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The Mater Medical Research Institute is a world-class medical research institute conducting research that is aimed at improving health care.

A cornerstone of our research is studying the body and its natural repair and defence mechanisms, in order to develop ways to help the body fight disease. Each discovery is an important step towards the cure for illness and disease in men, women and children everywhere by developing better diagnosis and treatment.

The Mercy mission includes compassion and lack of prejudice, and MMRI has an obligation to ensure that our research has clinical meaning and fulfils a fundamental aim to relieve suffering.
I regret to have to record the departure of Professor Derek Hart, our founding director, and wish him the best of luck in the future. The performance of MMRI over the ten years with Derek at the helm was outstanding and a number of scientists’ careers were molded at MMRI during this time. Our activities highlight the importance of collaboration to the advancement of research. One of the features of MMRI’s activities during these years has been its partnership with the University of Queensland, Queensland University of Technology and the State Government in developing the $350 million Translational Research Institute. After three years of planning, construction will commence in 2010. This significant project is designed to develop synergies between the biomedical research of each of the partners. Another important achievement has been through our participation in the Cooperative Research Centre for Biomarker Translation which has seven other partners including Mater Health Services. With the assistance of Deputy Director Topaz Conway we progressed several important CRC projects, especially in graft versus host disease.

From a board perspective, I would like to thank Professor Peter Brooks, who stepped down during the year, for his contribution. We welcomed two new directors, Professor Brandon Wainwright and Professor David McIntyre, both of whom bring a wealth of experience and knowledge to their role.

To look forward, the future of MMRI is exciting. New director Professor John Prins has already well established his mark through a number of initiatives. Included among these is the greater integration with research carried out throughout the Mater hospitals, ensuring that the owners of MMRI (the Sisters of Mercy, Brisbane and the Mater Health Services) continue to realize their vision through the activities of MMRI.

Professor Ian Zimmer
Chairman
In opening this report, I acknowledge the enormous contribution made by Professor Derek Hart, the inaugural and previous Director of MMRI, to the strength and status of the Institute and for establishing such a strong platform for the future.

As CEO and Director of the MMRI since October, my aim is three-fold. First, we must maximise the opportunity of our location in a vibrant and world class clinical campus by fully integrating our research activities with clinical care in paediatric, maternity and adult patients. Second, we need to take advantage of enormous collaborative opportunities within this city, but also throughout Australia and internationally. Third, we need to continue our rates of success, expansion and to pursue the Mercy values.

To this end, we have begun to integrate the strong research activities in Mater Children’s, Mater Mother’s, Mater Adult and Mater Private hospitals with those of MMRI with a view to an integrated research effort bridging basic science through to patient care. Existing research programs range from studies of how the placenta influences child and adult health through investigation of the causes of intellectual impairment and psychological dysfunction, treatment for cancers, maximising outcome of bone marrow transplantation to causes and treatments of brain tumours. The range of research activities is wide, and we need to organise, facilitate and nurture these activities to maximise efficiency, productivity and patient benefit. As a clinician and researcher it is apparent to me on a daily basis that we have much room for improvement in patient care, and our research is aimed to help address this deficiency.

In parallel, we are moving to integrate our activities more closely and efficiently with Universities and Research Institutes – best exemplified by the Translational Research Institute – to improve productivity by collaboration and, in the final analysis, to reduce disease burden.

The Mercy mission includes compassion and lack of prejudice, and MMRI has an obligation to ensure that our research has clinical meaning and a fundamental aim to relieve suffering. In many cases Health Care is compromised not by lack of knowledge but by lack of availability/access or implementation of appropriate therapy. In view of this, in parallel with the activities of the Mater Hospitals, the MMRI plans to extend its research into health care delivery with a view particularly to benefit the less privileged and less fortunate.

Furthermore, we cannot consider research in isolation. It must progress hand in hand with education – of scientists, health care professionals, patients, healthy children and adults – and it must inform, and be informed by, patients within the Mater hospitals and elsewhere. This is a responsibility that we do not take lightly.

Finally, I wish to thank the MMRI staff and Board, the Mater Foundation, the Mater Health Services and the Sisters of Mercy for their terrific and warm welcome to me, for their support and for their shared vision of improved patient outcome through research. I also wish to convey thanks to those that have donated time and/or money to support medical research on the Mater campus – we are working hard to ensure that your generosity will benefit patients now and into the future.

Professor John Prins
CEO/Director
Message from Sisters of Mercy

The Sisters of Mercy have had a long-standing commitment to research as an integral part of their health related services. Today we can be justly proud of the Mater Medical Research Institute which has grown into a world-class facility conducting internationally recognized research, and attracting leading scientists from around the world.

The Sisters of Mercy

The Sisters of Mercy have had a long-standing commitment to research as an integral part of their health related services. Today we can be justly proud of the Mater Medical Research Institute which has grown into a world-class facility conducting internationally recognized research, and attracting leading scientists from around the world.

2009 has been a year of scientific achievement, change and growth for the Mater Medical Research Institute. We farewelled the founding Director, Professor Derek Hart, who had lead the Institute from its inception in 1998. The foundation years of a new organisation are often the hardest, and I acknowledge Prof Hart’s contribution and scientific achievements.

2009 also saw the delivery of the Kiel /Williamson strategy report. This report was commissioned to identify ways to further improve research on the wider Mater Campus, and to examine the merits of integrating those diverse clinical research activities with the work of the MMRI. The report was adopted enthusiastically by the Mater Health Services Board and the MMRI Board.

The aim of these initiatives is to drive greater collaboration and integration of research initiatives across the Mater campus by bringing clinicians and researchers together into one organisation. Thus it is proposed to bring together under the MMRI umbrella areas such as the Mater Mothers’ Research Centre and Mater Children’s Hospital Research, and to improve the administration of all research on campus by integrating the

Mater Research Support Centre with the administrative services of the MMRI.

A major step forward for MMRI and the Mater campus research strategy was the appointment of Professor John Prins as CEO/Director. John is a distinguished researcher, respected clinician and has an excellent record of collaborative leadership in research. John was a member of the Scientific Advisory Committee for the MMRI and hence has had a ‘running start’ in taking up the role of Director.

On behalf of Mater Health Services, may I extend my thanks to the MMRI staff for their outstanding research achievements, and for their patience as the MMRI and MHS research communities merge. I am confident the outcome will be substantially greater than the sum of the parts. I would also like to thank the members of the MMRI Board for their time, insight, diligence and leadership in the governance of this fine Institute. The work of the MMRI continues to be of substantial benefit to the health care of Mater patients, to clinicians, students and educators on the Mater campus, as well as making a material contribution to the health of the international community through published research.

John O’Donnell
Chief Executive Officer
Mater Health Services

Sisters of Mercy
MMRI would like to thank Professor Peter Doherty and the Hon Peter Beattie for their continued support and position as Patrons for the organisation.

Thank you

1. Peter Beattie
2. Professor Peter Doherty

1. Professor Ian Zimmer (Chair)
2. Dr Carrie Hillyard (Vice Chair)
3. Professor Peter Brooks (resigned April 2009)
4. Sister Deirdre Gardner
5. Professor Geoff Kiel
6. Dr John O’Donnell
7. Mr Jim Walker, AM
8. Professor Brandon Wainwright (appointed February 2010)
9. Professor David McIntyre (appointed February 2010)
Members of the MMRI Ltd (Sister of Mercy & Mater Health Services)

Audit & Risk Management Committee

Scientific Advisory Committee

Director/CEO

Deputy Director (Operations)

Deputy Director (Development)

Research Support Services

Research Support Services

Immunotherapy Research

Mater Children’s Research

Biotherapy Research

Mater Mothers’ Research

Mucosal Diseases Research

Remuneration Committee

Executive Leadership Team

Marketing, Philanthropic & Commercialisation Services
Supporting our Research

2009 marks the end of an era for the management of the institute with Professor Derek Hart’s directorship coming to an end after the first ten years of the institute’s life. We are grateful to Professor Hart for his labours during this period. The incoming director, Professor John Prins has already made an impression, especially in our interactions with researchers on the wider Mater campus.

Expansion of research and funding

The Institute’s scientists are very successful in attracting competitive funding from Australia and overseas. Research grants do not fully cover the indirect costs associated with research: shared equipment, building maintenance, commercialisation and intellectual property costs, financial services, human resource management, research management, information technology and administrative support. As we expand both our scope across the Mater campus and add to our facilities through initiatives such as the Translational Research Institute, the demands increase. It is estimated that it costs an extra 60 cents for every research dollar to sustainably support research.

The gap is funded from a mixture of resources including the State and Federal Governments and from commercialisation but by far the largest supporters are our partners, the Mater Health Services and the Mater Foundation. Given the effects of the global economic crisis to sustain and expand our level of research, the institute is not only becoming increasingly reliant on the ongoing support of our generous benefactors but is acutely aware of the need to expand our funding base. This will be a continuing priority for the future of the institute.

Thank you

A/Prof Mark Bowles
The past year has brought a lot of changes to the MMRI, including the arrival of our new CEO and Institute Director, Prof John Prins, and the exciting challenge of growth and integration with the research across all of Mater Hospitals.

In the commercial world, investors and development companies were cautious, but the MMRI was fortunate to have two strong relationships with external companies, interested in funding some key scientific areas.

The first involves the work in the Haematopoietic Stem Cell (HSC) Team and their work around a specific mechanism affecting the ability of stem cells to recover after high dose chemotherapy. This work has been largely funded by a US biotech company. The relationship has produced exciting and promising data.

The second partnership established this year involved TransBio, the holding company of the Co-operative Research Centre for Biomarker Translation (CRC-BT), of which MMRI is a partner. This collaboration involves taking our current dendritic cell work around Graft vs Host Disease (GvHD), and funding a full program to take this forward as quickly as possible, to a potential therapeutic application. This relationship has been key to conducting a large body of research currently underway at MMRI and the ability to maximise our resources. This work gives us great hope for addressing this devastating disease.

The other great achievement for MMRI was the completion of our first Phase 1, prostate cancer vaccine Clinical Trial. This safety trial was successfully completed in early 2009, and the results are currently being evaluated. The trial involved a vaccine which provides the necessary elements to instruct the body’s own unresponsive immune system to attack prostate cancer cells. This technology is very exciting worldwide, and we are hopeful that new therapy from a US company will potentially be available overseas, utilising a very similar technique.

I wish to thank my dedicated teams for their hard work, and support throughout the year. Additionally, I am indebted to the partners I have worked with and gained their very real support for the incredible work that is being done at the MMRI.

Thank you

Topaz Conway
The Cooperative Research Centre for Biomarker Translation (CRC-BT) is a world leading collaboration of seven national and international medical research, health and biotechnology bodies. The Cooperative Research Centres (CRC) Program is an Australian Government funded initiative which aims to boost world-class research and turn Australia’s scientific innovations into successful new products, services and technologies, making our industries more efficient, productive and competitive.

The aim of CRC-BT (trading as TransBio Ltd) is to develop antibodies against therapeutic and diagnostic targets (biomarkers) that are present on cells that play a key role in major diseases, including autoimmune disease (especially rheumatoid arthritis) and cancers (haematological, colorectal, breast and prostate).

Outputs from the CRC-BT will transform the management of these diseases through the development of specific and sensitive diagnostic tests and new therapeutics associated with novel cell surface molecules, which we refer to as “Membrane Biomarkers”, identified on cancer cells and human white cells.

Successful projects of the CRC-BT could have the potential to reduce the overall cost of the treatment and management of diseases such as autoimmune, cancer and transplantation by $50 million a year.

By 2018, through the clinical use of the therapeutic agents and diagnostic tests that are developed, the CRC-BT will provide a training platform to medical staff that use these new therapies and tests.

In addition to the two pre-existing dendritic cell focused projects with the CRC-BT, MMRI is now establishing an important therapeutic antibody development project for future clinical use in the prevention of graft versus host disease in allogeneic haematopoietic stem cell transplantation. Unlike current therapies, this new antibody treatment does not compromise the graft versus leukaemia effect and immunity to infection.
Mucosal Diseases Program

Program Head: A/Prof Mike McGuckin

Mucosal diseases arise in the epithelial tissues that separate our bodies from the often hostile external environment. These tissues are common sites of infection (influenza, the common cold) which often develop debilitating inflammation (inflammatory bowel diseases, asthma). After a long period of insult, cancers may develop in these tissues.

The aim of the Mucosal Diseases Program is to study these diseases with a view to preventing them and improving current treatments. The Mucosal Biology and Inflammatory Bowel Disease teams work closely together on basic science and translational research projects with a particular emphasis on gastrointestinal infection, inflammation and cancer.
Summary
The Mucosal Biology Team is investigating the biology and clinical applications of a family of genes/proteins known as mucins. We have shown that mucins are a critical component of the barrier to bacterial and viral infection and that mutations in mucin genes can lead to inflammatory disease. Currently our goal is to increase our understanding of the mucosal barrier that separates the body from the outside world. Specifically: how it keeps bacteria from infecting the body, how inappropriate inflammation is initiated causing chronic disease, and how this chronic inflammation leads to cancer.

Projects:
- Characterisation of the role of cell surface and secreted mucins as fundamental components of the mucosal barrier to infection.
- MUC2 misfolding, endoplasmic reticulum stress in goblet cells and inflammatory bowel disease.
- Examination of the role of cell surface mucins in regulating growth and metastasis in adenocarcinomas.
- New therapeutics for Inflammatory Bowel Disease (IBD).
- New diagnostic tests for ovarian cancer.
- Characterising mucins and inflammation in chronic respiratory disease.

2009 highlights:
- In 2009 we published a major study showing how cell surface mucin shedding from the cell surface acts to prevent bacteria from infecting cells. This work could explain why some individuals are more susceptible to mucosal infections and was published in the international journal PLoS Pathogens.
- Ryan Partlett was awarded his PhD for ovarian cancer research.
- Awarding of new NHMRC project grant to Raj Eri for his intestinal inflammation studies.

Goals for 2010:
- Completing our studies showing how local immune factors regulate ER stress in intestinal secretory cells.
- Testing new ER stress modulating drugs to treat intestinal inflammation.
- Further characterisation of how cell surface mucins modulate immunity to mucosal pathogens.
- Showing the mechanism by which the hormone ghrelin dampens intestinal inflammation.
- Completing the prospective clinical trial of our ovarian cancer diagnostic test.
MUCOSAL DISEASES PROGRAM: INFLAMMATORY BOWEL DISEASES (IBD) TEAM

Team Leader: Prof Tim Florin
(Supported by NHMRC)

Program Head: A/Prof Mike McGuckin

Team Members:
Dr John Duley, Senior Lecturer UQ Pharmacy
Dr Chin Wen Png, Research Officer
Dr Rohan Lourie, PhD Student and Pathologist,
Mater Pathology Services
Dr Iulia Oancea, PhD Student
Ms Rachel Adams, Research Assistant
Mr Indrajit Das, PhD student shared with Mucosal Biology Team
Ms Sharyn Tauro, Finishing PhD student shared with Mucosal Biology Team
Mr Chad Heazlewood, Finishing PhD student shared with Mucosal Biology Team

Summary
IBD are chronic inflammatory diseases of the intestine. There are two main types: ulcerative colitis and Crohn’s disease. These diseases can be devastating, often affecting young patients. They also cause a large burden on the Australian economy. The Mater Health Services is a clinical centre of excellence in IBD. Our centre has the largest number of IBD patients north of Melbourne and south of the Brisbane River, with over 1200 patients.

Projects:
The IBD team conducts laboratory research into the underlying causes of ulcerative colitis and Crohn’s disease, and translation of our findings into improved treatment and management of the diseases. We have a national and international reputation for our novel work at the forefront of understanding and treating IBD.

- The role of secretory cells in the pathogenesis of ulcerative colitis and Crohn’s disease.
- Joint projects with the Mucosal Biology team to assess novel treatments directed at reducing endoplasmic reticulum stress in secretory cells.
- The better use of thiopurine drugs. These drugs are the mainstay of IBD treatment because they work and are economical. The quest is to make them work more often because a sizeable number of patients do not respond to them or are intolerant of them.

2009 Highlights:
- Completed a project on the role of bacteria that break down the mucus barrier. We hope to publish this work this year.
- Chin Wen Png gained his PhD in October 2009. He is now a post-doc in our lab.
- Published a study about the novel combination of an anti-inflammatory and a thiopurine drug.
- First time, a model of thiopurine-related veno-occlusive liver disease (6TG-VOD). The aim of this project is to understand 6TG-VOD and potentially lead to safer and more effective treatments at a reasonable cost to the health budget. This was funded in part by the Mater Hospitals’ JP Kelly Fund and the Queensland Crohn’s and Colitis Association in 2009. We have attracted Queensland Cancer Council funding for 2010-11.
Program Head: Dr David Munster

The MMRI Immunotherapy Program aims to generate, understand and deliver immunological solutions to human health problems.

The immune system is central to defence against infection and cancer, but it is also responsible for autoimmune diseases, transplant complications and some cancers. White blood cells are key components of the immune system, including T cells that kill cancerous and infected cells, B cells that make protective antibodies and dendritic cells (DC) that control these and other immune cells.

MMRI Immunotherapy Program scientists are world leaders in human DC research, and are currently investigating DC and other immune cells with the hope of providing improved immune based therapies for patients with cancer or unwanted immune responses.

Research in the Program is carried out by five teams:

- Dendritic Cell Cancer Team
- Dendritic Cell Immunoregulation Team
- Bone Marrow Transplant Team
- Dendritic Cell in Multiple Myeloma and Diabetes Team
- Dendritic Cell Antigens Team
DENDRITIC CELL ANTIGENS TEAM

Team Leader: Dr David Munster

Team Members:
Dr Xiaosong Liu, Senior Research Officer
Ms Anna Palkova, Research Assistant
Ms Therese Seldon, PhD Student

Summary
The MMRI DC Antigens Team is discovering and developing new DC based therapies.
As DCs are involved in many aspects of immune function, the team’s work can potentially impact on numerous diseases and conditions.
Current work is directed toward a serious complication of bone marrow transplantation called Graft versus Host Disease (GVHD).

Projects:
• Therapeutic anti-DC antibody development – CD83.
• Human-(NOD-) SCID mouse models of GVHD and leukaemia.
• DC surface antigen discovery by phage display.

2009 Highlights:
• Developed CD83 antibodies that target activated DC, one of which shows promise as a therapeutic for GVHD.
• Adoption of our CD83 therapeutic antibody project by the Cooperative Research Centre for Biomarker Translation (CRC-BT).

Goals for 2010:
• Demonstrate that CD83 therapeutic antibody treatment for GVHD does not compromise immunity to infection or the desired graft vs. leukaemia effect in bone marrow transplantation.
• Develop more and better CD83 antibodies to maximize the chances of developing a useful therapeutic for bone marrow transplant patients.
Summary
The Dendritic Cell (DC) Cancer Team aims to understand fundamental human DC biology that is essential for the development of new vaccines.

Immunotherapy, using the patient’s own DC instructed in the laboratory to initiate and direct anti-cancer immune responses, is a new non-toxic strategy which has the potential to treat a variety of malignancies and infectious diseases.

The complexity of DC subsets and their specialised functions is only just beginning to be revealed. The clinical translation of this data is limited by the lack of knowledge about human DC subsets.

Our goal is to identify the human DC subset(s) responsible for inducing anti-cancer immune and anti-viral immune responses. This will allow us to develop more potent and specific vaccines by developing technologies to target the most appropriate DC subsets directly in the laboratory.

Projects:
• Function of human blood DC subsets.
• Kallikrein 4 as a novel antigen for prostate cancer immunotherapy.

2009 Highlights:
• Developed methods to isolate rare dendritic cell subsets and study their function for the first time. Importantly, we demonstrated a role for one of these subsets in the induction of anti-tumour and anti-viral immune responses.
• Validated kallikrein 4 as a good candidate antigen for a potential vaccine to prevent prostate cancer with potential in ovarian cancer.

Goals for 2010:
• To investigate the mechanisms which allow particular human dendritic cell subsets to initiate potent anti-tumour and anti-viral immune responses. To exploit this knowledge to develop more potent vaccines.
• To further improve the technology that would allow us to use kallikrein 4 as a treatment for a range of hormone dependent cancers.
DENDRITIC CELLS IN MULTIPLE MYELOMA AND DIABETES TEAM

Team Leader: Dr Slavica Vuckovic

Team Members:
Dr Frank Vari, Senior Research Officer
Mrs Dalia Khalil, Research Assistant
Ms Melinda Dean, PhD Student

Summary
The Dendritic Cells in Multiple Myeloma and Diabetes Team is investigating the biology of dendritic cells (DC) in multiple myeloma and type one diabetes mellitus and applying this knowledge to switch on immune responses in multiple myeloma and switch off unwanted autoimmune responses in type 1 diabetes mellitus.

Projects:
• Monitoring cytotoxic alloreactive T cell responses in myeloma.
• Defining paracrine mechanisms used by myeloma-produced vascular endothelial growth factor (VEGF) to regulate human DC biology by employing molecular and functional approaches.
• Defining whether defects in innate and adoptive immunity is primary to type one diabetes mellitus by immune profiling of blood cells in children with the disease, at-risk family members and age matched healthy controls.

2009 Highlights:
• Establishment of a reliable and reproducible model for human multiple myeloma.
• Development of bioluminescence and fluorescence techniques for sensitive monitoring of myeloma progression in vivo.
• Melinda Dean was awarded her PhD for her immunology research.

Goals for 2010:
• Dissect T cell recognition and T cell repertoires in a setting where alloreactive T cells combat myeloma cells.
• Understand vascular endothelial growth factor (VEGF) mediated regulation of human DC biology in MM-infiltrated bone marrow environment.
• Define whether a defect in immune system is primary to pathogenesis of type one diabetes mellitus.
DENDRITIC CELL IMMUNOREGULATION TEAM

Team Leader: A/Prof Georgina Clark

Team Members:
Dr Xinsheng Ju, Senior Research Officer
Ms Yitian Ding, Research Assistant
Dr Courtney Tate, MBBS/PhD Student
Ms Maryam Azlan, PhD Student
Mr Neil Doyle, PhD Student
Ms Rebecca Pryor, Honours Student

Summary
The Immunoregulation Team studies proteins on the surface of white blood cells. Proteins on the surface of white blood cells monitor the external environment and react by sending signals into the cell. These signals regulate how a cell responds to environmental stimuli. The molecules we are interested in are able to amplify or diminish an immune response.

One group of these molecules is the human CD300 molecules (CD300a-f). By studying the biology of the CD300 molecules, our team will determine what role CD300 molecules play in chronic inflammatory diseases such as psoriasis. Furthermore, we are interested in how these molecules may be used to develop targeted therapies to treat Acute Myeloid Leukaemia.

Molecules expressed only by the specialised white blood cells known as dendritic cells (DC) may be helpful in sensing and responding to the invasion of foreign pathogens. Our CRC-Biomarker Translation funded project is aimed at using proteomics to discover novel molecules previously unknown to be on the surface of different subsets of dendritic cells.

We have also focused work on the role of two molecules called CD302 and AHCYL1. We have been characterising experimental models where these two molecules are no longer found so that we can understand the role of each of these molecules in the ability of dendritic cells to respond to pathogenic invaders.

Projects:
• Proteomic analysis of human blood dendritic cells.
• CD300 molecules as regulators of DC and monocyte function.
• Characterization of CD302 and AHCYL1 gene deletion models.

2009 Highlights:
• Published the first major review of the CD300 molecules in a top tier immunology review journal.
• Identified a phenotype for the AHCYL1 gene deletion model.
• Developed proteomic technology to allow us to probe the proteins expressed on the surface of dendritic cells.

Goals for 2010:
• Publish our results showing differences in the function of dendritic cell subsets in the blood of healthy donors and donors with the chronic inflammatory disease, psoriasis.
• Publish our results showing CD300 molecules help control inflammatory responses.
• Continue to understand the array of proteins expressed on the cell surface of human peripheral blood dendritic cells in health and disease using proteomic technology.
Summary
Prostate cancer (PC) is the most common cancer diagnosed in Australia and the second leading cause of cancer death in Australian men. Every year almost 20,000 men are diagnosed and approximately 3,300 will die from the disease.

MMRI’s prostate carcinoma blood dendritic cell clinical trials are a promising approach for new effective Dendritic Cell (DC) vaccine treatments for late stage PC.

2009 Highlights:
• Demonstration in the MMRI CT-1 clinical trial that it is feasible to produce the BDCA-1 BDC-peptide loaded vaccine from prostate cancer patients and that the vaccine is well tolerated. This data demonstrates the feasibility of using immunoselected BDC for immunotherapy protocols.
• Initiation of the immune monitoring analysis of blood samples from participants on the first MMRI led investigator-sponsored clinical trial of a BDC immunotherapy for prostate cancer. The immune monitoring assays will allow us to determine the ability of our novel BDC based therapies to modulate the trial participant’s immune system and direct it to recognise and attack the prostate tumour cells. The outcomes from these assays will be reviewed along side the clinical data to establish the outcomes of the trial.
• Development and validation of another clinically applicable BDC isolation protocol for CMRF-56+ BDC from prostate cancer patients utilising the CMRF-56 antibody developed and owned by MMRI.
• Establishment of a Good Manufacturing Practice compliant training system for the manufacture of cell therapy products.

Goals for 2010:
• Complete the data analysis and publish the outcomes from the completed BDCA-1 BDC trial.

Commercial collaborators
Miltenyi Biotec

Principal Investigator: Prof Derek Hart
Clinical Investigator: Dr Peter Swindle, Urologist
Team Leader: Dr Rebecca Prue

Team Members:
Dr. Robert Coleman, Clinical Research Fellow
Dr Frank Vare, Senior Research Officer
Dr Wendy Chung, Research Officer
Dr Melinda Hardy, Research Assistant
Ms Hui Tong, Research Assistant
Ms Rachael D’Rozario, Research Assistant
Ms Cecile Francis, Clinical Trials Manager
Ms Diana Gibson, Clinical Trials Projects Manager
Ms Sonia Hancock, Clinical Research Nurse
Ms Stephanie Diaz-Guijas, Clinical Trials Nurse
Ms Topaz Conway, Deputy Director (Development)
**BONE MARROW TRANSPLANT TEAM**

**Team Leader: A/Prof Alison Rice**  
(Supported by Queensland Smart Futures Fellowship)

**Team Members:**  
Dr Hannah Cullup, José Carreras Foundation Fellow  
Mr Bruce Xu, Research Assistant  
Ms Melinda Kambouris, PhD student

**Summary**

Not all patients with leukaemia will be cured by chemotherapy. Stem cell transplantation improves their chances of survival. Stem cell transplantation requires intensive chemotherapy and radiotherapy to eradicate the underlying disease followed by infusion of healthy stem cells to provide an anti-leukaemic effect and normal blood cells. Recovery from transplantation is not straightforward. Recovery can be hampered by Graft versus Host Disease (GVHD), despite immunosupression. GVHD produces serious damage to the internal organs and lining of the mouth and gut and is associated with an increased risk of death after transplantation. Recovery can also be circumvented by leukaemic relapse. We are investigating therapeutic cell based strategies designed to prevent GVHD and relapse to allow engraftment of a healthy donor blood system. Together, these studies will improve the therapeutic options and long-term survival of patients receiving stem cell transplantation as treatment for leukemia.

**2009 Highlights:**

- Identification of an antibody specific for the DC-activation marker CD83. This may become a potential new treatment option for GVHD in patients undergoing allogeneic (allo) haematopoietic stem cell (HSC) transplant.
- Transient attenuation of GVHD using mesenchymal stromal cells (MSC).

**Melinda Kambouris** submitted her PhD entitled “An investigation into the potential of mesenchymal stromal cells to attenuate graft-versus-host disease” for examination.

**Dr Hannah Cullup**, Senior Research Officer, was awarded the Women In Technology/Biotech Rising Star Award. Sponsored by IHBi, this award is intended to celebrate, recognise and reward a candidate regarded as having the potential to make significant contributions to the future of the biotechnology industry or research sector.

**Goals for 2010:**

- Prevention of GVHD and preservation of anti-leukaemic effect after treatment with anti-CD83 antibody.
- Determination of the mechanism of action of CD83 depletion.

**A/Prof Alison Rice** was awarded Queensland Government Smart Futures Fellowship (level 1; $300,000 for 2009-2012).

**Dr Hannah Cullup** was awarded the Jose Carreras International Leukaemia Foundation, E.D. Thomas Post Doctoral Fellowship 2008. “Antibody-mediated dendritic cell depletion to attenuate GVHD and promote GVL”. US $50,000, 2009-2011.

**The BMT Team & DC Antigens Team** were awarded the 2009 European Blood & Marrow Transplant Congress Basic Science Award (€2000) and presentation of our work in the Presidential Symposium in Sweden.

**Melinda Kambouris’** PhD studies were short-listed for the 2009 European Blood & Marrow Transplant Congress poster prize.

**A/Prof Alison Rice** and **Dr David Munster** were awarded a Grant-in-Aid from the Leukaemia Foundation of Australia, “Methods to prevent GVHD”, 2009 $50,000.
Biotherapy Program

Program Head: Professor Kerry Atkinson

MMRI’s Biotherapy Program is investigating how the body’s innate repair mechanism acts in healing tissue after disease or injury, and how blood and immune cells are formed in the bone marrow.

This program hopes to improve treatments for patients in need of a bone marrow transplant and those who have suffered a heart attack.

Scientists are exploring ways in which adult stem cells can be used to repair damage from stroke, brain injury, anaemia, leukaemia and other immune-related diseases.
Team Leader: Prof Kerry Atkinson

Team Members:
A/Prof G Brooke, Senior Research Officer
Dr M Doran
Dr C Blair
Ms Kate Kollar, PhD student
Mr Matthew Cook, PhD student
Ms Celena Heazlewood, PhD student
Ms Samah Alharbi, PhD student

Summary
The focus of the Adult Stem Cell Laboratory is on the cellular and molecular biology of mesenchymal stem cells (MSC), including their interaction with haematopoietic stem cells (HSC), their use in preclinical models of disease and application in clinical trials. In addition, we have started work this year on the generation of organ-specific cells such as enterocytes and cardiomyocytes from human adult induced pluripotent stem cells.

Projects:
Our scientific and clinical effort is aimed at building a major regenerative medicine program in Queensland comprising a basic and translational mesenchymal stem cell biology component developed in parallel with an MSC clinical trial program and a goal to initiate clinical trials with cells differentiated from adult human induced pluripotent stem cells within 5 years.

2009 Highlights:
• We have shown that MSC injected intra-myocardially markedly improve cardiac function in a model of acute myocardial infarction (heart attack) which we have developed.
• We have shown that HSC expanded ex vivo on a monolayer of MSC proliferate and contribute to long-term haematopoietic engraftment after both primary and secondary transplantation where the marrow has been totally ablated by irradiation.
• We are developing novel bioreactors for the ex vivo expansion of both MSC and HSC.

Goals for 2010:
We have manufactured clinical grade human MSC derived from human placenta and have initiated our first clinical trial in patients receiving cord blood transplants for otherwise incurable haematopoietic malignancies. We have a second trial HREC*-approved for treatment of drug-resistant graft versus host disease and a third HREC-approved for use in patients with interstitial pulmonary fibrosis. We plan to initiate phase I trials of unrelated, MHC-unmatched (“off-the-shelf”) MSC in 2010 in patients with severe acute myocardial infarction and in patients with drug-resistant Crohn’s disease.

Finally, we are currently initiating our first project to differentiate mature human cells from human induced pluripotent stem cells. Our first target is the generation of enterocytes and hepatocytes. Subsequent targets in 2011 are cardiomyocytes and neurons.

* HREC – Human Research Ethics Committee
HAEMATOPOIETIC STEM CELL TEAM

Team Leader: A/Prof Jean-Pierre Levesque (supported by Cancer Council of Queensland)

Team Members:
Dr Ingrid Winkler, NHRMC Peter Doherty Fellow
Dr Falak Helwan, NHRMC CDA1 Fellow
Ms Valerie Barbier, Senior Research Assistant
Ms Bianca Nowlan, Research Assistant
Ms Yi Shen, PhD student
Ms Rebecca Jacobsen, Honours student

Summary
Haematopoietic stem cells (HSC) replenish blood and immune systems throughout our life. HSC are the only stem cells routinely transplanted in cancer patients to repair blood and immune systems damaged by disease or by chemotherapy treatments. Maintenance of the appropriate numbers of HSC and their progeny leukocytes is tightly regulated in the bone marrow (BM) to keep the adequate number of red and white blood cells within a very narrow range. Breakdown in HSC regulation leads to bone marrow failure, anaemia, leukaemia and immune or bone disorders. To better treat these conditions, it is critical to understand the regulation of HSC. In the bone marrow, HSC reside in very specialised microdomains called "niches" (kennel in French), which fine tune all aspects of HSC behaviour.

The HSC Team is studying these niches at the molecular level in order to understand how HSC are regulated and to identify new therapeutic targets to treat blood, bone and immune diseases.

Projects:
• Molecular and cellular characterisation of HSC niches.
• Regulation of HSC and their niches.
• Role of hypoxia and selectins in HSC regulation.
• Mechanisms of HSC mobilisation.
• New therapies to increase HSC mobilisation and resistance to chemotherapies and radiation.

2009 Highlights:
• Award of an NHMRC Project grant to A/Prof Levesque and Dr Winkler to study how hypoxia and hypoxia inducible transcription factors regulate haematopoiesis.
• Two PCT patent applications on the use of E-selectin antagonists to increase HSC resistance to chemotherapy and increase HSC mobilisation.
• Demonstration that a synthetic glycomimetic molecule E-selectin inhibitor can enhance HSC resistance to cytotoxic chemotherapy in vivo. These results were selected for oral presentation at the annual conference of the American Society of Haematology in New Orleans in December 2009.
• Rebecca Jacobsen awarded 1st Class Honours.

Goals for 2010:
• To complete the proof-of-principle study on the clinical use of selectin inhibitors to protect HSC from chemotherapy and support our patient position.
• To consolidate and publish our studies of the regulation of HSC niches by bone marrow macrophages.
• To pursue our work on the role of hypoxia-inducible factor in HSC regulation and leukaemogenesis.
• To expand the laboratory to take advantage of our discoveries.
SOLID ORGAN TRANSPLANT TEAM

Team Leader: A/Prof Steven McTaggart

Team Members:
Dr Carolyn Clark, PhD Student
Mr Ben Jones, PhD Student

Summary
The Solid Organ Transplant Team is investigating how stem cells affect the immune system. We are trying to discover if stem cells are able to alter the body’s immune response with a view to developing novel therapies for use in clinical acute kidney injury and solid organ transplantation.

The HSC Team is studying these niches at the molecular level in order to understand how HSC are regulated and to identify new therapeutic targets to treat blood, bone and immune diseases.

Projects:
• Identification of mechanisms by which MSC ameliorate kidney ischaemia reperfusion injury.

2009 Highlights:
• Development of both in vitro and in vivo models to test the role of MSC in ameliorating ischaemic kidney injury.
• Dr Clark spent 1 week at the Harvard Institute of Medicine, Boston, as part of her PhD studies into immune regulation of ischaemic kidney injury.
• Ben Jones was awarded his PhD for his thesis entitled “The Use of Mesenchymal Stromal Cells in Renal Transplantation”.
• Ongoing scientific collaborations with Professor Glenda Gobe and the Renal Research Laboratory at Princess Alexandra Hospital.

Goals for 2010:
• Continue to examine the role of MSC in renal ischaemia in both in vitro and in vivo models. From these experiments we hope to be able to identify the key pathways that are involved in the protective effects of MSC in acute ischaemic kidney injury.
Team Leader: A/Prof Nigel Waterhouse
(Supported by the ARC and NHMRC)

Team Members:
Ms Melinda Christensen, Senior Research Assistant
Ms Elisa Jansen, Senior Research Assistant
Dr Katherine Baran, CJ Martin Fellow (joint appointment with St Jude Children’s Research Hospital, Memphis, TN, USA)

Summary
Apoptosis is a form of cell death by which the body naturally eliminates many billions of dangerous or unwanted cells every day. To become cancerous, a cell must avoid death. As such, cancer cells often contain defects in cell death pathways which render them resistant to pro-death stimuli, including many chemotherapeutic drugs. To design new and better cancer therapies, it is essential that we understand the critical processes that control cell death and develop effective ways to either reset, or bypass, defects in cell death pathways which have contributed to cancer development.

Cytotoxic lymphocytes, including cytotoxic T lymphocytes (CTL) and natural killer (NK) cells, are cells of the immune system that protect us from viral infection and cancer by directly killing tumour cells, or cells harbouring a virus. One crucial mechanism they use to kill their targets is the ‘granule exocytosis’ pathway. This involves secretion of a potent mix of toxins from the cytotoxic lymphocyte and their subsequent uptake by the target. The major secreted toxins include perforin, a pore-forming toxin and granule enzymes called granzymes. Granule exocytosis is a crucial part of the body’s natural defence against such dangerous cells and understanding how cytotoxic lymphocytes use granzymes to kill their targets will provide information on how the body protects itself. This is likely to yield novel strategies and identify new molecular targets for anticancer or antiviral therapies.

Our lab investigates cell death by apoptosis and other novel mechanisms that the human body naturally uses to eliminate dangerous cells.

2009 Highlights:
• Establishment of the Apoptosis and Cytotoxicity team at MMRI.
• Award of Associate Professorship (School of Medicine, University of Queensland) to A/Prof Waterhouse.
• Award of ARC Future Fellowship to A/Prot Waterhouse.
• Award of NH&MRC Career Development Award (CDA Level 2) to A/Prof Waterhouse.
• Participation of A/Prof Waterhouse in National Science Week.
• Participation of A/Prof Waterhouse in Science Meets Parliament.
• Award of CJ Martin fellowship to Dr Katherine Baran.
• Submission of PhD thesis by Melinda Christensen.
PALLIATIVE CARE TEAM

Team Leader: Prof Janet Hardy

Team Members:
RN Angela O’Shea, Clinical Trials Coordinator
RN Helen Anderson, Research Nurse
RN Trudi Spanner, Research Nurse
RN Decima Jones, Clinical Nurse/recruitment
Ms Alice Pinkerton, Data Manager

Summary
Mater Palliative Care research team develops and runs clinical trials suited to the palliative care population that involve pain and symptom management. Trial programs comprise both investigator driven and pharmaceutical company sponsored studies. Mater is a key site within a national multi-site palliative care clinical studies research collaborative (PaCCSC). The primary aim of the collaborative is to provide the evidence necessary to improve the affordable access to key medications for symptom control within the community.

2009 Highlights:
• Development of a comprehensive research program encompassing both pharmaceutical company and independently led studies of pain and symptom management.
• 14 clinical trials currently recruiting.
• Key member of PaCCSC.
• Highest national recruiter to PaCCSC trials nationally (>30% of all patients recruited to date).
• Completion of first collaborative trial with the Australian centre for Paediatric Pharmacokinetics.
• Completion of pilot dose finding IMET study of methylphenidate for the management of fatigue.
• Development of key collaborations with UQ, QUT, Flinders University, Arohanui Hospice (NZ), Marie Curie Centre (Belfast).
• Awarded NHMRC grant for trials in the management of nausea in patients with advanced cancer.
• Completion of international study of the efficacy of a combined opioid/opioid antagonist preparation (highest recruiter in Australia).

Goals for 2010:
• Key involvement in the evolution of PaCCSC as a self-sustaining national research collaborative.
• Expansion of research staff to focus on recruitment to established studies.
• Exceed recruitment targets through our participation with the PaCCSC national project.
• Continued collaboration with the ACPP for opioid PK studies in palliative care patients.
• Development of the IMET study program (including pilocarpine for xerostomia).
• Assessment of opioid induced respiratory compromise through sleep study program.
• Continued collaboration with the respiratory unit in dyspnoea studies.
• Development of local, national and international collaborations with key researchers.
Collaborators

Prof Ross Barnard, UQ
Prof Perry Bartlett, QBI, UQ
Prof Thomas Boren, Umea University, Sweden
Prof Ken Bradstock, Westmead Millennium Institute
Prof Judith Clements, School of Life Sciences, QUT
Prof Pascale Cossart, Institute Pasteur, Paris, France
Prof Ken Bradstock, Westmead Millennium Institute
Prof Judith Clements, School of Life Sciences, QUT
Prof Pascale Cossart, Institute Pasteur, Paris, France
Prof David Currow - Dept Palliative & Support Services, Flinders University
Prof Francesco Dazzi, Imperial College, London
Prof Anne Dickenson, University of Newcastle-Upon-Tyne
Prof Michael Feneley, VCCRI, Sydney
Prof Robert Flower, Australian Red Cross Blood Service
Prof Christopher Goodnow, ANU
Prof David Gottlieb, Westmead Hospital
Prof Peter Gray, AIBN, UQ
Prof Richard Harvey, VCCRI, Sydney
Prof Adrian Herington, IHBI, QUT
Prof David Johnson, PAH
Prof Martin Lavin, QIMR
Prof Melissa Little, IMB, UQ
Prof Cornelis Melief, Leiden University
Prof Lars Nielsen, AIBN, UQ
Prof Geoff Osborne, QBI, UQ
Prof Christopher Parish, ANU
Prof Lewis Perrin, Gynaecologic Oncology, MAH
Prof Brent Reynolds, Queensland Brain Institute QBI
Prof Ranjeny Thomas, Diamantina Institute, UQ
Prof Michael Waters, IMB, UQ
Prof Robert Williamson, University of Melbourne
Prof Patsy Yates, School of Nursing and Midwifery, QUT
Prof Phil Bird, Monash University
Prof Joseph Trapani, Peter MacCallum Cancer Centre
Prof Doug Green, St Jude Children’s Research Hospital, USA
Prof Phil Bird, Monash University
Prof Sarah Russell, Peter MacCallum Cancer Centre
Prof Balfor Sartor, University of North Carolina, USA
Prof Lindsay Sly UQ
Prof Steve Turner, The University of Melbourne
Prof Geoff Hill, QIMR
A/Prof Lisa Chopin, IHBI, QUT
A/Prof Andrew Cotterill, MCH
A/Prof Glenda Gobe, UQ
A/Prof Darren Higgins, Harvard Medical School
A/Prof Ricky Johnstone, Peter MacCallum Cancer Centre
A/Prof Victoria Korolik, Institute for Glycomics, Griffith University, Miltenyi Biotec
A/Prof J Alejandro Lopez, QIMR
A/Prof Steve Mahler, AIBN, UQ
A/Prof George Mendz, University of NSW
A/Prof Geoff Mitchell, Discipline of General Practice, School of Medicine
A/Prof Ross Norris Australian Centre for Paediatric Pharmacokinetics, Mater Pharmacy Services
A/Prof Bruce Charles, UQ
A/Prof Ernst Wolvetaung, AIBN, UQ
A/Prof Yin Xiao, QUT, Australian Red Cross Blood Service, Sydney Children’s Hospital, Westmead Hospital, Sydney
A/Prof Phil Sutton, University of Melbourne
Dr Linda Bendall, Westmead Institute, Westmead
Dr Simon Bowler, Respiratory Medicine, MAH
Dr Chris Blair, VCCRI
Dr Kathleen Braet, UQ
Dr Jennifer Byrne, Westmead Children’s Hospital, NSW
Dr Laurence Catley, MAH
Dr Chris Clarke, Peter MacCallum Cancer Centre
Dr Ruth Cluck, Walter and Eliza Hall Institute
Dr Matt Cook, ANU
Dr Paul Dawson, School of Biomedical Sciences, UQ
Dr Grant Dewson, Walter and Eliza Hall Institute
Dr Michael Doran, AIBN, UQ
Dr Andre Dubois, Uniformed Services University of the Health Sciences, Bethesda, USA
Dr Edith Gardiner, Diamantina Institute, Brisbane
Dr. Sean Grimmond, IMB, UQ
Dr Misty Jenkins, Cambridge University
Dr Niclas Karlsson, University of Galway, Ireland
Dr Alfred Lam, Griffith University
Dr Sara Linden, Gothenburg University, Sweden
Dr Richard Lock, Children’s Cancer Institute Australia for Medical Research
Dr Daniel Markovich, School of Biomedical Sciences, UQ
Dr Chris McSweeney, CSIRO
Dr Anthony Moreman, University of Georgia, Atlanta, USA
Dr Andreas Obermair, Queensland Centre for Gynaecological Cancer
Dr T O’Brien, Sydney Children’s Hospital
Dr Jane Oljaro, Peter MacCallum Cancer Centre
Dr Allison Pettit, Centre for Clinical Research UQ
Dr Michael Pinkoski, Medical Research Council (UK)
Dr Chris Pyke, MHS
Dr Graham Radford-Smith, Royal Brisbane Hospital/QIMR
Dr Liza Raggatt, Centre for Clinical Research UQ
Dr David Roberts, Centre for Cancer Research, Bethesda, Maryland, USA
Dr Robyn Rodwell, Queensland Cord Blood Bank
Dr Fiona Scott, Apoptos (California)
Dr David Serisier, Respiratory Medicine, MAH
Dr John Silke, LaTrobe University
Dr Natalie Sims, St Vincent’s Institute, Melbourne
Dr Matt Sweet, IMB, UQ
Dr Peter Swindle, MHS
Dr David Thornton, Welcome Trust Centre for Cell Matrix Research, Manchester (UK)
Dr Nick Timmins, AIBN, UQ
Dr Carl Walkley, St Vincent’s Institute, Melbourne
Dr Faten Zaibak, University of Melbourne
Dr Andrew Zannettino, Institute for Medical and Veterinary Science and the Hanson Institute, Adelaide
Dr Erwin Zoetendal, Wajimingen

AIBN - Australian Institute for Bioengineering and Nanotechnology
ANU - Australian National University
DI - Diamantina Institute, UQ
IHBI - Institute of Health and Biotechnology, QUT
IMB - Institute for Molecular Biology
MAH - Mater Adults Hospital
MCH - Mater Children’s Hospital
MHS - Mater Health Services
QBI - Queensland Brain Institute
QIMR - Queensland Institute of Medical Research
QRI - Queensland Radiation Institute
QUT - Queensland University of Technology
UQ - University of Queensland
VCCRI-Victor Chang Cardiac Research Institute
Mr Nigel Harris
Mater Foundation, Executive Director

Research being conducted at the Mater Medical Research Institute (MMRI) has the potential to improve the lives of people all over the world, both now and in the future.

The Mater Foundation helps make this potential a reality by harnessing community, individual and corporate support to fund research projects.

The Mater has provided exceptional care to Queenslanders for more than 100 years and has always enjoyed great community support. Today the contribution the community makes to research will in many ways have the greatest impact on future generations.

I’d like to take this opportunity to thank Professor John Prins and his talented team for their dedication to finding new treatments and ultimately cures for many devastating diseases. And most importantly I would like to thank our many loyal donors and supporters. You truly make a difference.

Thank You

Nigel Harris

2009 Donors

$500,000+
Mater Foundation
Mater Health Services

$350,000+
Bottlemart Smiling for Smiddy Challenge

$100,000+
BHP Billiton Mitsubishi Alliance
Estate of Norma Pepper
Incolink

$50,000-$99,999
Arrow Energy
Bechtel Group Foundation
Jupiters Casino Community Benefit Fund
Patrick & Patricia McMonagle
Pradella family
Rendezvous with Romance
Talking PC
The Vince Rehbein Trust
**$25,000-49,999**
Bartent Pty Ltd
Boyne Tannum HookUp
CIPQ
John Holland Pty Ltd
Karl Morris & Family
Lexus of Brisbane
Lions Prostate Cancer Research & Treatment Project

**$1,000-$4,999**
Alicia Hill
Brisbane Marine Pilots Pty Ltd
Chalk Hotel (Gift In Kind)
Clayton Utz
David Harrison
Dell’Ugo New Farm
Gavin and Karen Bird
Gold Coast City Council Sports Taskforce
Greg & Jan Marsh
Hale Street Link Project
Hickson Media
Kellies Antiques
Mackay Area Industry Network (MAIN) Co-operative Ltd
Mayne Family
Moreton Hire
Lionel Morris
Neil Peacey
Patrick Dixon Executive Leasing
Peter Evans
Plumbing Industry Associations of Qld
Professor and Mrs Roy and Heather Webb
Ross Sorbello
Seppeltsfield Vineyard Cottage
Simcorp Pty Ltd
Super Butcher

**Tell Creative**
Westpac Business Banking Gold Coast
Wild Horse Cutting Inc
Zash Hair Design
Brian Flannery
Geoff Kiel
Jenny Stellino
JJ Richards & Sons Pty Ltd
John Burke
Margaret Bailey
Patrick Dixon
QMI Solutions Ltd
Townley Group International Pty Ltd
Peter Brooks
**2009 Financial Summary**

Total revenue was $10.26 million (2008: $8.94 million). It consists of:

- Grant income (including Cooperative Research Centre for Biomarker Translation funding) of $3.56 million
- Government Infrastructure of $1 million
- Mater Health Services Infrastructure funding $2 million
- Donations and Bequests $1.92 million
- Other Income $1.73 million
- Commercial Funding $0.05 million

The revenue increase primarily reflects increased grants income received from funding organisations.

Total expenditure was $9.78 million (2008: $8.97 million). It consists of:

- Research and Development expenses $5.33 million
- Scientific Support expenses (including scientific equipment depreciation) $3.47 million
- Administration expenses (including patents) $0.98 million

Overall, this increase in expenses reflects the increase in size and operations of MMRI in 2009.
2009 Revenue Streams by Type

- Grant Income: 34%
- Donations and Bequests: 20%
- Commercial Funding: 1%
- Mater Health Services Infrastructure Funding: 19%
- Government Infrastructure Funding: 10%
- Other Income: 16%

2009 Expenditure Streams by Type

- Research and development expenses: 55%
- Administration expenses: 10%
- Scientific Support expenses: 35%
## MMRI Patents

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MMRI 2009 Publications


In Press:


Clinical Challenges and Images.

Book Chapters:


Book Chapters (continued):


Chapter 36


Chapters in press:


Rossetti T. Production of human placental MSC for clinical trial. Stem Cell Development.

Books:

Awards, Education Seminars and Symposia

MMRI believes that education and continued professional development is essential for the discovery and advancement of science. In 2009, MMRI hosted a number of seminars and two Symposia. These events, which were provided at no cost thanks to the support of our sponsors, were open to scientists and collaborators from across the world.

**Dendritic Cell Symposium**  
Mouse Models in Translating Dendritic Cell Biology  
6th & 7th August 2009  
Major Sponsor: Miltenyi Biotec

**Stem Cell Symposium**  
Stem Cell and Regenerative Medicine  
21st & 22nd May 2009  
Major Sponsor: Miltenyi Biotec

**2009 Education Committee**  
A/Prof Gary Brooke (Chair)  
A/Prof Michael McGuckin (Deputy Chair)  
A/Prof Jean-Pierre Levesque  
Dr Penny Jeffery  
Dr Hannah Cullup  
Matthew Cook (student)  
Nicole Shively

**2009 Honours Completions**  
Rebecca Jacobson (Haematopoietic Stem Cell) 1st Class  
Rebecca Pryor (DC Immunoregulation) 1st Class

**2009 PhD Completions**  
Melinda Dean (DC Growth & Differentiation)  
Chin Wen Png (Inflammatory Bowel Disease)  
Jennifer Freeman Hsu (DC Clinical Trials)  
Ryan Parlett (Mucosal Biology)  
Ben Jones (Solid Organ Transplant)

**2009 Medal and Student Awards**  
MMRI recognises the achievements of outstanding team members by awarding the Sister Regis Mary Dunne Medal for outstanding scientific contribution and the Sister Madonna Josey Medal for outstanding contribution to the Institute. The Sister Regis Mary Dunne Medal was presented to Dr Dave Munster. Dave joined the Institute in 1999 and now leads the Cancer and Immunology Program.  
The Madonna Josey Medal was awarded Vince & Barbara Rehbein for their outstanding contribution to the MMRI. In 2008, they donated $1,000,000 to prostate cancer research.  
The Summit Fleet Leasing MMRI Student Award was presented to Sharyn Tauro. This award recognises the student who has made a significant contribution to the MMRI and the community.

**National Science Week**  
The MMRI once again hit the road to spread the science message during National Science Week, with the assistance of a Commonwealth grant. Starting in Toowoomba, heading up to Mt Isa and finishing in Brisbane, it is estimated that over 1000 students were able to see one of the many presentations – all devised by MMRI scientists.  
Such was the demand for visits by our scientists, the National Science Week was extended from the end of July to the middle of September, to fulfil requests.  
National Science Week is an Australian Government initiative that is helping to inform us about science and technology so that everyone can be better prepared to make the best choices for our future.

**MMRI High School Student Program**  
Scientists at MMRI are passionate about sharing their knowledge with enthusiastic and bright students, and in 2009 the team hosted senior school students from Sommerville House and, for the first time, All Hallows’ School.
### Peer Review Grant Funding

<table>
<thead>
<tr>
<th>Funding Body</th>
<th>Chief Investigators</th>
<th>Type</th>
<th>Program</th>
<th>Title</th>
<th>Years</th>
<th>Total Funding Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANZ Trustees</td>
<td>Cook, Matthew</td>
<td>PhD Scholarship</td>
<td>Biotherapy</td>
<td>Comparison of mesenchymal stem cells (MSC), haematopoietic progenitor cells (HPC), endothelial progenitor cells (EPC) and proangiogenic macrophages (PM) for migration to, and repair of, cardiac damage after acute myocardial infarction</td>
<td>2008-2010</td>
<td>$57,537</td>
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<tr>
<td>Australian Crohn's &amp; Colitis Association Queensland</td>
<td>Florin, Timothy</td>
<td>Project Funding</td>
<td>Mucosal Diseases</td>
<td>Improving patient outcomes through better understanding of metabolism of thiopurine drugs</td>
<td>2008-2009</td>
<td>$48,000</td>
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<tr>
<td>Cancer Australia</td>
<td>Hart, Derek</td>
<td>Project Funding</td>
<td>Dendritic Cell</td>
<td>RNA loading of tumour associated antigens and the activation of blood dendritic cells for prostate cancer immunotherapy</td>
<td>2009-2011</td>
<td>$594,900</td>
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<tr>
<td>Australian Stem Cell Centre</td>
<td>Kollar, Katarina</td>
<td>PhD Top Up Scholarship</td>
<td>Biotherapy</td>
<td>Analysis of the molecular homing mechanisms of MSC to damaged organs, using acute myocardial infarct as a model and the ability of MSC to improve cardiac function after AMI</td>
<td>2007-2009</td>
<td>$18,000</td>
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<tr>
<td>Cancer Council Queensland</td>
<td>Levesque, Jean-Pierre</td>
<td>Fellowship</td>
<td>Biotherapy</td>
<td>Basic biology of the haematopoietic system and therapeutic applications for the treatment of cancers</td>
<td>2006-2010</td>
<td>$555,229</td>
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<tr>
<td>Cancer Council Queensland</td>
<td>Radford, Kristen Rice, Alison Pinkerton, Ross</td>
<td>Project Funding</td>
<td>Dendritic Cell</td>
<td>A Novel Strategy for the Discovery and Validation of new Targets for Leukaemia Immunotherapy</td>
<td>2008-2009</td>
<td>$160,000</td>
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<tr>
<td>Cancer Council Queensland</td>
<td>Munster, David Rice, Alison</td>
<td>Project Funding</td>
<td>Dendritic Cell</td>
<td>Human Dendritic Cell Targeted GVHD Therapy in a Preclinical Mouse Model</td>
<td>2008-2009</td>
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<tr>
<td>Cancer Council Queensland</td>
<td>McGuckin, Michael Florin, Timothy Le Leu, Richard</td>
<td>Project Funding</td>
<td>Mucosal Diseases</td>
<td>Mucin deficiency and the development of intestinal cancers</td>
<td>2008-2009</td>
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<tr>
<td>Cooperative Research Centre for Biomarker Translation</td>
<td>Hart, Derek</td>
<td>Project Funding</td>
<td>Dendritic Cell</td>
<td>Characterisation of CD13c+ as a biomarker</td>
<td>2009</td>
<td>$376,061</td>
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<tr>
<td>Cancer Council Queensland</td>
<td>Hart, Derek Gill, Devinder Catley, Laurence</td>
<td>Project Funding</td>
<td>Dendritic Cell</td>
<td>Combined active dendritic cell and passive cytotoxic T lymphocytes immunotherapy for multiple myeloma</td>
<td>2009-2010</td>
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<td>Clive and Vera Ramaciotti Foundation</td>
<td>Jeffery, Penelope</td>
<td>Project Funding</td>
<td>Mucosal Diseases</td>
<td>Application of Ghrelin peptides for treating IBD</td>
<td>2009</td>
<td>$30,000</td>
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<tr>
<td>Funding Body</td>
<td>Chief Investigators</td>
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<td>Program</td>
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<td>Years</td>
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<td>Inner Wheel Australia</td>
<td>Atkinson, Kerry</td>
<td>Project Funding</td>
<td>Biotherapy</td>
<td>Ex vivo expansion of human cord blood CD34⁺ haematopoietic stem cells in a co-culture bioreactor system with mesenchymal stem cells</td>
<td>2009</td>
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<tr>
<td>Jose Carreras International Fellowship</td>
<td>Cullup, Hannah</td>
<td>Fellowship</td>
<td>Dendritic Cell</td>
<td>Antibody-mediated dendritic cell depletion to attenuate GVHD and promote GVL</td>
<td>2009-2011</td>
<td>USD 150,000</td>
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<tr>
<td>Leukaemia Foundation of Australia</td>
<td>Modra, Courtney</td>
<td>PhD Scholarship</td>
<td>Dendritic Cell</td>
<td>Potential new target molecules for AML treatment: the role of the 35-L5 molecule</td>
<td>2005-2009</td>
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<tr>
<td>Leukaemia Foundation of Australia</td>
<td>Seldon, Therese</td>
<td>PhD Scholarship</td>
<td>Dendritic Cell</td>
<td>Development of dendritic cell biomarker antibodies and applications in leukaemia</td>
<td>2008-2010</td>
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<td>Leukaemia Foundation of Queensland</td>
<td>Rice, Alison</td>
<td>Project Funding</td>
<td>Dendritic Cell</td>
<td>Methods to prevent GVHD after transplantation</td>
<td>2009</td>
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<tr>
<td>National Health and Medical Research Council</td>
<td>Waterhouse, Nigel</td>
<td>Career Development Award Level 2</td>
<td>Biotherapy</td>
<td>Identification of mechanisms by which mesenchymal stromal cells ameliorate renal ischaemia reperfusion injury</td>
<td>2009</td>
<td>$61,507</td>
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<tr>
<td>National Health and Medical Research Council</td>
<td>Clark, Carolyn</td>
<td>PhD Scholarship</td>
<td>Biotherapy</td>
<td>Identification of mechanisms by which mesenchymal stromal cells ameliorate renal ischaemia reperfusion injury</td>
<td>2009-2011</td>
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<tr>
<td>National Health and Medical Research Council</td>
<td>Kassianos, Andrew</td>
<td>PhD Scholarship</td>
<td>Dendritic Cell</td>
<td>The development of a DC-based strategy for the discovery of breast cancer antigens for immunotherapy</td>
<td>2007-2010</td>
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<td>National Health and Medical Research Council</td>
<td>Levesque, Jean-Pierre</td>
<td>Project Funding</td>
<td>Biotherapy</td>
<td>Mechanisms of HSC mobilisation: Role of the cross-talk between bone marrow and bone</td>
<td>2007-2009</td>
<td>$443,250</td>
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<td>National Health and Medical Research Council</td>
<td>Hart, Derek</td>
<td>Project Funding</td>
<td>Dendritic Cell</td>
<td>A Phase 1 Clinical Trial of a Human Chimeric Anti-Activated DC Antibody to prevent AGVHD in high risk allo HSCT</td>
<td>2007-2009</td>
<td>$588,000</td>
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</tbody>
</table>
### Peer Review Grant Funding

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<tr>
<td>National Health and Medical Research Council</td>
<td>Jetter, Penelope</td>
<td>Fellowship</td>
<td>Mucosal Diseases</td>
<td>Cell surface mucins modulate epithelial cell growth and apoptosis of normal mucosal wound repair and epithelial cancers</td>
<td>2006-2009</td>
<td>$264,000</td>
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<td>National Health and Medical Research Council</td>
<td>Rice, Alison Munster, David Atkinson, Kerry</td>
<td>Project Funding</td>
<td>Biotherapy</td>
<td>Antibody-mediated DC depletion to attenuate GVHD</td>
<td>2007-2009</td>
<td>$417,900</td>
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<td>National Health and Medical Research Council</td>
<td>Vuckovic, Slavica Catley, Laurence Vafi, Frank</td>
<td>Project Funding</td>
<td>Dendritic Cell</td>
<td>Targeting human DC in a multiple myeloma humanized NOD/SCID model</td>
<td>2007-2009</td>
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<tr>
<td>National Health and Medical Research Council</td>
<td>Jeffery, Penelope Eri, Rajaraman</td>
<td>Project Funding (New Investigator)</td>
<td>Mucosal Diseases</td>
<td>Novel applications of ghrelin peptides in mouse models of inflammatory bowel disease</td>
<td>2008-2010</td>
<td>$233,250</td>
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<td>National Health and Medical Research Council</td>
<td>McGuckin, Michael Florin, Timothy Radford-Smith, Graham Eri, Rajaraman Cook, Matthew</td>
<td>Project Funding</td>
<td>Mucosal Diseases</td>
<td>Goblet cell stress and intestinal inflammation</td>
<td>2008-2010</td>
<td>$548,250</td>
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<tr>
<td>National Health and Medical Research Council</td>
<td>McGuckin, Michael</td>
<td>Fellowship</td>
<td>Mucosal Diseases</td>
<td>Senior Research Fellowship</td>
<td>2009-2013</td>
<td>$607,500</td>
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<tr>
<td>National Health and Medical Research Council</td>
<td>Hardy, Janet Norris, Ross Charles, Adrian</td>
<td>Project Funding</td>
<td>Clinical Trials Centre</td>
<td>An evaluation of the validity of measuring oxycodone concentrations for pharmacokinetic studies in palliative care patients</td>
<td>2008-2009</td>
<td>$49,135</td>
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<td>National Health and Medical Research Council</td>
<td>Winkler, Ingrid</td>
<td>Career Development Award</td>
<td>Biotherapy</td>
<td>Interactions between haematopoietic, bone, vascular and endocrine systems control stem cell rate and mobilisation</td>
<td>2008-2011</td>
<td>$362,000</td>
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<td>National Health and Medical Research Council</td>
<td>Helwani, Falak</td>
<td>Biomedical Training Fellowship</td>
<td>Biotherapy</td>
<td>Cellular and molecular determinants that regulate osteoblasts at the endosteal niche during HSC mobilisation</td>
<td>2008-2011</td>
<td>$254,000</td>
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<tr>
<td>Funding Body</td>
<td>Chief Investigators</td>
<td>Type</td>
<td>Program</td>
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<tr>
<td>National Health and Medical Research Council</td>
<td>Waterhouse, Nigel</td>
<td>Project Funding</td>
<td>Biotherapy</td>
<td>Molecular mechanisms of death in cells with defective apoptotic pathways</td>
<td>2009</td>
<td>$57,026</td>
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<tr>
<td>National Health and Medical Research Council</td>
<td>Winkler, Ingrid Levesque, Jean-Pierre</td>
<td>Project Funding</td>
<td>Biotherapy</td>
<td>Manipulation of haematopoietic stem cell niches to improve their clinical use</td>
<td>2009-2011</td>
<td>$534,000</td>
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<td>National Health and Medical Research Council</td>
<td>McGuckin, Michael Sutton, Phillip Every, Alison Linden, Sara Korolik, Victoria</td>
<td>Project Funding</td>
<td>Mucosal Diseases</td>
<td>Cell surface mucins in gastrointestinal infection and inflammation</td>
<td>2009-2011</td>
<td>$568,500</td>
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<td>National Health and Medical Research Council</td>
<td>Baran, Katherine</td>
<td>Fellowship</td>
<td>Biotherapy</td>
<td>CJ Martin Overseas Training Fellowship</td>
<td>2009-2012</td>
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<td>National Heart Foundation</td>
<td>Atkinson, Kerry Feneley, Michael Brooke, Gary Levesque, Jean-Pierre Blair, Chris</td>
<td>Project Funding</td>
<td>Biotherapy</td>
<td>Mesenchymal stem cell therapy for cardiac repair; molecular mechanisms and functional consequences</td>
<td>2009-2010</td>
<td>$129,000</td>
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<tr>
<td>Prostate Cancer Foundation of Australia</td>
<td>Radford, Kristen Hart, Derek Clements, Judith</td>
<td>Project Funding</td>
<td>Dendritic Cell</td>
<td>Potential of Human Kallikrein 4 as a novel target for prostate cancer immunotherapy</td>
<td>2008-2010</td>
<td>$240,000</td>
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<tr>
<td>Queensland Government Smart Futures Fellowship</td>
<td>Rice, Alison</td>
<td>Fellowship</td>
<td>Dendritic Cell</td>
<td>A new method to make bone marrow transplantation safer by preventing Graft versus Host Disease</td>
<td>2009-2012</td>
<td>$300,000</td>
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<tr>
<td>United States Army (USA)</td>
<td>Hart, Derek Prue, Rebecca</td>
<td>Project Funding</td>
<td>Clinical Trials Centre</td>
<td>A Phase I clinical trial of a CMRF-56+ blood DC preparation for the immunotherapy of metastatic, hormone refractory prostate cancer</td>
<td>2005-2009</td>
<td>$999,423 (USD)</td>
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<tr>
<td>Zig Zag Foundation</td>
<td>Clark, Georgina</td>
<td>Project Funding</td>
<td>Dendritic Cell</td>
<td>Does deletion of a gene called AHCYL1 provide a potential genetic model to study dendritic cell mediated immunosuppression?</td>
<td>2009</td>
<td>$20,000</td>
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