Queensland Institute of Medical Research

**Director**
Professor Michael Good

**Deputy Director**
Professor Adèle Green

**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

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Corporate Structure

Minister for Health
Queensland Government

QIMR Council

QIMR Trust

Director

Deputy Director

Assistant Directors

Chief Operating Officer

Corporate Division

Development and Marketing Department

Infectious Diseases and Immunology Division

Cancer and Cell Biology Division

Population Studies and Human Genetics Division

Indigenous Health Research Program

Therapeutic Development and Clinical Research Division
Since being established by the Queensland Government in 1945, QIMR has grown to become one of the largest medical research institutes in the southern hemisphere and is an internationally recognised centre of excellence for medical research.

It has achieved this recognition by promoting excellence in the conduct and support of its medical research projects. QIMR also portrays the essential features of innovation, risk taking and discovery.

QIMR houses over 800 scientists, students and support staff in four research divisions which include 38 separate laboratories, an Indigenous Health Program and a Corporate Division.

QIMR accommodates scientists in world-class facilities with expertise in molecular biology, population studies, gene discovery and translational research.

QIMR has established an international reputation and pursues key research areas in cellular and molecular sciences, epidemiology and population health, cancer biology, biotechnology, infectious diseases and vaccine development.

In 2004-05, QIMR successfully used $5.5 million of grant funding from the Queensland Government to leverage $30 million in funding for research services from domestic grants and over $9 million from international grants.

QIMR has built on its reputation in Queensland and Australia as a leading research services provider and now provides research services to the developed and developing world. Its ability to attract international grants makes QIMR a significant exporter of research services which benefits QIMR and the flow-on effects benefit the community of Queensland.

In 2005-06 QIMR received $10.5 million for its exported research services by attracting grant funding from the United States, Europe and Asia. Research grants for research services are received from the National Institutes of Health (NIH), the US Department of Defence, the Bill and Melinda Gates Foundation and the Wellcome Foundation (UK).

QIMR has now established itself as the biggest recipient of NIH funding within Australia with an annual value of $8.4 million.

The international links thus created from its world-class reputation results in international visitors travelling to study in Queensland who frequently stay for a holiday and as a result this benefits the local purveyors of tourism products. QIMR and its medical research programs are good business for Queensland not just for the new therapies and discoveries that flow from its research but from the benefits that flow from having a $50 million international business and a significant exporter of services to the developed and developing world.

The Queensland Institute of Medical Research (QIMR) is the State’s premier health and medical research institution and has gained worldwide recognition for its research into the prevention and cures for cancer and infectious diseases.
Sir Bruce Watson AC BE (Elec) BCom (Chairman)

Sir Bruce Watson was born in Queensland in 1928. In 1956 he joined MIM Holdings Limited and 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.

Mr Paul Wright AM FAIM FFin FAICD (Deputy Chairman)

Paul has combined banking, health, hospitality and consulting into a career which has encompassed over 25 years in senior executive management with a breadth and depth in leadership roles. He has been General Manager Queensland and Northern Territory of Medical Benefits Fund of Australia Limited and provided executive services as General Manager of The Brisbane Club.

Paul has also been a company director for more than 20 years and has served as Chairman/President of The Australian Institute of Management and is now serving a second term as Chairman of The Royal Flying Doctor Service (Qld). He is currently the Chairman of The CyberInstitute Pty Ltd, The Queensland Institute of Medical Research Trust and Phoenix Eagle Company Pty Ltd. Other current Board appointments include PQ Lifestyles Pty Ltd and Queensland Fruit and Vegetable Growers Limited.
Professor Bryan Campbell AM MD BS FRACP FRACMA

Professor Campbell was formerly Chief Health Officer Queensland 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 was Deputy Chair of the Australian Health Ethics Committee and a member of the NHMRC Embryo Research Licensing Committee until June 2006.

Prof 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. Professor Clements is currently Program Leader of the Hormone-Dependent Cancer Program within the Institute of Health and Biomedical Innovation at the Queensland University of Technology and also an NHMRC Principal Research Fellow.

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 Medical Science, and a past Director of the Australian Society of Medical Research (ASMR) from 1999 to 2001. She has authored 117 peer-reviewed publications to date 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.

Dr Paula Marlton MB BS (Hons) FRACP FRACPA (From February 2006)

Paula Marlton is the Head of Leukaemia and Lymphoma Services at the Princess Alexandra Hospital where she has worked as the Deputy Director of Haematology since 1994. Her previous appointments included 3 years at the MD Anderson Cancer Centre in Houston Texas. Dr Marlton has a very broad experience in clinical research including roles as principal investigator of national trials and an ongoing involvement in translational research in haematologic malignancies.

She was the founding Chair of the Australasian Leukaemia and Lymphoma Group Laboratory Science Committee and has established and continues to direct the PWC Leukaemia and Lymphoma Tissue Bank. Her other professional activities include serving on the Board of the Leukaemia Foundation, Drug Advisory Boards, Government Advisory Committees as well as a wide range of teaching and clinical service activities.

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 Christopher Coyne LLB
Christopher Coyne is a solicitor of the Supreme Court of Queensland, specialising in insurance law, health law, corporate government and risk management. He was admitted as a solicitor in 1979 and was a partner in the national law firm Clayton Utz from 1984 to 2002. He is an Adjunct Professor at The University of Queensland School of Law. He is Chair of the Mater Health Services Human Research Committee and a member of the Australian Health Ethics Committee and the NHMRC Gene Related Therapy Research Advisory Panel. Chris is Chairman of the Queensland Law Society’s captive insurer, Lexon and is a director of the Heart Research Institute (Queensland). He is a sitting member of the Queensland Commercial and Consumer Tribunal.

Mr Paul Fennelly BA LLB
Mr Fennelly has wide experience in financial management, business and public administration.

Dr Gerry FitzGerald MD BS BHA FACEM FRACMA FACHSE (To August 2005)
Dr FitzGerald was the Chief Health Officer for Queensland until August 2005. He graduated from the University of Queensland in 1976. After two years at the Mater Hospital he worked as Medical Registrar and subsequently the 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 a position he held for almost ten years. He has held numerous positions within the College for Emergency Medicine and the Journal Emergency Medicine and as part of his current position represents the Department of Health on numerous Councils and boards including the NHMRC and ACHS.

Professor Alan Lopez BSc (Hons) MS PhD
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.

Dr Jeannette Young MB BS FRACMA MBA AFACHSE (From September 2006)
Dr Young has been the Chief Health Officer for Queensland since August 2005. In her previous position she was the Executive Director of Medical Services at the Princess Alexandra Hospital in Brisbane for six years where she was responsible for the provision of Medical services across the Hospital and a member of the Executive team. She came to the position following four years as the Director of Medical Services at the Rockhampton Base Hospital. Prior to that she spent nine years at Westmead Hospital in Sydney working, initially, in the area of Emergency Medicine followed by responsibility for medico-legal issues and management of junior medical staff.

One of her major areas of interest has been in medical workforce management and development. Until recently she was the Chair of the Australian Medical Workforce Advisory Council and an AHMAC nominee on the Australian Medical Council. Another area of interest has been in organ and tissue donation and transplantation. Until recently she was the Eastern States representative on Australians Donate, the national peak body for organ and tissue donation. In her current role she is on the Queensland Medical Board, the Radiation Advisory Council, co-chairs the Queensland Emergency Medical System Advisory Committee, chairs the Queensland Blood Advisory Committee and is Queensland’s representative on the National Health and Medical Research Council and the Australian Health Protection Committee. She has recently been appointed to the newly established AHMAC Clinical, Technical and Ethical Principal Committee.
From the Director

The Institute’s research capability has expanded this year, with three new laboratories becoming established. Professor Jeff Gorman heads the Protein Discovery Centre which identifies proteins involved in, or affected by, physiological and disease processes and the ways in which these proteins function and interact.

Professor Emma Whitelaw relocated her team and laboratory from the University of Sydney to research the role of epigenetics in determining phenotype in mammals. Dr Corinne Lendon spearheads a new direction into mental health research at QIMR, and now leads the Molecular Psychiatry Laboratory which investigates factors that modify susceptibility to Alzheimer’s disease and related neurological and psychiatric disorders.

QIMR continues to gain international recognition for its research. This year, Institute scientists were named on 375 scientific publications, with a good proportion of these in high impact journals. This represents a 25% increase on QIMR’s publications for the previous year – an admirable result. Research highlights this year include:

Scientists from the Helminth Biology Laboratory have developed a prototype vaccine against schistosomes, or blood flukes, parasitic worms that infect 200 million people worldwide and are responsible for hundreds of thousands of deaths annually. The vaccine gives a 50-60 percent protection rate and also reduces faecal egg outputs by 60-70%, thus minimising parasite load in the host and in the environment, and hence – future transmission of the parasite.

The Immunovirology Laboratory developed an experimental cancer treatment based on intratumoural delivery of GM-CSF by the Kunjin replikon vector and also discovered the use of PEP005 for induction of anti-cancer T cells and for co-delivery with anti-cancer vaccines to regress metastasis.

Research in the Molecular Immunology Laboratory demonstrated that ultra low doses of whole inactivated malaria parasites can induce protection from malaria. Members of the Molecular Parasitology Laboratory undertook a successful vaccination trial against echinococcosis in dog definitive hosts in China using recombinant antigens expressed by the mature adult worm.

The Mosquito Control Laboratory developed the Ross River virus Early Detection and Surveillance System, a web-based Geographic Information System to assist local government to respond to outbreaks of Ross River virus with control and prevention programs.

Researchers studying Dendritic Cells (DCs) have also found vital clues suggesting how breast cancer cells evade recognition by the immune system to progress into tumours. Patients with breast
cancer were compared with healthy women to demonstrate a higher percentage of dying DCs, indicating that the body is unable to effectively suppress tumour progression because the DCs die before they can trigger an immune response.

Further highlights from the Cancer and Cell Biology Division include identification of low risk genes for breast cancer, development of assays to assess the functions of variants of BRCA1 and BRCA2, identification of several new tumour suppressor genes for cutaneous melanoma, and identification of a novel damage control protein and its link with cancer.

A link has been established between the childhood cancer Ewing’s sarcoma and children born with hernias in the Cancer and Population Studies Laboratory. In particular, umbilical hernias and congenital hernias were associated with an increased risk of Ewing’s sarcoma.

Epidemiologists found that aspirin may assist in reducing the risk of developing skin cancer, showing that regular doses of 200mg or more of nonsteroidal anti-inflammatory drugs such as aspirin may offer protection against squamous cell carcinoma and actinic keratoses.

Scientists studying the genetics of endometriosis in the Molecular and Genetic Epidemiology Laboratories have identified significant linkage to Chromosome 10 and research from the Signal Transduction Laboratory has uncovered a new protein, Cep55, that may play a critical role in the development of cancer.

Important research from the Indigenous Health Program revealed the likelihood of death is significantly higher for Indigenous than non-Indigenous cancer patients even after taking into account cancer stage at diagnosis, place of residence, cancer treatment and the presence of other medical conditions.

**Awards and Achievements**

Each year, QIMR scientists are recipients of highly prestigious honours and Awards. In March 2006 Professor Brian Kay was elected to the Australian Academy of Science. In June 2006, Professor Kay Ellem was made an Officer of the Order of Australia for his lifetime of achievement in cancer research. Professor Nick Martin received the Dobzhansky Award for lifetime contributions to behaviour genetics and three QIMR scientists received research special fellowships – Dr James McCarthy from Smart State Queensland, Dr David Whiteman from the US-Australia Fulbright Commission and Dr Nathan Subramaniam from the Gastroenterological Society of Australia. Dr Chris Schmidt won the ASMR Queensland Premier’s Senior Postdoctoral Award, and Dr Alberto Pinzon-Charry the Queensland Premier’s Postgraduate Student Award.

Dr Stephen L Hoffman, Chief Executive and Scientific Officer from Sanaria Inc in Bethesda, USA gave the Derrick-Mackerras Memorial Lecture in November 2005, which coincided with the Institute’s 60th Anniversary celebrations. Dr Hoffman is one of the world’s leading malaria vaccine researchers.

QIMR’s high achievement Awards were given at the
same ceremony, and this year Mr Mark Weaver received the Bancroft Medal, Mr Paul Wright and Professor John Kerr were made QIMR Fellows and Professor Brian Kay was awarded the Ralph Doherty Prize for Excellence in Medical Research.

**Grants and Funding Success**

NHMRC grants for the year included 19 new project and one new program grant, bringing total NHMRC funding to almost $20 million in total. For the same period, Institute scientists received three Research Fellowships, four Career Development Awards, one Training Fellowship and four Postgraduate Scholarships.

Six NIH grants were received from the United States, totalling more than $US8 million, two for parasitology research, three for genetic epidemiology and one for breast cancer research. The Queensland Cancer Fund provided seven grants for research covering a range of different cancer-related areas, and the Australian Research Council funded four different projects.

The Leukaemia Foundation continues to provide significant funding for the Leukaemia Foundation Laboratory headed by Professor Andrew Boyd from The University of Queensland.

The Development Department continues to elicit funding from a range of other sources. Besides receiving on-going donations and bequests from a large proportion of the community, QIMR is engaged in a three year corporate sponsorship contract with Suncorp who this year held the Bridge to Brisbane Fun Run, with the Institute as beneficiary. A special Christmas campaign during this year featured Rupert McCall’s Green and Gold Malaria poem.

The Development Department also performs the important function of disseminating QIMR research to the wider community, and does so through external speaking engagements and tours of Institute facilities and This year, more than 9,000 people learned about QIMR through these avenues. The Department also mails over 20,000 copies of Life Lab magazine each quarter.

This year also saw the retirement of two long-standing QIMR scientists, Professor Peter Parsons in April 2006 and Dr Greg Lawrence in June 2006. Professor Parsons began his career at the Institute in 1972, and as Head of the Melanoma Genomics Laboratory has made significant contributions to the treatment of skin cancer. Dr Lawrence also started work at QIMR during the 1970s and is renowned for developing a vaccine to protect against Pigbel - a disease which was a common cause of child mortality in Papua New Guinea. QIMR is grateful to these two valuable scientists for their contributions to the Institute over the years, and wishes both a happy and fulfilling retirement.

As always, the Institute remains inordinately grateful to our visionary sponsors, Atlantic Philanthropies and Mr Clive Berghofer, and the many other donors, both small and large who continue to contribute to the very worthy cause of medical research in Queensland.

Michael Good
Director
Research

Research is conducted in 40 separate laboratories under four separate Divisions, each with a major focus. Important research collaborations take place within and between the laboratories, 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 disease.

The Population 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. The 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 people.

The Therapeutic Development and Clinical Research Division develops and tests immunotherapeutics manufactured within the Q-Gen laboratory at QIMR. Currently, it oversees clinical research and trials using cell-based therapeutics that target post-transplant lymphoma, malignant melanoma, prostate cancer and cytomegalovirus infection.
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, as well as the role of the immune system in the control of cancer. Through such increases in knowledge, it will then be possible to develop:

- New tools to diagnose infection
- New treatments for infection
- New vaccines to prevent infection
- New methods to control cancer

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 and tumours, to study of the biology of a number of pathogens ranging from viruses to worms – to the development and testing of vaccines.

**Highlights of the year include:**

The laboratory of Dr Geoff Hill has defined the role of NK T cells in graft-versus-leukaemia effects after transplantation.

Dr Scott Burrow’s laboratory has highlighted the importance of epitopes of over 10 amino acids in length as CTL epitopes from viral and tumour antigens for vaccine development.

Work in the laboratory of Dr Christian Engwerda has led to the development of several cysteine proteases from pineapple stems as novel anti-cancer and immunosuppressive drugs.

Work in the laboratory of Dr Andreas Suhrbier that has resulted in the development and patenting of a new cancer treatment based on intratumoural delivery of GM-CSF by the Kunjin replikon vector system.

Demonstration in the laboratory of Professor Michael Good that ultra low doses of whole inactivated malaria parasites can induce protection from malaria.
Bacterial Pathogenesis
Associate Professor Kadaba Sriprakash

This laboratory undertakes research into groups A (GAS), B (GBS) and G (GGS) streptococcus, a group of bacteria that cause a wide range of potentially fatal diseases in humans.

GAS, GGS and GBS cause a wide range of human disease, some of which are fatal. Genetic, epidemiological and pathogenic studies of these organisms were undertaken during the year. SIC and the closely related DRS are proteins secreted from GAS that have the capacity to bind multiple host factors, including components of the immune system.

The Bacterial Pathogenesis Laboratory continued to dissect the interaction of SIC/DRS with various host proteins, including the complement proteins C6 and C7, as well as the beta-defensins. In collaboration with Dr Natkuman Keteesan, the contribution of these proteins to post-streptococcal glomerulonephritis is also being investigated.

GGS, a close genetic relative of GAS traditionally recognised as a commensal organism, has emerged as a significant human pathogen in its own right. Research continues to emphasise the continuing genetic transfer that occurs between GAS and GGS. This transfer occurs more frequently in regions where the GAS and GGS infection is endemic. Such transfers have the capacity to significantly alter the pathogenicity of individual strains and may account for the increase in pathogenicity of GGS. As part of this study, this laboratory was the first to provide a complete nucleotide sequence for a GGS bacteriophage.

Projects investigating the development of a two-component vaccine, and the role of biofilms in the pathogenesis of GAS are yielding good results. A fruitful collaboration with the WuChopperen Health Service investigating skin sores in Indigenous communities in Northern Queensland was also established and new projects in the field of streptococcal diagnostics have begun.

Along with the Molecular Immunology Laboratory, this laboratory co-hosted the XVIth Lancefield International Symposium on Streptococci and Streptococcal Diseases which brought together internationally renowned experts to discuss the latest developments in streptococcal research. The success of this conference continued to build the international reputation of QIMR.
Bone Marrow Transplantation
Dr Geoff Hill

The Bone Marrow Transplantation Laboratory works towards understanding the pathophysiology of the complications of bone marrow transplantation, particularly Graft-versus-Host disease.

The Bone Marrow Transplantation team studies the pathophysiology of Bone Marrow Transplantation complications, particularly Graft-versus-Host disease and the mechanisms by which leukaemia is eradicated during the procedure.

The ultimate aim is to develop more effective preventative and treatment therapeutics to translate to the clinical setting.

In the last year the laboratory has continued to make progress in the understanding of GVHD and Graft-versus-Leukaemia (GVL) effects after transplantation. This work has lead to multiple publications in the last year, culminating in a Journal of Clinical Investigation publication outlining the effects of cytokines on donor NKT Cells and subsequent GVL effects.

This high productivity reflects in large part the stable and highly experienced members within the group.

The laboratory continues to be funded by a program grant from the NH&MRC and both Dr Geoffrey Hill and Dr Kelli MacDonald received NH&MRC fellowships in the past year. The laboratory continued to excel at the Transplantation Society of Australia and NZ annual meeting with Helen Bofinger winning the Presidents prize for best original work this year. This is the third year in a row that the laboratory has won this award.

HIGHLIGHTS
Analysed new cytokines to mobilise stem cells for allogeneic transplantation in the clinic
Defined the role of NKT cells in graft-versus-leukaemia effects after transplantation
Defined the effect of recipient B cells in Graft-versus-Host disease after transplantation

Bone Marrow
Transplantation
Laboratory Staff:
From left: Back row: Geoff Hill (Head), Tatjana Banovic, Naomi Odorico, Kate Markey, Alistair Don.
Front row: Rachel Kuns, Renae Skoczylas, Angela Burman, Helen Bofinger, Kelli MacDonald
Cellular Immunology
Associate Professor Scott Burrows

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

Mammalian cells have developed complex mechanisms to alert the body’s immune defense mechanisms of 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. Critical molecules in this process are the cell surface molecules that bind the viral peptides and present them for recognition by CTLs. These are called class I histocompatibility antigens (HLAs) in humans.

Other critical molecules in this process are T cell receptors (TCRs) that are expressed on the surface of CTLs and are responsible for specifically recognising viral peptides bound to HLA molecules. In collaboration with researchers in Melbourne, this laboratory recently showed that unusually long viral peptides are presented on the cell surface with an irregular bulging conformation.

Since long viral peptides have not been studied in detail previously, a major aim of the lab during the year was to determine how TCRs bind to these extraordinary target structures.

Although TCR-peptide-HLA binding usually involves extensive contact between the TCR and the HLA molecule, it was demonstrated that the TCR sometimes make very little contact with the HLA molecule if the peptide being presented is unusually long, bulging beyond the surface of the HLA molecule. This work has provided surprising new insights into how the body’s immune system recognises virus-infected cells – information that could be exploited in vaccine and drug design for a range of human infections.

HIGHLIGHTS
Provided evidence and proposed the theory that international efforts to identify CTL epitopes from viral and tumour antigens for vaccine development have underestimated the importance of epitopes of over 10 amino acids in length.

Discovered that HLA-restricted T cell recognition sometimes involved very few contacts between the TCR and HLA molecules.

Identified new CTL epitopes from human cytomegalovirus and showed the dramatic influence of minor HLA differences on their immunogenicity.

Demonstrated that highly mobile HLA-bound peptides can be targeted by T cells.

Crystal structure of a T cell receptor molecule (blue and red) bound to a class I human leukocyte antigen (green) presenting a 13-mer viral peptide (yellow). Note the minimal contact between the T cell receptor and the human leukocyte antigen.

Cellular Immunology Laboratory Staff
From left: Jacqueline Burrows, Melissa Bell, John Miles, Scott Burrows (Head), Rebekah Brennan
Clinical Tropical Medicine
Associate Professor James McCarthy - Joint appointment with the Royal Brisbane and Women’s Hospital

This laboratory researches how malaria and other parasites cause disease, and to develop new and improved tests both to diagnose these parasite infections as well as to detect drug resistance.

Identification in the laboratory that a number of Antiretroviral Protease Inhibitors (ARPI) already in clinical use for treatment of HIV infection show activity against the malaria parasite in vitro has led to recent in vivo studies both in a rodent model of malaria, and using sera from patients taking these antiretrovirals for treatment of HIV. This work has indicated that these observations may have significant clinical relevance in regions where malaria and HIV occur together, regions where antiretrovirals are being more widely used.

A joint project with Dr Shelley Walton and other Investigators from the Menzies School of Health Research on drug resistance in human scabies has resulted in the identification of a mutation in a drug-resistant strain of the scabies mite. This will assist in combating this growing threat to community-based control programs currently underway in Indigenous communities across northern Australia.

In collaboration with Dr Qin Cheng of the Australian Army Malaria Institute why so-called rapid diagnostic tests for malaria sometimes do not work is being explored. This study has led to the identification of significant polymorphism in the HRP-II protein, the target of rapid diagnostic tests, which helps explain why these tests are sometimes unreliable. Epitope mapping to identify which parts of the HRP-II protein are recognised in these diagnostic tests has recently been completed.

Following a series of severe infections due to a virulent drug-resistant strain of Staphylococcus aureus in a southeast Queensland Indigenous community, a collaborative project was undertaken with external researchers to investigate the epidemiology of this important pathogen. The work resulted in the finding of high rates of carriage of this pathogen, particularly on skin sores, and has led to change in antibiotic prescription policy.

The laboratory is researching the interactions between malaria-infected erythrocytes and host receptors, developing new models for studying cytoadhesion in malaria, and identifying novel anti-disease therapeutics to target this
EBV Biology
Professor Denis Moss

This laboratory is committed to understanding the biology and immunology of two clinically important human pathogens, Epstein-Barr virus (EBV) and vaccinia virus. EBV laboratory findings are used in human clinical trials.

Evaluating a formulation designed to control nasopharyngeal carcinoma
A vaccine formulation has been designed that consists of a series of minimal EBV-specific CTL epitopes encoded in a replication-deficient form of adenovirus. Preliminary results indicate that this formulation can protect immunocompromised mice in which human nasopharyngeal carcinoma cells are growing.

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. This formulation has become the basis of activating cytotoxic T cells from nasopharyngeal carcinoma patients and subsequently adoptively transferring these cells back into these patients.

Mapping immune responses to vaccinia virus
The laboratory has been involved in collaborative projects to map and characterise the CD8+ T cell responses to vaccinia virus VACV in humans and mice. This work is important for our understanding of VACV as a vaccine vector and also for our understanding of immunity to poxviruses such as monkeypox and smallpox, the emergence or re-emergence of which is a current cause for concern. The main achievement was 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.

Nasopharyngeal carcinoma is caused by Epstein-Barr virus in association with a range of co-factors. While the virus is always present in this malignancy, the individual co-factor varies depending on geographical location.

HIGHLIGHTS
Investigated the potential of a vaccine formulation consisting of all of the possible epitopes within the proteins present in nasopharyngeal carcinoma (referred to as SAVINE vaccine)

Defined the immune response in healthy individuals and nasopharyngeal carcinoma patients using tis SAVINE vaccine encoded within adenovirus

Initiated clinical trial on adoptive transfer of EBV-specific T cells as a treatment option for nasopharyngeal carcinoma

Gained an understanding of the protective capacity of a polyepitope vaccine formulation delivered in adenovirus to protect against growth of human nasopharyngeal carcinoma
The major area of research in the EBV Molecular Biology Laboratory is how the Epstein-Barr virus (EBV) is able to transform normal cells into cancer cells.

The Epstein-Barr nuclear antigen 3A (EBNA3A) is one of only six viral proteins essential for Epstein-Barr virus (EBV)-induced transformation of primary human B-cells in vitro. Viral proteins, such as EBNA3A, are able to interact with cellular proteins, manipulating various biochemical and signalling pathways to initiate and maintain the transformed state of infected cells. EBNA3A has been reported to have one nuclear localisation signal and is targeted to the nucleus during transformation, where it associates with components of the nuclear matrix.

Using EGFP-tagged deletion mutants of EBNA3A, in combination with site directed mutagenesis, the laboratory has identified an additional five functional nuclear localisation signals in the EBNA3A protein. It is not understood why a single protein contains multiple NLS, however, EBNA3A has multiple binding partners with many of these partner proteins being present in the cytoplasm and recruited to the nucleus in the presence of EBNA3A.

Under these circumstances it is possible that interaction with cytoplasmic proteins may mask one or more of the NLS in the EBNA3A protein and multiple NLS would then be required to ensure that EBNA3A is efficiently targeted to the nucleus.

Human Sin1 (SAPK-interacting protein 1) was originally identified as a partial cDNA that inhibited signalling by constitutively activated RAS2G19V in yeast. Searches of online databases demonstrated the presence of both a Raf-like Ras-binding domain (RBD) and a pleckstrin homology (PH) domain in the human Sin1 protein and most of its orthologues. The RBD was shown to be able to bind to Ras while recombinant Sin1 interacted with GST-Ras in a GTP-dependent fashion in vitro, suggesting that the RBD is functional. Sin1 co-immunoprecipitated and co-localised with Ras in vivo and inhibited activation of the PI3K signalling pathways by Ras.

**HIGHLIGHTS**

Identified an additional five functional nuclear localisation signals in the EBNA3A protein

**Sub-cellular localisation of an EGFP-EBNA3A fusion construct following mutation of nuclear localisation signals**

**Sin 1 colocalises with activated RAS**
Efficacious recombinant vaccines have been identified for the two major blood-feeding helminth parasites of humans – schistosomes and hookworms.

Funding has been secured from the Gates Foundation to develop the hookworm vaccine and it is undergoing process development for clinical trials. Funds are currently being sought to develop the schistosomiasis vaccine and take it into clinical trials.

This laboratory continues to discover hookworm vaccine antigens from the gut of the parasite using Laser Microdissection Microscopy and was the first to apply this technique to a parasitic helminth. Hookworm genes that are associated with the transition from a free-living to a parasitic state are also being identified.

Two new projects, both funded by NIH have gotten underway. One explores the roles of liver fluke secretions in causing cancer of the bile ducts in Southeast Asia. In the other, immunomodulatory proteins secreted by hookworm parasites are being studied to determine how these might be developed as therapeutics for autoimmune disorders.

Detection of the integral membrane protein, Sm-TSP-2 on the outer tegument of Schistosoma mansoni parasites.
HIV Molecular Virology
Dr David Harrich

The principal focus in this laboratory is detailed analysis of a step in HIV replication called reverse transcription. During this process, HIV is able to convert its genetic material composed of RNA into a form compatible with human DNA.

Over the last several years, our research and that of others worldwide has revealed complex interactions between viral proteins, unexpected roles for virus RNA, and requirements for cell factors to support virus growth.

HIV is, in most respects, a typical retrovirus. The virus particle is 100 nm in diameter and surrounded by a cell-derived lipid membrane. Within the virus are the structural proteins including reverse transcriptase, and the genomic RNA. Reverse transcriptase is a viral enzyme and its role is to convert the viral genomic RNA into DNA so that the genomic material is compatible with the cell. Studies by other labs and confirmed by this laboratory show that virions contain very little, if any, DNA. Given that the virus machinery is designed to convert RNA to DNA using reverse transcriptase, it has been puzzling why reverse transcription is repressed in virions.

A clear understanding of how HIV regulates reverse transcription, and how cellular factors impact this process have potential to identify novel antiviral strategies.

HIGHLIGHTS
Revealed that an HIV protein called Tat directly stimulates reverse transcriptase activity
Recent experiments suggested TAR forms a unique ribonucleoprotein complex, and additional critical RNA elements regulating reverse transcription have been identified
Showed for the first time that protein kinase C regulated an early event during HIV-1 but not through cellular receptors
Research supported the hypothesis that reverse transcription must initiate in a core, but requires unknown factors to complete the process
Demonstrated that protein methylation is critical for HIV-1 infectivity
This laboratory studies the host immune response during malaria and leishmaniasis, and aims to distinguish host immune responses to parasites that lead to control of disease and those that contribute to tissue pathology.

Work on experimental models of cerebral malaria caused by *Plasmodium berghei* and visceral leishmaniasis caused by *Leishmania donovani* aims to identify the key molecules and cells that cause tissue pathology associated with infection. Many of the molecules and cells identified to date also play important roles in protection against infection, indicating they are either produced in excessive amounts or in inappropriate tissue locations.

Research on experimental cerebral malaria has identified a key role for regulatory T cells in the pathogenesis of this disease. These cells play an important role in balancing immune responses to prevent pathology. However, they can sometimes exert too much influence and prevent effective control of parasite growth. Results to date indicate that regulatory T cells promote an early burst of pro-inflammatory cytokine production that contributes to the induction of cerebral pathology, but also restrict the development of anti-parasitic cell mediated immunity at a critical stage in infection.

Work on visceral leishmaniasis revealed important, but distinct, roles for lymphotoxin alpha and tumour necrosis factor in the host immune response during experimental visceral leishmaniasis. These studies were extended to find that VCAM-1, a cell adhesion molecule that is expressed in the liver following lymphotoxin alpha and tumour necrosis factor production during visceral leishmaniasis, plays an important role in the recruitment of cells into the liver during infection, as well as the generation of cell mediated immune responses in the liver very early after infection.

The laboratory has also been involved in a research program to identify cysteine proteases from pineapple stems with immunomodulatory properties and has now successfully cloned several distinct cysteine proteases into yeast and produced recombinant enzymes.
This laboratory researches 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 regulatory and cytolytic proteins, such as cytokines, perforin and enzymes known as granzymes. This laboratory is investigating ways to control activation and inhibition of CTL so that they express functions needed for host protection.

A new project is investigating the functional flexibility of memory CD8⁺ T cells generated in various priming conditions using transgenic OT-I CD8⁺ T cells and OT-II CD4⁺ T cells that recognise defined sequences in the protein ovalbumin (OVA). Conditions have been established for induction of effector and memory CD8⁺ T cells following adoptive transfer of the transgenic cells into congenic mice and immunisation with OVA. Experiments are in progress to assess the functions and expression of effector genes in the transferred cells.

Effects of the cytokine interleukin-4 (IL-4) on tumour growth control and the tumour-induced CD8 T cell response were explored in two mouse models. When the tumour cells secreted IL-4, their clearance was impaired and they induced markedly higher expression of granzyme A and IL-4 mRNAs in the responding T cells than did control tumour cells. These in vivo data are consistent with the finding in vitro that IL-4 enhanced granzyme A mRNA levels and functional enzymic activity.

Following an earlier demonstration that IL-4 induced CD8α down-regulation and impaired CTL function in activated primary CD8⁺ T cells, the laboratory examined whether re-expression of CD8α cDNA restores CTL function. Recombinant expression of the Lyt2.1 CD8low allele in Lyt2.2 CD8low T cells did not increase CTL activity or perforin and granzyme mRNA levels, arguing against a causal link between CD8 expression and cytolytic function. When transferred into congenic mice, in vitro generated OT-I CD8low T cells persisted for up to 3 months. However, some cells re-acquired CD8 expression after injection of OVA-expressing tumour cells. Current work is investigating the conditions that maintain the CD8low phenotype long term and their implications for tumour control in vivo.

**HIGHLIGHTS**
- Showed in a second tumour model that IL-4 secretion by tumours increases the frequency of secondary tumours that are poorly immunogenic.
- Found that the IL-4-induced CD8low T cells persist long term in vivo and do not re-acquire cytolytic function when CD8low expression is restored ectopically.
- Established a new project to assess the functional flexibility of memory CD8⁺ T cells.
The Immunovirology Laboratory is exploiting new knowledge about interactions between viruses and the immune system to develop novel anti-viral and anti-cancer strategies.

Patents have been the main focus of work in the past year. A novel intratumoural gene therapy system was developed that uses the Kunjin replicon system (developed by Dr Khromykh, UQ) to deliver the immunostimulatory cytokine GM-CSF into a growing tumour. The self replicating Kunjin RNA vector combines with GM-CSF to stimulate the immune system to generate anti-cancer T cells that then destroy the tumour cells. The system was patented and assigned to Replikun Ltd who was awarded an AU$1 million Commercial Ready grant to develop this system for human trials.

The novel topical chemotherapeutic agent PEP005 being developed by Peplin Ltd has shown considerable promise in recent clinical trials of non-melanoma skin cancer. Much of the preclinical work for this compound was performed at QIMR and ongoing research has illustrated that PEP005 can be used to stimulate anti-cancer T cells. Treatment of primary tumours with PEP005 has been shown to synergise with cancer vaccines to eradicate distant secondary tumours. PEP005 may thus emerge as a unique chemotherapeutic drug that can be readily used together with immune-based anti-cancer therapies to reduce the rate of cancer relapse. This work was assigned to Peplin Ltd and patented.

CBio Ltd has developed a novel anti-inflammatory compound, Cpn10 which has shown some extraordinary success in recent clinical trials, particularly for rheumatoid arthritis. Under a contract R&D agreement the Immunovirology Laboratory was involved in establishing how this biological agent mediates its activity. Cpn10 has anti-inflammatory properties and inhibits the production of inflammatory mediators by Toll-like receptor agonists. This work was assigned to C-Bio Ltd and patented.

Work on SerpinB2, a serine protease inhibitor induced during most inflammatory processes continued. The discovery that SerpinB2 is potently induced by HIV-1 infection of macrophages and that SerpinB2 then enhances HIV-1 transcription and replication raises the question of whether polymorphisms in the SerpinB2 gene play a role in the progression to AIDS.

SerpinB2 is nearly always expressed during inflammation and infection and affects gene expression via its effect on Rb.
Malaria and Scabies
Professor David Kemp

Work in this laboratory concentrates on the control of diseases caused by the scabies mite *Sarcoptes Scabiei* and on malaria, which is transmitted by mosquitos of the *Plasmodium* genus.

Scabies, caused by the mite *Sarcoptes scabiei* which burrows through the skin, is a major problem in northern Australia. It facilitates infection by group A streptococci, which cause rheumatic fever and heart disease.

Research this year has focused on the unexpected family of scabies mite inactivated protease paralogues (SMIPPs) previously discovered in this laboratory, and thought to play some important role in evading host defences. It has been demonstrated that they are secreted into the gut and excreted in faeces; hence they could interact with the host both internally and externally.

Colleagues at Monash University have demonstrated by X-ray crystallography that these molecules, produced in *Pichia pastoris*, are in proper conformation and so their functions can now be examined.

Malaria is caused by infection with parasitic protozoa of the genus *Plasmodium*, and is transmitted by the bite of an infected *Anopheles* mosquito.

Gametocytogenesis is a poorly understood stage of the parasite lifecycle that is essential for transmission of the parasite from the human to the mosquito host. This stage is being explored as a potential focus for intervention strategies.

Aminopeptidases are being evaluated as potential drug targets. There are four aminopeptidases involved in haemoglobin degradation and each enzyme represents a potential target at which novel antimalarial drugs that disrupt parasite protein turnover and synthesis could be developed.

A number of Ring Exported Proteins (REX) have been localised to a unique trafficking organelle in the host red blood cell which is used to transport virulence genes involved in severe disease to surface of the RBC. GFP fusions and photo-bleaching studies have been used to investigate the properties of these proteins.

Below: Transfected *Plasmodium falciparum* expressing the Maurer’s cleft protein, REX2, fused to green fluorescent protein. Maurer’s clefts are parasite-derived structures within the host cell cytoplasm that are thought to function as a sorting compartment between the parasite and the erythrocyte membrane. A series of confocal images was generated from a single infected red blood cell and reconstructed to give a 3-dimensional representation with volumetric rendering. The images correspond to the 00 and 900 different rotation frames. Images collected by P. L. Hawthorne, Queensland Institute of Medical Research and N. Klonis, La Trobe University.

Malaria and Scabies Laboratory Staff
From left: Back row: Cassandra Lane, Katja Fischer, Dave Kemp (Laboratory Head), Katharine Trenholme. Front row: Karen Anderson, Mei-Fong Ho, Simone Beckham, Simone Smith
Malaria Biology
Dr Don Gardiner

To combat multi-drug resistant (MDR) malaria, transgenic approaches are used in this laboratory to investigate novel genes as possible targets for intervention therapy.

**HIGHLIGHTS**

Development of a technique in which transgenic parasites overexpress a target enzyme in order to validate its potential as a rational drug target.

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**Antiretroviral Protease Inhibitors (ARPIs) as antimalarials**

This laboratory has shown that antiretroviral drugs of the protease inhibitor class can inhibit the growth of malaria parasites in vitro. Recent data from the laboratory now confirms that this in vitro activity has in vivo relevance. Not only has the group shown that these agents can kill malaria parasite in a rodent model, but has now shown that sera taken from HIV patients treated with the antiretroviral agents can also inhibit parasite growth. Antimalarial and HIV drug interactions are now being investigated in an effort to improve the treatment of co-infected malaria and HIV individuals, reduce treatment costs and prevent the development of drug resistance. Preliminary studies are very exciting, demonstrating that in addition to their own antimalarial activity, these protease inhibitors “boost” the antimalarial effects of other commonly used drugs.

**Evaluation of aminopeptidases as potential drug targets**

In conjunction with collaborator, Professor John Dalton, other potential targets for new antimalarial drugs are also being investigated. There are 4 aminopeptidases involved in haemoglobin degradation and they each represent a target at which novel anti-malaria drugs could be directed. The laboratory has developed a technique in which transgenic parasites overexpress a target enzyme in order to validate its potential as a rational drug target and will use this methodology to assess other candidate targets.

**Characterisation of a transmission and virulence locus on Chromosome 9**

In collaboration with the Malaria and Scabies Laboratory, the role of a 55kb region on the right arm of chromosome 9 is being investigated. Genes located in this region are known to be involved in cytoadherence, protein trafficking and agglutination, all of which are associated with virulence in *P. falciparum*. Genes involved in gametocytogenesis are also located in this region. Understanding the molecular and cellular processes involved in these critical phases of the parasite life cycle, may indicate novel targets for intervention.

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**Plasmodium falciparum expressing aspartyl aminopeptidase, fused to green fluorescent protein. A – Bright Field, B – GFP.**
Malaria Drug Resistance and Chemotherapy

Dr Qin Cheng - Australian Army Malaria Institute

This laboratory studies the mechanisms and processes leading to the development of drug resistance in malaria parasites, and also the factors influencing the survival and spread of resistant parasites.

Antigenic variation in *Plasmodium falciparum* resulting from varying the surface protein PfEMP1 helps parasites avoid the host immune response. Transcription from genes encoding PfEMP1 has been quantified using real-time RT-PCR and conventional RT-PCR, to find that in vitro cultivation significantly decreases transcription. Not all genes are equally affected which complicates investigation of malaria pathology and transcription of the virulence genes since some in vitro cultivation is usually required to expand parasite material obtained from patients.

Var genes encoding PfEMP1 are highly diverse with little overlap between *P. falciparum* isolates. Five var genes shared at a high frequency have been identified among *P. falciparum* isolates in the West Pacific region, mapped to chromosomes 4 and 7, approximately 100kb to drug resistance determinants (pfdhfr and pfcrt), demonstrating that the conservation of these var genes result from their physical linkage with drug resistant genes and drug selections.

We expressed fusion proteins of several var genes to examine the characteristics of antibodies in volunteers and patients who were infected with *P. falciparum*. The results suggest that a parasitemia above ~20 parasites/μl is required to trigger an immune response to PfEMP1, and once triggered, the response is rapidly boosted following re-exposure. Antibodies generally last longer than 100 days and show both cross-reactivity, and specificity. The specific antibodies agglutinate parasites and the cross-reactive antibodies disrupted the rosettes.

Vivax malaria differs from *falciparum* malaria in its ability to cause clinical relapses, initiated by the release of hypnozoites from the liver. Studies suggest that clonal hypnozoites are released at pre-determined periods causing a relapse, even though there may be several clones infecting the liver, as shown by the later release of a different clone. These findings suggest remarkable regulation of relapse intervals in *vivax* malaria and highlight the importance of reducing the number of infective mosquito bites in minimising the number of relapses.
Molecular Genetics
Associate Professor Peter Upcroft

This laboratory works on the two most common protozoan parasites of medical importance, the sexually transmitted Trichomonas vaginalis and the intestinal parasite Giardia duodenalis.

The anaerobic protozoan parasite Trichomonas vaginalis is the most prevalent sexually transmitted infection. It is associated with preterm delivery, low birthweight and predisposes women to HIV/AIDS. The focus in this laboratory is on following virulent and drug resistant infections in a community, and on developing new drugs and treatment for infections caused by this organism.

Researchers from the Molecular Genetics Laboratory have used the genotyping method that they developed in collaboration with Professor Patricia Johnson at UCLA to show that T. vaginalis parasites from each infection can be specifically identified and that within a remote community such as the Highlands of Papua New Guinea, the parasite genotypes are more similar than in the worldwide community.

In combination with earlier studies on metronidazole resistance in the same community where 4 of 20 isolates displaying unexpectedly high levels of resistance were identified, the spread of drug-resistant strains of the parasite in a community can now be followed. The identification of such drug-resistant strains is also being targeted by in situ DNA hybridisation of metaphase arrested parasite chromosomes. This technique will identify markers for drug resistance and allow physical mapping of the large T. vaginalis genome partitioned across 6 chromosomes.

Five new drugs have been identified, of the same class of compounds as metronidazole, the treatment of choice for T. vaginalis infections, which are effective against metronidazole-resistant parasites. One in particular, which is readily synthesized in large quantities, is being focused upon and preclinical trials of this drug are being planned.

The laboratory has found the antiretroviral protease inhibitor Kaletra is effective against T. vaginalis parasites in vitro and are planning to study the T. vaginalis prevalence in patients from HIV endemic areas who are prescribed these drugs.

Molecular Genetics Laboratory Staff
From left: Janelle Wright, Rebecca Dunne, Jacqui Upcroft, Peter Upcroft (Head)
Molecular Immunology
Professor Michael Good

The Molecular Immunology Laboratory studies the immune response to pathogens with the goal of understanding pathogenesis and developing vaccines.

Malaria research is involved in developing a novel malaria vaccine and understanding why current vaccine candidates do not work. In the last year, data has been published showing that in mice the malaria parasites induce the death of memory B cells and long-lived plasma cells that mediate long term protection.

Most vaccines, including malaria vaccines, are required to generate these cells to protect the individual, years after vaccination. If death of these cells occurs in humans, as suggested by circumstantial evidence, then this could explain in part why current malaria vaccines have not been effective. The laboratory has also focused on development of a vaccine using an ultra low dose of whole killed parasites that protect primarily via T cells, work which will proceed into clinical trial in the near future.

With the continued support of the PATH Malaria Vaccine Initiative (MVI) and in collaboration with the Molecular Science Division of CSIRO Clayton, work has continued on the production and purification of the recombinant malarial vaccine candidate antigen RAP2. In July 2005, Dr Michael Hocart resigned from the project and Ms Katia Potter was appointed Project Leader. Subsequently a decision was made to relocate the RAP2 project team to Q-Gen, QIMR’s GMP manufacturing facility. CSIRO, with support from QIMR scientists, produced five 10L scale processes for development and consistency purposes, the product recovery improved through the series of runs with the last run producing good product yield. QIMR provided analytical support to CSIRO by developing appropriate assays to monitor the quality and quantity of protein present throughout the process. The QIMR team submitted their report to MVI for review at the end of June 2006.

It is with deep sadness that the Laboratory notes that Dr Michael Hocart passed away in January 2006.

Streptococcal research has focused on four key aspects:
- Defining the mechanism of immunity induced by the leading group A streptococcus (GAS) vaccine candidate J8 or its derivatives,
- Investigating the immune memory responses following immunisation with J8 or its derivatives,
- Evaluating novel mucosal delivery strategies for peptide based vaccines, and
- Finalisation of the J8-Diptheria Toxoid formulation to be used in phase I human clinical trials.

Recent research has demonstrated that immunisation with J8-Diptheria Toxoid can induce memory B-cells that are present for a minimum of 19 weeks post-primary immunisation. Researchers are convinced that memory B-cells are crucial for long-term protection following immunisation with their lead GAS vaccine candidate. This highlights the importance of a recent observation that J8-antisera is protective in passive transfer experiments and that these antibodies are the likely effector molecules in protection against GAS. In preparation for a phase I human clinical trial with J8-Diptheria Toxoid/alum, Q-Gen has been assisting in the GMP manufacture of the vaccine candidate and development of associated assays.

The laboratory is also interested in developing novel mucosal adjuvants such as lipopeptides which can stimulate a local immune response at the primary point of GAS infection and have demonstrated that the induction of a local immune response by GAS lipopeptides not only protects against GAS but also reduces GAS colonisation of the throat.
Molecular Parasitology
Professor Don McManus

This laboratory researches the biology and epidemiology of parasitic worms of humans and on developing new interventions and diagnostic procedures that will lead to their elimination.

Schistosomiasis and echinococcosis are two major diseases caused by parasitic worms. Work on schistosomiasis is focused predominantly in China and is aimed at:

– providing new insights into the prophylactic effects of the drug artemether against acute S. japonicum infection and to determine the effectiveness of combined artemether and praziquantel treatment as an adjunct to control,
– increasing knowledge of the environmental and genetic factors involved in predisposition to infection, and analysing the molecular and cellular mechanisms leading to formation of fibrotic hepatic lesions,
– determining the importance of buffalo reservoirs in the persistence of human schistosomiasis transmission,
– pursuing genomics and post-genomics research on existing and newly discovered S. japonicum molecules that are candidate vaccine and diagnostic targets, and
– developing a validated mathematical model for improved and sustainable schistosomiasis morbidity control.

Along with a commercial partner Agilent Technologies, a microarray has been constructed that contains the majority of the schistosome transcriptome which, 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.

Work on echinococcosis includes major field and epidemiological studies in China, and the further development of a highly sensitive and specific blood test (based on a recombinant antigen, EpC1) for diagnosis of patients infected with hydatid disease and its application for detection of the disease in sheep and marsupials.

Successful vaccination trials have been undertaken in China against echinococcosis in dog definitive hosts using recombinant antigens expressed by the mature adult worm. This work is important because it provides proof of principle that vaccination of the dog host against E. granulosus is feasible using recombinantly-derived proteins.

Microarray analysis of the adult worm and schistosomulum of Schistosoma japonicum

HIGHLIGHTS

Validated a microarray comprising the majority of the schistosome transcriptome

Identified unique family clustering of human echinococcosis cases in a Chinese community

Demonstrated a genetic component linked to human infection with Schistosoma japonicum in China

Characterised a surface-associated pathway for iron absorption in schistosomes

Undertook successful vaccine trials undertaken against canine echinococcosis

Defined a contributory role for hepatic stellate cells in the dynamics of egg-induced fibrosis in schistosomiasis

Demonstrated the effectiveness of artemether in preventing acute human schistosomiasis infection

Completed a drug-based intervention study to demonstrate the importance of buffaloes in human Schistosoma japonicum infection
Molecular Immunology Staff
From left: Back row: John Hartas, Michael Batzloff, Graham Magor, Lieke Berger, Kirsten Hanks, Michael Good (Head) Alberto Pinzon-Charr. Front row: Manisha Pandey, Meru Sheel, Michelle Wykes, Virginia McPhun, Yawalak Panpisuthchal, Xueqin Liu, Suhua Jiang

Molecular Parasitology Laboratory Staff

Mosquito Control Laboratory Staff
From left: Back row: Jason Jeffery, Brian Kay, Tanya Russell, Katie Lee, Tessa Knox. Front row: Anna Guerney, Hau Tran, Le Nguyen, Kay Marshall, Peter Ryan (Head)
Mosquito Control
Dr Peter Ryan

Research in the Mosquito Control Laboratory focuses on the biology and control of mosquito-borne viruses such as dengue, Ross River virus and Barmah Forest virus.

The World Health Organization recognises that water resource development and management contributes to the proliferation of dengue and other water related vector borne diseases by increasing mosquito breeding sites in infrastructure such as water storage jars, water tanks and wells. The contribution of new water infrastructure to dengue risk was demonstrated in Khanh Hoa Province in central Vietnam, where 92% of dengue mosquito production was occurring in 2000-litre UNICEF jars. This laboratory’s community based control programs, incorporating Mesocyclops as a biological control agent against Aedes aegypti, mitigated this risk by eliminating dengue mosquitoes from these and other water storage containers.

The Mosquito Control Laboratory is now involved in a new five-year AusAID funded project which aims to reduce dengue risk in rural areas in southern Vietnam that are receiving new water supply infrastructure as part of the Cuu Long Delta Rural Water Supply and Sanitation Project. This project, in collaboration with the Centre for Water Supply and Sanitation (CERWASS) and the Administration of Preventive Medicine in Vietnam, and the Australian Foundation for the Peoples of Asia and the Pacific Ltd, will establish broad inter-sectoral collaboration to devise, trial and refine new approaches to dengue control.

This will incorporate health impact assessments to monitor the impact of water supply infrastructure on dengue transmission risk, and if necessary, develop interventions at different stages of water infrastructure development to mitigate water-related dengue risk. This project will maximise the benefits of water supply programs by ensuring the water they provide is safe from water related vector borne diseases.

The laboratory continues collaborative research with the Mosquito and Arbovirus Research Committee – an independent organisation made up of representatives from local governments from Queensland, New South Wales and Victoria, and Queensland Health and industry. To assist local governments and facilitate responsive mosquito control and disease prevention interventions, a web-based, geographic information system has been developed to provide data on Ross River virus disease incidence in Queensland.

Below: Mrs Nguyen Thi Yen (National Institute of Hygiene and Epidemiology, Hanoi) and Mrs Luu Le Loan (Pasteur Institute, Ho Chi Minh City) inspect water storage tanks for dengue mosquito larvae, Long An Province, southern Vietnam. Photograph courtesy of Prof Vu Sinh Nam.

HIGHLIGHTS
Established broad inter-sectoral collaboration to devise, trial and refine new approaches to dengue control in three provinces in southern Vietnam

Incorporated health impact assessments to monitor the impact of water supply infrastructure on dengue transmission risk

Developed a web-based, GIS to provide timely data on Ross River virus disease incidence throughout Queensland

Determined the suitability of cuticular hydrocarbon (CH) and gene expression (GE) analyses for age grading a range of Australian mosquito vector species.

The Ross River virus Early Detection and Surveillance (RREDS) System is described in more detail in the ACITHN report on page 61.
Protein Discovery Centre
Professor Jeff Gorman

The Protein Discovery Centre aims to discover the identities of proteins involved in or affected by physiological and disease processes and the ways in which these proteins function and interact.

A variety of milestones have been achieved towards the establishment of the QIMR Protein Discovery Centre (PDC). As a consequence the Centre has a range of equipment and commissioned relevant staff employed in core roles to deliver outcomes to QIMR investigators, both through services and collaborative work.

Visits to the USA and Germany were undertaken during 2005 to evaluate latest equipment, particularly mass spectrometry, for proteomics operations. This was timed so that the most mature emerging technologies could be selected and delivered in a timeframe to coincide with occupation of the newly constructed QIMR laboratory space for the Protein Discovery Centre. These visits also provided opportunities to evaluate ancillary equipment. Specifications were subsequently written for a range of equipment and tender responses evaluated and orders written for selected instruments.

The staging of the assessment and acquisition process has enabled the most up to date equipment to be purchased. The package includes the first ESI-Linear Ion Trap-Fourier Transform-Tandem Mass Spectrometer (a.k.a. Orbitrap).

In addition, the Centre has acquired one of only two ESI-ETD-3D Ion Trap-Tandem Mass Spectrometers in Australia capable of the revolutionary new fragmentation process of Electron Transfer Dissociation (ETD). ETD is particularly suitable for the process of identification of phosphorylation sites in proteins which serve as critical switches in various biological processes.

Delivery of capability has already commenced with those pieces of equipment that have been fully commissioned. The fully commissioned equipment has been benchmarked against exacting performance expectations.

HIGHLIGHTS
Commissioned a MALDI-TOF/TOF tandem mass spectrometer and benchmarked its performance by analysis of post-translational modifications of murine dioxin receptor.

Determined a site of asparagines hydroxylation of the Notch protein by an asparaginyl hydroxylase that regulates the activity of this transcription factor’s role in stem cell differentiation.

Commissioned a MALDI-TOF mass spectrometer for open access by QIMR investigators to accommodate requirements to identify novel proteins.
This laboratory seeks 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.

Although both irradiation and multi-agent chemotherapy are efficient therapies for Hodkin’s Disease (HD), the non-specific nature of these treatments often results in severe side effects. Moreover, a significant proportion of HD patients relapse following chemo- and radio-therapy, who fail to respond to conventional therapeutic strategies. Recently, there has been an increasing emphasis to develop novel therapeutic strategies which are specifically designed to prime patient’s own immune system to recognise and destroy cancer cells with minimal or no associated toxicities. One such approach involves killer T cells which can be specially trained in vitro to recognise cancer cells and adoptive transfer of these cells often results in therapeutic benefit. This laboratory intends to develop a killer T cell epitope-based therapeutic vaccine which specifically recognise viral antigens in cancer cells from HD, ultimately to use this vaccine as a therapeutic tool for the treatment of relapsed HD.

Congenital human cytomegalovirus (HCMV) infection remains one of the major health problems and it is estimated that more than 1 million infants are born every year with HCMV infection. It is estimated that each year US$1 billion dollars are spent by the US government alone, for the management of congenital HCMV-related complications. According to a report published by the Institute of Medicine (IOM, USA), vaccination provides the most practical modality of achieving a long-term protection from congenital HCMV infection. According to a market analysis published by IOM, an HCMV vaccine can potentially have a worldwide market of US$500 million per annum.

The primary aim of this project is to develop such a vaccine. A large number of viral epitopes that activate protective killer T cells were identified. These epitopes provide an important platform for the development of a vaccine formulation. Over the last 12 months, an extensive population-based analysis of these epitopes has been conducted with a smaller panel selected to be tested for immunogenecity studies in a mouse model.

A final international patent describing these epitopes, along with population-based analysis, has been filed and it is anticipated that the epitopes identified in this project will form an important basis for the future design of an HCMV vaccine for human use. Over the last months, preliminary discussions have been initiated with two biotechnology companies (one Australian and one US-based) for licensing the HCMV epitopes for diagnostic application.
The Cancer and Cell Biology Division consists of 13 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, endometrial 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 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.

Highlights of the year include:
Identification of low risk genes for breast cancer
Development of assays to assess functions of variants of BRCA1 and BRCA2
Identification of several new tumor suppressor genes for cutaneous melanoma
Identification of a novel damage control protein and its link with cancer
Encouraging data from treatment of a patient with recurrent glioblastoma using Dendritic cell based immunotherapy in combination with chemotherapy
Demonstration of the use of antibodies and antagonists of Eph and Ephrin proteins as cancer therapeutics
Demonstration of protective effect of a novel nitroxide antioxidant on tumor latency in ATM mutant mice
Appointment of Dr Corinne Lendon as Head of the Molecular Psychiatry Laboratory at QIMR
Cancer Genetics
Dr Georgia Chenevix-Trench

This laboratory investigates why some people get cancer, and how these cancers develop from a normal cell, particularly breast and ovarian cancer which are often found together in the same families and share many similar characteristics.

Most of the 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 the last year the laboratory has also been heavily involved with three new international consortia, the Breast Cancer Association Consortium (BCAC), the Ovarian Cancer Association Consortium (OCAC), and Consortium of Investigators of Modifiers of BRCA1/2 (CIMBA), which aim to have sufficient power to find convincing evidence of low risk genes for breast and ovarian cancer, and for genetic modifiers of the major breast cancer genes, BRCA1 and BRCA2.

BCAC has collated data from 10,000 – 30,000 breast cancer cases and controls and refuted previous suggestions that commonly studied nine polymorphisms in the ADH1C, AURKA, BRCA2, ERCC2, LIG4, TP53, XRC1, XRCC2 and XRCC3 genes are associated with breast cancer risk. In contrast, in a similarly powered study, compelling evidence has been found that two other polymorphisms do affect breast cancer risk. Through OCAC, and using ~4500 cases and 7000 controls, the laboratory has validated their previous finding that a promoter polymorphism in the progesterone receptor reduces the risk of endometrioid ovarian cancer.

Further analysis of the rare mutation in the ATM gene that predisposes to breast cancer, 7271T>G (V2424G) has shown that it occurs in 7/3743 population-based cases (0.2%) and 0/1268 controls (P = 0.1) from the US and Australia, and confers a hazard ratio of 8.6 (95% CI 3.1-23.6; P < 0.001). The laboratory has now identified this mutation in three multiple-case breast cancer families in Australia, and shown that it acts as a dominant negative in terms of the expression profile in lymphoblastoid cell lines.
Cancer Immunotherapy
Dr Chris Schmidt

Understanding how the immune system succeeds in its fight against malignancies is central to the future development of cancer immunotherapies, and the focus of research in this laboratory.

In two recent studies, it was found that patients with advanced, metastatic melanoma who responded to an irradiated tumour/dendritic cell immunotherapy all had lower volume disease. This encouraged researchers to test the therapy in patients with resected, regional metastatic melanoma. In conjunction with Professor Michael O’Rourke (Mater Hospital), Professor Mark Smithers (Princess Alexandra Hospital), and Dr Ian Hermans (Malaghan Institute), a Phase III clinical trial has begun, with the aim of enrolling 200 patients. Manufacture under GMP is performed by QGen.

The success of the Phase I studies led to trials for prostate cancer (with Professor Frank Gardiner, the Royal Brisbane and Women’s Hospital, the University of Queensland, and the Northern section of the Urological Society of Australia) (LOC). These trials are nearing completion. The efficacy of the treatment in combination with chemotherapy was demonstrated in one patient who had complete remission of recurrent glioblastoma, in a recently completed trial in collaboration with Dr David Walker (Royal Brisbane and Women’s Hospital). A new trial with a modified dendritic cell therapy is planned. The core research focus in this laboratory remains the characteristics of a successful anti-tumour T cell response.

The Depot Cytokine Group (KE, MH, XH) 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. Encapsulation confines the cytokines to the tumour, thus avoiding the toxic effects of many cytokines when they enter the systemic circulation. The first clinical trial of this approach with canine patients will commence next year.

HIGHLIGHTS
Current Phase III trial for patients with early metastatic melanoma (Stage IIIB/C) reached 40% of planned accrual.

Dendritic cell-based immunotherapy, in conjunction with chemotherapy, proved capable of inducing a complete clinical response in a patient with recurrent glioblastoma.

Analysed ex-vivo anti-tumour T cell responses at the level of individual tumour epitopes using multi-colour flow cytometry.

Melanoma cell line

Cancer Immunology Laboratory and Dendritic cells and Cancer Laboratory Staff
From left: Back row: Michael Lai, Guillaume Bach, Michelle Neller, Tammy Maxwell, Chris Schmidt (Head, Cancer Immunology). Middle row: Ming Lin, Melanie Reiter, Alejandro López (Head, Dendritic Cells and Cancer), Cathy Lanagan. Front row: Nathan Martinez, Kalpana Patel, Xiang Quan Huang, Kay Ellem
Dendritic cells and Cancer
Associate Professor J Alejandro López

Dendritic cells (DC) are potent initiators of the immune response currently used in novel therapies for melanoma, prostate and glioblastoma at QIMR. This laboratory explores the function of DC in patients with breast cancer and in healthy donors and studies the role of DC in the response to cancer as the basis for optimised DC-based immunotherapy clinical trials.

The characterisation of DR+IC, an immature population of antigen presenting cells accumulating in patients with advanced cancer was completed. Interestingly, it was demonstrated that their functional defects may be recovered by the treatment with ligand (CD40L). These observations in patients with advanced cancer were replicated in the smaller proportion of DR+IC also present in healthy individuals.

In addition to the beneficial effect of CD40L on DR+IC, it was demonstrated that CD40L also prevents the induction of apoptosis in circulating DC. A higher proportion of blood DC undergo apoptosis in patients with breast cancer. It was shown that this process is induced by tumour products and efficiently prevented by the treatment with CD40L.

The laboratory investigated interactions between DC and tumour cells (melanoma) leading to antigen presentation and established that they efficiently form into conjugates incapable of eliciting recognition by melanoma specific CTL when melanoma cells were either intact or irradiated. However, when early apoptotic melanoma cells were used, specific recognition was observed.

Below: Contrast phase microscopy studying the interaction between DC (green) and melanoma cells (red) in a vaccine preparation for immunotherapy.

Left: Effect of breast cancer on DC. A. Shows apoptosis induced in circulating DC from a patient with advanced disease. B. Accumulation of immature cells (DC+IC) replacing bona fide DC shown here under light and electron microscopy.
Gene expression profiling was used to identify a molecular signature characteristic of ARF mutation status in a panel of 63 melanoma cell lines. Using siRNA knockdown and gene induction we confirmed a number of the differentially expressed genes as downstream effectors of ARF.

Mouse models for melanoma development have shown that activation of the Ras/MAPK pathway alone can increase susceptibility to UVR-induced melanoma. Furthermore, with the introduction of a Cdk4 mutation that is involved in susceptibility to melanoma in humans, the animals develop UVR-induced tumours very rapidly. The mutant Cdk4 both enhances initiation, and contributes to tumour progression, producing aggressive metastatic melanomas.

Using mRNA expression profiles from oesophageal adenocarcinomas, a number of genes have been identified which may be involved in patient survival, although immunohistochemistry revealed no association between the protein levels of either FN1 or AKAP12, and patient survival in a panel of 62 archival tumours. Comparative genome hybridisation arrays applied to a pilot sample of oesophageal tumours and cell lines has demonstrated evidence of homozygous deletion targeting the genes CDKN2A (9p21.3) and Fhit (3p14.2). We are currently working on combining similar DNA copy number methods and expression profiling to generate a whole-genome view of oesophageal adenocarcinoma in a large panel of biopsies taken from tumours and precancerous conditions. These data will be use to select novel cancer-related genes for confirmation and characterisation. In collaboration with Professor David Beer at the University Of Michigan Medical School, humoral response arrays have been used to assess the presence of circulating antibodies to tumour antigens in a combined sample of over 350 plasma samples, taken from control subjects and patients with oesophageal cancer or precancerous lesions.

Through continued collaboration with the lab of Dr Rick Sturm at IMB, the Neural Crest Cell Biology Group are now able to grow human melanoblasts (the precursors of melanocytes), the pigment producing cells in the skin. Work continues into determining the molecular pathways which control the differentiation process into a mature melanin producing terminally differentiated melanocyte and how these pathways might be reversed during tumorigenesis when unrestricted growth of melanocytes leads to melanoma.
Eph and ephrin membrane proteins in cancer
When Eph and ephrin proteins on adjacent cells bind together, they initiate bi-directional signals which affect the cytoskeleton and adhesion proteins generally resulting in de-adhesion and contact repulsion. These interactions have critical roles during embryonic development and in pathological states, notably in cancer.

Studies in this laboratory have paved the way for the development of antibodies and antagonists of Eph and ephrin proteins. Antibodies and antagonists of EphA3, a protein expressed on a high proportion of metastatic melanomas and other human tumours including leukaemias, have been tested as potential cancer therapeutics. In a leukaemic model an EphA3 antibody has been shown to be very effective in preventing spread of leukaemic cells.

EphA4 in spinal cord injury
A mouse knockout of the EphA4 gene was developed earlier in this laboratory and showed to have a defect in spinal cord development. It has now been shown that these mice, unlike normal animals, recover completely after spinal injury. Inhibitors of EphA4 have been used to show that these can promote healing in normal mice after spinal cord injury.

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.

Apoptosis inhibitors
The group headed by Dr 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.
Membrane Transport
Dr Nathan Subramaniam

This laboratory studies how the liver regulates iron metabolism. The identification of the molecules involved and defining the way they work has major implications for iron related disorders such as hereditary haemochromatosis and anaemia.

Many of the proteins implicated in iron metabolism are expressed at very high levels in the liver. Alterations in many of these proteins have been shown to lead to the iron overload disorder, hereditary haemochromatosis. The study of these molecules has been imperative in defining the various processes involved in maintaining the appropriate levels of this essential element.

In the past year, the first complete knockout animal model for type 3 hereditary haemochromatosis has been generated in this laboratory. The Transferrin Receptor 2 gene knockout mice develop iron overload in a similar fashion to humans with mutations in the transferrin receptor 2 gene. Analysis of these mice showed that they had an inappropriately low level of expression of the iron regulatory hormone hepcidin, indicating that transferrin receptor 2 is a regulator of this peptide. Using specific reagents for prohepcidin researchers showed, for the first time, that this peptide accumulates in the Golgi compartment of hepatocytes and that this could be another potential level of its regulation.

The laboratory is identifying the molecular basis of atypical iron overload or hereditary haemochromatosis in the Australian population, and has been at the forefront of studies in this field. In collaboration with Professor Darrell Crawford, from the Princess Alexandria Hospital in Brisbane, several mutations in the iron exporter ferroportin have been studied and identified to show that this leads to iron overload or ferroportin disease.

In a collaborative study from QIMR with Professor Powell, and Associate Professors Ramm and Anderson, it has been shown that unidentified asymptomatic individuals homozygous for the C282Y mutation of HFE were at a risk of iron overload-related hepatic fibrosis and cirrhosis, and if diagnosed early, fibrosis could be reversed by iron removal therapy.

**HIGHLIGHTS**
Generated and characterised the first complete Transferrin Receptor 2 knockout mouse, a model of type 3 hereditary haemochromatosis
Demonstrated that regulation of the iron regulatory peptide hepcidin is lost in the Transferrin Receptor 2 knockout mouse
Described prohepcidin expression in hepatocytes
Identified the first case of the A77D mutation of the ferroportin gene in the Australian population
Established that iron-related fibrosis in C282Y HFE subjects can be reversed by iron removal therapy if diagnosed early

Top Image: Perls’ staining showing iron deposits in livers of normal (left) and Transferrin Receptor 2 knockout mice (right)
Bottom Image: Prohepcidin expression in livers of mice with iron overload (left) and anaemia (right)
In some families, genes are inherited that predispose members to develop cancer. This laboratory works on identifying the genes which contribute to endometrial, breast, ovarian and colorectal cancer.

In collaboration with Dr Webb, many resources have been spent establishing a national endometrial cancer case-control-family study, involving set up of collaboration and recruitment at more than 25 sites across Australia. This NHMRC-funded project will create a data and biospecimen repository to allow investigation of the environmental and genetic causes of this disease, and the molecular features of tumours in relation to patient outcome. Work assessing the cancer-causing potential of subtle variants of the breast cancer predisposition genes BRCA1 and BRCA2 continues, and preliminary data indicate that use of tumour protein expression assays will aid the clinical classification of these variants. It has also been shown that RNA expression in long-lived cells from blood of patients with known mutations in these genes can distinguish mutation-carriers from individuals without such mutations. Data indicates that this methodology will be a useful tool to assess the clinical significance of variants in BRCA1 and BRCA2.

Work led by Dr Joanne Young continues to characterise the genetic predisposition to develop serrated neoplasia in the colorectum. A model has been developed describing three settings in which serrated neoplasia gives rise to cancer of the colorectum; hyperplastic polyposis as a recessive condition, serrated pathway syndrome as an autosomal dominant condition and sporadic MSI-H colorectal cancer as a mild gene-environment interaction. It has been shown that in hyperplastic polyposis, the extensive DNA methylation that occurs in serrated neoplasms also occurs in the normal bowel tissue, supporting evidence for a genetic field defect in the normal colon in this disorder. Further, studies of blood cells in patients with familial serrated neoplasia showed distinct gene expression profiles when compared to that of normal controls. We have also demonstrated that approximately 25% of women aged 50 or younger have a strong familial predisposition to develop not only endometrial but also colorectal cancer, a condition known as Lynch Syndrome.

Molecular Cancer Epidemiology
Dr Amanda Spurdle

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Molecular Pathology
Professor Sunil Lakhani – In collaboration with
The University of Queensland

The focus in this laboratory is the genetics and cell biology of breast cancer with the goal of improving the classification and diagnosis of this disease.

During the year this laboratory established the QIMR-RBWH tissue bank for the collection of normal breast tissue and breast cancer specimens from consenting patients.

The resource now contains samples from approximately 100 patients being used by researchers in this laboratory and collaborators within QIMR (Georgia Chenevix-Trench and Alejandro Lopez) and at the University of Queensland (Brent Reynolds). Studies include investigating familial breast cancer, and the use of mammospheres for dendritic cell immunotherapy and in the isolation of breast tumour stem cells.

In collaboration with Dr Glenn Francis, tissue microarrays (TMA) of over 600 sporadic tumours have been created and the matched in situ components from patients with comprehensive clinical follow up. The TMAs have been stained with a large panel of antibodies for molecules used in diagnostic practice, as validation of the cohort, and for molecules of interest to the laboratory. Data analysis and further immunohistochemistry is ongoing.

A large cohort of metastatic brain tumours have also been collected and their matched primary breast tumours through local and international collaborations in Brazil and the Czech Republic. A TMA has been created for this study and analysis is underway investigating the mechanisms of metastasis to the brain.

Techniques have been established in the laboratory for molecular genetic analysis – comparative genomic hybridisation, loss of heterozygosity, E-cadherin gene sequencing and gene methylation. These are being used to study the mechanism of development of lobular carcinomas and for cell biology and immunofluorescence which is being applied in the study of normal breast cells from sporadic and BRCA1 mutation patients.
Molecular Psychiatry
Dr Corinne Lendon

This Group investigates factors that modify susceptibility to dementia, especially Alzheimer’s disease and related neurological and psychiatric disorders, including psychosis and depression.

Staff and equipment for this laboratory arrived from the University of Birmingham, UK in March 2006. Since then the lab has become operational and ethics approvals secured.

One arm of the work involves a study of the carers of dementia patients. Some carers cope well with their role but others become overburdened and develop depressive symptoms themselves. So far, it has been revealed that carer burden is heightened by carers feelings of role captivity, a diminished confidence in their role and poor patient relationship quality.

The molecular investigations of the lab are aimed at discovering factors that predispose to or protect individuals from dementia and Alzheimer’s disease. Much of the current drug discovery programs in Alzheimer’s disease are aimed at mechanisms inspired by the rare familial forms caused by single-gene mutations. This laboratory focuses on the most common forms that are inherited in a non-Mendelian complex/sporadic manner.

A two pronged approach is used of hunting for novel genes and mechanisms that incur risk for the dementias using association strategies and in vitro modelling of their effects and interactions. This laboratory’s case-control cohorts, together with their European collaborators, extend cases to over 4000.

The novel and candidate genes arising from this work are further investigated using genotype-phenotype studies that incorporate variables including neuropathological measures, response to treatment and patient and carer well-being, memory and neuropsychological measures.

The behavioural and psychological symptoms of AD occur in some but not all patients. When they do occur, they cause both patient and carers considerable distress. Genes are studied that have been implicated in psychosis and depression, including neuregulin 1 and those of the serotonergic and catecholaminergic system, to determine whether they influence the presence and severity of symptoms.

The laboratory’s in vitro models incorporate expression systems as well as human brain cells, and patient lymphoblasts are used to investigate the molecular mechanisms of interaction between gene-environment factors known to be involved in predisposition to dementia, and those discovered by the laboratory and its collaborators.

It is envisaged that the combination of such studies could stimulate the development of novel treatment strategies aimed at the majority of clinical dementia cases, as well as an adaptation of those existing therapies and possible recommendations for acceptable levels of some agents in the environment.

Pathology of Alzheimer’s Disease
A: Diffuse amyloid deposits in brain parenchyma
B: Neurofibrillary tangles, tau deposits inside neurones
C: Dense cored amyloid plaque with surrounding reactive neurites and D: Amyloid deposits in cerebrovascularature
The research focus in the QCF Transgenics Laboratory is on cell and developmental biology with particular emphasis on using transgenic and knockout mice as model systems.

Epigenetic modulation of gene expression results from structural modifications to the genome that do not involve changes in the DNA sequence. Such epigenetic changes ensure that the information encoded within the genome is used correctly during development and in the maintenance of adult tissues. Gene expression is also epigenetically modulated in diseases, like cancer, where the expression of genes which favour disease progression, or our body’s response to disease, are modulated.

To effectively treat disease it is essential that we gain a full understanding of this level of gene expression control. This laboratory studies the Xist, Tsix and SmcHD1 genes that are involved in epigenetically modifying chromatin to silence one of the two X chromosomes in female cells thereby achieving dosage equivalence for expressed X-linked genes between males and females.

The Xist and Tsix genes are involved in initiating X inactivation while SmcHD1 protein product appears to be involved in maintaining the inactive state throughout development.

In another area of study, research in this laboratory has previously established a role for Vegf-B in the pathogenesis of arthritis using gene knockout mice. A prophylactic effect of anti-Vegf-B antibody administration on arthritic disease in mice has now been confirmed. This data further endorses the therapeutic potential of blocking Vegf-B signaling as a treatment for arthritis.

The pocket protein family (Rb1, p130 and p107) in conjunction with p53 act to regulate cell cycle progression and prevent tumour formation. Various combinations of these proteins are being deleted in mouse melanocytes to determine which combination is acting to prevent melanoma. Loss of Rb1, alone, does not cause melanoma but when the melanocytes are cultured they display some properties of cancer cells.
DNA damage response and its role in maintaining the integrity of DNA to minimize the risk of cancer and neurodegeneration is the major focus of research activity in this laboratory.

The gene defective in the human genetic disorder ataxia-telangiectasia (A-T), ATM, plays a key role in recognizing double strand breaks in DNA and signaling these breaks to the cell cycle checkpoints and the DNA repair machinery. Failure to recognize 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.

Recent data demonstrate that autophosphorylation and activation of ATM involves several separate phosphorylation sites on the molecule. These sites have been mapped and their functional significance in cell cycle control and protecting against radiation damage established. 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. Previous data from this laboratory showed that a novel isoindoline nitroxide (CTMIO) was capable of preventing some of the neurological features in ATM mutant mice. These studies have been extended to demonstrate that CTMIO increases dramatically the latency period for the appearance of thymomas in ATM mutant mice. This antioxidant also corrected neurobehavioural defects in these mice.

Since A-T is one of several related syndromes characterized by ataxia, investigations are underway on whether other related human ataxias might also be characterized by a reduced capacity to deal with different forms of damage in DNA. A role for the protein Aprataxin, defective in ataxia with oculomotor apraxia type 1 (AOA1), has been shown in the recognition and repair of single strand breaks in DNA. Research is currently under way on the gene product Senataxin, defective in a related syndrome AOA2, and preliminary data reveal that this protein too is involved in the DNA damage response. Other novel forms of AOA are being investigated with a view to determining whether the proteins involved participate in the DNA damage response and protection of the nervous system.
Colorectal cancer (CRC) is a heterogeneous disorder in which clinically relevant subgroups may be identified based on shared molecular alterations. Frequent target gene inactivation via promoter hypermethylation defines a subgroup of CRCs displaying the CpG Island Methylator Phenotype (CIMP). Approximately half of all CIMP+ tumours show a high level of microsatellite instability (MSI-H) due to methylation of the mismatch repair gene MLH1. Over the past year significant advances have been made towards identifying genes which may be relevant to the progression of CRC, in particular, those which define the CIMP+ and MSI subtypes. Research has demonstrated that BMP3 is dramatically down-regulated in most CRCs, commonly due to aberrant promoter hypermethylation in both polyps and cancers. KLF4 is a transcription factor down-regulated in 86% of CRCs. Despite a typical CpG island, it is not commonly methylated and is therefore currently being investigated for gene deletion and/or mutation. It has also been shown that THBS4 expression is down-regulated in the majority of CRCs through aberrant promoter hypermethylation, and the protein has been localised to epithelial cells. The functional consequences of re-expressing this protein in CRC cell lines are currently being investigated. Increased transcript expression of IL24 is common in sporadic (81%) and familial (70%) MSI-H tumours compared with 44% of remaining cancers (P<0.02). Intriguingly, protein expression does not always mimic the transcript pattern, which may be a consequence of disrupted secretion (see figure). ID4 methylation has been correlated with decreased expression to show that this occurs most frequently in CIMP+ tumours. Research also shows that SnoN expression is specifically down-regulated in MSI-H tumours, and the laboratory now proposes that these tumours represent a novel model system in which to study the complex functions of this important suppressor of TGFβ signalling. Mutation of the BRAF oncogene is highly correlated with CIMP+ cancers. A conditional intestine-specific BRAF V600E mouse model is being generated to further probe the function of this gene in colorectal tumorigenesis.
This laboratory seeks to understand signal transduction pathways involved in the detection, signalling, or repair of DNA damage, an area of critical importance to cancer research.

A novel ssDNA binding protein (hSSB1), which is more closely related to both the bacterial and archaeal SSB proteins has been characterised. Single stranded DNA (ssDNA) binding proteins are ubiquitous to life. They bind to ssDNA regions protecting them from further damage and are involved in the recruitment of other repair proteins to sites of DNA damage. The laboratory has found that hSSB1 is stabilised after treatment of cells with various DNA damaging agents and ionising (IR) and UV irradiation-induced stabilisation is dependent on the presence of functional ATM and ATR kinases, respectively. In response to IR, hSSB1 rapidly localises to nuclear foci that also contain other repair proteins. Downregulation of hSSB1 expression by small interfering RNA yields a radiosensitive phenotype and prevents IR-induced repair focus formation and ssDNA formation at the site of DNA damage. Depletion of hSSB1 in normal cells results in cell cycle arrest due to chronic activation of the DNA damage response pathway.

Taken together, our results indicate that hSSB1 is dispensable for induction of cell cycle checkpoints but is required for repair of double strand breaks by homologous recombination.

In collaboration with Dr Grant McArthur from the Peter MacCallum Institute, evidence has been provided for a novel role of cyclin dependent kinases in the activation of DNA damage response pathway, which can be used to selectively enhance responses of cancer cells to DNA-damaging agents like cytotoxic chemotherapy and radiotherapy application.

Evidence for redox-dependent regulation of SBP2, a key regulator of selenoproteins synthesis in cells, has also been provided. Incorporation of selenocysteine (Sec) into selenoproteins employs a unique mechanism to decode the UGA stop codon. The process requires the Sec insertion sequence (SECIS) element, the tRNASec and protein factors including the SECIS binding protein 2 (SBP2).

The laboratory has found that SBP2 shuttles between the nucleus and the cytoplasm. Oxidative stress induces nuclear accumulation of SBP2 via oxidation of cysteine residues within a redox-sensitive cysteine rich domain (CRD). These modifications are efficiently reversed in vitro by human thioredoxin and glutaredoxin, suggesting that these antioxidant systems might regulate redox status of SBP2 in vivo. Depletion of SBP2 in cell lines using siRNA results in a decrease in Sec incorporation, providing direct evidence for its requirement for selenoprotein synthesis. Furthermore, Sec incorporation is reduced substantially after treatment of cells with agents that cause oxidative stress suggesting that nuclear sequestration of SBP2 under such condition may represent a mechanism to regulate the expression of selenoproteins.
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, endometrial, 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. This year the Division welcomed a significant new group with the arrival of Emma Whitelaw and her epigenetics team. The role of epigenetic changes in the biology of complex disease has received increasing interest in recent years.

Many of the Division's projects make extensive use of large population studies to investigate patterns of disease and we are indebted to the public for their continued goodwill in helping to make so much of this research possible. A particular landmark this year has been the Nambour skin cancer study reaching its twentieth, and final year of followup. The collection of epidemiological and clinical data from studies such as these 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 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.
Cancer and Population Studies
Professor Adèle Green

The Cancer and Population Studies Group investigates the causes of cancer and other chronic diseases and avenues for their prevention.

Three of the main projects being conducted by the Cancer and Population Studies Group are nationwide studies of cancers of the ovary, oesophagus and more recently, endometrium.

On the one hand, the group aims to identify their causes, and on the other, the prognostic life-courses followed by patients after diagnosis of such cancers. The work combines epidemiological methodology and clinical follow-up data with collaborative genetic analyses of blood and tumour tissue. This involves working with clinical and research collaborators, not only locally but across Australia, to recruit several thousands of people with these cancers and related conditions.

To assess causality, researchers ascertain cancer-free people of the same sex and similar ages with whom to compare the affected individuals in regard to their environmental and personal exposures (ranging, for example, from dietary intake to medication history to reproductive history and related factors in women); and in regard to the expression of various relevant genes.

Follow-up of the occurrence of skin cancers in a cohort of some 1,000 residents of the Queensland township of Nambour, originally ascertained in 1986, who were participants in the Nambour Skin Cancer Prevention Trial (1992-1996), is now in its twentieth and final year.


HIGHLIGHTS
Nambour (skin cancer) cohort study reaches its 20th and final year of follow-up

Obtained evidence that melanomas on the face are associated with chronic high-level sun exposure, whereas those on the trunk are associated with lower levels of sunlight

Developed a novel risk prediction algorithm for cutaneous melanoma

Completed participant recruitment and both data and sample collection for national studies of ovarian and oesophageal cancer.

Commenced recruitment for the national study of endometrial cancer in collaboration with the Molecular Epidemiology Laboratory.
The group is collecting ongoing information relevant to sun exposure, general lifestyle, other sun-related disease, and occurrence of other cancers and serious diseases as well. A major focus is to clarify the role of diet alongside sun exposure in causation of skin cancer through this cohort. Researchers are also collaborating with a European consortium to study the 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. Topics include asthma, bronchiectasis, diabetes in youth, and health service care of adult Aboriginal and Torres Strait Islander cancer patients after diagnosis in Queensland.

This group is also the base for the newly-established QIMR-RBWH Statistics Unit and will assist them in facilitating biostatistical collaborative research and support within the Institute.

Indigenous Health Research Program
Ms Janelle Stirling

This Program covers work across QIMR Divisions with a research agenda which includes projects on cancer, childhood respiratory diseases, scabies, Group A Streptococcus and type 2 diabetes.

The Indigenous Health Research Program covers a range of research projects which include:

**Asthma Education Intervention Study in the Torres Strait:**
This is a collaborative project with Associate Professor Anne Chang and Dr Brent Masters of the Royal Children’s Hospital, Brisbane and the Queensland Asthma Foundation. Four specialist clinics have now been conducted with a total of 305 children and young people seen by the team with no adverse events. At this stage there are 70 children enrolled in the study. Future clinics are planned for July and October 2006.

During the March 2006 clinic, the 12 month Doctor Reviews for the 1st cohort were completed with 11 children seen. A Participant’s Manual and three day workshop course has been developed and, to date, has been delivered on three occasions on Thursday Island. In addition to the workshops, children’s educational booklets have been developed and are currently being used by health care workers to reinforce information to the children. In order to fully evaluate the educational materials, an education intervention study which commenced in 2005 is currently underway and data collection for this evaluation will be completed in October 2007.

During the project, three health worker trainer courses have been conducted on 11th-13th April 2005, 18th-20th July 2005 and 13th-15th March 2006. During the April, July and March workshops a total of 29 health staff (one nurse and 28 health workers) have completed the training course. The first training workshop was delivered to 10 Torres Strait Islander health workers and one nurse and the second workshop was delivered to ten health workers from the outer island communities.

**The Wuchopperen Skin Study**
Data collection has been completed and analysis of the results is currently underway. This collaborative study with the
Wuchopperen Health Service in Cairns, aims to assist the health service find out more about the types of skin sores presenting at the clinic and researchers at QIMR will use the Group A Streptococcus (GAS) strains found to further their research towards developing a vaccine for GAS.

**The Multi Centre Bronchiectasis Study**

Part of the observational component of this study (a collaborative and international study of bronchiectasis in Indigenous children) has commenced in some sites. The intervention component is currently being organised. Because of the international and multi-site nature of this project, there is an enormous amount of regulatory requirements that have to be met before this component can start.

Top: Vanessa Clements – Master of Applied Epidemiology Student. Centre: Dr Sue Vlack and Alzira Conlon presenting at the Brisbane Aboriginal Health CRC Showcase in June 2006, Bottom: Bayley Wilson, a student from the Spotlighting Careers in Indigenous Health Program in May 2006

**HIGHLIGHTS**

- Awarded two NHMRC grants and a Royal Children’s Hospital Foundation grant
- Published a paper in the Lancet (Valery PC, Coory M, Stirling J, Green A). Cancer diagnosis, treatment and survival in Indigenous compared with non-Indigenous Australians treated in public hospitals)
- Vanessa Clements joined the program as a QIMR based ANU Master of Applied Epidemiology student
- Held the third Spotlighting Careers in Indigenous Health and Science Program
- Hosted the Cooperative Research Centre for Aboriginal Health Brisbane Showcase
- Sue Moore awarded an NHMRC scholarship to further investigate findings from the Program’s recently published cancer study (to commence July 2006)
Epigenetics
Professor Emma Whitelaw

The Epigenetics Laboratory became established at QIMR in February 2006 with the main aim of understanding the role of epigenetics in the determination of phenotype in mammals.

This laboratory investigates the role of epigenetics in the establishment of phenotype in mammals, both mice and humans. The ultimate aim of the research is to test the hypothesis that epimutation plays a role in complex disease and sporadic disease.

All the members of the old Whitelaw laboratory at the University of Sydney moved to Brisbane and into the Clive Berghofer Cancer Research Centre in February this year, accompanied by a large truckload of equipment and many mice.

The mice are now settled into their new facility and breeding well. Grateful thanks are expressed to the senior postdoc in the lab, Suyinn Chong, whose embryonic skills enabled the group to rederive the majority of their mouse strains so that their health status would comply with QIMR Animal House standards.

Staff in the QIMR Animal House also helped to make this difficult transition happen with relatively little pain.

The laboratory is now functioning well with many of the personnel collaborating with other scientists in the Institute and learning new skills. For example, protein gels are being run for the first time! Microarray hybridizations have also been initiated to study genome-wide changes both in DNA copy number and in methylation state.

In collaboration with Professor Nick Martin from the Genetic Epidemiology Laboratory, investigations have begun into the epigenetic state of the genome in identical twins and in individuals with idiopathic disease.

Monozygotic twins may share identical genetic information, but whether they differ in epigenetic state is currently being investigated.
Genetic Epidemiology

Professor Nick Martin

The Genetic Epidemiology Group investigates the pattern of disease in families, particularly identical and nonidentical twins, to assess the relative importance of genes and environment in a variety of important health problems and to 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, 23,000 subjects in all, have been surveyed, and telephone interviews with over 11,000 twins and 4,000 of their spouses have been conducted.

Genetic factors account for about two thirds of the susceptibility to alcoholism in both women and men in Australia. Blood samples have been obtained from these twins with a view to identifying particular genes predisposing to drinking problems. A major interest is the alcohol metabolising enzymes; the alcohol dehydrogenase gene complex on chromosome 4 has a significant effect on risk of alcoholism and detailed fine mapping of this region is being undertaken to identify causal variants.

Major projects are also underway to find major genes influencing several important women’s health problems including endometriosis, the latter being a major risk factor for infertility. The laboratory is also interested in the genetics of super-fertility, as manifested in...
familial dizygotic twinning and have genotyped over 400 pairs of sisters who each have DZ twins in order to find the genes responsible and are currently expanding this sample to 500 affected sister pairs.

A further 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. By obtaining detailed information on sun exposure, natural coloration and moliness in index cases and their relatives, a much better perspective of the role of genetic factors in melanoma is being gained. Much of the year has been spent investigating the role of the OCA2 gene as a melanoma risk factor.

It is clear that moles (melanocytic naevi) are a major risk factor for melanoma. It is therefore important that more is known about the factors responsible for development and change of moles. In an NHMRC/QCF-funded study, moles in over 1000 pairs of Brisbane 12 year old twins are being counted and mapped, and then followed up at their fourteenth birthday. The research has shown that individual differences in moliness in this sample are largely genetic and a genome scan that indicates a number of chromosomal regions of major effect has recently been completed.

Different screens from the ViewPoint program created by Harry Beeby and Sarah Medland to assist researchers to visualise the outputs of genetic analyses. From top:

- ViewPoint Combined Chromosomes Univariate plot showing two variables in separate plot panels for each.
- ViewPoint Multivariate plot for Chromosome 1 showing active points, and two pinned panels displaying sub-factors contributing to the point score.
- ViewPoint Multivariate all-chromosome summary display.
- ViewPoint Univariate plot for Chromosome 5, showing active points on X axis and two pinned marker flags.
Hepatic Fibrosis
Associate Professor Grant Ramm

This laboratory investigates the role of liver cells called hepatic stellate cells, in the fibrosis and cirrhosis (liver scar tissue formation), which accompanies serious liver diseases of children.

In a project which investigates the mechanisms of cellular and tissue injury in the liver in the iron overload disease haemochromatosis, this group has shown that a population of liver cells called hepatic stellate cells, are activated in haemochromatosis and are responsible for excess collagen deposition causing scarring of the liver, or fibrosis. In recent research, the laboratory has identified a number of signalling molecules within these stellate cells, which are themselves activated in the presence of an iron-binding/transport protein called ferritin. The group has also demonstrated that signalling events elicited through ferritin binding to its cell surface receptor on hepatic stellate cells appear to be responsible for activating genes involved in inflammation and fibrosis. New gene “knockout” technologies are now being utilised in the laboratory to silence the genes involved in ferritin-induced signalling within hepatic stellate cells in an attempt to halt these cells from transforming into a fibrogenic phenotype and thus inhibiting the development of liver scarring.

The laboratory is also actively involved in researching potential mechanisms responsible for paediatric cholestatic liver diseases, such as cystic fibrosis and extrahepatic biliary atresia. The work is currently funded by a National Institutes of Health (NIH) grant, under a clinical research consortium with Professor Ross Shepherd, Director of Paediatrics at Washington University, St Louis. This year, the collaboration has shown that the degree of liver fibrosis at the time of diagnostic liver biopsy in infants with biliary atresia predicts the likelihood of progression to liver transplantation and that hepatic stellate cell activation is pivotal in this prediction. These studies are being extended to identify disease-specific markers in the liver and blood to make a much earlier diagnosis in infants with biliary atresia so that they may progress to surgical correction rather than be subject to liver transplantation in future years.

HIGHLIGHTS
Demonstrated that in haemochromatosis, significant liver fibrosis is frequent in asymptomatic subjects and, except when cirrhosis is present, this liver fibrosis is reversed by iron removal from the liver.

Demonstrated a role for neutrophils in the liver and liver matrix degrading enzymes expressed by these neutrophils in repairing the liver following liver injury caused by bile duct obstruction.

Paracrine interaction between liver cells in iron overload-induced activation of hepatic stellate cells (HSC). Iron overload initially in hepatocytes and subsequently in Kupffer cells leads to the production of a variety of molecules capable of activating hepatic stellate cells to produce fibrosis. (Ramm GA and Ruddell RG, Semin. Liver Dis., 2005;25(4):433-449).

Hepatic Fibrosis Laboratory Staff
From Left: Back row: Richard Ruddell, Jeffrey Smith, Grant Ramm (Head), Louise Ramm. Front row: Pengcheng Li, Tamara Pereira, Lynn Reid, Chunxia Xu, Marie Bertrand-Philippe.
Iron Metabolism
Associate Professor Greg Anderson

The Iron Metabolism Laboratory focuses on understanding how the essential trace 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 efforts in the laboratory have 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, the acute phase response (which is associated with infection) and pregnancy.

The relationship between various liver diseases (notably alcoholic liver disease and fatty liver disease) and iron homeostasis has also been investigated. Research 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 collaborative study has led to the identification of a putative haem transporter in the small intestine. Haem is a major source of dietary iron but how it is absorbed is very poorly understood at present.

The laboratory continues to generate evidence that the level of diferric transferrin in the plasma, the major blood iron transport protein, is an important determinant of hepcidin expression and thus of body iron homeostasis.

In addition, this group maintains a strong interest in the pathogenesis, penetrance and genetics of the iron loading disorder haemochromatosis.

Pathways by which the expression of the iron regulatory hormone hepcidin is regulated

HIGHLIGHTS
Identified HCP1, a candidate intestinal haem iron transporter
Demonstrated that the diferric transferrin in the plasma is a major factor regulating hepcidin expression
Showed that subclinical liver disease is common in patients with haemochromatosis and that it can be successfully ameliorated by phlebotomy therapy
Determined that hepatic steatosis (fatty liver) is an important co-factor in patients with haemochromatosis

Iron Metabolism Laboratory Staff
From left: Back row: David Raffelt, Deepak Darshan, Cameron McDonald, Melanie Beaton, Lawrie Powell. Middle row: Emily Hay, Paula Hawthorne, Jeanette Dixon, Greg Anderson (Laboratory Head). Front row: Priya Shah, Sarah Wilkins

Pathways by which the expression of the iron regulatory hormone hepcidin is regulated

Iron Metabolism Laboratory Staff
From left: Back row: David Raffelt, Deepak Darshan, Cameron McDonald, Melanie Beaton, Lawrie Powell. Middle row: Emily Hay, Paula Hawthorne, Jeanette Dixon, Greg Anderson (Laboratory Head). Front row: Priya Shah, Sarah Wilkins
Melanoma Genomics
Professor Peter Parsons

This laboratory combines expertise in cancer biology with genomics and drug discovery. Cell communication networks in sun-induced cancers, cancers of the head and neck and ovarian cancer reveal responses that address important issues of prevention and treatment.

The overall theme is to identify and study the function of genes that are important in the development and treatment of certain cancers, with the longer term aim of discovering agents that can be aimed at specific targets. Several such genes have been identified in ovarian cancer, squamous cell carcinoma of the head and neck, and breast cancer, to being followed up at the functional level.

The above approaches applied within a collaborative NHMRC program have led to siRNA reagents being developed and applied to several gene candidates for the progression of ovarian cancer and head and neck cancer. This followed on from extensive genomic and immunohistochemical analysis of tumors, followed by data analysis in order to establish correlations between molecular markers and clinical responses. One of the lead genes found in ovarian cancer has been successfully overexpressed and is now being functionally evaluated in a mouse model.

Such information might well establish gene expression pathways of fundamental significance in tumor development. Similarly, the role of a novel cytokine this laboratory found to be highly expressed in melanoma progression has been further elucidated and shown to be necessary for tumorigenicity in a mouse model.

Drug discovery has involved screening large numbers of novel compounds on selected tumor cell lines chosen for their particular signalling pathway characteristics. These compounds were sourced from a variety of natural products. This group conducted the primary screening, purification and subsequent development for several Australian companies.

Right: Expression profiling reveals novel progression markers of ovarian cancer subtypes. A hierarchical clustering dendrogram grouping of over 3,000 genes selected using a non-parametric ANOVA test (p<0.05) and multiple testing correction. Blue, normal ovarian tissue; Yellow, benign ovarian tumors; Green, ovarian tumors of low malignant potential; Red, malignant ovarian tumors.

HIGHLIGHTS
Discovered that expression of the melanoma-associated MIC-1 cytokine is regulated by the PI3 kinase and MAP kinase signalling pathways

Identified a candidate gene in the Wnt pathway for the progression of ovarian cancer, from gene expression profiling of tumors and normal tissue

Found that loss of expression of the HRev107 gene is associated with high sensitivity to protein kinase C activators and consequent senescence in human breast, melanoma and colon cancer cells
Molecular Epidemiology
Dr Grant Montgomery

The Molecular Epidemiology Group investigates patterns of disease in families using high throughput genomics platforms to identify genes and pathways contributing to disease risk.

The overall theme of the laboratory is to identify variation in genes and gene pathways contributing to risk for common human diseases. The laboratory has a focus on women’s health with projects on the genetics of endometriosis and dizygotic twinning. Work is also undertaken on a range of other diseases including migraine, melanoma, asthma, alcohol and drug dependence.

One aim is to identify genes that influence risk for endometriosis in collaboration with Dr Sue Treloar and Prof Nick Martin, who have assembled the largest collection of affected sister pair families and triad families (a case and two parents), including 3,900 women with clinically diagnosed endometriosis. The first genome wide scan and identified significant linkage to chromosomal 10 was published during the year. The Illumina Bead Station is being used to genotype markers under the linkage peak to find the gene or genes predisposing to endometriosis.

Another project is trying to understand why twins run in some families. The tendency to conceive spontaneous dizygotic twins is complex and influenced by genetic and environmental factors. Finding the gene(s) responsible for twinning is likely to provide insights into mechanisms of female fertility and may have practical implications for controlling fertility and infertility. Five hundred pairs of sisters from Australia and five hundred pairs of sisters from the Netherlands are being recruited for gene discovery in these families.

The laboratory supports a range of studies in the Genetic Epidemiology Laboratory by maintaining the large biobank of samples held by the Genetic Epidemiology and Molecular Epidemiology Laboratories for twin and family studies. This laboratory processes blood samples, extracts DNA and prepares samples for large scale genotyping projects. It is located with the QIMR SNP genotyping facility. This facility has Sequenom MassARRAY and Illumina Bead Station genomics platforms for high throughput genotyping and gene expression analyses. Genotyping services (zygosity testing, microsatellite and SNP genotyping) are provided for a range of projects.

HIGHLIGHTS
Published the first genome wide linkage scan with evidence for significant linkage to endometriosis on chromosome 10 and suggestive linkage on chromosome 20
Identified additional loss of function mutations in GDF9 in mothers of twins and demonstrated that rare mutations in the ovarian pathway controlling follicle growth contribute to twinning frequency
Developed improved analysis methods for data from DNA pools generated from genome wide single nucleotide marker genotyping chips. Typing DNA pools can significantly decrease the cost of genome wide association studies
The Therapeutic Development and Clinical Research Division is committed to the development and testing of immunotherapeutics manufactured within QGen. Laboratories included in the Division are the EBV Biology, Cancer Immunotherapy, Tumour Immunology and Cancer Therapy laboratories.

Five cell-based clinical trials have been sponsored by QIMR. These trials are aimed at testing cell-based therapeutics associated with prostate cancer, melanoma, glioma and cytomegalovirus. The success of these trials is dependent on the production of clinical material within the QGen to a standard approved by the Therapeutic Goods Administration (TGA) (referred to as GMP standard).

During the past year, Atlantic Philanthropies have announced that they will continue funding cell-based projects within the Division. This is extremely important in that it will provide support for the shortfall currently available from other funding agencies.
The goal of the Translational Research Laboratory is to foster research collaborations between scientists and clinicians for the benefit of patients and society.

Breast cancer is a major public health problem in Australia. This year, well over 11,000 women in Australia will be diagnosed with breast cancer and there will be more than 2,500 deaths. The focus of the Translational Research Laboratory is to develop research programs around an understanding of the biology of breast cancer, the consequences of survivorship, and the engagement of women with breast cancer in research.

Significant improvements of survival after a diagnosis of breast cancer have been the result of early detection and more intensive treatments. Cognitive impairment has been reported by women after treatment for breast cancer and the Cognition in Breast Cancer Study is setting out to evaluate the nature and extent of cognitive change after chemotherapy for breast cancer, as well as the impact of cognitive change on daily living. To date, more than 150 women have agreed to participate in this project and early results indicate that a measurable change in memory can be identified after treatment. However, further recruitment and longer follow-up are necessary to identify the full range of cognitive changes as a result of treatment, and to assess patterns of recovery. The final results of this study will provide important information about the long term functional and social outcomes for women with breast cancer.

An understanding of the biology of breast cancer is an increasingly important imperative in research in order to better understand both prognosis and predictors of response to the ever increasing array of therapeutic options for women with early breast cancer. The Translational Research Laboratory continues to accumulate a large number of breast cancer pathology specimens in order to provide a database for future development and application of biomarker assays to predict outcome and response to treatments.

As our understanding of both the nature of breast cancer and the explosion of emerging therapeutic agents increases, more opportunities will become available for women to participate in clinical trials and research projects such as the Cognition in Breast Cancer Study. Consequently there is an increasing need to address ethical issues for women in participation of such studies.

The Translational Research Laboratory is currently undertaking two research projects to evaluate the understanding of women with a diagnosis of breast cancer of the ethics of participation in clinical trials and molecular research. In addition, an important project is currently underway to evaluate the perception of cancer nurses about patient participation in cancer clinical trials.
<table>
<thead>
<tr>
<th>Clinical Trial</th>
<th>Investigators</th>
<th>Funding</th>
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</thead>
<tbody>
<tr>
<td><strong>Prostate cancer: An internal solid-malignancy model for vaccine therapy</strong></td>
<td>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 (University of Queensland, Royal Brisbane Hospital), Prof Greg Seymour (University of Queensland), Prof Derek Hart (Mater Medical Research Institute), Dr David Yaxley, Dr David Nicol (Urological Society of Australasia)</td>
<td>Royal Brisbane and Women’s Hospital Research Foundation $46,500</td>
</tr>
<tr>
<td><strong>Phase III trial of an immunotherapy for Stage III (AJCC) melanoma based on cultured autologous dendritic cells presenting autologous tumor cell antigens</strong></td>
<td>Prof Kay Ellem, Dr Christopher Schmidt (QIMR), Prof Michael O’Rourke (Mater Adult Hospital), Dr Barry O’Loughlin (Royal Brisbane and Women’s Hospital), A/Prof Mark Smithers (Princess Alexandra Hospital), Dr Ian Hermans (Malaghan Institute, New Zealand)</td>
<td>Atlantic Philanthropies $350,000</td>
</tr>
<tr>
<td><strong>Dendritic cell vaccination trial for hormone refractory prostate cancer with autologous tumour as the antigen</strong></td>
<td>Prof Kay Ellem, Dr Christopher Schmidt, Prof Martin Lavin, Dr Michelle Burger, Ms Linda O’Connor (QIMR), Prof Frank Gardiner (University of Queensland, Royal Brisbane and Women’s Hospital)</td>
<td>Royal Brisbane and Women’s Hospital Research Foundation $46,500</td>
</tr>
<tr>
<td><strong>Adoptive immunotherapy for the prevention of human cytomegalovirus (HVMV) reactivation and disease after allogeneic stem cell transplantation</strong></td>
<td>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)</td>
<td>Leukaemia Foundation $200,000</td>
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Australian Centre for International Tropical Health

The Australian Centre for International Tropical Health and Nutrition (ACITHN) changed its name to the Australian Centre for International Tropical Health (ACITH) in January 2006. This year saw the fourth renewal of the Public Health Education and Research Program of the Australian Government Department of Health and Ageing, and of ACITH. This core funding until 31 December 2010 will take our tropical health education, training and research activities to its twentieth year. In July 2005, Professor Brian Kay stepped down as Director, ACITH by a rotational arrangement with University colleagues and Professor Richard Taylor is wished every success in maintaining ACITH as one of Australia’s two national flagship centres for regional public health. Professor Kay has agreed to be Deputy Director, ACITH and to effectively represent QIMR.

ACITH expects to further develop national leadership in international and tropical health, addressing emerging national priorities in indigenous public health and workforce development. It will respond to emerging and existing infectious disease threats that have bearing on national and regional biosecurity and disaster response, while recognising that lifestyle (chronic) diseases have assumed great importance to the overall burden of disease. The Centre is expected to take a lead role in improving the quality of research and its academic impact on population health. Because the new contract is more output driven, with payment conditional on achievement of designated milestones, it will be important for all QIMR ACITH members to assess how they can best contribute to these goals.

Whereas research and research training are important at the individual level, the growing of collaborative relationships with other bodies involved in public health is also seen as important. In 2005, ACITHN and the Australian Biosecurity CRC signed an agreement to foster collaboration and greater effectiveness, and in 2006, Dr Kathy Andrews was nominated to enhance joint activities between QIMR (and ACITH) with Griffith University and the new Griffith Medical Research College. Collaborative linkages to the Pacific Asia Travel Association were enhanced by Professors Kay and Jeff Wilks (UQ Centre for Tourism and Risk Management) who agreed to be keynote discussants at their Macau conference during April 2005. During the summer months, Drs Peter Ryan and Michelle Gatton launched a trial to evaluate the usefulness of their Ross River virus Early Detection and Surveillance System (RREDS), facilitated through the collaboration of local governments in Queensland, Queensland Health and the QIMR IT department to develop the web base for access.

ACITH has a proud record at QIMR, facilitated in part through these collegial collaborations. The Centre thanks its partners for their effort and looks forward to the future.

The Ross River virus Early Detection and Surveillance (RREDS) System was developed in an effort to assist Local Governments and facilitate responsive mosquito control and disease prevention interventions. A web-based, geographic information system, it provides timely data on Ross River virus disease incidence throughout Queensland.

The system was trialed by 15 Queensland Local Governments during the year, and allowed users to actively track disease patterns during the most recent transmission season, providing seasonal data on unusually high disease occurrence in South East Queensland during February and March 2006. The success of the system during the initial trial period provided a robust platform for the statewide release of the system.
CRC for Vaccine Technology

This year saw the closure of the CRC for Vaccine Technology which has been located at QIMR, as host partner, since its inception in 1993.

From the beginning, the CRC has had excellent leadership with Sir Bruce Watson AC as the initial Chairman and Professor Michael Good as Director, assisted by a committed Board of Management. Researchers from partner institutions addressed the challenges implicit in the Mission and Objectives of the Centre – to develop and improve vaccines for medical and veterinary purposes.

In 1999, funding was achieved for a second term with new partners, staff and Board. Professor Anne Kelso was appointed Director and led the Centre admirably through the last six years of its existence, with a number of Committees to assist with the Centre’s executive, commercial and education aspects.

A lasting legacy of the CRC-VT is the students who have been able to progress their careers under quality supervision of some of the nation’s best medical researchers. Presentations made by the students have been one of the highlights of the Centre’s Annual Conferences, functions through which they were able to interact with contacts that will be of inestimable value in their futures.

The year just finished has been very intense, with considerable involvement in legal agreements associated with the closure. Much effort was needed to ensure that the Intellectual Property which has been developed will find a “champion” to continue the good work into the future. In this context, QIMR is gratefully acknowledged for the role it has undertaken to be the Trustee for the other Parties in many areas. A number of inventions and discoveries have led to commercial arrangements. Major international companies and research funding organisations have recognised the value of the research conducted through the CRC-VT. The spin-off company, VacTX Pty Ltd, is in the early stages of its development.

A decision was made by the Board not to seek third term funding or to create a modified CRC for consideration in the last round of funding. The emphasis on commercial outcomes and the need for all parties to commit to a seven year programme were significant issues.

The last event for the CRC-VT was the extremely successful Symposium – Capturing Value from Biomedical Research – held in Melbourne in May. Dame Bridget Ogilvie headed a most impressive list of speakers, who together helped to make it a memorable occasion and a fitting legacy for the CRC.

Ian Goddard
Chairman
Spin-Off Companies

Q-Pharm Pty Ltd

Q-Pharm Pty Ltd is a clinical trials company specialising in Phase I and II trials and bioequivalence and bioavailability studies. The company conducts trials on pharmaceutical, biotechnology and complementary medicine products spanning the areas of therapeutic, diagnostic and prophylactic agents. Q-Pharm Pty Ltd offers the best appointed early phase clinical trials facilities in Australasia, with facilities including a specialised 12-bed clinic for the conduct of the most medically demanding trials and an open plan 36 bed facility for larger healthy volunteer trials. The company concluded its fourth full year of trading as a private company on 30 June 2006 and has continued the very satisfactory growth shown in the previous year. Highlights include:

- Gross revenue from operations has increased in line with forecasts as profitable trade continues.
- Continued growth in all areas of the business with Phase I/II clinical trials now accounting for approximately fifty percent of revenue.
- Bioequivalence Studies remain a very strong contributor to the company’s operation.
- Broadening of the client base has continued in accordance with the business plan with sixty percent of Q-Pharm’s dealings now with international clients.
- Q-Pharm played a leading role in the establishment of the Queensland Clinical Trials Network and has been actively involved in promoting both the company’s and Queensland’s capabilities at various national and international conferences.
- Healthy employment growth continued in the company which now supports around 50 full-time-equivalent positions.

Q-Gen Pty Ltd

Q-Gen Pty Ltd, established as a commercial spin-off company for contract manufacture of investigational therapeutics, is now in its second year of trading. This year has seen substantial structural reorganisation and expansion to ensure that operations are carried out with a customer satisfaction focused marketing strategy.

A number of contracts have been successfully completed or are in progress in the facility including: Mater Medical Research Institute – Development of a bioprocess for the cGMP manufacture of a human/chimeric IgG4 antibody to an antigen expressed on human blood dendritic cells and the subsequent cGMP manufacture of the antibody for clinical use; Phoenix Eagle Company Pty Ltd – Translational development and GMP manufacture of an investigational therapeutic in the treatment and prevention of ulcers; Murdoch Children’s Research Institute – Bioprocess Development of attenuated live Rotavirus Vaccine; Incitive Pty Ltd – Production of Native and Recombinant ICV-0019 for preclinical studies in autoimmune disease targets; Herdvac Pty Ltd – GMP compliant masterbanking of vaccine organism and Implicit Biosciences Pty Ltd – GMP storage, clinical release and recall or materials for a clinical trial in an infectious disease indication (HepC).

Q-Gen is presently qualifying a new aseptic vialing suite so that Q-Gen’s customers will be able not only to produce their recombinant actives at the facility, but also have these actives formulated and filled, labelled and packaged for clinical trials.
Replikun Biotech Pty Ltd

Replikun Biotech (a biotechnology company formed by QIMR in March 2005) took great strides in the last year, achieving some significant milestones in its development. The company is commercialising the Kunjin Replicon, a novel delivery system for vaccine and immunotherapy design. The company was awarded a $1 million Commercial Ready grant in January 2006, which will assist the development of its lead oncology product, KUN-GMCSF.

An important part of that project is the manufacture of GMP master and working cell banks, being done by Cobra Biomanufacturing in the UK. The cell line will be an important asset for Replikun as it seeks to create value by partnering its technology with biopharmaceutical companies.

Adipogen Pty Ltd

Adipogen is a company that was established by the University of Queensland using intellectual property that was developed by staff of the University of Queensland and the Queensland Department of Health. The Queensland Institute of Medical Research manages the interests of Queensland Health in the commercialisation of the intellectual property and is a minor shareholder in Adipogen.

Vaccine Solutions Pty Ltd

Vaccine Solutions is a joint venture between the Queensland Institute of Medical Research (QIMR) and CSL each of whom have equal shares. Vaccine Solutions was established by the CRC for Vaccine Technology. Its purpose is to commercialise the intellectual property developed in CRC programs.

During 2005-6 the operations of Vaccine Solutions was wound down and the company was prepared for the transition to a wholly owned company of CSL which will occur in late 2006. Many of the licenses and contracts that were held by Vaccines Solutions have been assigned to QIMR who is the trustee for the CRC-VT with a few specific contracts being maintained in Vaccine Solutions under the management of CSL Limited.
Corporate Division

The Corporate Division provides support to almost 800 QIMR scientists through groups covering finance and administration, human resources, scientific services, information technology, building services, regulatory affairs, business development and safety.

This year, the Finance team has further developed strategies to enhance and support the integration of financial information and reporting both for internal users and external stakeholders. This has included development of a grant management system which integrates the grant register with receivables to ensure that grant revenue inflows are monitored and received on a timely basis. The team has also responded to a significant increase in compliance requirements, particularly in the area of audit of project grants, and has successfully completed a comprehensive internal audit program conducted on an ongoing basis throughout the year.

From left: Back row: Joy Black, Nerida Fox, Mark Weaver, Simon Jaremzsuk, Damian James, Mark Feodoroff, Margaret Stromberg, Karen Moran, Catherine Baldwin. Third row: Melanie Anderson, Lorna Lane, Famena Khaya, Tracey Laing, Kathy Laza, Christine McNally, Pauline Donnelly, Xiaping Lin, Peter Kaim. Second row: Lachlan Ward, Chris Ward, Nicole Green, Michael Staley (COO), Michael Good (Director), Marlene Cornell, Helen Leonard, Juan Cooper, Gerald Haaima. Front row: Agnes Nutley, Donalee O’Brien, Madeleine Kersting, Roxanne Gray, Mandie Quince, Jann O’Keefe, Jennifer Ho, Tracey Checkley, Janet Fox
Human Resources has been largely involved in the ongoing process of developing, implementing and evaluating progress of new HR systems and procedures, and also formalising and reviewing existing practices. Significant progress was made towards formalising and updating the regulatory framework governing employment of QIMR staff, including the introduction of new employment contracts for all categories of staff.

Negotiations for a replacement Certified Agreement and salary increases for staff were commenced in conjunction with the Department of Industrial Relations and the implications of the Federal Government’s WorkChoices legislation for QIMR are being monitored on an ongoing basis, pending the State Government’s strategy for statutory authorities covered by the legislation.

Core scientific support for QIMR researchers is provided by a dedicated team of professionals in stores and purchasing, glassware, animal holding and culture media. A range of state-of-the-art biotechnological services such as DNA sequencing, flow cytometry, confocal microscopy and histotechnology are also offered.

A highlight this year was the refurbishment of the Animal Facility, completed in 2005 with all animal operations successfully transferred in October. The cleaner, more environmentally enriched animal holding areas together with the higher level of containment have been well received by researchers and facility staff. QIMR researchers also benefited from several major equipment purchases to support technology platforms providing genotyping and gene expression analysis: Illumina Beadstation funded by the NHMRC, live cell imaging funded by the NHMRC and automated scanning of pathology slides funded by the Golden Casket Foundation.

Building Services have successfully brought on line both level C of the CBCRC building and the fully re-fitted animal facility within the Bancroft Centre with all redundant animal containment equipment disposed of by either recycling or being reused by other facilities. The auditorium audio visual equipment upgrade has been successfully completed with optimum performance being achieved using digital control technology. All major items of plant and equipment have been successfully tested and overhauled as required without any disruption to the facility.
Information Technology this year began the adoption of ITIL (IT Infrastructure Library, an internationally accepted standard for best practice in IT). This has already realised benefits in the areas of change management and process control. QIMR’s network has seen an expansion of active and passive network infrastructure providing additional capacity and greater network resilience. Additional servers and disk storage have been added to cope with the data and processing demands of modern medical research. A significant collaborative scientific project with the Mosquito Control laboratory has received major IT support, resulting in the development of the web-based RREDS (Ross River Early Detection Surveillance) system which has been very well received by Local Government Authorities throughout Queensland. There is considerable interest in expanding the system to include other notifiable diseases.

In Regulatory Affairs, the QIMR Human Research Ethics Committee (HREC) and the QIMR Animal Ethics Committee (AEC) reviewed 311 and 284 research applications respectively. To keep abreast of the changes in the ethical and regulatory framework, HREC members attended the 5th Annual Health and Medical Research Conference and the 3rd Annual Australasian Biospecimen Network Meeting, both in Brisbane in November 2005. The HREC Chairman provided a written submission to Australian Health Ethics Committee on behalf of the HREC regarding the second round of the revision of the National Statement on Ethical Conduct Involving Humans. An external audit of QIMR animal facilities, animal research activities, and AEC operations was conducted by the Queensland Department of Primary Industries and Fisheries on October 2005 to assess compliance with the Queensland Animal Care and Protection Act, 2001.

The Business Development Office has a number of strategies in place to facilitate the identification, protection and commercialisation of novel research carried out by QIMR scientists. These include the formation of collaborative relationships with medical institutes and universities, both at home and abroad, the out licensing of patented technology and the formation of start-up companies. QIMR now have business relationships with over thirty two commercial companies, such arrangements include licensing of QIMR patented technology as well as contract research arrangements. QIMR has a proven track record as a contract research and development facility. QIMR recognise companies’ need to protect their intellectual property, and their need to develop products. An example of this during 2005-2006 was the signing of a research and development agreement with Incitive Limited to develop Incitive’s lead compound, ICV-0019 (formerly CCS), for the treatment of inflammation and autoimmune disease. Safety Services provided audit and review to ensure that QIMR’s operations and facilities comply with the appropriate regulations. In March 2006, doors were added to the ends of the corridors on all lab floors in Bancroft Centre to enable QIMR to apply for certification under OGTR guidelines for these floors to be classed as PC2 containment rather then individual labs being certified. OGTR certification was also obtained for new facilities on C floor CBCRC and the expanded G floor facility in Bancroft. QIMR now has 25 OGTR certified facilities. The Institute was audited under the Radiation Safety Act by Radiation Health and was found to be compliant with good radiation practice. This is the first QIMR radiation practice audit since the new Act commenced in 2000. Over the year, the Safety Committee either approved or returned for amendment 378 safety protocols, 309 risk management forms and 445 OGTR forms.
Science cannot be conducted by stealth. Therefore scientists collaborate with colleagues from state to state and around the world in a common search for cures to hitherto incurable diseases. This is vital if we are to play a meaningful role in the effort to eliminate cancer and many diseases and the fear that they engender.

Equally as important is the involvement of the wider community. To this end, the role of the Development and Marketing Department is to share the research progress and breakthroughs with the community at large and inform them of advances in health and medical research. One of the fundamental activities of the Department is to disseminate research findings to numerous community groups and associations and, as QIMR has no budget for advertising, this is done through external speaking presentations and providing tours of QIMR’s laboratories and facilities.

Since 1995, more than 9,000 people learned more about vital medical research and how this impacts on health, life and longevity directly via these community initiatives. Furthermore, our quarterly newsletter, LifeLab and no-cost media articles, are also vital in communicating our research to donors, and generates significant donations to ensure that life-saving medical research continues.

To fast-track QIMR’s judicious application of medical science, with individuals including Clive Berghofer and companies such as Suncorp, as well as many others whose names are listed on pages 107-112 of this report. It is their contribution to the most noble of goals which is outstanding and enhances the quality of our research, inspiring our scientists to greater goals.

We must also pay tribute to the many people who attend the Development and Marketing Department’s various fund-raising events or participate through donations, gifts-in-kind, sponsorship, spread the word about QIMR through their networks and leave provisions in their wills. Quite simply, our research would not exist and would certainly not be propelled forward without their unwavering support.

As QIMR celebrates 60 years of research & results, being prepared for the possibilities that lie in research is not simply just a matter of applying talent, time and collaborative effort. The ongoing relationship between medical research and its supporters is crucial and most definitely one of mutual benefit, as funding is essential for research and research is essential for solving the many medical mysteries that afflict our community. Each one of our donors assists the vigorous research effort at QIMR and, in the long term, contributes to results of immense community benefit.

Thank you for joining QIMR on the journey of medical discovery.
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Prof Alan Lopez
Dr Paula Marlon (from Feb 06)
Dr Jeannette Young (from Sep 05)

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Prof Judith Clements
Mr Paul Fennelly
Dr Gerry FitzGerald (to Aug 05)
Prof Alan Lopez
Dr Paula Marlon (from Feb 06)
Dr Jeannette Young (from Sep 05)

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Dr Amanda Spurde
Prof Denis Moss
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Dr Arne Mould
Dr Darren Krause
Dr Vicki Whitehall
Ms Melina Georgousakis
Mr Sri Shekar

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Dr Juan Cooper
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Mr Ian Manly
Mr Rod Wylie
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Ms Margot de Groot
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Ms Jane Seawright

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Mr Ian Manly
Mr Bruce Phillips

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Ms Jane Seawright
Ms Michelle Lagana
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, and its world class facilities and support services. Postgraduate students represent a valuable part of the research effort at QIMR, and the Institute strives to provide them with a solid grounding in medical research for subsequent careers either in Australia or abroad.

Thirty six new higher degrees students were admitted this year and fifty students visited QIMR. Currently the student body at QIMR comprises 110 PhD, 15 research Masters and 29 Honours students. 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 students at QIMR are enrolled through The University of Queensland with particularly strong links existing with the School of Population Health and the School of Medicine. An increasing number of students now enrol through other Universities including Griffith University, the Queensland University of Technology and the University of the Sunshine Coast.

Postgraduate students from QIMR have continued to make an impact in the wider scientific community this year and again have received a number of significant accolades. Some examples include: Alberto Pinzon-Charry who received the ASMR Queensland Premier’s Postgraduate Student Award, Alyson Ashe who received an award for the best poster at the Lorne Genome Conference and Manuel Ferriera who gave the best Student Oral Presentation at the 5th Australasian Human Gene Mapping Conference.

The Higher Degrees Committee (HDC) continues to oversee student activities at QIMR. Among the duties of the Committee are 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 HDC has undertaken 43 reviews of students.

The Institute continues a two-part workshop for supervisors of postgraduate students. This workshop is conducted in conjunction with the Teaching and Educational Development Institute and the School of Population Health of the University of Queensland.
# Completed Students 2005-2006

<table>
<thead>
<tr>
<th>Student Name</th>
<th>University / Supervisors</th>
<th>Thesis Title</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PhD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jacqui Fleming</td>
<td>QUT, JA Lopez, CW Schmidt, T Fosters</td>
<td>Cross-presentation of tumour antigens by dendritic cells may require phagocytosis of early apoptotic tumour cells</td>
</tr>
<tr>
<td>Rebekah Brennan</td>
<td>UQ, S Burrows</td>
<td>Cytotoxic T cell control of viral infection in humans</td>
</tr>
<tr>
<td>Mark Pearson</td>
<td>UQ, A Loukas, D McManus, D Smyth</td>
<td>Identification, characterization and vaccine efficacy of membrane proteins of Schistosoma mansoni</td>
</tr>
<tr>
<td>Itaru Anraku</td>
<td>UQ, A Suhrbier</td>
<td>Induction of long lasting protective CD8+ lymphocyte responses buy Kunjin replicon-based vaccine vectors</td>
</tr>
<tr>
<td>Lynette Beattie</td>
<td>QUT, M Good</td>
<td>The role of the spleen in malaria: Cellular changes that affect the development of immunity</td>
</tr>
<tr>
<td>Alan Brockman</td>
<td>UQ, D McManus</td>
<td>In vitro and genetic studies of Plasmodium falciparum drug resistance in northwestern Thailand</td>
</tr>
<tr>
<td>Shannon Duffy</td>
<td>UQ, A Boyd</td>
<td>The role of the EphA1 receptor tyrosine kinase during embryogenesis and cancer</td>
</tr>
<tr>
<td>Con Stylianou</td>
<td>UQ, A Boyd</td>
<td>The role of Eph an ephrins in melanoma metastasis and as potential targets for immunotherapy</td>
</tr>
<tr>
<td>Tanya Bell</td>
<td>UQ, D Purdie, A Green, S Treloar</td>
<td>Risk factors for Endometriosis</td>
</tr>
<tr>
<td>Nikki Vickaryous</td>
<td>University of Sydney</td>
<td>An ENU screen for modifiers of epigenetic state</td>
</tr>
<tr>
<td>Manuel Ferreira</td>
<td>UQ, N Martin, D Duffy</td>
<td>Genetic risk factors for allergic asthma</td>
</tr>
<tr>
<td>Sarah Medland</td>
<td>UQ, M Wright, N Martin, D Duffy</td>
<td>Genetic epidemiology of behavioural laterality</td>
</tr>
<tr>
<td>Rayleen Bowman</td>
<td>UQ, P Parsons</td>
<td>Mechanisms of human bronchial carcinogenesis</td>
</tr>
<tr>
<td>Sarah Cozzi</td>
<td>UQ, P Parsons</td>
<td>Molecular targets of anticancer PKC activators in the treatment of melanoma</td>
</tr>
<tr>
<td>Tanya Newton</td>
<td>UQ, P Parsons</td>
<td>Factors associated with treatment response and survival among women with late stage ovarian cancer</td>
</tr>
<tr>
<td>Kerry Roper</td>
<td>UQ, B Dugan</td>
<td>Cellular and molecular targets of allelochemicals from marine sponges</td>
</tr>
<tr>
<td>Liam St Pierre</td>
<td>QUT, Martin Lavin</td>
<td>Identification and comparative analysis of novel factors from the venom gland of the coastal taipan (Oxyuranus scutellatus) and related species</td>
</tr>
<tr>
<td>Michael Hamilton</td>
<td>UQ, K Ellem, C Schmidt</td>
<td>The development and use of cytokine producing microcapsules for anti-angiogenic therapy in mouse melanoma</td>
</tr>
<tr>
<td>Ranbir Sarai</td>
<td>UQ, J McCarthy</td>
<td>The role of B-tubulin polymorphism in benzimidazole drug resistance</td>
</tr>
<tr>
<td>Simone Smith</td>
<td>GU, K Andrews</td>
<td>Towards a humanised rodent malaria cytoadhesion model</td>
</tr>
<tr>
<td><strong>MPhil Scholars</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penny McBride</td>
<td>UQ, A Green</td>
<td>Association between epidermodysplasia verruciformis-associated human papillomavirus and squamous cell carcinoma, and keratosis development: a follow up study</td>
</tr>
<tr>
<td><strong>BSc(Hons)</strong></td>
<td></td>
<td></td>
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<tr>
<td>Grace Eng</td>
<td>QUT, G Ramm, T Pereira, T Walsh</td>
<td>Bile aid induction of chemokine expression in cholestatic liver disease</td>
</tr>
<tr>
<td>Vanessa Oaakes</td>
<td>QUT, KK Khanna</td>
<td></td>
</tr>
<tr>
<td>Janelle Hancock</td>
<td>QUT, M Lavin, A Kijas</td>
<td></td>
</tr>
<tr>
<td><strong>BMedSci</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rong Bing</td>
<td>The University of Melbourne G Ramm, R Ruddell, M Bertrand-Philippe</td>
<td>The role of protein kinase C-zeta in activation and survival of the hepatic stellate cell</td>
</tr>
</tbody>
</table>
## Student Awards

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Award Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alyson Ashe</td>
<td>Best Poster Prize</td>
<td>Best poster at Lorne Genome Conference, Jan 2006</td>
</tr>
<tr>
<td>Simon Apte</td>
<td>Basil Shaw Fellowship</td>
<td>Australian Rotary Health Research Fund, Jan 2006</td>
</tr>
<tr>
<td>Anita Burgess</td>
<td>Travel Award</td>
<td>Queensland Cancer Fund, Apr 2006</td>
</tr>
<tr>
<td>Bennett Datu</td>
<td>ANPRN Travel Award</td>
<td>Visit laboratories of colleagues in USA and UK, Feb 2006</td>
</tr>
<tr>
<td>Matthew Dixon</td>
<td>2nd Prize Best Student Presentation</td>
<td>UQ School of Population Health</td>
</tr>
<tr>
<td>Manuel Ferriera</td>
<td>Best Student Oral Presentation</td>
<td>5th Australasian Human Gene Mapping Conference, Nov 2005</td>
</tr>
<tr>
<td>Melina Georgousakis</td>
<td>QIMR 2005 Best Student Presentation</td>
<td>QIMR Student Seminar Series, Dec 2005</td>
</tr>
<tr>
<td>Elke Hacker</td>
<td>QCF Travel Grant</td>
<td>Attend Conference, Sep 2005</td>
</tr>
<tr>
<td>Elke Hacker</td>
<td>Thenie Baddams Award from the Australian Federation of University Women</td>
<td>Attend Conference, Aug 2005</td>
</tr>
<tr>
<td>Susan Jordan</td>
<td>1st Prize Best Student Presentation</td>
<td>UQ School of Population Health</td>
</tr>
<tr>
<td>Susan Jordan</td>
<td>2nd Prize Oral Presentation</td>
<td>QIMR Student Conference, Nov 2005</td>
</tr>
<tr>
<td>Tammy Maxwell</td>
<td>3rd Prize Oral Presentation</td>
<td>ASMR Student Conference, June 2006</td>
</tr>
<tr>
<td>Tammy Maxwell</td>
<td>QCF Travel Grant, QUT Grant-in-aid and QIMR Travel Grant</td>
<td>Attend International Conference, May-Jun 2006</td>
</tr>
<tr>
<td>Tammy Maxwell</td>
<td>QUT Development Program</td>
<td>Laboratory Visit</td>
</tr>
<tr>
<td>Michelle Neller</td>
<td>Runner up – Best Oral Presentation</td>
<td>UQ School of Medicine Postgraduate Student Conference, Sep 2005</td>
</tr>
<tr>
<td>Michelle Neller</td>
<td>Poster Prize</td>
<td>UQ School of Medicine Postgraduate Student Conference, Sep 2005</td>
</tr>
<tr>
<td>Alberto Pinzon-Charry</td>
<td>ASMR Queensland Premier’s Award</td>
<td>Postgraduate Medical Research</td>
</tr>
<tr>
<td>Najju Ranjit</td>
<td>ARC/NHMRC Parasitology Research Network Travel Award</td>
<td>Attend Woods Hole Molecular Parasitology Course in USA, Jun 2006</td>
</tr>
<tr>
<td>Nikki Vickaryous</td>
<td>Promega Student Award</td>
<td>Selected to give presentation at Lorne Genome Conference, Jan 2006</td>
</tr>
<tr>
<td>Nicci Wayte</td>
<td>Top Up Scholarship</td>
<td>Smart State, Queensland, Jan 2006</td>
</tr>
<tr>
<td>Nadia Whitelay</td>
<td>University Medal</td>
<td>University of Sydney Academic Medal</td>
</tr>
</tbody>
</table>
QIMR continues to focus on stimulating, attracting, training and mentoring students in their progression towards a career in science. Students are engaged with at three critical stages: Senior High School (Biology, Physics, Chemistry), as undergraduate science or medicine students and during their postgraduate science or medical degree. This year, the focus has been on partnering with the QBEN (Queensland Biotechnology Education Network), a group of senior biology teachers, providing professional development that translates to their science classrooms.

Encouraged by the Queensland Department of Education and Peter Andrews, Queensland’s Chief Scientist, a partnership with similar teacher/student science development programs (BioQuest, SBRI) in the USA is also being formed. This is supported by a Memorandum of Understanding by the Queensland Government with Washington State to share and develop biotechnology at all levels.

Recently all Brisbane bioscience-related educators have formed a cooperative group called QWAG (Queensland Washington Advancement Group) whose aim is science outreach. This group aims to form practical links and share resources both locally and internationally. As part of QWAG, Ms Simone Cross, QIMR Education Coordinator, is compiling a comprehensive science-related resource directory LEAP (Life Science Education Advancement Partnership) for teachers in Queensland.

The QIMR High School Lecture Series had 350 Senior Biology students and their teachers attend the Institute’s biannual High School Seminars held in October 2005 and April 2006.

This year, the series was able to be videoconferenced to some regional schools who had videoconferencing facilities, enthralling students in both audiences and stimulating a lot more questions after each of the seminars.

Alongside the High School Seminars, two “Hands-on-Science: Application to Health and Disease” teacher workshops were held in the EBV Molecular Biology laboratory of QIMR.

In the first, 25 biology teachers and school lab assistants isolated their own DNA, amplified it using PCR, and then did gel electrophoresis to detect their gene polymorphisms. Four scientists spoke about the way they use this biotechnology in their research and to define disease patterns. One teacher shared her use of this technology at Cavendish Road State High School.

In the second workshop, teachers and lab assistants cloned some DNA. Talks followed on the medical, research and everyday use of recombinant proteins from cloned DNA. A tour of the new Protein Discovery Centre at QIMR and a presentation by Peter Musk, Head of the Biology Department at Gympie State High School and former QIMR scientist, revealed many applications and resources for biology teachers. Strategic planning by Chris Kern and teacher networking were also included in the two day workshops. Education Queensland played a vital part in organising this professional development for teachers.

Other Education activities with high school groups, such as tours of QIMR by senior physics and biology students for both private and state schools continue, as does the High School Work Experience program. Many of the postgraduate students here are increasingly interested in doing science outreach within and outside of QIMR.
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>2005</td>
<td>Dr Stephen L. Hoffman</td>
<td>Rationale and Plans for Moving from Modern Genomics, Immunology, and Molecular Biology to Basic Parasitology and Entomology to Develop an Effective Malaria Vaccine</td>
</tr>
<tr>
<td>2004</td>
<td>Dr James Watson</td>
<td>B28 – From Bone to B Cells</td>
</tr>
<tr>
<td>2003</td>
<td>Professor Bob Williamson</td>
<td>Human Genes and Cloning People: The Medical Realities and the Public Fears</td>
</tr>
<tr>
<td>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>2001</td>
<td>Sir Gustav Nossal</td>
<td>The Genomics Revolution to Prove a New Model for Spaceship Earth</td>
</tr>
<tr>
<td>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>1999</td>
<td>Professor Frank Fenner</td>
<td>Disease Eradication and Bioterrorism: Opposite Ends of a Public Health Spectrum</td>
</tr>
<tr>
<td>1998</td>
<td>Dr Lois “Lowitja” O’Donoghue</td>
<td>Indigenous Health: Monitoring the Vital Signs</td>
</tr>
<tr>
<td>1997</td>
<td>Professor Peter Doherty</td>
<td>Killer Cells and the Control of Viral Infections</td>
</tr>
<tr>
<td>1996</td>
<td>Professor Bridget M Oglvie</td>
<td>The Support of Medical Research: People, Programs and Policies</td>
</tr>
<tr>
<td>1995</td>
<td>Professor C Thomas Caskey</td>
<td>Genetics and the Future</td>
</tr>
<tr>
<td>1994</td>
<td>Dr Baruch Blumberg</td>
<td>Evolution, Sex and the Hepatitis B Virus</td>
</tr>
<tr>
<td>1993</td>
<td>Professor M Ferguson-Smith</td>
<td>Modern Genetics Research and its Consequences for Society</td>
</tr>
<tr>
<td>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>1991</td>
<td>Professor Chev Kidson</td>
<td>Genes, Galaxies and Ghosts! Science, Medicine and the Future of Man</td>
</tr>
<tr>
<td>1988</td>
<td>The Honourable Mike Ahern</td>
<td>Overview of the History of the Struggles and the Successes in the Development of Science and Technology Policy in Queensland</td>
</tr>
<tr>
<td>1985</td>
<td>Dr Louis H Miller</td>
<td>Parasites and Mankind: The Challenge of Malaria in Human History</td>
</tr>
<tr>
<td>1984</td>
<td>Dr Steven Jay Gould</td>
<td>Evolution Beyond Darwin</td>
</tr>
<tr>
<td>1983</td>
<td>Dr Robyn Williams</td>
<td>The Future of Medicine - Five Nightmares</td>
</tr>
<tr>
<td>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>1981</td>
<td>Professor Ralph Doherty</td>
<td>Major contributions by Australians to Medical Science</td>
</tr>
</tbody>
</table>

QIMR Bancroft Medallists

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 Queensland. The QIMR Bancroft Medal is awarded to those who have made an outstanding contribution to QIMR.

- Mr Mark Weaver (2005)
- Ms Sue Cassidy (2004)
- Professor Peter Parsons (2003)
- Dr Suzanne Elliott (2003)
- Mrs Beth Dawe (2003)
- Mrs Veron Conley (2003)
- Ms Christine Borthwick (2002)
- Dr Peter Upcroft (2002)
- 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
QIMR Fellows

Outstanding individuals are named as Fellows of the Institute at the same event each year. This year the Awards went to Mr Paul Wright and Professor John Kerr.

2005
Paul Wright
John Kerr
2004
Peter Wills
2003
Bryan Campbell
Clive Berghofer
Sam Coco
2002
Diana Cavaye (deceased)
Sr Regis Mary Dunne
2001
Phillip Desbrow (deceased)
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 AC
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 (deceased)
Ralph Doherty
Frank Fenner
Eric French
Sir Abraham Fryberg
Douglas Lee
Margaret Macgregor
Aubrey Pye (deceased)
William Reeves
John Sprent
Harry Standfast
George Taylor
John Tonge
Australian Academy of Science Elects QIMR Scientist

Following his AM and RL Doherty Prize for outstanding achievement and leadership in medical research in 2005, Professor Brian Kay was elected to the Australian Academy of Science in 2006 with the following citation:

“Brian Kay is a celebrated expert in epidemiology, insect vectors, and mosquito control. He has made valuable contributions to understanding a range of regional arbovirus problems, especially dengue but also Ross River and Murray Valley encephalitis viruses. His research has led to the control of arbovirus diseases in northern Australia and Asia”.

QIMR congratulates Professor Kay, who is only the second person at the Institute to be afforded such an honour, the first being Dr Edward Derrick, the discoverer of Q Fever, in 1954.

Other Awards

<table>
<thead>
<tr>
<th>Name</th>
<th>Award</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kay Ellem</td>
<td>Order of Australia</td>
<td>Lifetime of achievement in cancer research, Jun 2006</td>
</tr>
<tr>
<td>Michael Good</td>
<td>Named Oration – Research challenges for vaccines in developing countries</td>
<td>Frontiers in Vaccinology Lecture, Centre for Vaccine Development, Baltimore, USA, 2005</td>
</tr>
<tr>
<td>Michael Good</td>
<td>Named Oration – Vaccines for the heart: an opportunity to further improve cardiovascular health</td>
<td>Paddy Woolcock Oration, The Prince Charles Hospital, Brisbane, 2005</td>
</tr>
<tr>
<td>Nick Martin</td>
<td>Dobzhansky Award</td>
<td>Lifetime contributions to behaviour genetics, 2005</td>
</tr>
<tr>
<td>Nathan Subramaniam</td>
<td>Senior Research Fellowship</td>
<td>Gastroenterological Society of Australia, 2006</td>
</tr>
<tr>
<td>James McCarthy</td>
<td>Clinical Research Fellowship</td>
<td>Smart State Queensland, Apr 2006</td>
</tr>
<tr>
<td>Chris Schmidt</td>
<td>ASMR Queensland Premier’s Award</td>
<td>Senior Postdoctoral Award, 2006</td>
</tr>
<tr>
<td>Susan Treloar</td>
<td>Patron of the Endometriosis Association Qld Inc</td>
<td>Outstanding work and dedication in the field of endometriosis research, 2006</td>
</tr>
<tr>
<td>Alberto Pinzon-Charry</td>
<td>ASMR Queensland Premier’s Award for Medical Research</td>
<td>Most meritorious research by an early researcher, 2006</td>
</tr>
<tr>
<td>Stuart Macgregor</td>
<td>Finalist, ASMR Queensland Premier’s Award for Medical Research</td>
<td>Work on DNA pooling, 2006</td>
</tr>
<tr>
<td>June Chia</td>
<td>Young Investigator Award for Basic Science, RBWH Research Week</td>
<td>Best oral presentation in basic science section of RBWH Research Week, 2006</td>
</tr>
<tr>
<td>Vicki Whitehall</td>
<td>American Association for Cancer Research Scholar in Training Award</td>
<td>ACCR Colorectal Cancer Pathways Conference, California, USA, 2005</td>
</tr>
<tr>
<td>Helen Bofinger</td>
<td>Presidents Prize</td>
<td>Best original work at TSANZ Annual Meeting, 2006</td>
</tr>
<tr>
<td>Tina Skinner-Adams</td>
<td>Best Presentation</td>
<td>Queensland Health Annual Conference, 2005</td>
</tr>
<tr>
<td>Tina Skinner-Adams</td>
<td>Establishment Award</td>
<td>Clive and Vera Ramaciotti Grant, 2005</td>
</tr>
<tr>
<td>Vicki Whitehall</td>
<td>QCF Travel Award</td>
<td>Travel to International Conference, 2006</td>
</tr>
<tr>
<td>Geoffrey Gobert</td>
<td>North American Travel Award</td>
<td>Australian Academy of Science, 2005</td>
</tr>
<tr>
<td>Chunxia Xu</td>
<td>Ian Potter Foundation Travel Award</td>
<td>American Association for the Study of Liver Diseases Meeting, San Francisco, USA, 2005</td>
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</table>
# Grants and Funding

## NHMRC Grants Awarded

(Excluding Equipment Grants, Fellowships and Scholarships)

<table>
<thead>
<tr>
<th>Calendar Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
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</thead>
<tbody>
<tr>
<td>Project Grants - Standard</td>
<td>717,557</td>
<td>900,623</td>
<td>2,745,278</td>
<td>3,574,000</td>
<td>4,793,386</td>
<td>7,229,937</td>
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<tr>
<td>Project Grants - Genomics</td>
<td>863,000</td>
<td>853,000</td>
<td>394,000</td>
<td>–</td>
<td>–</td>
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<tr>
<td>Program Grants</td>
<td>–</td>
<td>2,110,000</td>
<td>2,965,000</td>
<td>4,421,083</td>
<td>5,426,606</td>
<td>4,830,000</td>
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<tr>
<td>Transitional Institute Grant (TIG)</td>
<td>–</td>
<td>900,000</td>
<td>900,000</td>
<td>900,000</td>
<td>900,000</td>
<td>919,800</td>
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<tr>
<td>Transitional Block Grant (TBG)</td>
<td>4,863,644</td>
<td>4,049,556</td>
<td>2,466,426</td>
<td>511,146</td>
<td>–</td>
<td>–</td>
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<tr>
<td>Development Grants</td>
<td>–</td>
<td>–</td>
<td>155,000</td>
<td>155,000</td>
<td>156,500</td>
<td>–</td>
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<tr>
<td>International Collaborative Grants</td>
<td>–</td>
<td>–</td>
<td>150,000</td>
<td>415,942</td>
<td>265,942</td>
<td>–</td>
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<tr>
<td><strong>Total</strong></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>
<td>16,457,237</td>
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## NHMRC Fellowships and Scholarships Awarded

<table>
<thead>
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<th>Calendar Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
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<tr>
<td>Postgraduate Scholarships</td>
<td>101,824</td>
<td>82,243</td>
<td>92,067</td>
<td>58,977</td>
<td>172,339</td>
<td>106,155</td>
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<tr>
<td>Training Fellowships</td>
<td>327,377</td>
<td>399,910</td>
<td>620,202</td>
<td>434,866</td>
<td>565,746</td>
<td>299,856</td>
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<tr>
<td>Career Development Awards</td>
<td>-</td>
<td>160,000</td>
<td>511,000</td>
<td>606,750</td>
<td>884,000</td>
<td>972,500</td>
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<tr>
<td>Research Fellowships</td>
<td>354,576</td>
<td>660,000</td>
<td>787,750</td>
<td>1,305,000</td>
<td>1,548,750</td>
<td>1,532,250</td>
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<tr>
<td><strong>Total</strong></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>
<td>2,910,761</td>
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## Leukaemia Foundation of Queensland

<table>
<thead>
<tr>
<th>Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
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<tbody>
<tr>
<td>Leukaemia Foundation QLD</td>
<td>226,025</td>
<td>361,982</td>
<td>286,115</td>
<td>423,347</td>
<td>283,286</td>
<td>281,585</td>
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</tbody>
</table>

## Grants funding received from all sources 2005-2006

- **QIMR Trust**: $3,150,007
- **Qld Health**: $5,558,872
- **NHMRC**: $19,758,889
- **NIH**: $8,236,936
## Major New Grants Awarded in 2005-2006 (over $100,000)

<table>
<thead>
<tr>
<th>Source</th>
<th>Chief Investigators and 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>FABBRO M: “Preventing genetic damage with BIX – a novel player in the DNA damage response pathway.” (Administered by Griffith University)</td>
<td>3 yrs</td>
<td>2006-08</td>
<td>$265,000</td>
</tr>
<tr>
<td>ARC</td>
<td>LAVIN M et al: &quot;Identification of functionally important autophosphorylation site(s) on ataxia telangiectasia and Rad 3-related (ATR) protein kinase.&quot;</td>
<td>3 yrs</td>
<td>2006-08</td>
<td>$265,000</td>
</tr>
<tr>
<td>ARC</td>
<td>MARTIN N, WRIGHT M, LUCIANO M: &quot;Locating genes for cognitive traits using linkage and association analyses.&quot; (Administered by The University of Queensland)</td>
<td>3 yrs</td>
<td>2006-08</td>
<td>$510,000</td>
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<tr>
<td>ARC</td>
<td>SMITH R: &quot;Proteomics analysis of interactions between Chaperonin 10 and Cell Surface Proteins.&quot; (Administered by The University of Queensland; QIMR Investigator: J GORMAN)</td>
<td>2 yrs</td>
<td>2006-07</td>
<td>$300,000</td>
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<tr>
<td>CRCAH</td>
<td>ANDREWS R: “Filling the Gaps in the Healthy Skin Program.” (Administered by the Menzies School of Health Research; QIMR PIs: D. KEMP and S. SRIPRAKASH)</td>
<td>3 yrs</td>
<td>2005-08</td>
<td>$240,067</td>
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<tr>
<td>EU</td>
<td>“Genetic and behavioural risk factors for melanoma.” (Administered by the University of Leeds; QIMR PI: N. HAYWARD)</td>
<td>5 yrs</td>
<td>2006-10</td>
<td>EURO $141,084</td>
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<tr>
<td>KOMEN</td>
<td>TRENCHE G: “Methylated CpG islands as biomarkers.”</td>
<td>2 yrs</td>
<td>2006-08</td>
<td>US$249,928</td>
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<tr>
<td>NBCF</td>
<td>Lopez A et al: “Mammospheres for immunootherapy.”</td>
<td>2 yrs</td>
<td>2005-07</td>
<td>$150,000</td>
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<tr>
<td>NHMRC</td>
<td>ANDERSON G, FRAZER D: &quot;The mechanism of intestinal haem iron absorption and characterisation of a novel haem-binding protein.&quot;</td>
<td>3 yrs</td>
<td>2006-08</td>
<td>$526,500</td>
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<tr>
<td>NHMRC</td>
<td>ENGWERDA C, MYNOTT T: “Development of novel anti-cancer and immunosuppressive drugs derived from pineapple stems (Ananus comosus).”</td>
<td>2 yrs</td>
<td>2005-07</td>
<td>$313,000</td>
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<tr>
<td>NHMRC</td>
<td>ENGWERDA C et al: “Defining the roles of TNF, lymphotoxin alpha and LIGHT in experimental visceral leishmaniasis.”</td>
<td>3 yrs</td>
<td>2006-08</td>
<td>$401,250</td>
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<tr>
<td>NHMRC</td>
<td>HARRICH D et al: &quot;The HIV-1 Tat protein is a reverse transcription co-factor.&quot;</td>
<td>3 yrs</td>
<td>2006-08</td>
<td>$396,075</td>
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<tr>
<td>NHMRC</td>
<td>KHANNA R, GANDHI M: &quot;Prophylactic Vaccine for Human Cytomegalovirus.”</td>
<td>3 yrs</td>
<td>2006-08</td>
<td>$364,875</td>
</tr>
<tr>
<td>NHMRC</td>
<td>LAVIN M: “Mechanism of activation of ATM by DNA double strand breaks and other stimuli.” (Administered by University of Queensland from 1/04/06).</td>
<td>3 yrs</td>
<td>2006-08</td>
<td>$466,500</td>
</tr>
<tr>
<td>NHMRC</td>
<td>LOUKAS A et al: &quot;Haemoglobin degrading proteases as targets of anti-hookworm vaccines.&quot;</td>
<td>3 yrs</td>
<td>2006-08</td>
<td>$511,500</td>
</tr>
<tr>
<td>NHMRC</td>
<td>MARTIN N, MONTGOMERY G, DUFFY D, VISSCHER P: “Genome-wide combined linkage-association scan of multiply phenotyped twin sibships.”</td>
<td>4 yrs</td>
<td>2006-09</td>
<td>$1,920,000</td>
</tr>
<tr>
<td>NHMRC</td>
<td>MARTIN N, MONTGOMERY G, DUFFY D: “Genetics of melanoma risk factors.”</td>
<td>3 yrs</td>
<td>2006-08</td>
<td>$627,975</td>
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<tr>
<td>Funding Body</td>
<td>Sponsor</td>
<td>Project Title</td>
<td>Duration</td>
<td>Start Year</td>
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<tr>
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<tr>
<td>NHMRC</td>
<td>MORRIS P, VALERY P et al</td>
<td>&quot;Multicentre Bronchiectasis Study: A collaborative and international study of bronchiectasis in Indigenous children.&quot;</td>
<td>5 yrs</td>
<td>2006-10</td>
</tr>
<tr>
<td>NHMRC</td>
<td>MOSS D, KHANNA R, BURROWS S</td>
<td>&quot;Immunobiology of Human Herpesvirus Infections.&quot;</td>
<td>5 yrs</td>
<td>2006-10</td>
</tr>
<tr>
<td>NHMRC</td>
<td>PARSONS P, BOYLE G et al</td>
<td>&quot;The role of MiC-1 in the promotion and progression of skin squamous cell carcinoma.&quot;</td>
<td>3 yrs</td>
<td>2006-08</td>
</tr>
<tr>
<td>NHMRC</td>
<td>SUHRBIER A, DARNELL G</td>
<td>&quot;The human papilloma virus oncoprotein E7 degrades the retinoblastoma protein by enhancing calpain activity.&quot;</td>
<td>3 yrs</td>
<td>2006-08</td>
</tr>
<tr>
<td>NHMRC</td>
<td>VISSCHER P et al</td>
<td>&quot;Statistical methods and algorithms for analysis of high-throughput genetics and genomics platforms.&quot;</td>
<td>5 yrs</td>
<td>2006-10</td>
</tr>
<tr>
<td>NHMRC</td>
<td>WHITELAW E et al</td>
<td>&quot;A role for epigenetic modifiers in maintaining chromosome integrity during passage through the male gamete in the mouse.&quot;</td>
<td>3 yrs</td>
<td>2006-08</td>
</tr>
<tr>
<td>NMHRC</td>
<td>WHITEMAN D, GREEN A et al</td>
<td>&quot;Towards Prognostic Markers for Oesophageal Cancer.&quot;</td>
<td>3 yrs</td>
<td>2006-08</td>
</tr>
<tr>
<td>NIH</td>
<td>BRINDLEY P</td>
<td>&quot;Pathogenesis of liver fluke induced cancer in Thailand.&quot; (Administered by Tulane University in New Orleans; QIMR Investigator: A LOUKAS)</td>
<td>5 yrs</td>
<td>2005-10</td>
</tr>
<tr>
<td>NIH</td>
<td>CONSTANT S</td>
<td>&quot;Role of hookworm secretions in host immunomodulation.&quot; (Administered by George Washington University in Washington; QIMR Investigator: A LOUKAS)</td>
<td>4 yrs</td>
<td>2006-10</td>
</tr>
<tr>
<td>NIH</td>
<td>HEATH A</td>
<td>&quot;Parental alcoholism and child environmental risk.&quot; (Administered by Washington University; QIMR Investigator: N. Martin)</td>
<td>4 yrs</td>
<td>2005-09</td>
</tr>
<tr>
<td>NIH</td>
<td>LYNSEY M</td>
<td>&quot;Cannabis and other illicit drug use: A twin study.&quot; (Administered by Washington University; QIMR Investigator: N. Martin)</td>
<td>5 yrs</td>
<td>2005-10</td>
</tr>
<tr>
<td>NIH</td>
<td>TODD R</td>
<td>&quot;Molecular genetics of inattention in Australia.&quot; (Administered by Washington University; QIMR Investigator: N. Martin)</td>
<td>5 yrs</td>
<td>2005-10</td>
</tr>
<tr>
<td>NIH</td>
<td>TRENCH G et al</td>
<td>&quot;The role of the ATM gene in familial breast cancer.&quot;</td>
<td>5 yrs</td>
<td>2005-09</td>
</tr>
<tr>
<td>QCF</td>
<td>KELSO A</td>
<td>&quot;Differentiation regulation of perforin and granzyme gene expression in CD8+ T lymphocytes&quot;</td>
<td>2 yrs</td>
<td>2006-07</td>
</tr>
<tr>
<td>QCF</td>
<td>LAVIN M</td>
<td>&quot;Functional Importance of ATR – dependent Mre11 phosphorylation in response to stalled DNA replication forks.&quot;</td>
<td>2 yrs</td>
<td>2006-07</td>
</tr>
<tr>
<td>QCF</td>
<td>MacDONALD K</td>
<td>&quot;Lineage specific roles of SOCS3 in the regulation of GVHD.&quot;</td>
<td>2 yrs</td>
<td>2006-07</td>
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<tr>
<td>QCF</td>
<td>MOSS D</td>
<td>&quot;A phase 1 trial on adoptive transfer of EBV-specific cytotoxic T cells to nasopharyngeal carcinoma patients.&quot;</td>
<td>2 yrs</td>
<td>2006-07</td>
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<td>QCF</td>
<td>WALKER G</td>
<td>&quot;Mechanisms of UVR-induced melanoma in melanoma-prone mice.&quot;</td>
<td>3 yrs</td>
<td>2006-08</td>
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<tr>
<td>QCF</td>
<td>WEBB P</td>
<td>&quot;Folate and related micronutrients, folate metabolising genes and risk of ovarian cancer.&quot;</td>
<td>2 yrs</td>
<td>2006-07</td>
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<tr>
<td>QCF</td>
<td>YOUNG J</td>
<td>&quot;Molecular Pathways in Endometrial Cancer.&quot;</td>
<td>2 yrs</td>
<td>2006-07</td>
</tr>
</tbody>
</table>
2005-2006 Publications

Agrawal A, Heath AC, Grant JD, Pergadia ML, Statham DJ, Bucholz KK, Martin NG and Madden PA. Assortative mating for cigarette smoking and alcohol consumption in female Australian twins and their spouses. Behav Genet 36: 553-566, 2006

Agrawal A, Madden PA, Heath AC, Lynskey MT, Bucholz KK and Martin NG. Correlates of regular cigarette smoking in a population-based sample of Australian twins. Addiction 100: 1709-19, 2005


Anderson CA, McRae AF and Visscher PM. A simple linear regression method for quantitative trait Loci linkage analysis with censored observations. Genetics 173: 1735-1745, 2006


Anderson GJ and Frazer DM. Recent advances in intestinal iron transport. Curr Gastroenterol Rep 7: 365-72, 2005


Birley AJ, Whitfield JB, Neale MC, Duffy DL, Heath AC, Boomsma DI and Martin NG. Genetic time-series analysis identifies a major QTL for in vivo alcohol metabolism not predicted by in vitro studies of structural protein polymorphism at the ADH1B or ADH1C loci. Behav Genet 35: 509-24, 2005


Birley AJ, Whitfield JB, Neale MC, Duffy DL, Heath AC, Boomsma DI and Martin NG. Genetic time-series analysis identifies a major QTL for in vivo alcohol metabolism not predicted by in vitro studies of structural protein polymorphism at the ADH1B or ADH1C loci. Behav Genet 35: 509-24, 2005


Cornes BK, Medland SE, Ferreira MAR, Morley KI, Duffy DL, Hejmanats B, Montgomery GW and Martin NG. Sex-limited genome-wide linkage scan for body mass index in an unselected sample of 933 Australian twin families. *Twin Res and Hum Genet* 8: 616-32, 2005


Davies MR, Tran TN, McMillan DJ, Gardiner DL, Currie BJ and Sriprakash KS. Inter-species genetic movement may blur the epidemiology of streptococcal diseases in endemic regions. *Microbes Infect* 7: 1128-38, 2005


Dickson PA, Montgomery GW, Henders A, Campbell M, Martin NG and James MR. Evaluation of multiple displacement amplification in a 5cm STR genome wide scan. Nucleic Acids Res 33: e119, 2005


D’Onofrio BM, Turkerhime E, Emery RE, Slutskes WS, Heath AC, Madden PA and Martin NG. A genetically informed study of the processes underlying the association between parental marital instability and offspring adjustment. Dev Psychol 42: 486-99, 2006


Ferreira MA, O’Gorman L, Le Souef P, Burton PR, Toelle BG, Robertson CF, Martin NG and Duffy DL. Variance components analyses of multiple asthma traits in a large sample of Australian families ascertained through a twin proband. Allergy 61: 245-53, 2006

Ferreira MA, Visscher PM, Martin NG and Duffy DL. A simple method to localise pleiotropic susceptibility loci using univariate linkage analyses of correlated traits. Eur J Hum Genet 14: 953-62, 2006


Frazier DM, Wilkins SJ, Vulpe CD and Anderson GJ. The role of duodenal cytchrome b in intestinal iron absorption remains unclear. Blood 106: 4413, 2005


Gandhi MK and Khanna R. Viruses and lymphoma. Pathology 37: 420-33, 2005


Gardiner DL, McCarthy JS and Trenholme KR. Malaria in the post-genomics era: light at the end of the tunnel or just another train? Postgrad Med J 81: 505-509, 2005


Hansell NK, Wright MJ, Luciano M, Geffen GM, Geffen LB and Martin NG. Genetic covariation between event-related potential (ERP) and behavioral non-ERP measures of working-memory, processing speed, and IQ. Behav Genet 35: 695-706, 2005.


Hurl YM, Luciano M, Martin NG, Boomsma DI, Iacono WG, McGuie M, Shin JS, Jun JK, Ooki S, van Beijsterveldt CE and Han JY. A comparison of twin birthweight data from Australia, the Netherlands, the United States, Japan, and South Korea: are genetic and environmental variations in birthweight similar in Caucasians and East Asians? Twin Res Hum Genet 8: 638-48, 2005


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<th>Title</th>
<th>QIMR scientist</th>
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* Refer to QIMR Start-Up Companies
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<td>Dr Fiona Amante</td>
<td>Role of Regulatory T cells in the Development of Experimental Cerebral Malaria</td>
<td>Brisbane Immunology Group, Seminar Program, Brisbane, Sep 2005</td>
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<td>Associate Professor Greg Anderson</td>
<td>Ironing in the new millennium: How the body regulates the homeostasis of an essential metal</td>
<td>Center for Endocrinology and Diabetes Research, Princess Alexandra Hospital, Brisbane, Mar 2006</td>
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<td>Dr Michael Batzloff</td>
<td>Evaluation of a totally synthetic self-adjuvanting lipopeptide GAS vaccine candidate</td>
<td>XVIth Lancefield International Symposium on Streptococci and Streptococcal Diseases, Palm Cove, Sep 2005</td>
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<td>Associate Professor Scott Burrows</td>
<td>Immune control of an old foe – Epstein-Barr virus</td>
<td>Biochemistry and Molecular Biology Department, Monash University, Melbourne, Sep 2005</td>
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<td>Epitope selection in the cytotoxic T cell response to viral infection</td>
<td>The Centre for Molecular Biodiscovery, The University of Auckland, Auckland, New Zealand, Nov 2005</td>
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<td>The immunogenicity of a viral cytotoxic T cell epitope is controlled by its MHC-bound conformation</td>
<td>Australasian Society for Immunology Meeting, Melbourne, Dec 2005</td>
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<td>An Epstein-Barr virus vaccine: Have we cut ourselves too short in mapping CTL epitopes?</td>
<td>Australian Virology Group Meeting, Phillip Island, Victoria, Dec 2005</td>
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<td>Have we cut ourselves too short in mapping CTL epitopes?</td>
<td>Mater Medical Research Institute, Brisbane, May 2006</td>
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<td>Dr Georgia Chenevix-Trench</td>
<td>Update on kConFab</td>
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<td>Benign or Malignant? Understanding the role of genetic variation in the BRCA1, BRCA2 and ATM genes in breast cancer susceptibility</td>
<td>Children’s Medical Research Institute, Sydney, Oct 2005</td>
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<td>Benign or Malignant? Understanding the role of genetic variation in the BRCA1, BRCA2 and ATM genes in breast cancer susceptibility</td>
<td>Human Genetics Society of Australasia, South Australian branch, Adelaide, Nov 2005</td>
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<td>Breast cancer genetics: is the sun rising again after a decade of darkness?</td>
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<td>Dr Qin Cheng</td>
<td>Genetic Diversity in Antigens Targeted by Malaria RDTs</td>
<td>WHO Informal consultation of the malaria RDT specimen bank, Kisumu, Kenya, Jun 2006</td>
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<td>Genetic Diversity in Antigens Targeted by Malaria RDTs</td>
<td>WHO Informal consultation on development of methods for testing malaria rapid diagnostic tests, Geneva, Switzerland, Feb 2006</td>
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<td>Genetic diversity of <em>P. vivax</em> parasites in relapsing patients</td>
<td>Vivax malaria research: 2005 and beyond, Washington DC, USA, Dec 2005</td>
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<td>Defining pathways of pathogenesis in Experimental Cerebral Malaria</td>
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<td>Woods Hole Immunoparasitology Meeting, Woods Hole, MA, USA, Apr 2006</td>
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<td>Aminopeptidases in <em>Plasmodium falciparum</em> parasites: overexpression</td>
<td>Symposium on Malaria Protein Structure and Function, Melbourne, Feb 2006</td>
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<td>Grand Rounds Clinical Meeting, Redcliffe Hospital, Brisbane, May 2006</td>
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<td>Institute for Molecular Biology Seminar, Brisbane, Oct 2005</td>
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<td>New directions in Leukaemia Research, 1st meeting, Sunshine Coast, Apr 2006</td>
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<td>Transplantation Society of Australia and NZ annual meeting, Canberra, Mar 2006</td>
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<td>Developing a practical control strategy for <em>Verrallina funerea</em>, a</td>
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<td>medically important mosquito species in Queensland, Australia</td>
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<td><strong>Professor Brian Kay</strong></td>
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<tr>
<td>New methods to control mosquito-borne diseases</td>
<td>Australian Academy of Science, Canberra, May 2005</td>
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<tr>
<td>New approaches to control of dengue vectors</td>
<td>Centers for Disease Control - Bill and Melinda Gates Foundation global, workshop on dengue vector control Fort Collins, USA, May 2006</td>
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<td><strong>Professor Anne Kelso</strong></td>
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<tr>
<td>Development and specialisation of cytolytic T lymphocytes</td>
<td>Centre for Immunology and Cancer Research, University of Queensland, Princess Alexandra Hospital, Brisbane, Jul 2005</td>
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<tr>
<td>Postcard from the jungle</td>
<td>Brisbane Immunology Group Annual Retreat, Gold Coast, Aug 2005</td>
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<td>Modern Immunological Concepts and Vaccine Design</td>
<td>Third Indo-Australian Conference on Biotechnology, Hyderabad, India, Mar 2006</td>
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<td>Building an Australian biotechnology industry – opportunities and</td>
<td>Cooperative Research Centres Association Conference, Brisbane, May 2006</td>
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<td>challenges for medical sector CRCs</td>
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<td><strong>Dr Norbert Kienzle</strong></td>
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<tr>
<td>Mechanisms by which IL-4 impairs T cell immunity against tumours</td>
<td>Department of Microbiology and Immunology, The University of Melbourne, Melbourne, May 2006</td>
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<tr>
<td>Impact of IL-4 on tumor immunity and differentiation of CD8+ T cells</td>
<td>James Cook University, Townsville, Nov 2005</td>
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<td><strong>Dr Kum Kum Khanna</strong></td>
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<td>Functional characterization of novel interactors of ATM kinase</td>
<td>The 2005 International Workshop on Ataxia Telangiectasia, ATM and the DNA damage Response, Lake Maggiore, Italy, Jun 2005</td>
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<tr>
<td>Regulation of ATM kinase activity by protein phosphatase, PP2A</td>
<td>Australian Society of Biochemistry and Molecular Biology, Combo meeting, Adelaide, Sep 2005</td>
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<tr>
<td>DNA damage response and cancer susceptibility</td>
<td>Regina Elena Cancer Institute, Rome, Italy, Nov 2005</td>
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<td><strong>Professor Sunil Lakhani</strong></td>
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<tr>
<td>Molecular Pathology of Breast Cancer</td>
<td>Radiation Oncology Group, Brisbane, Jul 2005</td>
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<td>Molecular Pathology of Preinvasive Breast Disease</td>
<td>Manipal Hospital and Medical School, Manipal, India, Aug 2005</td>
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<td>Molecular Pathology of Invasive Breast Disease</td>
<td>Manipal Hospital and Medical School, Manipal, India, Aug 2005</td>
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<td>Immunohistochemistry in breast cancer diagnosis</td>
<td>Royal College of Surgeons of Sri Lanka and British Society of Surgical Oncology, Colombo, Sri Lanka, Aug 2005</td>
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<td>Molecular Classification of Breast Cancer</td>
<td>Royal College of Surgeons of Sri Lanka and British Society of Surgical Oncology, Colombo, Sri Lanka, Aug 2005</td>
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<td>Myoepithelial Cells and Breast Cancer</td>
<td>IARC Congress, Lyon, Paris, Sep 2005</td>
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<td>Molecular Pathology of Breast Cancer</td>
<td>Cancer Collaborative Group Seminar, PA Hospital, Brisbane, Oct 2005</td>
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<td>Pathology of Familial Breast Cancer</td>
<td>Wesley Breast Clinic, Brisbane, Oct 2005</td>
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<td>Epithelial Cells from Normal Lobes Versus DCIS</td>
<td>From Gene to Cure Conference, Amsterdam, Netherlands, Feb 2006</td>
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<td>Molecular Pathology of Breast Cancer</td>
<td>Breast Multidisciplinary Team – Royal Brisbane &amp; Women’s Hospital Dinner, Brisbane, Nov 2005</td>
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<td>Pathology of Familial Breast Cancer</td>
<td>Japanese Society of Pathology, Omiya, Japan, May 2006</td>
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<td>Molecular Pathology of Breast Cancer</td>
<td>Japanese Society of Pathology, Omiya, Japan, May 2006</td>
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<td>Myoepithelial Cell and Cancer</td>
<td>Malta College of Pathologists, Malta, May 2006</td>
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<td><strong>Associate Professor Rajiv Khanna</strong></td>
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<td><strong>T cell perturbations during persistent viral infections</strong></td>
<td>John Curtin School of Medicine, Canberra, ACT, May 2005</td>
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<td>Immune monitoring of HCMV infection in transplant patients</td>
<td>Annual Scientific Meeting of Australian Society for Microbiology, Canberra, ACT Sept 2005</td>
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<td>Designing prophylactic vaccine for HCMV disease</td>
<td>Panacea Biotech, New Delhi, India, Mar 2005</td>
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<td>Invited Valedictory Lecture</td>
<td>Indo-Australian Meeting on Biotechnology, Hyderabad, India, Mar 2006</td>
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<td><strong>Technology Transfer: Vaccine, Diagnostic and Therapeutics</strong></td>
<td>Annual Scientific meeting of Australian Society for Microbiology, Gold Coast, Jul 2006</td>
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<td><strong>Pathogenesis of Hodgkin Lymphoma – Epstein-Barr Virus (EBV) in Hodgkin Lymphoma (HL)</strong></td>
<td>Amgen Hematology Symposium, Sydney, Feb 2005</td>
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<td><strong>Professor Martin Lavin</strong></td>
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<td>Spinocerebellar ataxia, oxidative stress and DNA damage response</td>
<td>Cellular Responses to DNA damage, Copenhagen, Denmark, Aug 2005</td>
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<td>Activation of ATM kinase and downstream signalling</td>
<td>The 2005 International workshop on Ataxia-Telangiectasia, ATM and the DNA damage response, Belgrate, Italy, Jun 2005</td>
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<td>Ataxia telangiectasia and oculomotor</td>
<td>Ataxia 2005, Gold Coast, Nov 2005</td>
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<td>Orion International Technologies</td>
<td>Low Level Radiation Effects Summit, Carlsbad, New Mexico, Jan 2006</td>
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<td><strong>The Radiation Casualty Medical Research Centre</strong></td>
<td>Hiroshima University, Hiroshima, Japan, Feb 2006</td>
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<td>Radiation 2006</td>
<td>University of Sydney, Sydney, Apr 2006</td>
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<tr>
<td>A subgroup of spinocerebellar ataxias defective in DNA damage response</td>
<td>First Genome Dynamics in Neuroscience Meeting, Oslo, Copenhagen, Apr 2006</td>
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<td><strong>Professor Barbara Leggett</strong></td>
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<td>The malignant potential of hyperplastic polyps</td>
<td>Australian Gastroenterology Week, Brisbane, Oct 2005</td>
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<td><strong>Dr Corinne Lendon</strong></td>
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<tr>
<td>Molecular Genetic mechanisms in Alzheimers</td>
<td>Peking University, China, Dec 2005</td>
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<td>Molecular Genetic mechanisms in Alzheimers</td>
<td>Jinan Hospital, China, Dec 2005</td>
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<td><strong>Associate Professor Alejandro López</strong></td>
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<td>A CD40Ligand-responsive population of HLA-DR⁺ immature cells accumulate in the blood dendritic cell compartment of patients with different types of cancer</td>
<td>35th Annual ASI Meeting. Tumour Immunology Workshop, Melbourne, Dec 2005</td>
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<tr>
<td>A population of HLA-DR⁺ immature cells accumulate in the blood dendritic cell compartment of patients with different types of cancer</td>
<td>ASMR National Scientific Conference, Couran Cove, Nov 2005</td>
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<td>Malignant melanoma and its influence on clinical and immunological responses following dendritic cell immunotherapy</td>
<td>Australasian Dermatopathology Society Conference, Brisbane, Aug 2005</td>
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<td>Dendritic cells and breast cancer: A growing hope</td>
<td>CICR, Princess Alexandra Hospital, Brisbane, May 2006</td>
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<tr>
<td>Name</td>
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<tr>
<td>Dr Alex Loukas</td>
<td>A Novel Dendritic Cell mRNA Delivery Strategy for Cancer Immunotherapy</td>
<td>ASMR Postgraduate Conference, Wesley Hospital, Brisbane, May 2006</td>
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<td>Proteins at the host-parasite interface in human helminth infections</td>
<td>ARC/NHMRC Research Network for Parasitology Annual Conference, Melbourne, Jul 2005</td>
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<td>Vaccines against blood-feeding helminths</td>
<td>Federal University of Minas Gerais, Belo Horizonte, Brazil, Sep 2005</td>
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<td>Mice vaccinated with <em>Schistosoma mansoni</em> tetraspanin, Sm-TSP-2 are protected against larval challenge</td>
<td>Schistosomiasis Symposium, Belo Horizonte, Brazil, Sep 2005</td>
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<tr>
<td>Dr Kelli MacDonald</td>
<td>Antigen presentation in GVHD. Dendritic cells in GVHD. RelB translocation within APC is critical for the initiation and maintenance of GVHD</td>
<td>CICR Seminar, Brisbane, Jul 2005; QIMR Diamond Anniversary Symposium, Brisbane, Oct 2005</td>
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<td>Dr Grant Montgomery</td>
<td>SNP typing in human disease genetics</td>
<td>AGRF Special Workshop, Brisbane, Jul 2005</td>
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<td>Basic concepts for DNA analysis</td>
<td>DNA and the Law Conference, Brisbane, Nov 2005</td>
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<td>Finding susceptibility genes for endometriosis</td>
<td>Pan Asia HUGO Conference, Taipei, Taiwan, Mar 2006</td>
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<td>Genetic studies of twinning in sheep and humans</td>
<td>Department of Reproductive Medicine, UCSD, San Diego, USA, Mar 2006</td>
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<tr>
<td>Dr Edward Morris</td>
<td>NKT cells in transplantation</td>
<td>Australian Society of Immunology, Annual meeting, Melbourne, Dec 2005</td>
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<tr>
<td>Associate Professor James McCarthy</td>
<td>Will filariasis control programs lead to anthelmintic drug resistance?</td>
<td>Mectizan Expert Committee, London, UK, Jan 2006</td>
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<td>Anthelmintic drug resistance in humans: what’s the evidence</td>
<td>54th Annual Meeting of the American Society of Tropical Medicine and Hygiene, Washington DC USA, Dec 2005</td>
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<td>Professor Nick Martin</td>
<td>Progress in finding genes for intelligence</td>
<td>Behavior Genetics Association, Storrs CT USA, Jun 2006</td>
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<td>Genetics of melanoma risk factors</td>
<td>Human Gene Mapping meeting, Helsinki, May 2006</td>
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<td>Achievements and prospects in QTL mapping for complex traits</td>
<td>Twin Methodology workshop, Boulder, USA, Mar 2006</td>
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<tr>
<td>Dr David McMillan</td>
<td>Research in Germany: my experience</td>
<td>German Queensland Science and Technology Week, Brisbane, Apr 2006</td>
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<td>Professor Don McManus</td>
<td>Molecular variation in <em>Echinococcus</em></td>
<td>Taeniasis/Cysticercosis and Echinococcosis International Symposium with Focus on Asia and The Pacific, Asahikawa, Japan, Jul 2005</td>
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<td></td>
<td>A vaccine against Asian schistosomiasis</td>
<td>Alternative Routes for Vaccine Design Against Parasitic Diseases. American Society for Tropical Medicine and Hygiene Meeting, Washington DC, USA, Dec 2005</td>
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<td>Australian Society of Immunology, Annual meeting, Melbourne, Dec 2005</td>
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</table>
### Professor Denis Moss

**Moving towards an immunotherapeutic cure for Epstein-Barr virus-associated malignancies**
Third India and Australia Biotechnology Conference, Hyderabad, India, Mar 2006

**Immunotherapeutic options for EBV-associated disease**
Croucher Foundation Advanced Studies Conference, Hong Kong, Jan 2006

**Building a Scientific Career at QIMR**
Annual Post-graduate Students Annual Retreat, Wesley Hospital, Brisbane, Apr 2006

**Moving towards an immunotherapeutic cure for nasopharyngeal carcinoma**
Australian Society of Immunology Annual Conference, Melbourne, Dec 2005

**Prospects for immunotherapeutic control of EBV-associated malignancies – tricky but not without hope**
Gordon Ada Lecture, Melbourne, Dec 2005

**Therapeutic Development and Clinical Research Division**
QIMR/IMB Retreat, Noosa, Jul 2005

### Dr Tamara Pereira

**Mechanisms of Hepatic Fibrogenesis in Paediatric Liver Diseases**
School of Biomolecular and Biomedical Sciences Seminar Series, Griffith University, May 2006

### Professor Peter Parsons

**Induction of senescence by diterpene esters in human melanoma cells**
International Pigment Cell Congress, Washington DC, USA, Sep 2005

### Professor Lawrie Powell

**Iron storage in disease in the Asia-Pacific region**
Asian Pacific Association for the Study of the Liver, Bali, Aug 2006

**My paradigm for a raised serum ferritin level**
Gastroenterological Society of Australia, Brisbane, Oct 2005

**Recent advances in haemochromatosis**
Alfred Hospital Symposium, Melbourne, Mar 2006

### Associate Professor Grant Ramm

**Genesis of Hepatic Fibrosis: Candidate Molecules and Serum Markers in Paediatric Cholestatic Liver Disease**
The Asian Pacific Association for the Study of Liver (APASL) Biennial Conference, Aug 2005

**Role of Serum Markers in Detection and Monitoring Progression of CF Liver Disease**
North American Cystic Fibrosis Conference, Oct 2005

**Hepatic Fibrogenesis: Mechanisms, Markers and Candidate Molecules**
Department of Gastroenterology, The University of Western Ontario, USA, Oct 2005

**Molecular Mechanisms of Hepatic Fibrogenesis**
The Asian Pacific Association for the Study of Liver (APASL) Annual Conference, Mar 2006

**Clinical Complications of Cirrhosis**
The Asian Pacific Association for the Study of the Liver (APASL) Annual Conference, Mar 2006

**Current status of serum markers for hepatic fibrosis**
Brisbane Inter-Hospital Liver Group (BILG) Meeting, Mar 2006

### Dr Peter Ryan

**Strategies and new methodology in dengue vector control**
Institute Pasteur, Ho Chi Minh City, Vietnam, Feb 2006

**Medical research – making a difference to people’s lives**
Mt Crosby-Moggill Lions Club, Brisbane, May 2006

### Dr Chris Schmidt

**Melanoma immunotherapy: a response model**
Australasian Dermatopathology Society, 26th Annual Conference, Brisbane, Aug 2005

**Towards a response model for dendritic cell immunotherapy of advanced metastatic melanoma**
QIMR 60th Anniversary Symposium, Brisbane, Nov 2005

**Towards a response model for dendritic cell immunotherapy of advanced metastatic melanoma**
Australasian Society for Immunology, Melbourne, Dec 2005

**Immunotherapy for Melanoma and Prostate Cancer**
Third Indo-Australian Conference on Biotechnology, Hyderabad, India, Mar 2006

**Cancer Immunotherapy: a response model**
Malaghan Institute, Wellington, New Zealand, Jun 2006

### Dr Tina Skinner-Adams

**Efficacy of HIV protease inhibitors against malaria**
University of Queensland Lecture, Brisbane, Sep 2005

### Associate Professor Sri Sriprakash

**Are commensal streptococci in bad company among their pathogenic relatives?**
Strep-Euro conference, Lund, Sweden, Apr 2006
<table>
<thead>
<tr>
<th>Event</th>
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<tr>
<td>Group G streptococcus - Is it a wolf in sheep’s clothing?</td>
<td>Indian Institute of Science</td>
<td>Bangalore, India</td>
<td>Mar 2006</td>
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<td>Group A streptococcus and avoidance of innate immunity</td>
<td>Indian Institute of Science</td>
<td>Bangalore, India</td>
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<tr>
<td>Are Commensal Streptococci in Bad Company Among Their Pathogenic Relatives? - Ongoing lateral movement of genetic traits (Keynote Address)</td>
<td>National symposium on Recent trends in Streptococcal diseases</td>
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<td>Group A streptococcus and Innate immunity.</td>
<td>Christian Medical College</td>
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<td>Group A streptococcus and avoidance of innate immunity.</td>
<td>James Cook University</td>
<td>Townsville, Oct 2005</td>
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<td>Dr Nathan Subramaniam</td>
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<td>Genetics of non-HFE Haemochromatosis</td>
<td>QIMR Diamond Anniversary Symposium</td>
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<td>Associate Professor Andreas Suhrbier</td>
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<td>Immunostimulatory chemotherapy using local PEP005</td>
<td>The 3rd India Australia Biotech Conference</td>
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<td>Immunostimulatory chemotherapy using local PEP005 from common weed to new topical chemotherapy; necrosis, PKC and immunopotentiation</td>
<td>Peplin Research Forum, Manchester, UK</td>
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<td>Getting IP out of Institutions and into the commercial world.</td>
<td>AusBiotech Biotechnology Summit</td>
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<td>Tribulations and innovations in viral gene therapy.</td>
<td>The 3rd Scientific Meeting of the Australian Virology Group</td>
<td>Phillip Island, Dec 2005</td>
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<td>ABC Documentary and Panel Discussion</td>
<td>Queensland New Innovators, 5th Annual Health and Medical Research Conference</td>
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<td>Dr Sue Treloar</td>
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<td>Dr Jacqueline Upcroft</td>
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<td>Kaletra - an effective anti-trichomonal and anti-giardial agent</td>
<td>International Conference on Anaerobic Proteists, Sardinia, Italy</td>
<td>Sept 2005</td>
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<td>Associate Professor Peter Upcroft</td>
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<td>Genome organisation of <em>Trichomonas vaginalis</em></td>
<td>International Conference on Anaerobic Proteists, Sardinia, Italy</td>
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<td>Dr Patricia Valery</td>
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<td>Cancer in Aboriginal and Torres Strait Islander people in Queensland</td>
<td>Clinical Oncological Society of Australia, Crossing Cancer Boundaries</td>
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<td>Dr Nikki Vickaryous</td>
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<td>An ENU mutagenesis screen for modifiers</td>
<td>Lorne Genome Conference</td>
<td>Lorne, Jan 2006</td>
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<td>Dr Michael Walsh</td>
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<td>Population screening for hereditary non-polyposis colorectal cancer in Western Australia</td>
<td>St John of God Healthcare</td>
<td>Perth, Mar 2006</td>
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<td>Mismatch repair protein immunohistochemistry: applications and pitfalls</td>
<td>Western Australian Clinical Oncology Group</td>
<td>Perth, Mar 2006</td>
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<td>Dr Penny Webb</td>
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<td>Ovarian cancer and the Ovarian Cancer Study</td>
<td>NSW Cancer Council</td>
<td>Sydney, Sep 2006</td>
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Epidemiology of Ovarian Cancer
36th International Symposium of the Princess Takamatsu Cancer Research Fund, Tokyo, Japan, Nov 2005

Molecular Epidemiology of Endometrial Cancer: the Australian National Endometrial Cancer Study (ANECS)

SNPs in gene mapping and population genetics research
AGRF workshop Brisbane, Brisbane, Jul 2005

Estimation of heritability from actual relationships between relatives
Wellcome Trust advanced course in statistical genetics, Oxford, UK, Jul 2005

Gene mapping strategies
Brain Institute, Sydney, Sep 2005

Quantitative Genetic Theory
Advanced Course on QTL mapping, Netherlands, Oct 2005

Estimation of heritability from actual relationships between relatives
2005 Gene Mappers Meeting, Mt Buller, Nov 2005

Future impact – genomics
Sheep Genomics meeting, Sydney, Jul 2005

Dr David Whiteman

Molecular epidemiology at the cross-roads: the intersection of genomics and public health
Australasian Faculty of Public Health Medicine/Public Health Association, Brisbane, Jul 2005

Divergent Causal Pathways to Melanoma
6th World Congress on Melanoma, Vancouver, Canada, Sep 2005

Progress in melanoma and skin cancer
4th Annual American Association for Cancer Research Conference on Frontiers in Cancer Prevention Research, Baltimore MD, USA, Oct 2005

Epidemiology of Barrett’s Oesophagus and Oesophageal Adenocarcinoma
10th Annual Coolum Update in Gastroenterology and Hepatology, Coolum, Jun 2006

Do all melanomas arise through the same causal pathway? Epidemiologic and histologic explorations

Professor Emma Whitelaw

An ENU mutagenesis screen for modifiers
Epigenetics Gordon Conference, New Hampshire, USA, Aug 2005

Swan Song
School of Molecular and Microbial Biosciences, University of Sydney, Sydney, Sep 2005

An ENU mutagenesis screen for modifiers of epigenetic state in the mouse
ARC Centre of Excellence in Biotechnology and Development, 3rd Scientific Meeting, Melbourne, Oct 2005

Epigenetics
Murdoch Children’s Research Institute, Epigenetics Symposium, Melbourne, Oct 2005

Epigenetics and the Environment
2005 Environmental Genomics Meeting, Durham, North Carolina, USA, Nov 2005

Epigenetics
Fetal Basis of Adult Disease, NIEHS Workshop, Durham, NC, USA, Nov 2005

Transgenerational epigenetic inheritance
Department of Biology, University of Toronto, Toronto, Canada, Nov 2005

Transgenerational epigenetic inheritance
Congress on Developmental Origins of Health and Disease, Toronto, Canada, Nov 2005

An ENU mutagenesis screen for modifiers of epigenetic state in the mouse
Sir Mark Oliphant Conference: Epigenetic Regulation in Disease and Development, Canberra, Dec 2005

Epigenetics
CINP/ASPR Australian Society for Psychiatric Research, Brisbane, Dec 2005

An ENU mutagenesis screen for modifiers of epigenetic state in the mouse
Keystone Symposium on Epigenetics, Keysone, Colorado, USA, Jan 2006

Epigenetics and the Environment
International Association for the Study of Obesity Stock Conference, Epigenetics and Obesity, Bangkok, Thailand, Mar 2006

An ENU mutagenesis screen for modifiers of epigenetic state in the mouse
Novartis Foundation Open Meeting, Decoding the Genetic Control of Immune Reactions, Canberra, Mar 2006

Epigenetics and Human Disease
Comparative Genomics Centre, James Cook University, Townsville, Apr 2006

Epigenetics and Human Disease
Queensland Institute of Medical Research, Brisbane, Apr 2006
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<th>Event</th>
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<tr>
<td>Epigenetics and Human Disease</td>
<td>Genetic Resolution of Disease Phenotypes, Epigenetics Workshop, Scripps Research Institute, San Diego, USA, May 2006</td>
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<tr>
<td>Epigenetics</td>
<td>NGED Annual Meeting, Cairns, May 2006</td>
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<tr>
<td>Epigenetics and Human Disease</td>
<td>Human Genome Meeting 2006, Helsinki, Finland, May 2006</td>
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<tr>
<td>Dr John Whitfield</td>
<td>Guidelines for genetic testing: Evidence, issues and evolution</td>
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<td>The challenges of personalised medicine and pharmacogenomics</td>
<td>International Congress of Clinical Chemistry, Orlando, USA, Jul 2005</td>
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<tr>
<td>Dr Michelle Wykes</td>
<td>The challenges of personalised medicine and pharmacogenomics</td>
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<td>The effect of malaria on B cell memory of vaccines</td>
<td>AACC-AACB Conference. Laboratory Medicine into the Future: Planning for Tomorrow’s Technology, Cairns, May 2005</td>
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<td>Why vaccines to malaria may not work!</td>
<td>Australian Society of Parasitology Network Conference, Melbourne, Jul 2005</td>
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<td>The effect of malaria on B cell memory of vaccines</td>
<td>ADCD Meeting, Sydney, Aug 2005</td>
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<td>Immunological impediments to developing a blood stage malaria vaccine</td>
<td>National Institutes of Health, Washington, USA, Mar 2006</td>
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<td>The effect of malaria on B cell memory of vaccines</td>
<td>QIMR Institute Seminar, Brisbane, Apr 2006</td>
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<tr>
<td>Dr Joanne Young</td>
<td>The effect of malaria on B cell memory of vaccines</td>
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<td>Genetics of Serrated Neoplasia</td>
<td>1st Australasian Vaccines and Immunotherapeutics Development Meeting, Melbourne, May 2006</td>
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<tr>
<td>Genetic Predisposition to Serrated Neoplasia</td>
<td>Researchers on the Move Series, Australian Gastroenterology Week, Brisbane, Oct 2005</td>
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<td></td>
<td>Familial Cancer: Research and Practice, Couran Cove, Aug 2005</td>
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</table>
In my 6 years as Chairman of The Queensland Institute of Medical Research Trust I have had the privilege and honour of working with some of the most passionate, motivated and intelligent people in Australia.

These people – the 700 dedicated scientists at QIMR – continually astound me with their zeal for discovery, their boundless enthusiasm for improving human health and their ability to focus on the smallest molecule or cell and to envisage this minute cell within the larger framework of eliminating or reducing the burden of disease.

Visiting QIMR always makes me feel positive and proud of our team of intrepid scientists whose life’s work is not about self-glory or material gain but about the greater good of human kind. In fact a baby born on this day this year will live on average 93 days longer than a baby born on this day last year. This improved longevity is as a direct result of medical research.

I know that our many supporters are as proud of the QIMR team as I am - and it is your donations and support that inspire our scientists to find the vaccines, treatments, cures and diagnostic tests to enable better health and longer lives for us all.

Medical research is about people. People who dedicate their lives to saving the lives of others. People who couldn’t do this without donations from people like you.

QIMR is indebted to all of these people, our friends, many of whom are listed on pages 107-112 of this report, who through individual contributions, fundraising events and bequests have assisted our scientists in the daily battle to defeat disease. Mr Clive Berghofer is one of these people whose contribution warrants a special mention as a result of his unwavering funding which has enabled vital cancer projects to continue, particularly fast-tracking our cutting-edge clinical trials.

To all of our cherished friends who provide donations towards our valuable research, we offer you our sincerest thanks. Every dollar goes directly towards positioning more cancer patients on our trials, purchasing much-needed scientific equipment, and providing us with the ability to pursue innovative research projects, many of which are outlined in this Annual Report.

To those of you who have left a provision in your will to QIMR, I am confident this lasting legacy will ensure that the “constant” of QIMR, following 60 years of research and results and our dedication to human health will continue to provide hope for generations to come.

Finally, a special thanks to those of you who have provided your time, commitment and inspiration to our vision of a “Disease Free World” – particularly the voluntary members of the QIMR Trust and the Development & Marketing team.

Together we are achieving extraordinary achievements everyday.

Paul Wright AM
Chairman
Mr Paul Wright AM FAIM F Fin FAICD (Chairman, QIMR Trust and Deputy Chairman of QIMR Council)

Paul Wright has combined banking, health, hospitality and consulting into 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 (Queensland and Northern Territory) of Medical Benefits Fund 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 the Chairman/President of The Australian Institute of Management and The Royal Flying Doctor Service. He is currently Chairman of The CyberInstitute Pty Ltd and Phoenix Eagle Company Pty Ltd. Other current Board appointments include 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 B Comm BA FCA FAICD

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 and QIMR Personnel Administration Committee.
Mr Ian Manly MBA FAIM
Ian Manly has extensive experience in business management and corporate development. He is the Managing Director of First 5 Minutes Pty Ltd, a company providing fire and emergency procedures and training to the property industry throughout Australia. Mr Manly is also a member of the QIMR Investment Committee.

Ms Jane Seawright BA LLB(Hons) MBus (Marketing)
Jane Seawright is a lawyer with extensive experience in marketing and Strategy. Having worked as a solicitor and run a marketing consultancy for a number of years, she currently practises as a senior corporate and commercial lawyer at Phillips Fox. She is also a Law Society-accredited mediator, and registered adjudicator under the Building and Construction Industry Payments Act 2004. Ms Seawright is a member of the QIMR Marketing Committee.

Mr Richard Joel AM MAICD
Richard Joel was 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 was a Director of Queensland Railways until May 2006. Richard 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.

Sadly Richard Joel passed away on 20 June 2006.

Ms Margot de Groot LLB GradDip (Legal Practice)
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 Dip COM
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)
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. Ms McCormack is a member of the QIMR Personal Administration Committee.
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Wright Gordon & Dawn
Wyborn George
Yarrabee Coal Company Pty Ltd
Your Risk Protection Specialists
## Staff 2005-2006

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

### Deputy Director
A C Green  
AC MBBS MSc PhD  

### Secretary and Chief Operating Officer
M J Staley  
MSc GMQ MBA  
MAACB MACS FAIM  
MAICD  

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

T Checkley  
BAppSc DipBusComm  

J O'Keefe  
BApplSc  

### INFECTIOUS DISEASES AND IMMUNOLOGY DIVISION

#### Division Chair: J McCarthy

### Bacterial Pathogenesis
K S Srirakak  
BPharm MPHarm PhD  

M Binks  
BSc  

C Denham  
BSc(Hons)  
(to Feb 06)  

D McMillan  
BSc(Hons)  
PhD  

J Shera  
BSc(Hons)  

### Bone Marrow Transplantation
G Hill  
BHB MBChB FRCPA  
FRACP MD  

T Banovic  
MD MMedSc  

H Bofinger  
BApplSc(Hons)  

P Bunn  

A Burman  
BSc PhD  

A Don  
BSc(Hons)  

R Kuns  
BSc(Hons)  

K MacDonald  
BSc(Hons) MSc PhD  

N Odorico  
BSc(Hons)  

V Rowe  
TechCertAnimalLabSc  
AdvCertAppSc  

### Cellular Immunology
S R Burrows  
BSc PhD  

M Bell  
BSc(Hons)  

R Brennan  
BSc(Hons)  

J Burrows  
BSc GradDipTeach  

S Silins  
BSc(Hons) PhD  

### Clinical Tropical Medicine
J S McCarthy  
MBBS FRACP MD  

Royal Brisbane and Women's Hospital  

K Andrews  
BSc(Hons) PhD  

N Lee  
BBiotech(Hons)  

L Melville  
BSc BA  

C Pasay  
BS MSc PhD  

### EBV Biology
D J Moss  
BSc PhD  

M Corban  
Biol MBiol  

P Crooks  
BSc(Hons)  

S Cross  
BSc(Hons) MSc DipEd  

J Davis  
BSc(Hons) PhD  

J Duraiswamy  
MSc BVSc PhD  
(to Jan 06)  

K Harej  
RN  

L Heslop  
BBiomedSc  
(to May 06)  

V Lutzky  
MSS PhD  

M Martinez  
DipAssSc  

L Morrison  
CBLT  

A Nehring  
BNurs BSc(Hons)  
(to Sep 05)  

D Tscharke  
BSc(Hons) PhD  
(to Jan 06)  

### EBV Molecular Biology
T B Sculley  
BSc(Hons) PhD  

M Buck  
DipMedTech  

I S Misko  
BSc(Hons) PhD  

### Helminth Biology
A C Loukas  
BSc(Hons) PhD  

S Gaze  
BSc MSc PhD  

J Mulvenna  
BComm BSc(Hons) PhD  

M Pearson  
BSc MSc PhD  

D Pickering  
BApplSc  

M Smout  
BSc(Hons)  

D Smyth  
BSc(Hons) PhD  

M Tran  
BSc PhD  
GradDipClinBioChem  

### HIV Molecular Virology
D A Herrich  
BSc PhD  

A Apolloni  
BSc PhD  

C Herrich  
RN BSc(Nurs)  

D Warrilow  
BSc(Hons) PhD  

N Willemens  
BApplSc(Hons)  

### Immunology and Infection
C R Engwerda  
BAagrPhSc  

F Amante  
BSc(Hons) PhD  

K Clark  
BSc(Hons) (to Dec 05)  

A Haque  
BA(Hons) PhD  

K McSweeney  
BSc(Hons)  

A Stanley  
BSc(Hons) PhD  

Y Zhou  
BMed DipAppSc  

### Immunoregulation
A Kelso  
BSc(Hons) PhD  

A Baz  
BCelim PhD  

K Buttigieg  
BBioTech  

P Groves  
BApplSc  

N Kienzle  
BSc PhD  

S Oliver  
BSc(Hons)  

### Immunovirology
A Suhbrib  
BA(Hons) PhD  

I Annaku  
BSc(Hons) PhD  

D Darnell  
BApplSc MAppSc PhD  
GradDipBiotech  

J Gardner  
BApplSc  

D Hoang-Le  
BSc(Hons)  

E Lambley  
BSc(Hons)  

### Malaria and Scabies
D J Kemp  
FAA BSc(Hons) PhD  

K Anderson  
CBLT  

S Beckham  
BSc  

K Fischer  
PhD  

M Ho  
BSc(Hons)  

S Smith  
BSc(Hons)  

A Topping  
BSc(Hons) (to Feb 06)  

K Trenholme  
BSc MSc PhD  

### Malaria Biology
D L Gardiner  
BApplSc PhD  

### Molecular Genetics
P Upcroft  
BSc(Hons) PhD  

L Dunn  
BSc(Hons) PhD  

J Upcroft  
BSc(Hons) PhD  

### Molecular Immunology
M F Good  
BSc(Med) MBBS(Hons) PhD MD DSc FASM  
FAPHPM FRACP(HON)  

V Anderson  
BSc(Hons)  

M Batzlow  
BSc(Hons) PhD  

L Beattie  
BApplSc(Hons) (to Jan 06)  

J Dyer  
BSc(Hons)  

J Hartas  
BApplSc  

N Huang  
BAgSc DipHortSc  
MApplSc MApplSc  

C Keighley  
MBBS  

X Liu  
BMed MMEdSc  

G Magor  
BSc(Hons)  

V McPhun  
BSc MSc  

C Olive  
BSc(Hons) PhD  

M Pandey  
BSc MSc PhD  

A Pinzon-Charry  
MD PhD  

M Wykes  
BSc(Hons) PhD  

H Xu  
BMed MMEd PhD  

### Molecular Parasitology
D P McManus  
BSc(Hons) PhD DSc  

M Duke  
AssocDipFarmMgmt  

G Gobert  
BSc(Hons) PhD  

M Jones  
BSc(Hons) PhD  

Y Li  
MD PhD  

L Zhang  
BMSc MMSc PhD (to Feb 06)  

W Zhang  
BSc PhD  

### Mosquito Control
P Ryan  
BSc(Hons) PhD  

P Fraley  
BSc(Hons) PhD  

T Hurst  
BSc(Hons) PhD  

J Jeffery  
BSc (Hons) BA  

B H Kay  
AM FAA BSc(Hons) PhD  

K Marshall  
BSc(Hons) PhD  

L Perkins  
BSc(Hons) PhD  

Protein Discovery Centre
J Gorman BSc PhD
B Hamilton BSc(Hons) PhD
M Headlam BSc PhD
T Wallis BSc(Hons) PhD

Tumour Immunology
R Khanna BSc MSc PhD
G Connolly BSc(Hons)
L Cooper BAppSc
t Crough BSc(Hons) (to Jun 06)
U Dua BSc MBiotech
M Gandhi MBChB MRCP MRCPath PhD
C Gastparini BBiomedSc(Hons) (to May 06)
M Rist BSc(Hons) PhD
C Smith BSc(Hons) PhD
J T ellam BSc MSc PhD
R T yagi BSc PhD (to Jan 06)

CANCER AND CELL BIOLOGY DIVISION

Division Chair: KK Khanna

Cancer Genetics
G Trench BSc(Hons) PhD
J Arnold BSc(Hons) PhD
J Beesley BSc(Hons) PhD
X Chen BMed
S Healey BSc DipEd BAppSc
H Holland BHlthSc(Hons) BA
S Johnatty MSc PhD
J Kerr BSc(Hons)
S Manu BSc MMicroBio
A Marsh BSc(Hons)
N Waddell BSc(Hons) PhD

Cancer Immunotherapy
C W Schmidt BSc(Hons) PhD
K Ellern AO BSc(Med) MBBS PhD
X Huang BMed PhD
C Lanagan BBlomedSc(Hons)
N Martinez BSc(Hons) PhD
L O’Connor AssocDegAppSc

Cell Therapy
A J Nicol MBBS FRACP FRCPA PhD (to Dec 05)

The University of Queensland

Dendritic Cells and Cancer
J A Lopez MD

Human Genetics
N K Hayward BSc MScQual PhD
L Aoude BA BEngineer
M Aurent BSc(Hons) PhD
V Bonazzi PhD
R Duncan BAppSc(Hons)
K Loffler BHlthSc BSc(Hons) PhD (to May 06)
D Nancarrow BSc MscQual PhD

L Packer BSc(Hons)
J Palmer RN
S Pavley BAppSc(Hons) PhD
P Schultz
M Stark BAppSc(Hons)
G Walker BSc MScQual PhD
GradiDipClinBiochem
S Walsh (to May 06)

Leukaemia Foundation
A W Boyd BMedSci(Hons) MBBS PhD FRACP

The University of Queensland
J Carter BAppSc(Hons)
K Chen BSc(Med)
J Cox GradDipBiotech
B Douglas BSc(Hons) (to Mar 06)

Membrane Transport
N BSc MSc PhD
Subramaniam L Summerville BSc GradDipClinBiochem

Molecular Cancer Epidemiology
A B Spurdle BSc MSc PhD
S Arnold BSc(Hons)
M Barker BAppSc MSc
G Birney BSc(Hons)
D Buchanan BSc(Hons)
R Byrnes BSc
K Ferguson
L Jackson BSc (to May 06)
L Jaskowski ADCLT
P Lovelock BSc(Hons) PhD
D McKeone AssDip LabTechniques
M Newman (to Nov 05)
M Walsh BSc
J Young GradDipBiotech

Molecular Psychiatry
C Lendon BSc(Hons) PhD
A Pritchard BMedSci(Hons)

QCF Transgenics
G F Kay BS(Sc)BSc(Hons) PhD
S Greco BSc
A Mould BSc(Hons) PhD
I Tonks BSc(Hons) PhD

A Zournazi BSc MAppSc

Radiation Biology and Oncology
M F Lavin BSc(Hons) PhD

The University of Queensland
O Becherel PhD
G Birrell CBT MMEdSc PhD
P Chen BSc MSc PhD
A Farrell NCEA CertAppBiol
M Gatei BSc PhD
N Guven BSc MSc PhD
A Kijas BBiotech PhD
S Koecher BEng
S Kozlov MSc PhD
J Luff CVetNurs/AnCare
C Peng MMed PhD
N Rundle MSc(Hons) PhD (to Nov 05)
R Sirling BSc(Hons)
M Trabi BSc(Hons) PhD
R Woods BSc(Hons) PhD

RBWH Gastroenterology
B A Leggett MBBS(Hons) MD FRACP

Royal Brisbane Women’s Hospital
C Bond BSc (Hons)
J Chia BBiotech(Hons)
S Cozzi BAppSc(Hons)
E Pelzer BA BAppSc
R Price CertVetNurse LabAnimalTechCert (to Jul 05)

Signal Transduction
K K Khanna BSc MSc PhD
E Bolderson BSc(Hons) PhD
K Hobson BSc(Hons)
S Khan DipEd Mphil MSc BSc PhD
L Papp BSc(Hons)
D Richard BSc(Hons) PhD
M Shariﬀ BSc (Hons)
S Tsvetanov MSc PhD
A Urquhart BSc(Hons) PhD
D Young BSc(Hons) PhD (to Dec 05)

POPULATION STUDIES AND HUMAN GENETICS DIVISION

Division Chair: G Anderson

Cancer and Population Studies
A C Green MBBS MSc PhD
B Alexander RN BNursing
D Ayers BInfoTech
J Bain (to Jul 05)
C Baxter BA
S Brown RN BA
R Cicero BA
M Connard BSc(Hons)
T Corish RN
<table>
<thead>
<tr>
<th>Name</th>
<th>Degree(s) and Details</th>
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<tbody>
<tr>
<td>H Croy</td>
<td>BSc BNursing (to Jul 05)</td>
</tr>
<tr>
<td>M Davis</td>
<td>MPH MD</td>
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<tr>
<td>J Doecke</td>
<td>BSc(Hons)</td>
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<tr>
<td>M Dunkis</td>
<td>RN (to Dec 05)</td>
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<tr>
<td>R Dutton</td>
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<tr>
<td>L Green</td>
<td>RN</td>
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<tr>
<td>M Hughes</td>
<td>BS MMedSc</td>
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<tr>
<td>K Ibiebele</td>
<td>BScClinDiet MPH(SocSc) PhD</td>
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<tr>
<td>L Jackman</td>
<td>BSc(BusAdmin)</td>
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<td>D Lincoln</td>
<td>BSc(Hons) MBiostats (to Jan 06)</td>
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<td>V Logan</td>
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<td>C Loos</td>
<td>BAAppSc</td>
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<tr>
<td>T Luong</td>
<td>AssocDipArts/Photography</td>
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<td>M Malt</td>
<td>BBus EN</td>
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<td>A Mapfumo</td>
<td>(to Oct 05)</td>
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<tr>
<td>K Martin</td>
<td>RN BNHlthAdmin</td>
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<td>J Mayhew</td>
<td>RN</td>
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<td>A McMurtrie</td>
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<td>E Minehan</td>
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<tr>
<td>S Moore</td>
<td>RN BHlthSc MPH</td>
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<td>P Moser</td>
<td>BSc RN (to Dec 05)</td>
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<td>S Mott</td>
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<td>C Nagle</td>
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<tr>
<td>S O’Brien</td>
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<td>S O’Keeffe</td>
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<tr>
<td>C Olsen</td>
<td>DipAppScNurs BAAppSc Nurs MEnvironCommHlth BEnvirHlthSc (to Jun 06)</td>
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<td>S Perry</td>
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<tr>
<td>K Quinn</td>
<td>(to Dec 05)</td>
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<tr>
<td>J Ramsden</td>
<td>RDT RDP (to Sep 05)</td>
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<tr>
<td>H Rangappa</td>
<td>MBBS MPH</td>
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<tr>
<td>B Ranieri</td>
<td>AssDipBus (to Mar 06)</td>
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<tr>
<td>A Richards</td>
<td>RN</td>
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<td>D Roffe</td>
<td>BIT BSc</td>
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<td>T Sadkowski</td>
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<td>J Scott</td>
<td>DipNurs BSc</td>
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<tr>
<td>H Shirley</td>
<td>BSc PhD</td>
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<td>V Siskind</td>
<td>RN</td>
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<td>M Steele</td>
<td>RN</td>
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<tr>
<td>A Taylor</td>
<td>RN BHlthSc MHlthPlan MHlthLaw (to Jan 06)</td>
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<td>L Terry</td>
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<tr>
<td>J Thomas</td>
<td>BHlthSc (to Sep 05)</td>
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<tr>
<td>P Valery</td>
<td>BMed MPH</td>
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<tr>
<td>F Walker</td>
<td>RN (to Sep 05)</td>
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<tr>
<td>A Ward</td>
<td>RN</td>
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<tr>
<td>P Webb</td>
<td>MA PhD</td>
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<td>S Webb</td>
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<tr>
<td>J White</td>
<td>RN</td>
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<tr>
<td>D Whiteman</td>
<td>BMedSc MBBS(Hons) PhD</td>
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<tr>
<td><strong>Epigenetics</strong></td>
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<tr>
<td>E Whitelaw</td>
<td>BSc(Hons) PhD</td>
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<tr>
<td>S Chong</td>
<td>BAAppSc(Hons) Phd</td>
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<tr>
<td>J Van Vliet</td>
<td>BSc(Hons) PhD</td>
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<tr>
<td>N Vickaryous</td>
<td>BSc MSc PhD</td>
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<tr>
<td><strong>Genetic Epidemiology</strong></td>
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<tr>
<td>N G Martin</td>
<td>FASSA BSc(Hons) PhD</td>
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<tr>
<td>L Anderson</td>
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<tr>
<td>L Barnes</td>
<td>RN (to Sep 05)</td>
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<tr>
<td>P Barton</td>
<td>BAppSc</td>
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<td>A Baxter</td>
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<tr>
<td>M Baylart</td>
<td>(to Feb 06)</td>
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<tr>
<td>H Beeby</td>
<td>BSc(Hons)</td>
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<tr>
<td>A Birley</td>
<td>BSc MSc PhD</td>
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<tr>
<td>S Brimstone</td>
<td>BA(Hons) MBus MEd</td>
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<td>J Brodie</td>
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<td>K Bunch</td>
<td>BPsych(Hons)</td>
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<td>S Burgess</td>
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<td>M Caffrey</td>
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<td>H Clarke</td>
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<tr>
<td>T Coates</td>
<td>BA GradDipEarlyChild (to Dec 05)</td>
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<td>J Cochrane</td>
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<td>L Connelly</td>
<td>BA(Hons)</td>
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<td>N Cross</td>
<td>BSc(Hons)</td>
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<tr>
<td>T De Dassel</td>
<td>BPsyC(Hons)</td>
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<tr>
<td>M De Nooyer</td>
<td>BSc(Hons) (to Oct 05)</td>
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<tr>
<td>P Dickson</td>
<td>MBBS PhD</td>
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<tr>
<td>D Duffy</td>
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<td>H Egan</td>
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<tr>
<td>A Eldridge</td>
<td>MA (to Mar 06)</td>
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<tr>
<td>R Eyers</td>
<td>BA(Psych)(Hons)</td>
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<tr>
<td>M Ferguson</td>
<td>PhD</td>
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<td>M Ferreira</td>
<td>BA(Hons) MCP</td>
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<td>M Furlong</td>
<td>BA(Hons)</td>
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<td>N Gillespie</td>
<td>BEng(Hons) PhD</td>
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<tr>
<td>S Gordon</td>
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<tr>
<td>M Grace</td>
<td>BSc(Psych)(Hons)</td>
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<tr>
<td>M Grimmer</td>
<td>MS(OccPsych)</td>
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<tr>
<td>T Gunasekera</td>
<td>BSc(Biotech)(Hons)</td>
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<td>N Hansell</td>
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<td>A Hawkins</td>
<td>BSc(Hons) Phd (to Aug 05)</td>
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<tr>
<td>D Healey</td>
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<td>D Hickey</td>
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<td>J Higgins</td>
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<td>F Husband</td>
<td>BSc(Hons) MSc PhD</td>
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<tr>
<td>M James</td>
<td>CertInfoTech</td>
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<td>S James</td>
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<tr>
<td>K Jordan</td>
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<td>L Kelpie</td>
<td>RN (to Sep 05)</td>
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<td>K King</td>
<td>BSc MSc</td>
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<td>C Lazians</td>
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<tr>
<td>M Lee-Smith</td>
<td>BAAppSc(Psych) (to Mar 06)</td>
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<tr>
<td>M Luciano</td>
<td>BPsych(Hons) PhD</td>
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<tr>
<td>S MacGregor</td>
<td>BSc MSc PhD</td>
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<tr>
<td>A MacKenzie</td>
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<td>C Madigan</td>
<td>BNursing BHlthSc (to Feb 06)</td>
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<td>E Mallon</td>
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<tr>
<td>L Matthews</td>
<td>BA(Psych)(Hons) (to Jan 06)</td>
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<td>K McAloney</td>
<td>BCommerse</td>
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<td>S McCoombe</td>
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<td>L McDonald</td>
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<tr>
<td>R McLaughlin</td>
<td>BA(Hons) (to Feb 06)</td>
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<tr>
<td>J McPhee</td>
<td>AssocDip CommunityRec (to Feb 06)</td>
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<tr>
<td>A McRae</td>
<td>BSc(Hons) PhD</td>
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<tr>
<td>S Medland</td>
<td>BA(Psych)(Hons) (to Feb 06)</td>
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<tr>
<td>L Nunn</td>
<td>DipTeaching</td>
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<tr>
<td>D Nyholt</td>
<td>BSc PhD</td>
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<tr>
<td>W O’Connell</td>
<td>(to Sep 05)</td>
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<tr>
<td>M Okello</td>
<td>BA P/GradEd P/ GPedSocPlan&amp;Develop (to May 06)</td>
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<tr>
<td>D Park</td>
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<td>H Park</td>
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<td>C Pink</td>
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<td>F Price</td>
<td>BA</td>
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<td>I Putnoki</td>
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<tr>
<td>C Redfern</td>
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<td>M Reilly</td>
<td>(to Mar 06)</td>
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<td>D Reynolds</td>
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<td>J Rosa</td>
<td>(to Nov 05)</td>
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<td>L Ryan</td>
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<td>L Saegck</td>
<td>BA GradDipHlthProm MHlthSc (to Nov 06)</td>
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<td>D Statham</td>
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<td>V Stringer</td>
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<td>L Sullivan</td>
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<tr>
<td>H Taylor</td>
<td>(to Feb 06)</td>
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<td>V Thomas</td>
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C McNally
K Moran
L Sanderson  DipAppSc (to Dec 05)
M Stromberg
Human Resources

HR Executive
N Green  BBus(HRM) MBA
HR Officer
L Lane
HR Assistant
M Anderson  CertBus

Business Development
Executive
T Myott  BAgSc PhD
Assistants
D Cann  BSc
J Fox  BSc PhD
R Osborne  (to Aug 05)

Regulatory Affairs
Executive
A Mitchell  BSc(Hons) PhD
Administrative Officers
J Chow  BA  BSc  MPH
M Griffiths  RN  BPsych
N Fielding  Cert Workplace Training DipAppSc
BSc(Hons) (to Apr 06)

Scientific Services
Manager
JA Cooper  BSc  MSc  PhD
GCertMgt
Sequencing and Synthesis
M Edmundson  BSc  MSc
P Collins  BSc(Hons)
Flow Cytometry
G Chojnowski  BAppSc
P Hall  BSc
Histotechnology
SH Park  DipClinPath
Animal Services
S Cassidy  CLabAnCare
N Felder
C Groennou
C Kerwick  BSc  MACVS (Animal Welfare)
R Lee  BBus
M McNees  CertAnimalCare
E Skevos
M Vandeleur
S Whitman  CLabAnTech
C Dickos  CerLabCare  AssDipAppSc
S Greene  Cert Companion Animal Services (to Jun 06)
A Hale
S James  Cert Companion Animal Services Cert Childrens Services
A O’Regan  Cert Companion Animal Services
J Sutton  (to Apr 06)
Media
L Jones
Glassware
G Cuthbert  BNurs
V Matthews
L Thompson
S Watkins
Store
S Wood
M Eaton
A Girle
T Kent
M McCade
Building and Security
Manager
A Stockman  HND (Elec Eng) HTC
(Plant)
Workshop
M Bugden  TradeCert(Refrig)
J-P Fahnren  CKennel/CatPrac
A McKee  AssocDipElectEngineer
G Madders
B Meyers
D Patrick  AssocDipElecEngineer
R Tyrrell  EngFitter
Safety
Safety Manager
H Leonard  BSc  MSc  PhD
Safety Officers
G Lawrence  MBBS  FRACP  MD  FAFPHM
T Murphy  BSc  MSc
Information Technology
Chief Information Technology Officer
C Ward  ADAB  MACS
GradDipCommComp
Computing Services
M Feodoroff  Blnf
D James
S Jareczuk  BBio1Sc MCP CAN
D Johnstone  DipInfoTech
P Kaim  BAAppSc
M Kersting
X Lin  BEng  MEng  PhD
A Nutley-Govaerts  BAAppSc
L Ward  BlInfoTech
Library
J Ho
R Caperon
Graphic Support
H Matthews  BA  CertPhotography
I Anderson  BlInfoTech(Hons) (to Apr 06)
S Sculley  (to Aug 05)

Development and Marketing
Director
M Lagana  BBus(PR)
AssocDipSocSc
General Manager
C Borthwick  BBusComm RN (to Jun 06)
Office Manager
H Carroll
T Reddcliff  (to Sep 05)
Senior Development and Marketing Officer
M Elliott
Development and Marketing Officer
S Millman  DipMktg BBusMktg
Events Manager
E Waites
Bequest Officers
M Gray  RN
B Hein
J Stockman
Media Relations Officer
F Beltran  BBus
Personal Assistant to Director
D Krha
Parasitology Network Officer
C Johnson  BBus(PR)
VISITING SCIENTISTS
Infectious Diseases and Immunology Division
P Bartley  BMedSc MBBS
M Green  BBiomedSc
C Hirunpetcharat
L Hugo  BSc(Hons) PhD
C Hyland  BSc  MSc  PhD
S Jiang  BSc  MSc
A Khromykh  BSc  PhD
A Lenarchyk  BSc(Hons) PhD
Y Liu  BA (to Dec 05)
J Mackenzie  BSc(Hons) PhD  FASM  FACTM (to Feb 06)
L Mateo  BSc  MSc (to Apr 06)
R Moqbel  BSc  MSc  PhD (to May 06)
T Ngo  (to Jul 05)
M Pender  MBBS FRACP MD
G Raso  MSc  Phd
D Shanks  BSc  MD  MPH
T Skinner-Adams  BSc(Hons) PhD
T Spielmann  MSc  PhD
F Teuscher  PhD
G Ulett  BBioSc(Hons) PhD
L Wen  BM  MSc (to mar 06)
G Williams  BSc(Hons) MSc  PhD
J Wilks  GradDipLegalPractice LLB(Hons) PhD
BA(Hons)
M Woods  MD  MPH (to Jan 06)
Cancer and Cell Biology Division
G Brooke BSc(Hons) PhD
M Bryant MBBS
M Burger BSc(Hons) PhD
R Buttenshaw CertChem
J Catto MB ChB FRCS Phd
R Clark BSc(Hons)
C Clarke BA(Hons) PhD
A Cook BSc(Hons)
M Cummings MBBS FRCPA PhD
L Da Silva MD
M Fabbro BSc(Hons) PhD
C Filippich BAppSc
J Fleming PhD
F Gardiner MBBS FRCS FRACS MD
D Gotley MBBS FRACS MD PhD (to Dec 05)
M Hamilton MBChB MRCP MRCGP
H Handoko BSc MSc PhD
A Jones BSc MResBiotech (to Oct 05)
P Keith BSc MPhil
S Lakhani BSc(Hons) MBBS MRCP MD FRCP
J Larsen BSc(Hons)
P Masci BSc Biochem
N Matigan BSc(Hons)
B Mowry MBBS BA(Hons) FRANZP MD
S Parry BSc(Hons) MSc
O Ramuz BSc MPhil
K Roper BSc PhD
H Smith BSc
A Sofronis BSc(Hons) MSc (to Aug 05)
L St Pierre BAppSc(Hons) PhD
A Sutherland BSc(Hons) PhD (to Dec 05)
F Tomlinson MDFRACS PhDMBBS(Hons)
CH Vo (to Jul 05)
D Walker BMEdSc MBBS(Hons) PhD
P Hall MBBS FRCPA FC
A Heath BA PhD
M Kedda BSc(Hons) PhD
L Kelly MBBS FRACR (to Dec 05)
P Lewindon MBBS MRCP FRACP
M Lungskey BSc(Hons) MSc PhD
G MacDonald MBBS FRACP
D Mackey BP Madden BS MS PhD
E Nelson BA MD
S BSc Nightswander-Rempel
G Radford-Smith BAEdSc MBCh PhD
D Reed BSc PhD
J Smith BSc PhD
R Sturm BSc(Hons) PhD
R Todd BA PhD
J Van der Pols BSc MSc DipScComm PhD
P Welburn (to Dec 05)
J Wicks BSc(Hons) MA BEcon (to Dec 05)
I Wood BSc BE(Hons) Phd

Therapeutic Development and Clinical Research
A Bosman BSc
B Dumevska DipHlthSc
J Harrison BAEdSc
L Kravets BSc
T Peura MSc BSc PhD

Population Studies and Human Genetics Division
K Andreyasen BDS MDS MPH (to Aug 05)
R Alati GradDip BD(Hons) MAppSc PhD
J Aylward BSc MSc PhD
C Bain BSc MBBS MPH MS
M Beaton BSc(Hons) MD
T Blackson BA MA PhD
W Chen BMEd MedMammology
Z Clavarino BA(Hons) PhD
L Fletcher BSc(Hons) PhD
M White
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<td>K Wynn</td>
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<tr>
<td>Y Yang</td>
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Research Students at QIMR as at 30 June 2006
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<td>V Clements</td>
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<tr>
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<td>E Morris</td>
<td>BMedSc MBBS(Hons) MRCP</td>
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<td>MD Scholar</td>
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<td>G Trench</td>
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<td>BA (Psych)</td>
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Our Location

Compilation and Design
Jann O’Keefe

Staff photographs
Heather Matthews
Madeleine Kersting

Printing
IPG Print