

## From the Director

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

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

### Some Research Highlights

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

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

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

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

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

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

In the Genetic Epidemiology Laboratory, collaborative research with the Royal Prince Alfred Hospital on the influence of genes on alcohol consumption and dependence revealed that although these two factors are closely related, variation in long-term alcohol intake is almost entirely due to genetic differences, indicating that some people are born with an increased risk of developing alcohol-related

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problems. The laboratory has also identified a major gene for migraine on chromosome 5 and regions for IQ on chromosomes 2 and 6.

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

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

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

Two new laboratories were welcomed into the Institute during the year. Dr Qin Cheng, a long-term collaborator in the Infectious Diseases and Immunology Division, now heads the Malaria Drug Resistance and Chemotherapy laboratory, based at the Army

Malaria Institute at Enogerra. In October 2004, Professor Sunil Lakhani took up an appointment with The University of Queensland and is now head of the Molecular Pathology Laboratory at QIMR. The Population Studies and Human Genetics Division also welcomed Professor Peter Visscher into its ranks this year, an internationally renowned quantitative geneticist from the University of Edinburgh.

### **Awards and Achievements**

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

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

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

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

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

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

also engaged during the year, in a position funded by the Australian Centre for International and Tropical Health and Nutrition.

### **Grants and Funding Success**

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

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

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

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

cancer seminars in all the major centres along the route and the event raised significant funds for skin cancer research.

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

The Institute is extremely grateful for the continuing support of Atlantic Philanthropies, Mr Clive Berghofer and the very many other donors, both large and small, whose generous contributions to QIMR progress the cause of medical research in Queensland by no small measure.