.

Conducted a pilot project with the AGRF on the Affymetrix GeneChip® SNP genotyping platform. Analysis of 60,000 SNPs demonstrated very low error rates for high quality DNA samples.

Failed to replicate previous findings of an association between the progesterone receptor and endometriosis in a large family collection.
This program carries out collaborative research projects for the improvement of the health and well being of Aboriginal and Torres Strait Islander peoples.

The Indigenous Health Program has continued to grow with an increase in students and collaborative projects. Simône Smith, the Program’s first Honors student who is working in the Clinical Tropical Medicine laboratory began this year, along with Lisa Whop, first National Indigenous Cadetship Project participant who is enrolled in a Bachelor of Applied Science (Medical Science) at QUT and will carry out her work placement with Scientific Services. Both Simône and Lisa are supported by the Cooperative Research Centre for Aboriginal Health (CRCAH) in terms of scholarship and work placement respectively.

Karen Taylor is close to completing her Masters of Applied Research (Science) project ‘Give your baby a better chance; innovative testing prior to birth’, funded by CRCAH. Aletia Twist is now working as a Senior Public Health Nutritionist in Cairns and has changed her PhD enrolment to part time for her project on obesity and Type 2 diabetes in the Torres Strait.

A new Indigenous staff member Vanessa Clements, whose position is funded through ACITHN, joined the team this year. Vanessa is working as a project officer and brings to the program valued expertise from her previous work as an Aboriginal Health Worker.

The Spotlighting Careers in Indigenous Health and Science Program was held again this year with student numbers increasing from eight to twelve. The Indigenous and non-Indigenous year 11 students from Far North Queensland, accompanied by two science teachers, spent three days working in QIMR laboratories. They also visited The University of Queensland Indigenous Health Division and the Queensland University of Technology to learn about undergraduate courses, Southbank and the Queensland Museum. Feedback from the students was very positive with all reporting it was a great chance to experience real science and do things they would never be able to do at school.

The cancer in Aboriginal and Torres Strait Islander People in Queensland project, conducted in collaboration with Queensland Health, has now been completed and findings will be published later this year. Detailed data on cancer in Indigenous people have only been published for SA, WA and NT. The first population-based comparative study of cancer in Indigenous and non-Indigenous patients in Queensland, in particular exploring cancer stage at diagnosis and co-morbidities, has also been completed. This study is seen as a first step in understanding the problem with much more knowledge needed in order to improve the situation. Findings will be presented and the possibility of further culturally respectful research projects discussed with representatives from health service delivery and the Aboriginal and Torres Strait Islander Community.
The work of the Malaria and Scabies, Bacterial Pathogenesis, Clinical Tropical Medicine and Molecular Immunology laboratories on improved treatment and prevention for scabies and vaccine development for Group A Streptococcus is continuing with its major funding from NHMRC, NIH and NHF. A small trial of the Wuchopperen skin study has been completed and outcomes are currently being analysed.

A project evaluating an education intervention program for childhood asthma by Aboriginal and Torres Strait Islander Health Workers commenced field work in April 2005. This is a collaborative project with the Thursday Island Primary Health Care Centre, the Asthma Foundation of Queensland and The Royal Children’s Hospital. During a first visit to Thursday Island, a three day Health Worker training course ‘Recognising and helping children with asthma in the Torres communities’ was conducted and attended by eleven local Health workers. Ninety children and young people visited the pediatric respiratory clinics conducted by Dr Brent Masters and Dr Anne Chang. From this group 18 were identified as suitable for inclusion in the intervention group. Local health workers are now conducting follow up visits with the intervention group in the hopes of showing an improvement in asthma management for this group.

Work on the multi-centre bronchiectasis observational study, which is part of a collaborative and international study of bronchiectasis in Indigenous children is continuing. The study site for this project in Australia is the Northern Territory.

Mr Michael Gooda, CEO for the CRCAH, addressed the Program’s anniversary seminar this year, sharing his insights into ‘Contradictions, confusion and Ironies in Aboriginal Affairs’.

In recent times the CRCAH board has been refining the research agenda and has made some changes in staff and management processes. The Board is pleased with the progress made by the CRCAH under Michael Gooda’s leadership and are currently negotiating for additional funding to support the work on scabies and Group A Streptococcus which fits into the healthy skin program. The Indigenous cancer project is also an in-kind project with the CRCAH.

The team looks forward to another productive year with the prospect of more publications from the program in the near future and further success in grant applications.
The Therapeutic Development and Clinical Research Division is committed to the development and testing of immunotherapeutics manufactured within the Q-Gen laboratories. Included in the Division are the EBV Biology, Cancer Immunotherapy, and Tumour Immunology laboratories. Currently, six cellular based vaccine trials are being undertaken or planned to commence shortly. These trials are aimed at testing cell-based therapeutics to cure post-transplant lymphoma, Hodgkin’s disease, malignant melanoma, prostate cancer and cytomegalovirus infection.

Five of the trials are phase I and one of the trials is a phase III trial on melanoma patients with minimal metastatic deposits. The Phase III trial is very important in the Division’s focus since it was initiated on the basis of promising results from a phase I/II trial. The Q-Gen facility has a licence from the Therapeutic Goods Administration (TGA) to manufacture products to Good Manufacturing Practice (GMP) standard for the Phase III trial.

It is important to point out that clinical trials conducted within the Division frequently become the focus for additional basic research. For example, the question of why some patients respond to cell-based therapy while others do not, opens up the scientific issue of defining the components of the immune system responsible for protection from cancer. This illustrates the concept that the Division aims to take laboratory-based research from the laboratory into the clinic and subsequently back into the laboratory, a cycle which should eventually result in the development of immune-based therapies that are capable of resolving disease.

Details of clinical trials currently underway are listed on the following page.
### QIMMR sponsored clinical trials during 2004-2005

**Chair – Professor Denis Moss**

<table>
<thead>
<tr>
<th>CLINICAL TRIAL</th>
<th>INVESTIGATORS</th>
<th>FUNDING</th>
</tr>
</thead>
</table>
| **Prostate cancer: An internal solid-malignancy model for vaccine therapy** (NUQM00J1) | Prof Kay Ellem, Dr Christopher Schmidt, Dr Bev Kerr, Mrs Linda O’Connor, Mrs Cathy Davern (QIMR), Prof Frank Gardiner, Mrs Betty Scells, Ms Liz Hamlyn (The University of Queensland, Royal Brisbane Hospital), Prof Greg Seymour (The University of Queensland), Prof Derek Hart (Mater Medical Research Institute), Dr David Yaxley, Dr David Nicol (Urological Society of Australasia). | Atlantic Philanthropies: $11,000  
Philanthropic sources: $45,000 |
| **Phase III trial of an immunotherapy for Stage III (AJCC) melanoma based on cultured autologous dendritic cells presenting autologous tumor cell antigens (MRPQ0161)** | Prof Kay Ellem, Dr Christopher Schmidt (QIMR), Prof Michael O’Rourke (Mater Adult Hospital), Dr Barry O’Loughlin (Royal Brisbane Hospital), A/Prof Mark Smithers (Princess Alexandra Hospital), Dr David Ritchie (Malaghan Institute, New Zealand) | Atlantic Philanthropies: $100,000  
Clive Berghofer Fund: $250,000  
NHMRC: $55,000 |
| **Phase I trial of the safety, the effect on immune parameters, and clinical efficacy of an immunotherapy for glioma, based on cultured autologous dendritic cells presenting autologous tumour antigens (RMQ0331)** | Dr Christopher Schmidt, Prof Kay Ellem (QIMR), Drs Richard Laherty, David Walker and Frank Tomlinson (Royal Brisbane Hospital), Prof Michael O’Rourke (Mater Adult Hospital) | RBWH Foundation: $20,000  
Viertel Fellowship: $30,000 |
| **Dendritic cell vaccination trial for hormone refractory prostate cancer with autologous tumour as the antigen (NRQ03J1)** | Prof Kay Ellem, Dr Christopher Schmidt, Prof Martin Lavin (The University of Queensland), Dr Michelle Burger, Ms Linda O’Connor (QIMR), Prof Frank Gardiner (University of Queensland, Royal Brisbane Hospital) | Atlantic Philanthropies: $11,000  
Philanthropic sources: $45,000 |
| **Adoptive immunotherapy for the prevention of human cytomegalovirus (HVMV) reactivation and disease after allogeneic stem cell transplantation (QR-2002-CMV1)** | Dr Rajiv Khanna (QIMR), Dr Geoff Hill (QIMR, Royal Brisbane Hospital), Drs Simon Durant, James Morton (Royal Brisbane Hospital), Dr Leanne Lockwood (Royal Children's Hospital), Dr Suzanne Elliott (Q-Pharm) | Queensland Leukaemia Foundation: $100,000 |
The goal of the Translational Research laboratory is to foster research collaborations between scientists and clinicians for the benefit of patients and society.

The Translational Research laboratory continues to build its activities principally around breast cancer research and currently holds almost 900 breast cancer pathology specimens with ethics approvals. These specimens have been fully characterised in terms of known clinical prognostic factors, and patient outcomes are known. Currently available biomarkers are being assessed on this database to determine their relevance as predictors of patient outcomes. In addition, the laboratory is extending this pathology database to more than 1500 samples. When complete, this expanded pathology database will provide an important basis for exploring novel genes involved in breast cancer behaviour.

The second major project is evaluating the impact of chemotherapy on cognitive functioning on women with breast cancer. To date, most studies in this emerging area of research have demonstrated measurable but minor impairments during and after treatment with chemotherapy. Interpretation of these studies has been hampered by their design. The current study is undertaking the important step in assessing cognitive functioning of women with breast cancer immediately after diagnosis and before chemotherapy starts. The project continues to attract participants at a steady rate and is now the second largest longitudinal study in the world. Preliminary results confirm that the cognitive tasks selected for this study can identify subtle but definite differences in cognitive functioning immediately after completion of chemotherapy. This project will continue to recruit women with early breast cancer over the next year and preliminary results of long term effects of chemotherapy on cognitive functioning will be available in the next 2 years.
In 2004, considerable efforts were expended in preparing submissions for a review of the third Public Health Education and Research Program cycle. Submissions were prepared by QIMR, the School of Population Health at The University of Queensland, the Centre for Indigenous Health and the Australian Network of Academic Public Health Institutions. These were considered, amongst many others, by a steering committee convened by the Australian Government Department of Health and Ageing.

The Australian Centre for International and Tropical Health and Nutrition (ACITHN) objectives were outlined as developed in a 1995 contract with the Australian Government which formally designated ACITHN as a national centre. In today's national and regional context, these objectives are considered more important than ever. Mainly based on evidence already provided in annual reporting documents and ACITHN Annual Reports, it was argued that ACITHN is a valuable and cost-effective resource for public health workforce development, research training and strategic research, and one which created leverage of 6.8 times the governmental contribution in 2004-2005. A great strength of ACITHN is in outreach activities via numerous collaborations with scientists and educators in 26 countries, and its strong contribution to policy development through numerous memberships on expert panels and committees.

The submission outlined some future directions for ACITHN and signalled a broadening of interest to include priority setting and policy development, and the development of interventions for both communicable and non-communicable diseases. A strategic approach was suggested that might enhance working alliances with key regional groups including WHO/WPRO, SEAMEO TROPMED and the Australian Biosecurity CRC for Emerging Infectious Disease.

During July 2004, ACITHN convened the Asia-Pacific Forum on Tropical Health Innovation with major sponsorship from the Qld Department of State Development and Innovation to link public health, biotechnology and information technology with other sectors such as the Armed Services, travel and tourism. The Forum will not only enhance capacity to deal with biosecurity and communicable diseases threats, but also assist in building economies by creating healthy destinations. In particular, this initiative which engaged the travel and tourism industry was stimulated by the appearance of SARS and Avian Influenza. Effective Australian public health will be better served by taking an Asia-Pacific perspective in terms of networking, surveillance and intervention. It is crucial that a capable workforce is fostered to carry out such tasks and develop dialogues with other interest groups.

During May 2005 when the federal budget was announced, the Public Health, Education and Research Program was included for renewal but at this stage, ACITHN awaits information from the Australian Government as to the actual format for the fourth cycle and confirmation of the directions it has nominated for the betterment of public health.
Cooperative Research Centre for Vaccine Technology

The Cooperative Research Centre for Vaccine Technology (CRC-VT) is a joint venture of eight organisations: the Queensland Institute of Medical Research, The Walter and Eliza Hall Institute of Medical Research, The University of Melbourne, Monash University, La Trobe University, CSIRO Division of Livestock Industries, the Australian Red Cross Blood Service (ARCBS) and CSL Limited.

In its last year of full Commonwealth funding, the CRC-VT focused research spending on six projects that show potential to be ready for commercialisation before the Centre grant ends in mid-2006. Two of those projects were led by Dr Rajiv Khanna at QIMR, one to develop a vaccine against human cytomegalovirus (HCMV) and the other to measure HCMV-specific T cell responses in transplant patients at the Princess Alexandra and Prince Charles Hospitals in Brisbane. Another QIMR-based project was led by Professor Denis Moss and is part of a major effort to develop a vaccine against the Epstein-Barr virus-related cancer nasopharyngeal carcinoma. Other CRC-VT projects continued development of human plasma-derived mannose binding lectin as a potential therapeutic agent, design of self-adjuvanting protein vaccines and testing of novel approaches to the induction of mucosal immunity.

The Centre now holds a substantial intellectual property (IP) portfolio in the fields of vaccines and immunotherapeutics. Negotiations for the commercial development of a number of patent-protected technologies were well advanced at the end of the year. A major strategic undertaking during the year was the analysis of pathways to manage CRC-VT IP and commercial agreements after the Centre completes work in mid-2006. By June 2005, implementation of the selected pathway was well advanced and should ensure that the long-term benefits of the Centre’s IP can be fully realised through commercial development and continued research in publicly-funded partnerships.

The CRC-VT continues to support a strong education program and is on track to see the completion of about 70 PhD students enrolled since 1993. In addition to undertaking very high quality research through their host institutions, CRC-VT students are exposed to training in various aspects of IP protection and commercialisation. During the year, several students undertook a CRC-VT-funded 2 to 3 month industry sabbatical at CSL or GlaxoSmithKline, in two cases leading to employment by the host company. In 2005, the CRC-VT also provided a retreat at the Bardon Centre in Brisbane for students from our Centre and two other Brisbane-based CRCs to learn about managing people and career development. The Centre’s contribution to the professional development of new researchers in the vaccine field is likely to have a lasting impact, as equally important as the commercial and other outcomes of its research activities.
Q-Pharm Pty Ltd

Q-Pharm concluded its third full year of trading as a private company on 30 June 2005 with 2004-2005 proving a very satisfactory year. Highlights of the year include:

- Gross revenue from operations increased by 50% from 2003-2004 levels and profitability improved substantially
- Growth occurred in all areas of the business but most importantly in the Phase I/II clinical trials area which has seen a 200% increase in revenue and in the bioequivalence study area which remains a very strong contributor to the company’s operations
- Broadening of the client base in accordance with the business plan, predominantly from overseas clients and major pharmaceutical companies
- Being named as an industry partner in a successful Pharmaceuticals Partnership Program grant, an outcome that should see at least a doubling in the volume of work from this client in the future
- Purchase of an API4000 liquid chromatograph/tandem mass spectrometer that will significantly increase analytical capability
- Healthy employment growth continued at Q-Pharm which now supports 45 full-time equivalent positions

Q-Gen Pty Ltd

In September 2004, QIMR created Q-Gen Pty Ltd as its commercial arm for contract manufacture of therapeutics. There has been considerable national and international interest in the commercial and academic provision of contract manufacturing services. Q-Gen Pty Ltd will offer contract production for cellular therapies including gene therapy, dendritic therapies, adoptive immunotherapy, somatic cell therapy and stem cell therapies. Additionally Q-Gen Pty Ltd has a fermentation and cell culture suite for the production of biologics up to 50L capacity. Stability trials for therapeutics will be offered and can be facilitated at a range of temperatures and time courses. The facility provides manufacturing areas which can be used for sterile manufacture, formulation, fill and finish for liquid dosages.

Q-Gen Pty Ltd runs an ISO 9001:2000 based Quality System for all of its products. The Q-Gen team has been through four multiple day audits by the Australian Therapeutics Goods Administration (TGA) and are confident in their ability to provide comprehensive services to external as well as internal (QIMR) clients.
Vaccine Solutions

QIMR is a 50% shareholder of Vaccine Solutions, a technology commercialisation company which was founded in 1997 to provide services to the Cooperative Research Centre for Vaccine Technology (CRC-VT), of which QIMR is a party. This year, Vaccine Solutions managed 20 patent families and in-licensed six technologies from the CRC-VT. The company has already negotiated deals to out-license five of its technologies. Two of these are related to inventions QIMR has contributed to the CRC-VT, diagnostic use of human cytomegalovirus epitopes and a polyepitope vaccine for use against EBV-related nasopharyngeal carcinoma. As part of its preparations for the end of the CRC-VT in June 2006, Vaccine Solutions transferred to QIMR two major malaria vaccine research and development contracts. These contracts are with the Seattle-based Program for Appropriate Technologies in Health (PATH) Malaria Vaccine Initiative (MVI).

Replikun Biotech Pty Ltd

Replikun Biotech Pty Ltd is a biotechnology company formed by QIMR in March 2005 to commercialise a novel, potent vector delivery system (KUNrep™). The KUNrep™ systems are derived from Kunjin virus, an Australian native flavivirus. Start-up funding of $1.875 million was raised from Start-Up Australia to support the first phases of development.

Replikun has an exclusive, worldwide licence to commercialise the technology with a portfolio of issued patents and pending patent applications that protect the KUNrep™ vectors, their means of production, modes of delivery and therapeutic applications.

There is a large, unmet need in the vaccine and gene therapy markets for a safe and robust delivery system. A major objective of the new company is for its technology to become the method of choice for delivering antigens or genes to patients, thus creating valuable medical products. Replikun will create value by partnering with biopharmaceutical companies and incorporating their gene/antigen into the KUNrep™ systems.

Adipogen Pty Ltd

Adipogen Pty Ltd is a spin-off company of the University of Queensland that has licensed intellectual property developed by Professor John Prins. The company is developing products to assist in the treatment of obesity.

The Queensland Institute of Medical Research holds equity in Adipogen Pty Ltd on behalf of Queensland Health.
QIMR has more than doubled in size and research activity since 1999. The world-class research carried out by the Institute's scientists requires high quality scientific and administrative support. The Corporate Division provides this support through departments covering finance and administration, human resources, scientific services, information technology, building services, regulatory affairs, business development and safety.

This last year has seen a further development and implementation of systems for financial and human resource services. During the 2004-2005 year, the Finance team commissioned a new grants management system and Human Resources implemented a new performance appraisal system for general staff.

Information Technology has managed significant infrastructure expansion to accommodate an ever increasing volume of scientific data. A major upgrade of network cabling in the Bancroft Centre provided faster network access for staff and mission critical E-forms system, which is used for electronic submission of Ethics and Safety proposals.

QIMR's Virtual Private Network (VPN) has become an extremely useful tool for staff requiring remote access to the network. The recent installation of a state of the art video-conferencing system was also successful. With connections via ISDN and/or the Internet, the system was recently used to allow Queensland high schools to participate in the Institute's annual High School Science Lecture series.

The Business Development office has the primary responsibility of protecting and commercialising QIMR's intellectual property, which is generated by QIMR's scientists. A successful example of this during 2004-2005 was the formation of the spin-out company, Replikun Biotech Pty Ltd (Replikun). The company was formed by QIMR to further develop and commercialise technology applications of the Australian Flavivirus, Kunjin. This technology has been developed over several years by scientists at the Department of Health Services, The University of Queensland and QIMR for new medical uses for the Kunjin virus.

In Scientific Services, this past year has seen considerable planning for redevelopment of the animal facility to increase animal holding space whilst providing a safe environment for both animals and staff. After extensive consultation with architects, researchers and the QIMR Animal Ethics Committee, the design development phase was completed early in 2005. Construction of a new experimental holding area and support areas began in June with expected transfer of animal operations in October 2005. Refurbishment of the facility is eagerly awaited by scientists and support staff.
To maintain up to date knowledge of the ethical and regulatory framework, QIMR Human Research Ethics Committee (HHREC) members attended an NHMRC Research Ethics Training Sessions in Brisbane in August 2004 and the NHMRC Research Ethics Conference in Canberra in May 2005. The HREC Chair provided a written submission to AHEC on behalf of the HREC regarding the revision of the National Statement on Ethical Conduct in Research Involving Humans.

The Safety team managed the compliance of more than 600 projects for chemical risk and biosafety. In addition, there are 107 users of isotopes within QIMR, and the Radiation Safety Officer examines 25-30 protocols a year for compliance. Staff training and education is a high priority and each year all staff attend workplace health and safety and fire safety training seminars. The Safety Committee oversaw all aspects of safety at QIMR during the year.

Building Services maintain the facilities at QIMR and are responsible for the security of many systems and services which are mission-critical to the research program. They provide a 24 hour service to ensure that essential systems are maintained and this year, have been actively involved in planning for the refurbishment of level G of the Bancroft Centre and Level C of the Clive Berghofer Cancer Research Centre.
QIMR COUNCIL
Sir Bruce Watson (Chair)
Mr Paul Wright (Deputy Chair)
Dr Paul Bartley (to June 05)
Prof Bryan Campbell
Prof Peter Brooks
Mr Christopher Coyne (from June 05)
Prof Judith Clements
Ms Clare Endicott (to June 05)
Mr Paul Fennelly
Dr Gerry FitzGerald
Prof Lyn Griffiths
Prof Alan Lopez (from June 05)
Prof Brandon Wainwright (to June 05)

Human Research Ethics Committee (HREC)
- HREC Scientific Sub-Committee
Dr Greg Anderson (Chair)
Dr Christian Engwerda
Dr Kevin Spring
Ms Carmel Kerwick
Dr Douglas Lincoln
Dr Don Gardiner
Dr Colleen Olive
Mrs Sue Cassidy
Dr Agnieszka Mitchell
Dr Helen Leonard
Ms Jo Chow - Secretary

- HREC Clinical Trial Protocol Sub-Committee
Dr Peter Roeser (Chair)
Dr Agnieszka Mitchell
Prof Andrew Boyd
Dr Suzanne Elliott
Dr Greg Lawrence
Dr Douglas Lincoln
Dr Christopher Schmidt
Dr Lesley Ross-Lee
Dr Geoff Beadle
Ms Alyce Maksoud
Dr Jason Lickliter
Ms Jo Chow - Secretary

Animal Ethics Committee (AEC)
- AEC Scientific Sub-Committee

Finance & Audit Committee
Mr Paul Wright (Chair from June 05)
Dr Paul Bartley (to June 05)
Prof Bryan Campbell (from June 05)
Dr Gerry FitzGerald
Mr Bruce Phillips (from June 05)
Sir Bruce Watson (Chair to June 05)
Mr Rod Wylie

Personnel Administration Committee
Sir Bruce Watson (Chair)
Ms Clare Endicott (to June 05)
Dr Gerry FitzGerald
Mr Rod Wylie (from June 05)
Mr Paul Wright

Prof Denis Moss
Mr Michael Staley
Dr Kum Kum Khanna
Dr James McCarthy
Dr Greg Anderson
Ms Janelle Stirling
Ms Nerida Fox – Secretary

Biosafety Committee
Dr Helen Leonard (Chair)
Dr David Tscharke (Deputy Chair)
A/Prof Peter Upcrofe
Mr Paul Collins
Dr Juan Cooper
Dr Therese Murphy
Mr Michael Staley
Mr Alan Stockman
Dr Christine Rzepczyk
Mr Andrew King
Prof Denis Moss
Dr Greg Lawrence
Dr Michael Batzloff
Dr Glen Boyle
Mr Ron Buttershaw
Ms Jo Chow - Secretary

Equipment Committee
Prof Andrew Boyd (Chair)
Dr Juan Cooper
Dr Kum Kum Khanna
Dr James McCarthy
Prof Denis Moss
Ms Alison McLean
Mr Chris Ward

Higher Degrees Committee
Dr Tom Sculley (Chair)
Prof Michael Good
Dr Graham Kay
Dr Nathan Subramaniam
A/Prof Andreas Suhrbier
A/Prof Alan Lawson
A/Prof Peter O’Rourke
Dr Judith Greer
Dr Peter Ryan

Committees reporting to the Director:
Management Executive Committee
Prof Michael Good (Chair)
Prof Adele Green
Prof Andrew Boyd
Prof Martin Lavin

Committees reporting to Council:
Appointments & Promotions Committee
Prof Peter Brooks (Chair)
Prof Graham Brown
Prof Julie Campbell
Prof Judith Clements
Dr Andrew Cuthbertson
Dr Gerry FitzGerald
Prof Lyn Griffiths
Prof Alan Lopez (from June 05)
Prof James McCluskey
Prof Joe Trapani (from June 05)
Prof Brandon Wainwright (to June 05)
Prof Michael Good (ex officio)

Finance & Audit Committee
Mr Paul Wright (Chair from June 05)
Dr Paul Bartley (to June 05)
Prof Bryan Campbell (from June 05)
Dr Gerry FitzGerald
Mr Bruce Phillips (from June 05)
Sir Bruce Watson (Chair to June 05)
Mr Rod Wylie

Personnel Administration Committee
Sir Bruce Watson (Chair)
Ms Clare Endicott (to June 05)
Dr Gerry FitzGerald
Mr Rod Wylie (from June 05)
Mr Paul Wright

Prof Denis Moss
Mr Michael Staley
Dr Kum Kum Khanna
Dr James McCarthy
Dr Greg Anderson
Ms Janelle Stirling
Ms Nerida Fox – Secretary

Biosafety Committee
Dr Helen Leonard (Chair)
Dr David Tscharke (Deputy Chair)
A/Prof Peter Upcrofe
Mr Paul Collins
Dr Juan Cooper
Dr Therese Murphy
Mr Michael Staley
Mr Alan Stockman
Dr Christine Rzepczyk
Mr Andrew King
Prof Denis Moss
Dr Greg Lawrence
Dr Michael Batzloff
Dr Glen Boyle
Mr Ron Buttershaw
Ms Jo Chow - Secretary

Equipment Committee
Prof Andrew Boyd (Chair)
Dr Juan Cooper
Dr Kum Kum Khanna
Dr James McCarthy
Prof Denis Moss
Ms Alison McLean
Mr Chris Ward

Higher Degrees Committee
Dr Tom Sculley (Chair)
Prof Michael Good
Dr Graham Kay
Dr Nathan Subramaniam
A/Prof Andreas Suhrbier
A/Prof Alan Lawson
A/Prof Peter O’Rourke
Dr Judith Greer
Dr Peter Ryan
Dr Jackie Upcroft
Dr Katherine Trenholme
Dr Sue Trelor - Secretary
Mrs Simone Cross
Ms Janelle Stirling
Ms Sarah-Jane Cozzi
Ms Lynette Beattie
Ms Jyoti Jonnalagadda

Joint Consultative Committee
Ms Nicole Green (Chair)
Dr Grant Ramm
Dr Penny Webb
Prof Michael Good
Mr Michael Staley
Dr Kum Kum Khanna
Mr Rick Woods
Mr Paul Collins
Ms Pauline Donnelly
QPSU Representative
QNU Representative

Medical Advisory Board
Prof Peter Brooks (Chair)
Prof Andrew Boyd (Deputy Chair)
Dr Paul Bartley
Dr Geoff Beadle
Dr Ian Bunce
Dr Don Cameron
Prof Adèle Green
Prof Michael Good
Dr Barbara Leggett
Dr Joseph McCormack
Dr Paul Sandstrom
Dr Mark Smithers
Dr John Varghese
Dr Michael O’Rourke

Mentoring Committee
Dr Grant Ramm (Chair)
Dr David Whiteman
Dr Nick Hayward
Dr Georgia Chenevix-Trench
Dr Rajiv Khanna

Scientific Advisory Board
Prof Graham Brown (Chair)
Prof Beth Newman
Prof Nicos Nicola
Prof Joe Trapani

Seminars Committee
Prof Michael Good (Chair)
Dr Grant Montgomery
Prof Martin Lavin
Dr Kate Green (to Dec 04)
Dr Katharine Trenholme
Ms Rosemary Lynch (to Feb 05)
Ms Jann O’Keefe (from Mar 05)

Committees reporting to the Chief Operating Officer:
Commercialisation Committee
Dr Tracey Mynott (Chair)
Dr Kate Andrews
Dr Mark Egerton
Mr Michael Staley
Prof Andrew Boyd
Prof Dave Kemp
A/Prof Andreas Suhrbier

IT Committee
Dr Tom Sculley (Chair)
Mr Christopher Ward
Mr Michael Staley
Dr Scott Burrows
Mr Mark Feodoroff
Ms Michelle Gatton
Ms Heather Matthews
Ms Nirmala Pandeya
Prof Peter Upcroft
Dr Nathan Subramaniam

Dr David Smyth
Dr Glen Smyth
Mr Mark Spanevello
Dr Nuri Gueven
Dr Agnieszka Mitchell
Dr Juan Cooper
Ms Jann O’Keefe (from Mar 03)

Library Committee
Mr Christopher Ward (Chair)
Prof Michael Good
Mr Michael Staley
Dr Greg Anderson
Prof Andrew Boyd
Dr David Whiteman
Ms Jennifer Ho
Dr Lihua Zhang
Prof Dave Kemp
Dr Rajiv Khanna

QIMR TRUST
Mr Paul Wright (Chair)
Mr John Garnsey
Mr Ian Manly
Mr Rod Wylie
Mr Richard Joel
Mr Bruce Phillips
Ms Margot de Groot
Ms Patricia McCormack
Ms Jane Seawright

Committees reporting to Trust:
Trust Investment Committee
Mr Rod Wylie (Chair)
Mr Paul Wright
Mr Ian Manly
Mr Bruce Phillips

Trust Marketing Committee
Mr John Garnsey
Ms Margot de Groot
Ms Jane Seawright
The Development and Marketing Department was established in 1994 to raise public awareness and funds for QIMR. The Department is responsible for many activities including fund raising events, bequests, news releases, media liaison, newsletters, fact sheets, brochures, powerpoint presentations and public awareness campaigns.

Below: Cyclists in the Suncorp Ride for Research, an event which raised significant funds for skin cancer research at QIMR, and included a number of keen QIMR cyclists, shown above

Tours of QIMR and external speaking engagements are also organised by the Department. Many of these are arranged by groups such as National Seniors Associations, Probus, the Association of Independent Retirees and church groups. Since 1995, the number and size of tours and speaking engagements has expanded enormously, and this year, more than 8,000 people learned more about vital medical research and how this impacts on health, life and longevity.

The Department has built numerous beneficial relationships with individuals and companies such as Clive Berghofer, Suncorp, Sam Coco, AMAQ VMO Committee, ABC Learning Centres, Callaway Golf Hi-Lite Pro Am, the Pratt Foundation, Queensland Property Foundation, the Wantz Committee and many others whose names are listed in the Donors section on pages 94–99.

One of the fundamental activities of the Department is to disseminate research findings to the community and, as QIMR has no budget for advertising, this is done through no-cost releases circulated regularly to the Australian media. Media coverage received as a result of these releases has more than tripled over the past seven years.

The quarterly newsletter, Lifelab, is vital in communicating QIMR research to the public and also generates significant donations to ensure that life-saving medical research continues. The amount of donations received following from Lifelab mailouts increases steadily, and has also tripled in over the same seven year period.

THANKS TO THE COMMUNITY

Many people attend QIMR fund-raising events or participate through donations, gifts-in-kind, bequests, sponsorship and through purchasing tables/tickets.

Likewise, many people spread the word about QIMR and its research, results and needs through their networks. For all this support, the Institute is greatly indebted.
This year QIMR admitted 33 new higher degrees students and had 46 visiting students at QIMR. Currently the student body at QIMR comprises 119 PhD, 17 research Masters and 21 Honours students. This indicates that an increasing number of students are turning to the Institute for advanced research training and emphasises the standing of QIMR in the research community. In addition to students working towards degrees, the Institute maintains an active Summer Vacation Scholarship Program and welcomes many work experience students from local high schools. Most QIMR students are enrolled through the University of Queensland, particularly through the School of Population Health and the School of Medicine. An increasing number of students are also coming through other Universities including Griffith University, the Queensland University of Technology and the University of the Sunshine Coast.

Postgraduate students from QIMR continue to make an impact in the wider scientific community, and again this year have received a number of significant accolades. Some examples include; Michelle Neller who received an award for the best oral presenter for a first year PhD student at the Australian Society for Medical Research during Medical Research Week, while Magda Ellis received the best student poster award at the Asia-Pacific Forum for Tropical Health in Cairns. Amber Glanfield was also awarded best student poster at the Australian Society for Parasitology Conference in Fremantle and Yang Yurong, best oral communication by a student at the XXIst International Congress of Hydatidology, Kenya, 2004.

The Higher Degrees Committee (HDC) continues to oversee student activities at QIMR. Committee duties include the evaluation of students prior to their acceptance as candidates at the Institute, monitoring student progress, providing education programs for students, establishing policy on issues relating to students, and assessing applicants for travel awards, Honours scholarships and PhD top-up scholarships. Increasing emphasis on the timely completion of research degrees has meant that the monitoring of student progress is becoming an ever more important activity and members of the HDC devote considerable time to the rigorous review of students during their study program. This year the committee undertook 58 reviews of students.

A new QIMR Student Club has organised various social functions to unify the larger numbers of students in both buildings of QIMR. Student Club committee members and the HDC student representatives are combining efforts to organise the next Student Retreat to be held in November 2005.

QIMR offers an outstanding environment for advanced training in biomedical research at an international level through the excellence of its scientists, its wide network of research collaboration both nationally and internationally, as well as world-class facilities and support services. Postgraduate students represent a valuable part of the research activities at QIMR, and the Institute seeks to provide them with a solid grounding in medical research for subsequent careers either in Australia or abroad.

Because the quality of supervision has a major impact on the quality of the students produced, the Institute conducts a two-part workshop for supervisors of postgraduate students in conjunction with the Teaching and Educational Development Institute and the School of Population Health of the University of Queensland. QIMR will continue to promote itself as a centre of excellence for postgraduate training in Australia.
## Completed Students 2004–2005

<table>
<thead>
<tr>
<th>Student Name</th>
<th>University/Supervisors</th>
<th>Thesis Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PhD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I Anraku</td>
<td>School of Population Health, UQ Andreas Surhbier, Alexander Khromykh</td>
<td>Induction of long lasting protective CD8+T lymphocyte responses by Kunjun replicon-based vaccine vectors</td>
</tr>
<tr>
<td>P Bartley</td>
<td>School of Population Health, UQ Don McManus</td>
<td>Artemether and the immunobiology of Schistosomiasis japonica</td>
</tr>
<tr>
<td>A Boyd</td>
<td>School of Population Health, UQ Brian Kay, Roy Hall</td>
<td>Interactions between common vertebrate hosts and the mosquito vectors of Ross River and Barmah Forest viruses in urban Brisbane, southeast Queensland</td>
</tr>
<tr>
<td>T Cook</td>
<td>Institute of Molecular Biology, UQ Rick Stern, Helen Leonard</td>
<td>Models of human neural crest cell differentiation in vitro</td>
</tr>
<tr>
<td>S Cozzi</td>
<td>Physiology and Pharmacology, UQ Peter Parsons</td>
<td>Molecular targets of anti-cancer PKC activators in the treatment of melanoma</td>
</tr>
<tr>
<td>S Duffy</td>
<td>School of Medicine, UQ Andrew Boyd, Joe Rothnagel</td>
<td>The role of the EphA1 receptor tyrosine kinase during embryogenesis and cancer</td>
</tr>
<tr>
<td>G Darnell</td>
<td>School of Population Health, UQ Andreas Surhbier, Toni Antalis</td>
<td>A novel intracellular activity for the serpin PAI-2</td>
</tr>
<tr>
<td>X Huang</td>
<td>School of Medicine, UQ Kay Ellem, Chris Schmidt</td>
<td>Depot cytokines and chemokines for anti-tumour therapy in a mouse model</td>
</tr>
<tr>
<td>L Hugo</td>
<td>School of Population Health, UQ Peter Ryan, Brian Kay, Scott O'Neill</td>
<td>Evaluation of methodologies for determining the age structure and survivorship of <em>Ochlerotatus vigilax</em> and other important mosquito vectors in Australia</td>
</tr>
<tr>
<td>T Hurst</td>
<td>School of Population Health, UQ Michael Brown, Brian Kay, Peter Ryan</td>
<td>Evaluation of Australian native fish and larvicides for the integrated control of freshwater mosquito vectors</td>
</tr>
<tr>
<td>C Monk</td>
<td>School of Medicine, UQ Lawrie Powell</td>
<td>Hereditary haemochromatosis: studies of its origins and its effects on quality of life</td>
</tr>
<tr>
<td>M Pearson</td>
<td>School of Population Health, UQ Don McManus, Alex Loukas</td>
<td>Identification, characterization and vaccine efficacy of membrane proteins of <em>Schistosoma mansoni</em></td>
</tr>
<tr>
<td>C Pyke</td>
<td>Surgery, UQ Martin Lavin</td>
<td>Risk quantification, therapeutic morbidity and quality of life in breast cancer</td>
</tr>
<tr>
<td>A Pinzon-Charry</td>
<td>School of Population Health, UQ J Alejandro López</td>
<td>Characterisation of blood dendritic cells in patients with cancer</td>
</tr>
<tr>
<td>J Whitson</td>
<td>School of Population Health, UQ Denis Moss, Martin Lavin, Sharon Stils</td>
<td>Cellular transformation and expression profiling studies related to nasopharyngeal carcinoma</td>
</tr>
<tr>
<td>C Xu</td>
<td>Molecular and Cellular Pathology, UQ Peter Parsons</td>
<td>Evaluation of the efficacy and safety of sunscreens</td>
</tr>
<tr>
<td>Y Yang</td>
<td>School of Population Health, UQ Don McManus, Malcolm Jones</td>
<td>Epidemiological, clinical and molecular studies on Echinococcosis in Ningxia Hui autonomous region, China</td>
</tr>
<tr>
<td>MPubHealth Scholars</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K Smith</td>
<td>School of Population Health, UQ David Whiteman</td>
<td>Risk factors for Barrett's oesophagus</td>
</tr>
<tr>
<td>M Stickley</td>
<td>School of Population Health, UQ David Whiteman</td>
<td>Sun exposure and site specific melanoma</td>
</tr>
<tr>
<td>MPhil Scholars</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G Butler</td>
<td>School of Population Health, UQ David Whiteman</td>
<td>Non-steroidal anti-inflammatory drugs and skin cancer</td>
</tr>
<tr>
<td>M Shariff</td>
<td>Surgery, UQ Martin Lavin</td>
<td>Composition and enzymatic activities of ataxia-telangiectasia mutated (ATM) protein complexes</td>
</tr>
<tr>
<td>Student Name</td>
<td>University/Supervisors</td>
<td>Thesis Title</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>M Elliot</td>
<td>Southern Clinical Division, UQ Denis Moss, Joanne Davis</td>
<td>Immunological, virological and molecular biological analysis of nasopharyngeal carcinoma</td>
</tr>
<tr>
<td>A Rives</td>
<td>Integrative Biology, UQ Mark Breitfuss, Brian Kay</td>
<td>The toxic activity of Bacillus sphaericus in Culex annulirostris cadavers</td>
</tr>
<tr>
<td>M Chai</td>
<td>Microbiology and Parasitology, UQ Geoff Gobert, Don McManus</td>
<td>Ultrastructural investigation and gene expression profiling of the lung stage schistosomulum of Schistosoma japonicum</td>
</tr>
<tr>
<td>P Dickson</td>
<td>Biochemistry and Molecular Biology, UQ, Nick Martin</td>
<td>Fine mapping of the human ADH genes</td>
</tr>
<tr>
<td>J Hansen</td>
<td>Zoology and Entomology, UQ Nick Martin</td>
<td>Genetics of taste</td>
</tr>
<tr>
<td>A Marshall</td>
<td>School of Life Sciences, QUT Greg Anderson, Brian Harmon</td>
<td>The distribution and regulation of transferring receptor 1 in the small intestine</td>
</tr>
<tr>
<td>S Shekar</td>
<td>Zoology and Entomology, UQ Nick Martin</td>
<td>Genetics of wrinkling</td>
</tr>
<tr>
<td>P Sivadorai</td>
<td>Microbiology and Parasitology, UQ Malcolm Jones, Don McManus</td>
<td>The role of iron in embryogenesis of schistosomes</td>
</tr>
<tr>
<td>T Tran</td>
<td>Microbiology and Parasitology, UQ Sri Sripakash</td>
<td>Evolution of Group G Streptococcal pathogenic variants</td>
</tr>
<tr>
<td>H Bofinger</td>
<td>School of Life Sciences, UQ Geoff Hill</td>
<td>Pegylated G-CSF promotes the augmentation of CD4 T cell regulatory function</td>
</tr>
<tr>
<td>J Challacombe</td>
<td>Health Sciences, UQ Peter Parsons</td>
<td>The role of granulocytes in the efficacy of PEP005 against skin tumours</td>
</tr>
<tr>
<td>L Major</td>
<td>School of Population Health, UQ Andreas Suhbier, Grant Darnell</td>
<td>Bcl-3 and Bcl-2 bind the retinoblastoma tumour suppressor protein</td>
</tr>
<tr>
<td>R Moor</td>
<td>School of Life Sciences, QUT David Tscharke, Denis Moss</td>
<td>Assessing EBV specific CD8+ T cell function using CD 107 surface staining</td>
</tr>
<tr>
<td>M Neller</td>
<td>Science Faculty, QUT Chris Schmidt, Nathan Martinez</td>
<td>Ex vivo anti-tumour immunity directly correlates with clinical response to DC immunotherapy in Stage IV melanoma patients</td>
</tr>
<tr>
<td>C Perkins</td>
<td>Molecular and Microbial Sciences, UQ Alex Loukas</td>
<td>Molecular determinants of host range in blood-feeding parasites</td>
</tr>
<tr>
<td>N Richmond</td>
<td>School of Life Sciences, QUT Adele Green</td>
<td>A molecular epidemiological analysis of divergent pathways to melanoma development</td>
</tr>
<tr>
<td>K Wynn</td>
<td>School of Life Sciences, QUT Rajiv Khanna</td>
<td>BARF1 and Epstein-Barr virus</td>
</tr>
<tr>
<td>K Broad</td>
<td>Biomolecular and Biomedical Science, GU Tom Sculley</td>
<td>Characterisation of the interaction of the Epstein-Barr virus nuclear antigen 6 with intracellular proteins</td>
</tr>
<tr>
<td>C Chang</td>
<td>Molecular and Microbial Sciences, UQ Alex Loukas</td>
<td>Masking immune recognition by Schistosomiasis mansoni</td>
</tr>
<tr>
<td>J Chia</td>
<td>Molecular and Microbial Sciences, UQ James McCarthy</td>
<td>The Immunogenic proteins of Pediculus humanus</td>
</tr>
<tr>
<td>L Nelson</td>
<td>Biotechnology, UQ James McCarthy</td>
<td>The role of sequence variation in HRPII in the performance of Rapid Diagnostic Test (RDTs) for malaria</td>
</tr>
</tbody>
</table>
## Student Awards

<table>
<thead>
<tr>
<th>Name</th>
<th>Award Description</th>
<th>Institution/Conference</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simon Apte</td>
<td>Basil Shaw Fellowship</td>
<td>Australian Rotary Health Research Fund, Brisbane, 2005</td>
<td></td>
</tr>
<tr>
<td>Wendy Chung</td>
<td>3rd Prize for Best Oral Presentation</td>
<td>School of Population Health Postgrad Conference, Brisbane, 2004</td>
<td></td>
</tr>
<tr>
<td>Amber Glanfield</td>
<td>Best Presentation for a Non-confirmed Student</td>
<td>School of Population Health Postgrad Conference, Brisbane, 2004</td>
<td></td>
</tr>
<tr>
<td>Tessa Knox</td>
<td>Oral Presentation Commendation</td>
<td>School of Population Health Postgrad Conference, Brisbane, 2004</td>
<td></td>
</tr>
<tr>
<td>Amber Glanfield</td>
<td>Best Student Poster Award</td>
<td>Australian Society for Parasitology Conference, Fremantle, 2004</td>
<td></td>
</tr>
<tr>
<td>Magda Ellis</td>
<td>Best Student Poster Award</td>
<td>Asia-Pacific Forum for Tropical Health, Cairns, 2004</td>
<td></td>
</tr>
<tr>
<td>Yang Yurong</td>
<td>Best Oral Communication by a Student</td>
<td>XXIst International Congress of Hydatidology, Kenya, 2004</td>
<td></td>
</tr>
<tr>
<td>Jason Jeffery</td>
<td>Outstanding Student Presentation</td>
<td>The Elizabeth N Marks Award, 2004</td>
<td></td>
</tr>
<tr>
<td>Jason Jeffery</td>
<td>Best Oral Presentation</td>
<td>School of Population Health Postgrad Conference, Brisbane, 2004</td>
<td></td>
</tr>
<tr>
<td>Tanya Russell</td>
<td>2nd Prize for Best Oral Presentation</td>
<td>School of Population Health Postgrad Conference, Brisbane, 2004</td>
<td></td>
</tr>
<tr>
<td>Leisl Packer</td>
<td>Student Excellence Award</td>
<td>Ausbiotech QLD Student Presentation and Questioning, 2004</td>
<td></td>
</tr>
<tr>
<td>Leisl Packer</td>
<td>Young Australian of the Year</td>
<td>Australian Government, 2005</td>
<td></td>
</tr>
<tr>
<td>Leisl Packer</td>
<td>Young Researcher Award</td>
<td>Cure Cancer Foundation of Australia Awards, 2005</td>
<td></td>
</tr>
<tr>
<td>Amila Suraweena</td>
<td>First Prize, 2nd Year Oral Presentation</td>
<td>Bi-annual School of Medicine Postgrad Conference, Brisbane, 2004</td>
<td></td>
</tr>
<tr>
<td>Stephen Earl</td>
<td>First Prize, 2nd Year Oral Presentation</td>
<td>Bi-annual School of Medicine Postgrad Conference, Brisbane, 2004</td>
<td></td>
</tr>
<tr>
<td>Kelly Landers</td>
<td>First Prize, 3rd Year Oral Presentation</td>
<td>Bi-annual School of Medicine Postgrad Conference, Brisbane, 2004</td>
<td></td>
</tr>
<tr>
<td>Nathan Gillespie</td>
<td>Hans Eysenck Award for Genetics of Personality</td>
<td>2005</td>
<td></td>
</tr>
<tr>
<td>Michelle Neller</td>
<td>Best Oral Presentation</td>
<td>ASMR Student Conference, Brisbane, 2005</td>
<td></td>
</tr>
<tr>
<td>Jacqui Fleming</td>
<td>IM and MJ Mackerras Prize</td>
<td>Top marks in B App Sci (Medical Science)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>James Vincent Duhig Prize</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>JR Saal Prize</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aust Ass of Clinical Biochemist Prize</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Albert Pinzon-Chargy</td>
<td>Oral Presentation Award</td>
<td>ASMR Student Conference, Brisbane, 2005</td>
<td></td>
</tr>
</tbody>
</table>
This year, involvement with students at all stages of their career has increased markedly with the number of higher degree research students enrolled at the Institute doubling since 2001.

Senior High School Students
Forty-two schools attended the annual High School Lecture Series held at the end of July 2004. Schools participating included both state and private high schools from the CBD, Toowoomba, Sunshine and Gold Coast. The possibility of videoconferencing the lecture series to regional schools around Queensland is being investigated.

The Education Program received the Queensland Education Smart State 2004 Peter Doherty Award for Excellence in Science and Science Education by an Industry/ Business/ Research Institution in August 2004. The Award was based on a joint application which encompassed QIMR’s education and Indigenous student-teacher programs.

Leisl Packer, PhD student in the Human Genetics lab, was named Young Queenslander of the Year. She emphasised that medical research is a team effort and shared her passion for science aimed at curing and preventing skin cancer with senior secondary school students outside and inside QIMR.

Schools visited by QIMR during the 2004-2005 year included:

- All Hallows, Hillbrook Anglican School, Moreton Bay College, Kelvin Grove SHS, Capalaba, and the Christian College Outreach Centre, Mansfield. Past students of Moreton Bay College, Dr Vicki Whitehall and Hillbrook Anglican School, Dr Danielle Stanisic visited their old schools to present and interact with students and share their experiences of a career in science. Education Officer, Simone Cross, was invited speaker at both the Coopers Plains Science Teachers Conference at Nyandra SHS and the Northside Teachers Conference at Northpoint TAFE. Eighty students from the UQ Biofutures program were toured through research laboratories and the Q-Gen cGMP facility.

Undergraduate Students
Science students in their second or third university year can apply for QIMR competitive Summer Vacation Studentships which allow them to work on their own research project, with day-to-day supervision from staff members. Ten academically talented students, including one Indigenous student worked at QIMR for 6 weeks over the summer vacation, and five of these elected to continue on at QIMR for their Honours degree.
The name Bancroft is synonymous with excellence in scientific and medical endeavour, and is an enduring memorial to the family whose efforts did so much to shape the direction of biomedical scholarship in the state of Queensland. The QIMR Bancroft Medal is awarded to those who have made an outstanding contribution to QIMR.

Ms Sue Cassidy (2004)
Professor Peter Parsons (2003)
Dr Suzanne Elliott (2003)
Mrs Beth Dawe (2003)
Mrs Verion Conley (2003)
Ms Christine Borthwick (2002)
Dr Peter Upcroft (2002)
Mrs Heather Matthews (2001)
Mr Erin Fleay (2001)
Mr Chris Ward (2000)
Mr Allan Stockman (2000)
Professor Brian Kay (2000)
Queensland Medical Laboratories (1999)
Sullivan & Nicolaides (1999)
Ms Michelle Lagana (1997)
Ms Lee Casey (1996)
Professor John Kerr
Mr Fergus Wilson
Mr Ted Cole
Dr Ian Taylor
Sir Bruce Watson
Mr Rod Wylie OBE

Awards

Derrick-Mackerras Memorial Lectures

Each year, an eminent member of the scientific community is chosen to deliver the Derrick-Mackerras Memorial Lecture, named for the founding Director and the founding Deputy Director of QIMR.

<table>
<thead>
<tr>
<th>Year</th>
<th>Lecturer</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>21st 2004</td>
<td>Dr James Watson</td>
<td>B2B – From Bone to B Cells</td>
</tr>
<tr>
<td>20th 2003</td>
<td>Professor Bob Williamson</td>
<td>Human Genes and Cloning People: The Medical Realities and the Public Fears</td>
</tr>
<tr>
<td>19th 2002</td>
<td>Professor Fiona Stanley</td>
<td>Public Health, Human Rights and the Development of Civil Societies. What has health and medical research got to do with social justice?</td>
</tr>
<tr>
<td>18th 2001</td>
<td>Sir Gustav Nossal</td>
<td>The Genomics Revolution to Prove a New Model for Spaceship Earth</td>
</tr>
<tr>
<td>17th 2000</td>
<td>John M Vierling MD</td>
<td>Human Organ Transplantation in the New Millennium: Understanding and Controlling the Immune Response</td>
</tr>
<tr>
<td>16th 1999</td>
<td>Professor Frank Fenner</td>
<td>Disease Eradication and Bioterrorism: Opposite Ends of a Public Health Spectrum</td>
</tr>
<tr>
<td>15th 1998</td>
<td>Dr Lois “Lowitja” O’Donoghue</td>
<td>Indigenous Health: Monitoring the Vital Signs</td>
</tr>
<tr>
<td>14th 1997</td>
<td>Professor Peter Doherty</td>
<td>Killer Cells and the Control of Viral Infections</td>
</tr>
<tr>
<td>13th 1996</td>
<td>Professor Bridget M Ogilvie</td>
<td>The Support of Medical Research: People, Programs and Policies</td>
</tr>
<tr>
<td>12th 1995</td>
<td>Professor C Thomas Caskey</td>
<td>Genetics and the Future</td>
</tr>
<tr>
<td>11th 1994</td>
<td>Dr Baruch Blumberg</td>
<td>Evolution, Sex and the Hepatitis B Virus</td>
</tr>
<tr>
<td>10th 1993</td>
<td>Professor M Ferguson-Smith</td>
<td>Modern Genetics Research and its Consequences for Society</td>
</tr>
<tr>
<td>9th 1992</td>
<td>Professor J J Owen</td>
<td>Life and Death of Cells in the Immune System: Implications for Susceptibility to Infections and Disorders of the Immune Response</td>
</tr>
<tr>
<td>8th 1991</td>
<td>Professor Chev Kidson</td>
<td>Genes, Galaxies and Ghosts! Science, Medicine and the Future of Man</td>
</tr>
<tr>
<td>6th 1988</td>
<td>The Honourable Mike Ahern</td>
<td>Overview of the Story of the Struggles and the Successes in the Development of Science and Technology Policy in Queensland</td>
</tr>
<tr>
<td>5th 1985</td>
<td>Dr Louis H Miller</td>
<td>Parasites and Mankind: The Challenge of Malaria in Human History</td>
</tr>
<tr>
<td>4th 1984</td>
<td>Dr Steven Jay Gould</td>
<td>Evolution Beyond Darwin</td>
</tr>
<tr>
<td>3rd 1983</td>
<td>Dr Robyn Williams</td>
<td>The Future of Medicine - Five Nightmares</td>
</tr>
<tr>
<td>2nd 1982</td>
<td>Dr Carleton Gajdusek</td>
<td>Unravelling Causes of Human Disease: Lessons from Adventures in East Asia and the Western Pacific</td>
</tr>
<tr>
<td>1st 1981</td>
<td>Professor Ralph Doherty</td>
<td>Major Contributions by Australians to Medical Science</td>
</tr>
</tbody>
</table>
At the same event each year, outstanding individuals are named as Fellows of the Institute.

2004
Peter Wills

2003
Bryan Campbell
Clive Berghofer
Sam Coco

2002
Diana Cavaye
Sr Regis Mary Dunne

2001
Phillip Desbrow
William O’Sullivan

2000
Lawrie Powell
Tom Veivers

1999
Michael Barry
Kay Ellem
Ian Taylor

1998
Michael O’Rourke

1997
Peter Doherty
Paul Korner
Stephen Lynch
No awards 1996

1995
Ted Brown
1994
Mervyn Eadie
Bryan Emmerson
Ian Wilkey

1993
Graham Mitchell

1992
Michael Alpers
Rod Wylie

1991
Chev Kidson
Chamlong Harinasuta
Peter Livingstone
No awards 1990

1989
Sir Edward Stewart
Tao Yixun

1988
Mike Ahern
Neville McCarthy
Sir Gustav Nossal
Des O’Callaghan (posth)
Frank Schofield
No awards 1987

1986
Natth Bhamarapravati
Louis Miller
Sir Eric Saint
Robert Shope
Sir Bruce Watson

1985
Neville Davis
Robert Porter
Brian Wilson
No awards 1984

1983
Sir Anthony Epstein
Douglas Gordon
Elizabeth Marks

1982
Carleton Gajdusek
David Henderson
Owen Powell
Julie Sulianti Saroso
Edwin Westaway
Vincent Zigas

1981
Sir Macfarlane Burnet
Ralph Doherty
Frank Fenner
Eric French
Sir Abraham Fryberg
Douglas Lee
Margaret Macgregor
Aubrey Pye
William Reeves
John Sprent
Harry Standfast
George Taylor
John Tonge
### Other Awards

<table>
<thead>
<tr>
<th>Name</th>
<th>Award Description</th>
<th>Institution/Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Geoff Hill</td>
<td>Queenslander of the Year 2005</td>
<td>Queensland State Government, 2005</td>
</tr>
<tr>
<td>Kathy Andrews</td>
<td>Queensland Premier’s Award for Medical Research finalist</td>
<td>Queensland State Government, 2005</td>
</tr>
<tr>
<td>Kathy Andrews</td>
<td>Best Poster Prize</td>
<td>Queensland Health and Medical Scientific Meeting, 2005</td>
</tr>
<tr>
<td>Stuart Olver</td>
<td>Best Poster Prize</td>
<td>CRC-VT Annual Conference, Byron, 2005</td>
</tr>
<tr>
<td>Michael Good</td>
<td>Rubbo Medallion</td>
<td>Rubbo Oration, ASM Sydney, 2004</td>
</tr>
<tr>
<td>Brian Kay</td>
<td>Member of the Order of Australia (AM)</td>
<td>Queen's Birthday Honours List, 2005</td>
</tr>
<tr>
<td>Daniel Wallace</td>
<td>Queensland Premier’s Award and Medal for Medical Research in Senior Postdoctoral Category</td>
<td>Queensland State Government, 2005</td>
</tr>
<tr>
<td>Amanda Spurdle</td>
<td>Honorary Commendation for Poster Prize</td>
<td>QIMR 3rd Scientific Conference, Noosa, 2004</td>
</tr>
<tr>
<td>David Whiteman</td>
<td>Best Scientific Presentation</td>
<td>QIMR 3rd Scientific Conference, Noosa, 2004</td>
</tr>
<tr>
<td>David Whiteman</td>
<td>Best Scientific Paper published by QIMR faculty</td>
<td>Clive Berghofer Prize, QIMR, 2004</td>
</tr>
<tr>
<td>Nick Martin</td>
<td>Leadership and Excellence in Medical Research</td>
<td>Ralph Doherty Award, 2004</td>
</tr>
<tr>
<td>Richard Ruddell</td>
<td>June W Halliday Young Investigator Award</td>
<td>Gastroenterological Society of Australia, 2004</td>
</tr>
<tr>
<td>David Frazer</td>
<td>Bushell Foundation Research Fellowship</td>
<td>Gastroenterological Society of Australia, 2004</td>
</tr>
<tr>
<td>Sandro Prato</td>
<td>Best Poster Presentation</td>
<td>BIG Meeting 2004</td>
</tr>
<tr>
<td>Greg Lawrence</td>
<td>Long Service Award</td>
<td>Over 25 years service to QIMR</td>
</tr>
<tr>
<td>Ihor Misko</td>
<td>Long Service Award</td>
<td>Over 25 years service to QIMR</td>
</tr>
</tbody>
</table>
## NHMRC Grants Awarded
(Excluding Equipment Grants, Fellowships and Scholarships)

<table>
<thead>
<tr>
<th>Calendar Year:</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Grants - Standard</td>
<td>148,383</td>
<td>717,557</td>
<td>900,623</td>
<td>2,745,278</td>
<td>3,574,000</td>
<td>4,793,386</td>
</tr>
<tr>
<td>Project Grants - Genomics</td>
<td>-</td>
<td>863,000</td>
<td>853,000</td>
<td>394,000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Program Grants</td>
<td>-</td>
<td>-</td>
<td>2,110,000</td>
<td>2,965,000</td>
<td>4,421,083</td>
<td>5,426,606</td>
</tr>
<tr>
<td>Transitional Institute Grant (TIG)</td>
<td>-</td>
<td>-</td>
<td>900,000</td>
<td>900,000</td>
<td>900,000</td>
<td>900,000</td>
</tr>
<tr>
<td>Transitional Block Grant (TBG)</td>
<td>4,818,225</td>
<td>4,863,644</td>
<td>4,049,556</td>
<td>2,466,426</td>
<td>511,146</td>
<td>-</td>
</tr>
<tr>
<td>Development Grants</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>155,000</td>
<td>155,000</td>
<td>156,500</td>
</tr>
<tr>
<td>International Collaborative Grants</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>150,000</td>
<td>415,942</td>
<td>265,942</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4,966,608</td>
<td>6,444,201</td>
<td>8,813,179</td>
<td>9,775,704</td>
<td>9,977,171</td>
<td>11,542,434</td>
</tr>
</tbody>
</table>

## NHMRC Fellowships and Scholarships Awarded

<table>
<thead>
<tr>
<th>Calendar Year:</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postgraduate Scholarships</td>
<td>84,426</td>
<td>101,824</td>
<td>82,243</td>
<td>92,067</td>
<td>58,977</td>
<td>172,339</td>
</tr>
<tr>
<td>Training Fellowships</td>
<td>226,617</td>
<td>327,377</td>
<td>399,910</td>
<td>620,202</td>
<td>434,866</td>
<td>565,746</td>
</tr>
<tr>
<td>Career Development Awards</td>
<td>-</td>
<td>-</td>
<td>160,000</td>
<td>511,000</td>
<td>606,750</td>
<td>884,000</td>
</tr>
<tr>
<td>Research Fellowships</td>
<td>275,428</td>
<td>354,576</td>
<td>660,000</td>
<td>787,750</td>
<td>1,305,000</td>
<td>1,548,750</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>586,471</td>
<td>783,777</td>
<td>1,302,153</td>
<td>2,011,019</td>
<td>2,405,593</td>
<td>3,170,835</td>
</tr>
</tbody>
</table>

## Leukaemia Foundation of Queensland Funding

<table>
<thead>
<tr>
<th>Calendar Year:</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leukaemia Foundation QLD</td>
<td>249,649</td>
<td>212,812</td>
<td>432,773</td>
<td>381,265</td>
<td>312,818</td>
<td>280,568</td>
</tr>
</tbody>
</table>
## Major New Grants Awarded in 2004–2005 (over $100,000)

<table>
<thead>
<tr>
<th>Source</th>
<th>Chief Investigators &amp; Project Title</th>
<th>Term</th>
<th>Period</th>
<th>Total Funds or QIMR Component of Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARC</td>
<td>HAYWARD N, KAY G : “The function of menin in mammalian development.” (Administered by The University of Queensland)</td>
<td>3 yrs</td>
<td>2005-07</td>
<td>$230,000</td>
</tr>
<tr>
<td>ARC</td>
<td>KHANNA K, FABBRO M : “Functional characterisation of CMAP, a novel centrosome and midbody-associated protein.” (Administered by Griffith University)</td>
<td>3 yrs</td>
<td>2005-07</td>
<td>$230,000</td>
</tr>
<tr>
<td>CCNSW and QCF</td>
<td>BUTOW P et al. : “Quality of life and psychosocial predictors of outcome in a population based study of ovarian cancer.” (Multi-State Grant administered by University of Sydney; QLD PI: P WEBB)</td>
<td>2 yrs</td>
<td>2005-06</td>
<td>141,756</td>
</tr>
<tr>
<td>NHF</td>
<td>GOOD M : “Investigation of memory B-cells and long-lived plasma cells during group A streptococcal infection of mice immunised with candidate vaccines to prevent rheumatic fever and rheumatic heart disease: implications for vaccine design and administration.”</td>
<td>2 yrs</td>
<td>2005-06</td>
<td>$120,000</td>
</tr>
<tr>
<td>NHF</td>
<td>OLIVE C : “The development of a lipid core peptide-based vaccine against multiple virulence factors of group A streptococci to prevent rheumatic heart disease.”</td>
<td>2 yrs</td>
<td>2005-06</td>
<td>$120,000</td>
</tr>
<tr>
<td>NHMRC</td>
<td>BOYD A (UQ), BARTLETT P, TURNLEY A, GALEA M : “Is EphA4 the major molecular regulator of axonal regeneration?” (Administered by The University of Queensland)</td>
<td>3 yrs</td>
<td>2005-07</td>
<td>$227,250</td>
</tr>
<tr>
<td>NHMRC</td>
<td>DEVEREUX L : “Australian Biospecimen Network - Oncology.” (Administered by Peter MacCallum Cancer Centre; QIMR Investigators: C SCHMIDT, G CHENEVIX-TRENCH)</td>
<td>5 yrs</td>
<td>2004-09</td>
<td>$234,300</td>
</tr>
<tr>
<td>NHMRC</td>
<td>FRAZER I, THOMAS R, HILL G : “Immunological therapies for cancer and autoimmunity.” (Administered by The University of Queensland; QIMR Investigator: G HILL)</td>
<td>5 yrs</td>
<td>2005-09</td>
<td>$1,355,000</td>
</tr>
<tr>
<td>NHMRC</td>
<td>KAY G, HAYWARD N : “Transcriptional targets of the MEN1 tumour suppressor in endocrine cancer.”</td>
<td>3 yrs</td>
<td>2005-07</td>
<td>$447,750</td>
</tr>
<tr>
<td>NHMRC</td>
<td>KELSO A, BAZ A : “Generation of multipotential memory CD8+ T cells.”</td>
<td>3 yrs</td>
<td>2005-07</td>
<td>$473,500</td>
</tr>
<tr>
<td>NHMRC</td>
<td>LAVIN M (UQ), SCOTT S : “Functional significance of ATM-dependent phosphorylation of Mre11.”</td>
<td>3 yrs</td>
<td>2005-07</td>
<td>$208,500</td>
</tr>
<tr>
<td>NHMRC</td>
<td>MARTIN N : “Mapping genes for anxiety and depression.”</td>
<td>3 yrs</td>
<td>2005-07</td>
<td>$751,200</td>
</tr>
<tr>
<td>NHMRC</td>
<td>MONTGOMERY G et al. : “Fine mapping of a significant linkage region for endometriosis.”</td>
<td>3 yrs</td>
<td>2005-07</td>
<td>$512,663</td>
</tr>
<tr>
<td>Source</td>
<td>Chief Investigators &amp; Project Title</td>
<td>Term</td>
<td>Period</td>
<td>Total Funds or QIMR Component of Funds</td>
</tr>
<tr>
<td>------------</td>
<td>----------------------------------------------------------------------------------------------------</td>
<td>------</td>
<td>---------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>NHMRC</td>
<td>MOWRY B et al.: “A genome-wide linkage study of schizophrenia in a large sample from Tamil Nadu, India.”</td>
<td>3 yrs</td>
<td>2005-07</td>
<td>$500,000</td>
</tr>
<tr>
<td>NHMRC</td>
<td>SPURDLE A et al.: “Molecular epidemiology of endometrial cancer.”</td>
<td>3 yrs</td>
<td>2005-07</td>
<td>$1,451,998</td>
</tr>
<tr>
<td>NIH</td>
<td>GOOD M et al.: “Global GAS vaccine based on the M-protein.”</td>
<td>5 yrs</td>
<td>2004-09</td>
<td>US$2,705,945</td>
</tr>
<tr>
<td>NIH</td>
<td>HEATH A: “MARC: Genetic epidemiology of alcoholism and comorbidity.” (Administered by Washington University in St Louis; QIMR Investigator: N MARTIN)</td>
<td>5 yrs</td>
<td>2004-09</td>
<td>US$500,000</td>
</tr>
<tr>
<td>QCF</td>
<td>GANDHI M et al.: “EBV-specific cytotoxic T lymphocytes as tools for adoptive immunotherapy for EBV-positive Hodgkin’s lymphoma.”</td>
<td>2 yrs</td>
<td>2005-06</td>
<td>$143,400</td>
</tr>
<tr>
<td>QCF</td>
<td>HAYWARD N: “Identification of novel tumour suppressor genes in melanoma using array-CGH.”</td>
<td>2 yrs</td>
<td>2005-06</td>
<td>$143,400</td>
</tr>
<tr>
<td>QCF</td>
<td>HILL G: “Host B cells and graft-versus-host disease.”</td>
<td>2 yrs</td>
<td>2005-06</td>
<td>$143,400</td>
</tr>
<tr>
<td>QCF</td>
<td>KIENZLE N, KELSO A: “In vivo functions od CD8 low T cells.”</td>
<td>2 yrs</td>
<td>2005-06</td>
<td>$143,400</td>
</tr>
<tr>
<td>QCF</td>
<td>LOFFLER K, HAYWARD N: “Molecular mechanisms of insulinoma development.”</td>
<td>2 yrs</td>
<td>2005-06</td>
<td>$143,400</td>
</tr>
<tr>
<td>QCF</td>
<td>SPRING K, LEGGETT B, YOUNG J: “Role of oncogenic BRAF (V599E) mutation in the molecular pathogenesis of sporadic colorectal cancer.”</td>
<td>2 yrs</td>
<td>2005-06</td>
<td>$143,400</td>
</tr>
</tbody>
</table>

**Legend for Source of Funds**

ARC  Australian Research Council  
CCNSW  Cancer Council of New South Wales  
KOMEN  Susan G Komen Breast Cancer Foundation (USA)  
NBCF  National Breast Cancer Foundation  
NHF  National Heart Foundation of Australia  
NHMRC  National Health and Medical Research Council  
NIH  National Institutes of Health (USA)  
QCF  Queensland Cancer Fund  

---

GRANTS FUNDING RECEIVED FROM ALL SOURCES 2004–2005

---

Queensland Institute of Medical Research 79


Dietz HP, Hansell NK, Grace ME, Eldridge AM, Clarke B and Martin NG. Bladder neck mobility is a heritable trait. Br J Obstet Gynaecol 112: 334-9, 2005


Edwards ML, Fagan PK, Currie BJ and Srirapaksh K. The fibronectin-binding capacity and host cell adherence of Streptococcus pyogenes strains are discordant with each other. Microbes Infect 6: 1156-62, 2004

Edwards ML, Fagan PK, Towers RJ, Currie BJ and Srirapaksh K. Inhibition of Streptococcus pyogenes adherence to HaCaT cells by a peptide corresponding to the streptococcal fibronectin-binding protein, SfbI, is strain dependent. Microbes Infect 6: 926-8, 2004


Elliott SR, Kuns RD and Good MF. Heterologous immunity in the absence of variant-specific antibodies after exposure to sub patent infection with blood-stage malaria. Infect Immun 73: 2478-85, 2005


Engwerda CR and Good MF. Interactions between malaria parasites and the host immune system. Curr Opin Immunol 17: 381-7, 2005


Frances SP, Cooper RD, Rowcliffe KL, Chen N and Cheng Q. Occurrence of Ross River virus and Baranath Forest virus in mosquitoes at Shoalwater Bay Military Training Area, Queensland, Australia. J Med Entomol 41: 115-20, 2004

Frazier DM, Inglis HR, Wilkins SJ, Millard KN, Steele TM, McLaren GD, McKie AT, Vulpe CD and Anderson GJ. Delayed hepcidin response explains the lag period in iron absorption following a stimulus to increase erythropoiesis. Gut 53: 1509-15, 2004

Frazier DM, Wilkins SJ, Millard KN, McKie AT, Vulpe CD and Anderson GJ. Increased hepcidin expression and hypoferremia associated with an acute phase response are not affected by inactivation of HFE. Br J Haematol 126: 434-6, 2004


Gillespie NA, Whitfield JB, Williams B, Heath AC and Martin NG. The relationship between stressful life events, the serotonin transporter (5-HTTLPR) genotype and major depression. Psychol Med 35: 101-11, 2005

Gobert GN and McManus DP. Update on paramyosin in parasitic worms. Parasitol Int 54: 101-7, 2005


Good MF, Australians lead the way in vaccine research for malaria and other infectious diseases. Aust Life Scientist March/April Edition, p23, 2005

Good MF. Genetically modified Plasmodium highlights the potential of whole parasite vaccine strategies. Trends Immunol 26: 295-7, 2005

Good MF. Vaccine-induced immunity to malaria parasites and the need for novel strategies. Trends Parasitol 21: 29-34, Review, 2005

Good MF. Wise to the healthy, wealthy divide. In Griffith Review 4, ABC Books. pp175-84, 2005


Hansell NK, Dietz HP, Treloar SA, Clarke B and Martin NG. Genetic covariation of pelvic organ and elbow mobility in twins and their sisters. Twin Res 7: 254-60, 2004


Keller MC and Coventry WL. Quantifying and addressing parameter indeterminacy in the classical twin design. Twin Res Hum Genet 8: 60-8, 2005


Kennedy GA, Butler J, Western R, Morton J, Hill G and Durrant S. Predicting survival for myeloid leukaemia after HLA-identical sibling donor allogeneic stem cell transplantation. Leukemia 19: 317-8, 2005


Knopik VS, Heath AC, Madden PA, Bucholz KK, Slutske WS, Nelson EC, Statham D, Whitfield JB and Martin NG. Genetic effects on alcohol dependence risk: re-evaluating the importance of psychiatric and other heritable risk factors. Psychol Med 34: 1519-30, 2004


2004–2005 Publications


Siskind V, Whitman DC, Alten JK, Martin NG and Green AC. An analysis of risk factors for cutaneous melanoma by anatomic site (Australia). Cancer Causes Control 16: 193-9, 2005


Tscharke DC and Suhrbier A. From mice to humans-murine intelligence for human CDB+ T cell vaccine design. Expert Opin Biol Ther 5: 263-71, 2005


Upcroft JA, Abединia M and Upcroft P. Rearranged subtelomeric RNA genes in Giardia duodenalis. Eukaryot Cell 4: 484-6, 2005


Wicks J, Treloar SA, Martin NG and Duffy DL. New concepts for distinguishing the hidden patterns of linkage disequilibrium which underlie association between genotypes and complex phenotypes. Twin Res Hum Genet 8: 95-101, 2005
Wright CM, Dent OF, Newland RC, Barker M, Chapuis PH, Bokey EL, Young JP, Leggett BA, Jass JR and Macdonald GA. Low-level microsatellite instability may be associated with reduced cancer-specific survival in sporadic C colorectal carcinoma. Gut 54: 103-8, 2005
Wykes MN, Beattie L, Macpherson GG and Hart DN. Dendritic cells and follicular dendritic cells express a novel ligand for CD38 which influences their maturation and antibody responses. Immunology 113: 318-27, 2004
Zuidervaat W, van Nieuwpoort F, Stark M, Dijkman R, Packer L, Borgstein AM, Pavey S, van der Velden P, Out C, Jager M, Hayward NK and Gruis NA. Activation of the MAPK pathway is a common event in uveal melanomas although it rarely occurs through mutation of BRAF or RAS. Br J Cancer 92: 2032-8, 2005
# Invited Lectures and Presentations

<table>
<thead>
<tr>
<th>Lecturer</th>
<th>Title</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geoff Hill</td>
<td>G-CSF and the regulation of GVHD</td>
<td>Australian Rheumatology Association Annual Meeting, Cairns, 2004</td>
</tr>
<tr>
<td></td>
<td>Optimisation of stem cell mobilisation for the separation of GVHD and GVL</td>
<td>Haematology Society of Australia and NZ Annual Meeting, Melbourne, 2004</td>
</tr>
<tr>
<td></td>
<td>New methods of stem cell mobilisation</td>
<td>NSW Haematology Society of Australia and NZ Annual Meeting, Sydney, 2004</td>
</tr>
<tr>
<td></td>
<td>Stem cell biology in allogeneic SCT</td>
<td>Hanson symposium, Adelaide, 2004</td>
</tr>
<tr>
<td>Scott Burrows</td>
<td>The Epstein-Barr virus antigen EBNA1 is recognised by a highly restricted T cell receptor repertoire: implications for nasopharyngeal carcinoma</td>
<td>3rd Congress of FIMSA, Hangzhou, China, 2005</td>
</tr>
<tr>
<td></td>
<td>The immunogenicity of a viral cytotoxic T cell epitope is controlled by its MHC-bound conformation</td>
<td>3rd Congress of FIMSA, Hangzhou, China, 2005</td>
</tr>
<tr>
<td>James McCarthy</td>
<td>Drug resistant parasite infections: Where are we now?</td>
<td>6th Jakarta Antimicrobial Symposium. Indonesian Society for Tropical and Infectious Diseases, Jakarta, Indonesia, 2005</td>
</tr>
<tr>
<td></td>
<td>Drug resistance in parasite infections</td>
<td>Australian Society for Antimicrobials, Lorne, 2005</td>
</tr>
<tr>
<td>Denis Moss</td>
<td>Therapeutic opportunity for controlling nasopharyngeal carcinoma</td>
<td>Asia-Pacific Conference Cairns, 2004</td>
</tr>
<tr>
<td></td>
<td>A new generation vaccine to nasopharyngeal carcinoma</td>
<td>Indonesian National Immunology and Allergy Congress, Jogjakarta, Indonesia, 2005</td>
</tr>
<tr>
<td></td>
<td>Epstein-Barr virus: Looking backwards, looking forwards</td>
<td>Sun Yat-Sen University Cancer Centre, Guangzhou, 2004 and Second Military University Beijing, 2004</td>
</tr>
<tr>
<td></td>
<td>Immunotherapeutic opportunities for controlling EBV-associated diseases</td>
<td>Indo-Australian Conference on Biotechnology and Infectious Diseases, Manipal, India, 2005</td>
</tr>
<tr>
<td>Tom Sculley</td>
<td>The EBNA-3 gene family proteins disrupt the G2M checkpoint</td>
<td>The Eleventh International Symposium on EBV and Associated Diseases, Regensburg, Germany, 2004</td>
</tr>
<tr>
<td>Alex Loukas</td>
<td>The haemoglobin digestion pathway as a target for a hookworm vaccine.</td>
<td>Australian Society for Parasitology Annual Meeting, Fremantle, 2004</td>
</tr>
<tr>
<td></td>
<td>Excretory-secretory proteins of Toxocara canis developmentally arrested larvae.</td>
<td>American Society for Tropical Medicine and Hygiene Annual Meeting, Miami, USA, 2004</td>
</tr>
<tr>
<td></td>
<td>Towards a vaccine for human hookworm infection</td>
<td>IX European Multicolloquium of Parasitology, Valencia, Spain, 2004</td>
</tr>
<tr>
<td></td>
<td>Will unveiling the schistosome transcriptome accelerate or exacerbate vaccine development?</td>
<td>Brisbane Immunology Group Conference, Noosa, 2004</td>
</tr>
<tr>
<td></td>
<td>Hookworm immunomodulatory proteins</td>
<td>Australian Society for Parasitology, Fremantle, 2004</td>
</tr>
<tr>
<td></td>
<td>Development of hookworm vaccines</td>
<td>Immunomodulation by helminth parasites, Hamburg, Germany, 2005</td>
</tr>
<tr>
<td>David Harrich</td>
<td>Novel pathways for HIV replication</td>
<td>St. Louis University, St. Louis, USA, 2005</td>
</tr>
<tr>
<td></td>
<td>Tat is a reverse transcription cofactor</td>
<td>Keystone Symposia, Banff, Canada, 2005</td>
</tr>
<tr>
<td></td>
<td>Novel HIV-1 drug targets</td>
<td>Eli Lilly Kinase Summit, Indianapolis, USA, 2005</td>
</tr>
<tr>
<td></td>
<td>HIV replication strategies</td>
<td>Institut de Génétique Humaine, France, 2005</td>
</tr>
<tr>
<td></td>
<td>The mechanism of Tat-enhanced reverse transcription</td>
<td>National Institutes of Health, Bethesda, USA, 2005</td>
</tr>
<tr>
<td></td>
<td>HIV-1 reverse transcription strategies</td>
<td>The Gladstone Institute, San Francisco, USA, 2005</td>
</tr>
<tr>
<td>Christian Engwerda</td>
<td>Host immune responses in malaria and leishmania</td>
<td>7th FIMSA/ASI Advanced Training Course in Immunology, Adelaide, 2004</td>
</tr>
<tr>
<td>Anne Kelso</td>
<td>Pathways of cytolytic T lymphocyte development</td>
<td>12th International Congress of Immunology, Montreal, Canada, 2004</td>
</tr>
<tr>
<td></td>
<td>New insights into cytolytic T lymphocyte development</td>
<td>CSL Limited, Melbourne, 2004</td>
</tr>
<tr>
<td></td>
<td>Controlling the killer within: new insights into cytolytic T lymphocyte development</td>
<td>Dr Christina Cheers Symposium, University of Melbourne, Melbourne, 2004</td>
</tr>
<tr>
<td></td>
<td>Regulation of CTL development and function</td>
<td>7th FIMSA/ASI Advanced Training Course in Immunology, Adelaide, 2004</td>
</tr>
<tr>
<td>Title</td>
<td>Event</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Chance and necessity in the immune response</td>
<td>Annual Scientific Conference of the Australasian Society for Immunology, Adelaide, 2004</td>
<td></td>
</tr>
<tr>
<td>Development of effector and memory cytolytic T lymphocytes</td>
<td>3rd Congress of FIMSA, Hangzhou, China, 2005</td>
<td></td>
</tr>
<tr>
<td>Cytokine regulation of perforin and granzyme gene expression in normal CD8+ T cells</td>
<td>Apoptosis and Immunity 2005, Palm Cove, 2005</td>
<td></td>
</tr>
<tr>
<td>Effector T cell development</td>
<td>Postgraduate Lecture Series, The Walter and Eliza Hall Institute of Medical Research, Melbourne, 2005</td>
<td></td>
</tr>
<tr>
<td>Andreas Suhrbrier</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kunjin replicon vectors for cancer and HIV</td>
<td>Annual Scientific Conference of the Australasian Society for Immunology, Adelaide, 2004</td>
<td></td>
</tr>
<tr>
<td>Non cytopathic replicon vaccines based on the Flavivirus, Kunjin for the generation of long-lived protective CD8 T cell responses</td>
<td>12th International Congress of Immunology Montreal, Canada, 2004</td>
<td></td>
</tr>
<tr>
<td>Qin Cheng</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genetic diversity of histidine-rich protein 2 and its effect on the performance of PIHRP2-based rapid diagnostic tests</td>
<td>53rd Annual Meeting of American Society of Tropical Medicine and Hygiene, Miami, USA, 2004</td>
<td></td>
</tr>
<tr>
<td>Michael Good</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The burden of malaria – developing vaccine strategies</td>
<td>Asia-Pacific Conference, Cairns, 2004</td>
<td></td>
</tr>
<tr>
<td>Looking to the future – impact and challenges for translating biotechnology and medical research into better health</td>
<td>The Australian Family Association, Parliament House Brisbane, 2004</td>
<td></td>
</tr>
<tr>
<td>The challenges of vaccine development for developing countries and Indigenous populations</td>
<td>Rubbo Oration, ASM 2004, Sydney, 2004</td>
<td></td>
</tr>
<tr>
<td>Looking to the future - impact and challenges for translating biotechnology and medical research into better health</td>
<td>Guild of St Luke, Ballymore, Brisbane, 2004</td>
<td></td>
</tr>
<tr>
<td>Challenging the malaria vaccine paradigm</td>
<td>Centenary Institute of Cancer Medicine and Cell Biology, Sydney, 2004</td>
<td></td>
</tr>
<tr>
<td>Whole parasite strategies for malaria vaccine development</td>
<td>Annual Scientific Conference of the Australasian Society for Immunology, Adelaide, 2004</td>
<td></td>
</tr>
<tr>
<td>Preclinical evaluation of a GAS vaccine candidate based on the conserved region of the M-protein</td>
<td>Malaria Immunology Meeting, Baltimore, USA, 2005</td>
<td></td>
</tr>
<tr>
<td>Whole parasite strategies for malaria vaccination</td>
<td>Indo-Australian Conference on Biotechnology in Infectious Diseases, Manipal, India, 2005</td>
<td></td>
</tr>
<tr>
<td>Preclinical evaluation of a GAS vaccine candidate based on the conserved region of the M protein</td>
<td>CRC for Vaccine Technology Annual Conference Byron Bay, 2005</td>
<td></td>
</tr>
<tr>
<td>Don McManus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Molecular diagnosis of Echinococcus</td>
<td>XX1st International Congress of Hydatidology Nairobi, Kenya, 2004</td>
<td></td>
</tr>
<tr>
<td>Schistosome Microarrays</td>
<td>Chinese National Human Genome Centre Shanghai, China, 2004</td>
<td></td>
</tr>
<tr>
<td>Brian Kay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Astounding success in controlling dengue in Vietnam</td>
<td>Asia Pacific Forum on Tropical Health Cairns, 2004</td>
<td></td>
</tr>
<tr>
<td>Yellow fever mosquito: an old and new foe</td>
<td>9th Arbovirus Research in Australia and 6th Mosquito Control Assoc of Australia Symposiums, Noosa, 2004</td>
<td></td>
</tr>
<tr>
<td>Peter Ryan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optimising surveillance for dengue vector immatures in large water storage containers in Vietnam</td>
<td>9th Arbovirus Research in Australia and 6th Mosquito Control Assoc of Australia Symposiums, Noosa, 2004</td>
<td></td>
</tr>
<tr>
<td>Medical Research in Australia and QIMR dengue control research in Vietnam</td>
<td>Australia Post Sales Conference, Brisbane, 2004</td>
<td></td>
</tr>
<tr>
<td>Mosquito and Arbovirus Research Committee and research at QIMR</td>
<td>Health and Environmental Services Region of Councils Townsville, 2005</td>
<td></td>
</tr>
<tr>
<td>Multi-country study of the pupal productivity technique for the dengue vector <em>Aedes aegypti</em> Vietnam</td>
<td>UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Disease, Bogota, Colombia, 2005</td>
<td></td>
</tr>
</tbody>
</table>
### Invited Lectures and Presentations

<table>
<thead>
<tr>
<th>Rajiv Khanna</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profiling HCMV-specific T cell response in solid organ transplant patients</td>
</tr>
<tr>
<td>Preclinical studies on the development of a prophylactic vaccine for human cytomegalovirus disease</td>
</tr>
<tr>
<td>Pathogenesis of Hodgkin Lymphoma – EBV in Hodgkin Lymphoma (HL)</td>
</tr>
<tr>
<td>Prophylactic vaccine for human cytomegalovirus disease</td>
</tr>
<tr>
<td>Novel immunotherapeutic strategies for the treatment of nasopharyngeal carcinoma</td>
</tr>
<tr>
<td>T Cell perturbations during persistent viral infections</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Georgia Chenevix-Trench</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classification of unclassified variants in BRCA1 and BRCA2</td>
</tr>
<tr>
<td>Beyond BRCA1 and BRCA2</td>
</tr>
<tr>
<td>kConFab</td>
</tr>
<tr>
<td>kConFab</td>
</tr>
<tr>
<td>Beyond BRCA1 and BRCA2</td>
</tr>
<tr>
<td>The annual kConFab update</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chris Schmidt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metastatic melanoma responds to dendritic cell immunotherapy</td>
</tr>
<tr>
<td>Metastatic melanoma: a response model</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alejandro López</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methods for the evaluation of IFN-γ production by human CD8+ T lymphocytes</td>
</tr>
<tr>
<td>Direct correlation between immunological performance and clinical outcome in a DC-based immunotherapy for advanced melanoma</td>
</tr>
<tr>
<td>Multiple abnormalities in dendritic cell population in patients with breast carcinoma</td>
</tr>
<tr>
<td>State of the art on DC-immunotherapy and future perspectives</td>
</tr>
<tr>
<td>Correlation of clinical and immunological responses following DC immunotherapy</td>
</tr>
<tr>
<td>Functional characterisation of DC in patients with cancer</td>
</tr>
<tr>
<td>Dendritic cells in cancer: A mechanism for immunosuppression</td>
</tr>
<tr>
<td>mRNA as a tumour antigen loading strategy for DC immunotherapy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nick Hayward</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interactive effects of the MC1R and OCA2 genes on melanoma predisposition phenotypes and penetrance of CDKN2A mutations</td>
</tr>
<tr>
<td>Science Of Cancer: Where Are We Heading?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nathan Subramaniam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-HFE Haemochromatosis and Case Discussion</td>
</tr>
<tr>
<td>The Liver as Regulator of Iron Metabolism</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amanda Spurdle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation of unclassified variants of BRCA1 and BRCA2</td>
</tr>
<tr>
<td>Breast cancer genes – which unclassified variants cause cancer?</td>
</tr>
<tr>
<td>Molecular epidemiology of endometrial cancer: The Australian National Endometrial Cancer Study (ANECS)</td>
</tr>
<tr>
<td><strong>Barbara Leggett</strong></td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>Different pathways to colorectal carcinogenesis.</td>
</tr>
<tr>
<td>Mismatch repair in clinical practice: MSI, IHC or both?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Nick Martin</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Are there genes for DZ twinning?</td>
</tr>
<tr>
<td>Epigenetic factors in MZ discordance for schizophrenia</td>
</tr>
<tr>
<td>The use of twins to study childhood development and behaviour</td>
</tr>
<tr>
<td>QTLs for anxiety and depression using extreme discordant and concordant twins and sibs in Australia and The Netherlands.</td>
</tr>
<tr>
<td>The genetics of alcoholism.</td>
</tr>
<tr>
<td>Finding genes for cognition.</td>
</tr>
<tr>
<td>What's hot in Australian human gene mapping.</td>
</tr>
<tr>
<td>Hunting QTLs.</td>
</tr>
<tr>
<td>QTL linkage analysis for personality.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Grant Ramm</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Recent advances in hepatic fibrosis</td>
</tr>
<tr>
<td>Iron overload and liver injury</td>
</tr>
<tr>
<td>Monocyte Chemokaxis Protein-1: A candidate molecule for hepatic fibrogenesis in cholestatic liver disease and “The role of iron-binding proteins in hepatic stellate cell biology and hepatic fibrosis in haemochromatosis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Greg Anderson</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transports and traffickers</td>
</tr>
<tr>
<td>The molecular mechanisms and regulation of intestinal iron absorption</td>
</tr>
<tr>
<td>Iron in the CNS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Lawrie Powell</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>New players in iron metabolism</td>
</tr>
<tr>
<td>Haemochromatosis and iron overload with particular reference to Asia</td>
</tr>
<tr>
<td>Haemochromatosis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Lawrie Powell</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Genetic studies of twinning in sheep and humans</td>
</tr>
<tr>
<td>Genetics of complex disease: Twins and twin families</td>
</tr>
<tr>
<td>Biology of human twinning</td>
</tr>
<tr>
<td>Twinning: Mechanisms and unusual cases</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Janelle Stirling</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborative programmes at QIMR</td>
</tr>
<tr>
<td>Partnerships in research</td>
</tr>
</tbody>
</table>
Mr Paul Wright – Chairman of QIMR Trust

This year has seen considerable change at QIMR, proving once again that research is a dynamic and evolving industry. In my five years as Chairman of the QIMR Trust, I have been privileged to witness many encouraging developments, including a recent and ongoing venture in Hong Kong and China for the Institute’s experimental “immunotherapy” treatment against cancer affecting children as young as 7 years. This is testimony to QIMR’s status of being a world-class institute providing research benefiting communities globally. Closer to home is the Suncorp partnership supporting skin cancer research in QIMR’s Clive Berghofer Cancer Centre.

Many scientific achievements by QIMR’s 800 scientists are outlined in this Annual Report, achievements which steadily and positively impact on the health and wellbeing of us all and which will ultimately lead to reductions in the social, financial, emotional and physical costs of ill health in our community.

As the corporate dollar dwindles, the emphasis in raising funds has shifted to the individual and community base, from which many of our ardent supporters have come. QIMR is indebted to these people and they are acknowledged on pages XYZ of this report. One person who deserves a special mention is Mr Clive Berghofer. Clive’s support over the past 4 years has enabled vital human clinical trials to treat many forms of cancer to fast-track a potential new and non-invasive way of treating cancer which may ultimately benefit us all and future generations to come. For his unwavering and generous support we are most grateful.

We are deeply appreciative to every one of our supporters who have joined us on the highway of medical discovery. Whether you gave financial contributions to our research, held a fundraising event, have left a provision in your will to QIMR, helped spread our message to others or support us through in-kind contributions, you are integral to the ongoing medical research effort at QIMR.

Thank you to the QIMR Trust members and the Development and Marketing Department whose insights and persistence have resulted in significant funds raised and awareness generated which has contributed towards the purchase of vital research equipment and escalating research programs.

We hope our valued supporters will continue their relationship with QIMR and, above all, we hope that our medical research will continue to improve all of our lives. QIMR is about people who are searching for more effective treatments, diagnostic tests and vaccines to defeat diseases tomorrow but this can only be achieved with your support today.

Paul Wright
Chairman
Mr Paul Wright FAIM FAIBF FAICD

Mr Paul Wright has combined banking, health, hospitality and consulting industries in a career which has encompassed over twenty five years in senior executive management with a breadth and depth in leadership roles. He has been General Manager Qld and NT of Medical Benefits of Australia Limited and provided executive services as General Manager of The Brisbane Club.

Paul has also been a company director for more than twenty years and has served as Chairman/President of The Australian Institute of Management and The Royal Flying Doctor Service. He is currently Chairman of The CyberInstitute Pty Ltd, The Queensland Institute of Medical Research Trust and Phoenix Eagle Company Pty Ltd. Other current Board appointments include QIMR Council, The Royal Flying Doctor Service, PQ Lifestyles Pty Ltd and Queensland Fruit and Vegetable Growers Limited.

Mr John Garnsey FAIA (Dip)

The Trust benefits immeasurably from Mr John Garnsey’s accomplishments in strategic marketing and his knowledge of both national and international advertising campaign development. He is former Chairman and Managing Director of Garnsey Clemenger Advertising Agency and past Chairman of the Advertising Federation of Australia. Mr Garnsey chairs the QIMR Marketing Committee.

Mr Rodney Wylie OBE BA FCA FAICD DUniv(Griffith)

Mr Rod Wylie is a Brisbane-based Chartered Accountant with substantial experience in investment, company management and corporate governance issues across a wide range of organisations, in many cases with nationwide and international activities. He has been involved through Board/Council membership in the administration of a number of professional and community non-profit groups. Mr Wylie chairs the QIMR Investment Committee and is a member of the QIMR Finance and Audit Committee.

Mr Ian Manly MBA

Mr Ian Manly has extensive experience in business management and corporate development. He is the Managing Director of First 5 Minutes, a company providing fire and emergency procedures and training. Mr Manly is a member of the QIMR Investment Committee.
Mr Richard Alexander Joel AM MAICD

Mr Richard Joel is principal of Richard Joel and Associates Strategic Consultants. He was previously Chief Executive Officer of the Office of Economic Development for the city of Brisbane for 17 years and prior to that, Managing Director of the diversified public company Walter Reid and Company Ltd for 10 years. He has been a Director of several public and government companies and is currently a Director of Queensland Railways. Richard has had extensive experience in marketing and public relations both in Queensland and overseas and has undertaken a number of business courses in these areas. He was awarded an Order of Australia and the 2000 Centennial Medal for services in promoting economic development in Brisbane.

Ms Jane Seawright BA LLB(Hons) MBus (Marketing) AAIM

Ms Jane Seawright is a lawyer with extensive experience in marketing and strategy who established a freelance marketing consultancy, Seawright Consulting, in 2000. She has held the position of Independent Chair of the Queensland Furnishing Industry Superannuation Trust since 1990 and is also a Law Society-accredited mediator. Ms Seawright is a member of the QIMR Marketing Committee.

Ms Margot de Groot LLB GradDip(Legal Practice)

Ms Margot de Groot is the Managing Partner of de Groots Wills and Estate Lawyers, a Notary Public and former Director of Energex Retail Pty Ltd and Queensland Law Foundation Limited. Mrs de Groot is a member of the QIMR Marketing Committee.

Mr Bruce Phillips DipCom

Mr Bruce Phillips has extensive experience in the field of investment advice with some 40 years of active involvement in the Securities Industry. He is a former member of the Australian Stock Exchange Ltd, a past Chairman of the Brisbane Stock Exchange and is a Fellow of The Securities Institute of Australia. He has been a Director of The Bank of Queensland Limited since November 1996 and is a consultant to ABN AMRO Morgans Limited. Mr Phillips is a member of the QIMR Investment Committee and the QIMR Finance and Audit Committee.

Ms Patricia McCormack BA (Psych and IR)

Ms Patricia McCormack is a highly regarded People Management professional with extensive experience in all facets of Human Resource Management. She established People Focus in 2002 with the aim of providing HR services specialising in organisation development and human resources management.
Donors to the Institute

Visionary
(over $50,000)
ABC Learning Centres Callaway Golf Hi-Lite
Pro Am
Australian Rugby Union (Tom Slack Dinner)
Berghofer C
Carlton Crest Hotel Brisbane
Estate of Gwen Cameron
Estate of Kathleen Jenkins
Estate of Viva Busteed
Lee I
Macquarie Bank Foundation
Pratt Foundation
Suncorp
Suncorp Ride 4 Research
Yu Feng Pty Ltd
Wantz Committee

Platinum Friend Supporter
($20,000 - $49,999)
AMAQ VMO Committee
Boyd D (Bell Legal Group)
Bryan R & K
Champers Ball (Kathy Bourke)
Efron Family Foundation Ltd
Estate of Margaret Wilson
Estate of Elsie Squares
Gibson BC & MJ
Hair-Raising Cure
Intro International
Jen Retail Properties Limited
Jupiters Casino Community Benefit Fund
Marina Mirage Fashion Gala Designer Dinner
Qantas Airways
Queensland Property Foundation
Roy & HG Luncheon
Suncoast Social Dancers Association
Trust Company of Australia Limited
Zonta International (Gold Coast) Art Auction

Benefactor
($10,000 – $19,999)
Acton CR
Ἀντωνίου Μιχαήλ (Anagnostakis)
Australian Rotary Health Research Fund
Bored Housewives Luncheon
BT Investment Management Pty Ltd
Busdrivers’ Australia
Carlton & United Beverages
Christensen P (Gayler Cleland Towne)
Conrad Treasury Bachelor Auction
Early Risers’ Breakfasts
Estate of Gregory Hill
Estate of Kathleen Joan Kingsbury
Estate of Norah Jenkins
Estate of Thomas Ruddell
Estate of Walter Bell Taylor
Fitton Charity Stallion Tender
Francis GD & IA
Fung J
Gandel Charitable Trust
Gow H
Hayes K & E
Hicks BB
Horinbrook Buslines
Knight LM
Mckay B & E
Ongley M
Ongley N
Pedlen M
Queensland Rail
Rotary Club of Bardon
Rueben Pelemar Benevolent Foundation
Scuba-Doo International Pty Ltd
Sheraton Hotel Melbourne Cup Day
Thynne G & K
W FM Motors Pty Ltd
Zonta Club of Gold Coast

Gold Friend Supporter
($5,000 - $9,999)
All British Classic Car Club
ANZ Qld Community Foundation (13974505)
Arthur Erle Youth Foundation Limited
Bill & Lesley Freeman Jazz at Kianga
Brisbane Advertising Association Inc
Bruce Gleeson Solicitor
Coles M
Cook B (Sunflower Queen)
Cory Charitable Foundation
DK Marketing Pty Ltd
English JB & DP
Estate of Barbara Dalton
Estate of Gloria May Jean
Estate of HC & SM Robjohns
Estate of ML Morgan
Estate of Nonna Kras
Fairweather F
Fitton Insurance Charity Race Day
Fitton Stallion Tender
Gibney T
Green JE
Grigg B
Hillhouse Burrough McKeown
Holzapfel D & Holzapfel U
Indoorooppilly Golf Club
Mckay B
Mott M
Mullen C
O’Boyle D
Quantum Scientific Pty Ltd
Riverside Centre Charity Golf Day
Stevenson B
Shop Distributive & Allied Employees Association
Syme A
Watson B & J
Wesley Clinic For Hematology & Oncology
Witchery
Wylie R

Silver Friend Supporter
($1,000 - $4,999)
Acton CR
Allawey G & C
Andrew B
Apex Club of Meandarra
Austin S
Back R

Barnett LR
Blackburne Developments Pty Ltd
Boomerang Paper, A Division of CPI Group Ltd
Bradley Services
Brady K
Brew M
Cameron I
Celebrity Closet Clearance
Coleby R
Comino G & M
Conrad International Treasury Casino
Cowlishaw DO
Curnow B
Custance R
Dalley HE
Davis C
Deloitte
Drescher S
Driscoll K (National Homes Pty Ltd)
Duckwitz L
Duguid E
Earle Haven Community Church Fellowship
Egerton M (Fisher Adams Kelly)
Estate of Mavis Jarrott
Estate of Thomas & Coral Williams
Flecker PO
Former Origin Greats Ltd
Gates J
Goodtimes Photography Golf Day
Grafton Pony Club
Gram Engineering Pty Ltd
Hale JA
Happy Face Cent Auction
Haseler JM
Hawken B
Healthy Slimmers - Mitchelton
Heck B & P
Henderson Foundation
Herron K & J
Horton Park Golf Club Maroochydore Inc
Huysers EF
Infinity Five
Inner Wheel Club of Brisbane South Inc
Jackson RAS
Jameson Charitable Foundation
Karen Philips Corporate Communications
Kedron Wavell Ladies Auxiliary
KedronWavell Essex Women
Kennedy N
Lam S & Yau V
Law B & J (ESS Engineering Services)
Lendich V & A
Leonard C & S
Lindsey J
Lioness Club - Innisfail
Loughnann A & J
Lovell W & NB
Macmillan J
MacNeill J
Maleny Contract Bridge Club
Marina Mirage Boys Day Out
Maryborough City Council
Donors to the Institute

McCann Erickson Advertising
McDonald K
Meehan AM
Mermaid Beach Bowls Club Inc
Miano T & E (Volare Restaurant)
Morris A
Mt Coolum Charity Golf Day
Nambour Golf Club Inc.
National Seniors - Bribie Island
National Seniors Association - Nambour
National Seniors Association Caboolture Branch
Old Rockers Get Together
Onecard Australia Pty Ltd
Opala R
Order of the Eastern Star - Brisbane District Grand Chapter
Ozanne ST & DE Foundation
Paradise Point Bowls Club Inc
Parsons K
Penny Ridge Silk Stocking Ladies Race Day
Pirel ID
Phillips B
Pine Rivers Memorial Bowls Club
Poli LM
Price JB
Purcell P
QCWA - Iglestone Branch
Queensland Community Foundation
Quinn D
Quota International of Beenleigh Inc
Redman J
Refrigerated Warehouse & Transport Assoc of Australia Ltd
Remote Area Nurse
Robertson HF
Robinson Media
Rotary Club of Blackwater
Rotary Club of Noosa
Schwarz N
Sebel Suites & Quay West Hotels
Selleither D
Southport Worker's Club
Stein E
Stewart JM
Stormonth M
Talamin B (Queensland Vintage Vehicle Association)
Throp E
Tomlinson F
Tremewen J (Tremewen Water Colour + Design)
Turner G & Y
Tweed Links Music Club
United Medical Insurance Ltd
USM Events
Van Klinken A
Villa Luncheon
Wassman RC
Webb PG
Welsh P
Wesley Medical Centre
Wheeler E
White Foundation Limited
Whittaker P
Wynn RG
Zaccari F
Zonta Club Of Blackall Range

Bronze Friend Supporter ($500 - $999)
Aitchison D & N
Andrews P
Australian Hibiscus Society Inc - Buderim Branch
Australian Society For Medical Research
Austmel Pty Ltd
Badke A
Bailey D
Baird D & N
Baker RE
Bale S
Ball P
Barrett J (Urban Executive)
Beardmore HA & JM
Blackwell E
Boul L
Bourke L
Brisbane Marketing Pty Ltd
Brunswick Valley Cancer Action Group
Bunnings Browns Plains
Burgess GT & LB
Burleigh Heads United Church & Friends
Busta Pinata
Calmvale National Seniors
Carlton & United Brewery
Campbell IG & R
Caniglia D
Carter DH
Channel 9
Chen LY
Christopher B (Johnson Screens)
Clark DJ
Clark Y
Collinson RA
Conserv (No 1643) Pty Ltd
Conroy B & J
Cox C
Davis C (Chinchilla Rotary Club)
Day GL
de Bie V
Drummond GJ & VJ
Ducquet G
Easton N
Egger RC & JG
Eisenberg IB
English K
English L
Essex J (Busta Pinata)
Fawcett W
Firkins H
Furnival C & I
Future Floor Services
Gac M
Gannon T
Gill J & M
Glebe Road Uniting Church
Gold KA & GM
Good M
Goodtimes Network Photography
Gordon D
Grano S
Gray L
Grimmer K
Groh C
Hallett K & M
Hancock AB
Harwood RS
Hawthorne P
Hayman K
Hoey EM
Holmes C
Hughes M
Hurd S
Hutchinson Builders
Indooroopilly Garden Club Inc
Island Brisbane River Cruise Committee
J C Liao Family Trust
Jackson P
James R & P
Johnsson DK
Jones L & L
Kawana Senior Citizens Inc
Kelso A
Kester M (Syngenta Japan K K)
KG Transport Services
Kone Elevators
Lake S (GBST)
Larsen R & P
Lauder J & P
Leighton Holdings Limited
Les Cheveux Hair Artistry
Logan D
Lumley JW
May ME
McComiskie RJ & CM
McLaren D & L
Nickson Hotels
Murray M
Murray J
National Seniors Association – Hervey Bay
National Seniors Association - Redcliffe
National Seniors Association - Warwick
National Seniors Association - Wynnum
Manly Branch
National Servicemens Assn. (QLD) Inc
Caboolture And District Branch
New Age Productions - The Goddess Trust
Nickelson Transport
Nicklin J
O’Brien D
O’Connor B
Order Of The Eastern Star - Moreton Bay
Chapter No 152
Parker Family Bequest
Peacock RL
Perpetual Trustee Company Ltd
Perin L
Phillipson M
Phillips R
Phillips S
Potts & Family JG & PMP (Clanwilliam Pty Ltd)
Powter Trustee for E & S Powter S
Pratts M
Queensland Institute of Medical Research
Queensland Railway Institute
Ray White Surfers Paradise
Riethmuller C
Rose P
Royal National Agricultural & Industrial Association
Rutherford L-G
Sandling T
Sarafian K
Schramm M
Schuster R
Serco Pty Ltd
Sharpe FA
Sheeran L
Shepherd A
Shinners R
Sim L & S
Simpson M
Smallengage B
Smith BH & JM
Smith L
Southern Qld Women's Auxiliary
Stephens M
Stephenson D
Stonesteet's Coaches Pty Ltd
Stoney HN
Stanney A
Strathlea Pty Ltd
Sunnybank Masonic Lodge No 264 Uglq
Synergy Executive Sourcing
Syngenta China
Team Management Systems
Thomas Tsang Associates
Tindfe R & E
Tobias J (Women at Work)
Towowoomba Golf Club Women Members
Top End Partnership
Trisco Foods
Turner G
Ward F (Ruby & Company)
West NR
Whitten AI
Wong MC
Woodcock A & I
Wright G & D
Xu D
Zonta Club of Blackall Range

Friends
($200 - $499)
Abel K
Action Concrete & Asphalt, Drilling & Saving
Adam G
ADF Group
Aland RW
Albins V
Alcorn N
Alkin JC
Allanna Plumbing Services
Allen LH
Allison P
Ambrose J
Anderson K
Anglican Parish of Kilcoy
Anstey J
Armstrong B & L (Armstrong Excavation)
Armstrong YC
Arrowdynamics
Arthur G & J
Audrey Page & Associates
Austin CN
Australia Meat Holdings
Australia Post
Bach T
Barnett JC & MC
Baronioio PF & T
Bartlett D
Bartram G
Basei G & N
Batt Property
Baxter E
Baylis AM
Bechly C
Benny MP
Berkley Group
Berry E
Berry K
Bevan EF
Big Country Machine Tools
Billing W
Bird V
Bjorklund D
Body Bronze
Bray Park State High School Staff
Bretton D
Brian O'Connor Real Estate
Brickhill LW
Broadbeach Dental Centre
Brooks EL
Brown C
Bruderlin K
Brugby WA
Burns LR
Burrough M
Cameron A
Campbell A
Carlton & United Breweries
Carlyon C
Carseldine ML
Carter B
Carter M
Carter R & L
Catholic Womens League - Banyo
Catholic Womens League - Kawana Waters
Centenary Hire
Chatfield V
Chippendale F & ME
Christie HS
Christopher MRA
Clark WB
Clarke L
Clendinnen FJ
Cloherty L
Cock WJ
Cockram F & J
Colvin M
Comans L
Comerford J
Community Friendship Centre
Cook G
Cooke R A & J A
Cooper F
Cornell L
Courtice & Neilson Solicitors
Cox G & E
Crombie M
Crosthwaiite MA
Cullen R & V
Curragh Queensland Mining Pty Ltd
Dawes D
De Vryer R & H
Delaite Touche Tohmatsu
Dillon J
Disher Real Estate
Donnan DM
Dowling R
Drager Medical Australia
Drumon J
Drizza-Bone
Dunn B
Dustow E & J
Dwyer M
Dyer B
Earle WH
Eaton D
Edmeades R & A
Eeles GA
Ellis I & J
Elton V
Estate of Jill Bain McAdam
Evans and Hearn
Farley P
Ferguson M & L
Finn P
Fischle J
Fitch ES
Fookes AJ
Footo GM & BM
Formula Interiors
Forsyth S
Donors to the Institute

Foxyton HAB & AM
Francis BM
Frank Carroll Solicitor
Fraser EH
Freeman IB
Fry GC
Fuery TE
Fulton-Kennedy & Family B
Galley D
Galluzzo S
Gannon J
Carson CW
Gateway Properties
Gaythorne Ladies’ Bowling Club Inc
Geisler KA
Gibb N & A
Gibson M
GIO Social Club
Girl Guides Assoc Qld Aust - Stafford Trefoil
Guild
Glasgow M
Globenet Travel
Goldilocks
GrainCorp Operations Limited
Grant J
Granville P
Greenup RB & MC
Grigg F & E
Guest C
Guest FJ
Guilford P
Guy AL
Gynther M
Hanger B
Hannafor Rose & Geranium Club
Harkin S
Harris K
Harland RD
Harvey HL
Harwood K
Hawes RB & AM
Hay V
Heart Support Australia - Ipswich Branch
Heaton Electrical
Hemming A
Herron Todd White
Hill D
Hill K
Hill O
Hillier Engineering Services
Hoan L
Hockings E
Hockings V
Hollamby J
Hollis P
Holloway V
Holmes D
Honeywell Limited
Hughes RE
Humphrey P
Hurcom P
Hyde RE
Hyperion Asset Management
Ilett GB
Ingles GA
Institute of Chartered Accountants
Ipswich Hospital Nurses Assoc Inc
JJ Richards & Soes Pty Ltd
J W Maguire Medical Pty Ltd
James Frizelle’s Automotive Group Pty Ltd
Jenkinson NA & PE
Jobling WI
Jones PB & MG
Jordan KE
Kasali M & S
Kawana Quilters
Keates C
Kelly B
Kelly P
Kentish E
Keown B
Khoon GK
King R
Kirby A
Kirby L
Kreis B (Nayrb Nominees)
Kuhn Steel Fab Pty Ltd
Ladner A
Lambert L
Lancaster V
Larbalestier K
Lardencon Pty Ltd
Larkin W
Lawler S
Lawrence JM
Learnmonth JH
Legacy Widows of East Brisbane
Lekias D
Lewis R
Little JE
Living Close Retirement Village
Lockwood J & R
Long A
Low H
Lyle Lovelock & Associates
MacDonald K
Mackay D
MacKellar M
MacQuarie Goodman Industrial Trust
Mann J
Marina Mirage
Marshall J
McCready SP
McCuthan A
McEwan D & G
McGavin MH
McHenry T
McNally B
McKay R
McKay RJ & MJ
McMillan L
McVeigh M
Mei-Li C
Meritplan Pty Ltd
Miano T & E
Mickan RC
Miller N
Miller VM
Mitchell DE & Mitchell R
Mitchelton Bay HSF
Moody WG
Morris K
Morris W
Moses P
Mount Alvernia College Staff Club
Muir C
Murray K
Musgrave KJ & EW
National Seniors Association - Gympie
Nelson S
Network Ten
New South Wales Treasury Corporation
Newtowntown State School
Novartis Pharmaceuticals Australia Pty Ltd
Nundah Fellowship
Nundah Industries Pty Ltd
Oaks Resorts & Hotels
O’Brien D & G
O’Brien H
O’Hara B & L
Oliver S
O’Meally G
O’Neill A
O’Neill L & B
Order of the Eastern Star - Coolangatta
Chapter
Packett J
Parker J
Parry E
Parry-McKitrick M
Paxton J
Pearce GV
Perham J
Perpetual Investment Management
Pershouse C
Pipe-Jones R & J
Pitkanen A
Plummer A
Polley JV
Pondi P (Carswell & Company)
Poole D
Porter C
Potent J
Poulson GP & DM
Powell JG
PRD Nationwide
Price C
Price DJ
Price HD & A
Probus Club of Southport Incorporated
Public Trustee of Queensland
Pukall D & K
Purcell L
Purtell D
QCWA - Norwin Branch
QR1 Brisbane Branch
<table>
<thead>
<tr>
<th>Name</th>
<th>Organization/Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaid D</td>
<td>Queensland Country Women's Association</td>
</tr>
<tr>
<td>Queensland Rail</td>
<td></td>
</tr>
<tr>
<td>Queensland XXX Goldies Rugby Club</td>
<td></td>
</tr>
<tr>
<td>Quill J &amp; L</td>
<td></td>
</tr>
<tr>
<td>Quinn &amp; Scattini</td>
<td></td>
</tr>
<tr>
<td>Rains C &amp; MJ</td>
<td></td>
</tr>
<tr>
<td>Rapcivic Contractors Pty Ltd</td>
<td></td>
</tr>
<tr>
<td>Red P</td>
<td></td>
</tr>
<tr>
<td>Redbank Goodna Lioness Club</td>
<td></td>
</tr>
<tr>
<td>Redlands Engines Pty Ltd</td>
<td></td>
</tr>
<tr>
<td>Reed FC</td>
<td></td>
</tr>
<tr>
<td>Regnart AL &amp; OS</td>
<td></td>
</tr>
<tr>
<td>Reid C</td>
<td></td>
</tr>
<tr>
<td>Reid M</td>
<td></td>
</tr>
<tr>
<td>Reordan R</td>
<td></td>
</tr>
<tr>
<td>Rice B</td>
<td></td>
</tr>
<tr>
<td>Richardson G</td>
<td></td>
</tr>
<tr>
<td>Richardson K</td>
<td></td>
</tr>
<tr>
<td>Riverside Industrial Maintenance Pty Ltd</td>
<td></td>
</tr>
<tr>
<td>Riverside Newsagency</td>
<td></td>
</tr>
<tr>
<td>Robbins B</td>
<td></td>
</tr>
<tr>
<td>Roberts GE</td>
<td></td>
</tr>
<tr>
<td>Robinson W</td>
<td></td>
</tr>
<tr>
<td>Robinson W &amp; A</td>
<td></td>
</tr>
<tr>
<td>Rogers K</td>
<td></td>
</tr>
<tr>
<td>Rollason BM &amp; DR</td>
<td></td>
</tr>
<tr>
<td>Rose E</td>
<td></td>
</tr>
<tr>
<td>Rotary Club of Mitchelton</td>
<td></td>
</tr>
<tr>
<td>Rudler M</td>
<td></td>
</tr>
<tr>
<td>Russell K</td>
<td></td>
</tr>
<tr>
<td>Russell R</td>
<td></td>
</tr>
<tr>
<td>Sandgate Golf Club Associates</td>
<td></td>
</tr>
<tr>
<td>Say AH</td>
<td></td>
</tr>
<tr>
<td>Scheele J &amp; J</td>
<td></td>
</tr>
<tr>
<td>Schonfeld D</td>
<td></td>
</tr>
<tr>
<td>Schulte M</td>
<td></td>
</tr>
<tr>
<td>Scots College Campdraft Committee</td>
<td></td>
</tr>
<tr>
<td>Scott C</td>
<td></td>
</tr>
<tr>
<td>Scott RW</td>
<td></td>
</tr>
<tr>
<td>Seaman R</td>
<td></td>
</tr>
<tr>
<td>Seccombe J</td>
<td></td>
</tr>
<tr>
<td>Selwood RM</td>
<td></td>
</tr>
<tr>
<td>Serafin O</td>
<td></td>
</tr>
<tr>
<td>Shaw A</td>
<td></td>
</tr>
<tr>
<td>Sherlock G</td>
<td></td>
</tr>
<tr>
<td>Shields J &amp; R</td>
<td></td>
</tr>
<tr>
<td>Smeralda S</td>
<td></td>
</tr>
<tr>
<td>Smith BP &amp; BL</td>
<td></td>
</tr>
<tr>
<td>Smith C</td>
<td></td>
</tr>
<tr>
<td>Smith G</td>
<td></td>
</tr>
<tr>
<td>Smith I</td>
<td></td>
</tr>
<tr>
<td>Smith J &amp; V</td>
<td></td>
</tr>
<tr>
<td>Smith K</td>
<td></td>
</tr>
<tr>
<td>Smith M</td>
<td></td>
</tr>
<tr>
<td>Smith P</td>
<td></td>
</tr>
<tr>
<td>Smith R &amp; N</td>
<td></td>
</tr>
<tr>
<td>Solley E</td>
<td></td>
</tr>
<tr>
<td>Solomon I</td>
<td></td>
</tr>
<tr>
<td>Southern Cross Ford</td>
<td></td>
</tr>
<tr>
<td>Spencer R &amp; M</td>
<td></td>
</tr>
<tr>
<td>Spiers P</td>
<td></td>
</tr>
<tr>
<td>St Georges Anglican Church</td>
<td></td>
</tr>
<tr>
<td>St Monica's Soup &amp; Sandwich Group</td>
<td></td>
</tr>
<tr>
<td>Statham H</td>
<td></td>
</tr>
<tr>
<td>Stendrup VA</td>
<td></td>
</tr>
<tr>
<td>Stevens D</td>
<td></td>
</tr>
<tr>
<td>Stevens M &amp; M</td>
<td></td>
</tr>
<tr>
<td>Stewart DC</td>
<td></td>
</tr>
<tr>
<td>Stuart M</td>
<td></td>
</tr>
<tr>
<td>Sullivan D</td>
<td></td>
</tr>
<tr>
<td>Sunnybank Thin Thinkers</td>
<td></td>
</tr>
<tr>
<td>Swart M</td>
<td></td>
</tr>
<tr>
<td>SweetPea Corporation Pty Ltd</td>
<td></td>
</tr>
<tr>
<td>Syngenta Seeds</td>
<td></td>
</tr>
<tr>
<td>Tapscott B</td>
<td></td>
</tr>
<tr>
<td>Tempo &amp; A &amp; C</td>
<td></td>
</tr>
<tr>
<td>Tempo Services</td>
<td></td>
</tr>
<tr>
<td>Thomas AA</td>
<td></td>
</tr>
<tr>
<td>Thomson I &amp; D</td>
<td></td>
</tr>
<tr>
<td>Thynne N</td>
<td></td>
</tr>
<tr>
<td>Tice M</td>
<td></td>
</tr>
<tr>
<td>Tilse G</td>
<td></td>
</tr>
<tr>
<td>Timothy K</td>
<td></td>
</tr>
<tr>
<td>Tobler G</td>
<td></td>
</tr>
<tr>
<td>Todd V</td>
<td></td>
</tr>
<tr>
<td>Tompkins P</td>
<td></td>
</tr>
<tr>
<td>Toohey AB &amp; JW</td>
<td></td>
</tr>
<tr>
<td>Toombs P &amp; C</td>
<td></td>
</tr>
<tr>
<td>Townsend I &amp; I</td>
<td></td>
</tr>
<tr>
<td>Tree S</td>
<td></td>
</tr>
<tr>
<td>Tuesday Embroiderers</td>
<td></td>
</tr>
<tr>
<td>Unwin M</td>
<td></td>
</tr>
<tr>
<td>Vance V</td>
<td></td>
</tr>
<tr>
<td>Vandeleur P &amp; ME</td>
<td></td>
</tr>
<tr>
<td>Vandeven L</td>
<td></td>
</tr>
<tr>
<td>Venzke N</td>
<td></td>
</tr>
<tr>
<td>Verity N &amp; M</td>
<td></td>
</tr>
<tr>
<td>Wagner Investments Pty Ltd</td>
<td></td>
</tr>
<tr>
<td>Walsh Halligan Douglas</td>
<td></td>
</tr>
<tr>
<td>Wambo Shire Council</td>
<td></td>
</tr>
<tr>
<td>Wanless Mr &amp; Mrs</td>
<td></td>
</tr>
<tr>
<td>Warburton S</td>
<td></td>
</tr>
<tr>
<td>Ward M</td>
<td></td>
</tr>
<tr>
<td>Wardan E</td>
<td></td>
</tr>
<tr>
<td>Watson A</td>
<td></td>
</tr>
<tr>
<td>Watson B</td>
<td></td>
</tr>
<tr>
<td>Watson K &amp; D</td>
<td></td>
</tr>
<tr>
<td>Weatherstone J</td>
<td></td>
</tr>
<tr>
<td>Webb K</td>
<td></td>
</tr>
<tr>
<td>Webber BR &amp; JC</td>
<td></td>
</tr>
<tr>
<td>Weight Reduction Club of Lawnton</td>
<td></td>
</tr>
<tr>
<td>Wenck WN</td>
<td></td>
</tr>
<tr>
<td>Whitbread R</td>
<td></td>
</tr>
<tr>
<td>White N L &amp; P R</td>
<td></td>
</tr>
<tr>
<td>Wilkey I</td>
<td></td>
</tr>
<tr>
<td>Willcocks M</td>
<td></td>
</tr>
<tr>
<td>Williams D</td>
<td></td>
</tr>
<tr>
<td>Wilson K</td>
<td></td>
</tr>
<tr>
<td>Wilson KJH</td>
<td></td>
</tr>
<tr>
<td>Wilson HTM</td>
<td></td>
</tr>
<tr>
<td>Wilson Parking</td>
<td></td>
</tr>
<tr>
<td>Winkler JA</td>
<td></td>
</tr>
<tr>
<td>Woodhead K</td>
<td></td>
</tr>
<tr>
<td>Yarrabee Coal Company Pty Ltd</td>
<td></td>
</tr>
<tr>
<td>Zielke's Transport</td>
<td></td>
</tr>
<tr>
<td>Zinns A</td>
<td></td>
</tr>
</tbody>
</table>
DIVISION Chair: J McCarthy

Infectious Diseases and Immunology Division

Director: M F Good BSc(Med) MBBS(Hons) PhD MD DSc
FASM FAFPHM FRACP(HON) FAIM

Deputy Director: A C Green MSc PhD

Assistant Directors:
A W Boyd BMedSc(Hons) MBBS PhD FRACP

University of Queensland
M F Lavin BSc(Hons) PhD

Executive Secretary to Director:
J Chapple

Communications Officers:
R Lynch BSc MPH (to Feb 05)

K Green BSc(Hons) PhD (to Dec 04)
J O’Keefe BAppSc DiplBusComm

100 Queensland Institute of Medical Research

Queensland Institute of Medical Research

DSc F ASM FAFPHM FRACP(HON)
M F Good BSc(Med) MBBS(Hons) PhD MD

Dendritic Cells and Cancer

A Yamaura BMed MMed (to Dec 04)

I Azzam BSc(Hons) PhD

A Tazbirkova MD (to Aug 04)

A J Nicol MBBS FRACP FRCPA PhD

Mosquito Control
B H Kay BSc(Hons) PhD

M Brentjens BSc(Hons) PhD (to Sep 04)
P Palley T Hunt BSc(Hons) PhD

J Duraiswamy MSc BVSc PhD

M Sridhar MBChB MRC Path PhD

K S Sriprakash BSc(Hons) PhD

C D'Cruze BSc(Hons) PhD

P Ryan BSc(Hons) PhD

J McCarthy MBBS FRACP MD

J Trowbridge BSc(Hons) PhD

Tumour Immunology
R Khamra BSc MSc PhD

M Connolly BSc(Hons) (to Nov 04)

L Cooper BAppSc

T Crough BSc(Hons)

U Dua BSc MBioTech

C Fazou BSc(Hons) MSc (to Nov 04)

M Garabedian MBChB MRCP MRC Path PhD

L Jiang BMed MMed PhD

E Lambley BSc(Hons) (to Nov 04)

M Rist BSc(Hons) PhD

C Smith BSc(Hons)

J Tellam BSc MSc PhD

N Webb BSc GradDipClinBioChem

J Weiss BSc

Cancer and Cell Biology Division

Division Chair: KK Khanna

Cancer Genetics
G C Trench BSc(Hons) PhD

J Arnold BSc(Hons) PhD

J Beerley BSc(Hons)

X Chen BMed

H Holland BMedSc(Hons) BA

K Lermen BSc (to Dec 04)

J Kerr BSc(Hons)

A Marsh BSc(Hons)

N Waddell BSc(Hons) PhD

Cancer Immunology
C W Schmidt BSc(Hons) PhD

M Ariko GradDipAppSc BSc (to Jun 05)

K Ellen BSc(Med) MBBS PhD

X Huang BMed PhD

C Lanagan BMedSc(Hons)

M Martinez BSc(Hons) PhD

L O’Connor AssocDegAppSc

Cell Therapy
A J Nicola MBBS FRACP FRCPA PhD

University of Queensland
T Hagi BSc MSc (to Jan 05)

A Tazirikova MD (to Aug 04)

J Westcott BSc(Hons) (to Dec 04)

A Yamaura BMed Med (to Dec 04)

Dendritic Cells and Cancer
J A Lopez MD

Human Genetics
N K Hayward BSc MScQual PhD

L Arundel MSc(Hons) PhD

J Bowden (to Jan 04)
Royal Brisbane and Women's Hospital Foundation

A Leggett  MBBS(Hons) MD FRACP
B Alexander  RN BNursing
P Ashover  RN BNursing (to Apr 05)
J Bain  BA
C Baxter  BA
M Conner  RN BA
M Connard  BSc(Hons)
M Dunks  RN
R Dutton  RN
T Duke  RN
M Hughes  BS MMedSc
K Isbelele  BScClinDiet MPHScScPhD
J Jackman  BSc(BiotechAdmin)
G Jordan  MBBS (Hons) FRACGP
D Lincoln  BSc(Hons) MBiostats
V Logan  BAppSc
C Loos  BAppSc
T Luong  AsstDipArtsPhotogr
M Malt  BSc(Nursing)
M Martin  RN (to Aug 04)
M Mentor  RN BInfAdmin
A McMurtrie  RN BNurs
M Merritt  BSc(Hons)
E Minihane  RN
M Moore  RN BInfNurs MPH
P Moser  BSc RN
R Neale  BSc PhD
S O'Brien  Bnurs MPH
S O'Keeffe  BAppSc RN
N Pandeya  BSc GradDipAppSc
S Perry  DipAppSc NURS BAppSc Nurs
C Phillips  BSc(BiotechAdmin)
D Punitle  BSc(Hons) PhD (to Jun 05)

Cancer and Population Studies

A Green  MBBS MSc PhD
B Alexander  RN BNursing
P Ashover  RN BNursing (to Apr 05)
J Bain  BA
C Baxter  BA
M Conner  RN BA
M Connard  BSc(Hons)
M Dunks  RN
R Dutton  RN
M Hughes  BS MMedSc
K Isbelele  BScClinDiet MPHScScPhD
J Jackman  BSc(BiotechAdmin)
G Jordan  MBBS (Hons) FRACGP
D Lincoln  BSc(Hons) MBiostats
V Logan  BAppSc
C Loos  BAppSc
T Luong  AsstDipArtsPhotogr
M Malt  BSc(Nursing)
M Martin  RN (to Aug 04)
M Mentor  RN BInfAdmin
A McMurtrie  RN BNurs
M Merritt  BSc(Hons)
E Minihane  RN
M Moore  RN BInfNurs MPH
P Moser  BSc RN
R Neale  BSc PhD
S O'Brien  Bnurs MPH
S O'Keeffe  BAppSc RN
N Pandeya  BSc GradDipAppSc
S Perry  DipAppSc NURS BAppSc Nurs
C Phillips  BSc(BiotechAdmin)
D Punitle  BSc(Hons) PhD (to Jun 05)
Research Students at QIMR – as at 30 June 2005

PhD Scholars:

<table>
<thead>
<tr>
<th>Name</th>
<th>Degree</th>
<th>Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y Adams</td>
<td>BSc(Hons)</td>
<td>J McCarthy</td>
</tr>
<tr>
<td>C Anderson</td>
<td>BSc(Hons)</td>
<td>N Martin</td>
</tr>
<tr>
<td>V Anderson</td>
<td>BSc(Hons)</td>
<td>M Good</td>
</tr>
<tr>
<td>B Andrew</td>
<td>BSc(Hons)</td>
<td>A Kelso</td>
</tr>
<tr>
<td>J Balen</td>
<td>BSc(Hons)</td>
<td>N Martin</td>
</tr>
<tr>
<td>L Beattie</td>
<td>BAppSci(Hons)</td>
<td>D McManus</td>
</tr>
<tr>
<td>T Bell</td>
<td>BSc(Hons)</td>
<td>M Good</td>
</tr>
<tr>
<td>B Benyamin</td>
<td>BSc(Hons)</td>
<td>A Green</td>
</tr>
<tr>
<td>T Bladen</td>
<td>BAppSci(Hons)</td>
<td>D McManus</td>
</tr>
<tr>
<td>R Bowman</td>
<td>MBBS FRACP</td>
<td>P Parsons</td>
</tr>
<tr>
<td>J Brown</td>
<td>BAppSci(Hons)</td>
<td>N Martin</td>
</tr>
<tr>
<td>A Burgess</td>
<td>MSc(Hons)</td>
<td>N Martin</td>
</tr>
<tr>
<td>D Chin</td>
<td>MBBCh FRCSI</td>
<td>N Martin</td>
</tr>
<tr>
<td>T Chuah</td>
<td>BMedSc MBBS</td>
<td>N Martin</td>
</tr>
<tr>
<td>W Chung</td>
<td>BSc(Hons)</td>
<td>N Martin</td>
</tr>
<tr>
<td>J Condon</td>
<td>BA BSc(Hons)</td>
<td>M Good</td>
</tr>
<tr>
<td>B Comes</td>
<td>MBBS FRACP FIFCIM</td>
<td>A Boyd</td>
</tr>
<tr>
<td>M Coulthard</td>
<td>BAppEcon GradDipSocSc</td>
<td>N Martin</td>
</tr>
<tr>
<td>W Coventry</td>
<td>BA(Hons)(Psych)</td>
<td>A Loukas</td>
</tr>
<tr>
<td>B Datu</td>
<td>BSc MPH</td>
<td>N Martin</td>
</tr>
<tr>
<td>M Davies</td>
<td>BAppSci(Hons)</td>
<td>N Martin</td>
</tr>
<tr>
<td>M Dixon</td>
<td>BSc(Hons)</td>
<td>Siprijakash</td>
</tr>
<tr>
<td>B Russell</td>
<td>BSc(Hons)</td>
<td>Gardiner</td>
</tr>
<tr>
<td>S Earl</td>
<td>BBiotech(Hons)</td>
<td>N Martin</td>
</tr>
<tr>
<td>M Ellis</td>
<td>BSc(Hons)</td>
<td>M Lavin</td>
</tr>
<tr>
<td>J Evans</td>
<td>BSc(Hons)</td>
<td>N Martin</td>
</tr>
<tr>
<td>M Ferreira</td>
<td>BSc(Hons)</td>
<td>N Martin</td>
</tr>
<tr>
<td>M Georgousakis</td>
<td>BSc(Hons)</td>
<td>N Martin</td>
</tr>
<tr>
<td>A Glanfield</td>
<td>BSc(Hons)</td>
<td>N Martin</td>
</tr>
<tr>
<td>A Guerney</td>
<td>BSc MEAT</td>
<td>B Kay</td>
</tr>
<tr>
<td>E Hacker</td>
<td>BSc(Hons)</td>
<td>N Hayward</td>
</tr>
<tr>
<td>L Hall</td>
<td>BTechBiomedSci(Hons)</td>
<td>A Green</td>
</tr>
<tr>
<td>M Hamilton</td>
<td>MBChB MRCP MRCGP</td>
<td>N Schmidt</td>
</tr>
<tr>
<td>J Hancock</td>
<td>BSc(BBusMgt BSc(Hons))</td>
<td>N Martin</td>
</tr>
<tr>
<td>J Hansen</td>
<td>BSc (Hons)</td>
<td>D Gardiner</td>
</tr>
<tr>
<td>P Hawthorne</td>
<td>BSc(Hons)</td>
<td>N Martin</td>
</tr>
<tr>
<td>E Holliday</td>
<td>BSc(Hons)</td>
<td>G Anderson</td>
</tr>
<tr>
<td>H Inglis</td>
<td>BSc(Hons)</td>
<td>B Kay</td>
</tr>
<tr>
<td>J Jeffrey</td>
<td>BAppSci(Hons)</td>
<td>K Khanna</td>
</tr>
<tr>
<td>J Jekimovs</td>
<td>BSc(Hons)</td>
<td>K Khanna</td>
</tr>
<tr>
<td>M Jones</td>
<td>BSc(Hons)</td>
<td>K Khanna</td>
</tr>
<tr>
<td>J Jonnalagadda</td>
<td>MBBS(Hons) FRACP</td>
<td>BKay</td>
</tr>
<tr>
<td>S Jordan</td>
<td>MSc</td>
<td>N Hayward</td>
</tr>
<tr>
<td></td>
<td>DRANOCO GradDip</td>
<td>A Green</td>
</tr>
</tbody>
</table>

MD Scholar:

<table>
<thead>
<tr>
<th>Name</th>
<th>Degree</th>
<th>Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>E Morris</td>
<td>BMEdSc MBBS(Hons)</td>
<td>G Hill</td>
</tr>
</tbody>
</table>

MPH Scholar:

<table>
<thead>
<tr>
<th>Name</th>
<th>Degree</th>
<th>Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>C Olsen</td>
<td>BSc PhD</td>
<td>A Green</td>
</tr>
<tr>
<td>S Parekh</td>
<td>MD</td>
<td>A Green</td>
</tr>
</tbody>
</table>

MPhil Scholars:

<table>
<thead>
<tr>
<th>Name</th>
<th>Degree</th>
<th>Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Day</td>
<td>BSc(Hons)</td>
<td>A Boyd</td>
</tr>
<tr>
<td>K Kenney</td>
<td>BSc(Hons)</td>
<td>A Green</td>
</tr>
<tr>
<td>P McBride</td>
<td>BMEdSc MBBS</td>
<td>D Moss</td>
</tr>
<tr>
<td>M Smith</td>
<td>BSc MBBS</td>
<td>A Boyd</td>
</tr>
<tr>
<td>D Turkiewicz</td>
<td>MBBS</td>
<td></td>
</tr>
</tbody>
</table>

Honours Scholars:

<table>
<thead>
<tr>
<th>Name</th>
<th>Degree</th>
<th>Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y Anderson</td>
<td>BSc BA</td>
<td>N Martin</td>
</tr>
<tr>
<td>R Brennan</td>
<td>BBBioSc</td>
<td>S Burrows</td>
</tr>
<tr>
<td>M Chai</td>
<td>BSc</td>
<td>D McManus</td>
</tr>
<tr>
<td>T Chetter</td>
<td>BSc BA</td>
<td>N Martin</td>
</tr>
<tr>
<td>P Deedfall</td>
<td>BAppSc</td>
<td>M Martin</td>
</tr>
<tr>
<td>G Eng</td>
<td>BSc</td>
<td>A Boyd</td>
</tr>
<tr>
<td>J Fleming</td>
<td>BSc</td>
<td>G Rammm</td>
</tr>
<tr>
<td>L Gaces</td>
<td>BAppSc</td>
<td>A Lopez</td>
</tr>
<tr>
<td>T Higgins</td>
<td>BSc</td>
<td>D McManus</td>
</tr>
<tr>
<td>P Hillon</td>
<td>BSc</td>
<td>D McManus</td>
</tr>
<tr>
<td>S Mason</td>
<td>BAppSc</td>
<td>D McManus</td>
</tr>
<tr>
<td>K McSweeney</td>
<td>BSc</td>
<td>D McManus</td>
</tr>
<tr>
<td>T Nguyen</td>
<td>BSc</td>
<td>D McManus</td>
</tr>
<tr>
<td>V Oakes</td>
<td>BSc</td>
<td>D McManus</td>
</tr>
<tr>
<td>L O'Moore</td>
<td>BAppSc</td>
<td>D McManus</td>
</tr>
<tr>
<td>J Pincombe</td>
<td>BSc</td>
<td>D McManus</td>
</tr>
<tr>
<td>S Rossitti</td>
<td>BSc</td>
<td>D McManus</td>
</tr>
<tr>
<td>J Salvation-Jones</td>
<td>BSc</td>
<td>D McManus</td>
</tr>
<tr>
<td>R Sarai</td>
<td>BSc</td>
<td>D McManus</td>
</tr>
<tr>
<td>S Smith</td>
<td>BSc</td>
<td>D McManus</td>
</tr>
</tbody>
</table>

BAppSci Scholars:

<table>
<thead>
<tr>
<th>Name</th>
<th>Degree</th>
<th>Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>L Whop</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>