Mater Medical Research Institute (MMRI) is a world class institute that is committed to academic medicine and aims to discover, develop, translate, and commercialise medical research that integrates with relevant areas of excellence within clinical practice.

Proud of its strong history and relationship with Mater Health Services, MMRI continues to drive medical innovation which can be translated into clinical care for the benefit of all.

Professor Ian Zimmer
Chairman of MMRI Board of Directors

MMRI Board Chairman

As another year passes and I reflect upon the milestones which Mater Medical Research Institute has achieved I am proud of the exciting new direction which MMRI is taking. We have further established ourselves as a world class institute and are working more closely than ever with our clinical partners to translate research into practice.

2010 also saw MMRI establish four research themes, around which we have centred the range of activities undertaken—not just at MMRI but across the Mater campus—from biomedical science through to applied clinical research. Below is a diagram which shows the themes and their relationship to some health services.

Looking ahead, I am excited about the important partnerships which are being established, for example in 2012 we will welcome the opening of the Translational Research Institute (TRI). This will offer greater opportunity for collaboration, education and research across a range of areas.

On behalf of the MMRI Board of Directors I would like to acknowledge the contribution of Mater Health Services and the Sisters of Mercy in assisting MMRI to achieve its Mission to ‘discover, develop, translate and commercialise medical research that integrates with relevant areas of excellence within Mater Health Services’.

2010 Board of Directors

• Professor Ian Zimmer (Chair)
• Dr Carrie Hillyard (Deputy Chair)
• Jim Walker AM
• Dr John O’Donnell
• Professor Geoff Kiel
• Sister Deirdre Gardner RSM
• Professor Brandon Wainwright
• Professor David McIntyre

Theme relationship diagram

Professor Ian Zimmer
Chairman of MMRI Board of Directors
CEO/Director

My first full year as CEO/Director has been characterised by the implementation of significant changes in many facets of MMRI’s activities. Thanks go to our staff for embracing the philosophy behind the changes and for rising to meet the challenges which can accompany times of change.

Highlights are many, but it has been a year of establishing a platform for the future and hopefully the true beneficial impact of the changes will continue for many years. It has therefore been most gratifying that the institute has continued to perform extremely well in many aspects of operations, training of higher degree students and grant application success.

For me, the major achievements were:

- The collaboration between MMRI, Mater Health Services and Mater Foundation to organise all research on the campus into a thematic structure, with the aim of fully integrating clinical practice, research and teaching across all disciplines. Included in this collaboration was the inclusion into MMRI of the Mater Mothers’ Research Centre and the Research Support Centre.

- MMRI and The University of Queensland are working towards a closer and more formal agreement which will improve the synergies between education, research and clinical application.

- The appointment of Associate Professor Michael McGuckin as Deputy Director (Research). This is the first time Mater Executive has had scientific representation (aside from the Director) and highlights our aim to grow into a prominent player in Australian and international research. Mike has already had a major positive impact on the running, philosophy and future of the institute.

- Ongoing strong input into the planning of the Translational Research Institute, including well advanced planning for the ‘Mater Node’ to be located on the second floor of Aubigny Place. This development will greatly strengthen MMRI’s position and capacity for growth.

Some highlights warrant particular mention.

Firstly, we have been extremely fortunate to have recruited three new research groups to MMRI, those of Dr Paul Dawson, Associate Professor Jon Whitehead and Associate Professor John Hooper. All three groups have integrated well, have already seen success and, perhaps most importantly, have introduced research programs with clinical focus and clinical collaborations.

Secondly, the successful grant of almost $3 million from the Department of Defence to Professor Frank Bowling, Professor Deon Venter and Associate Professor Nigel Waterhouse to investigate the clinical consequences of the Aircraft “Deseal-Reseal” program. These investigators hail from Mater Health Services, Mater Pathology and MMRI respectively, and this collaborative approach was central to the success of the application.

Finally, I acknowledge the terrific support, guidance and sage counsel I have received from Professor Ian Zimmer (Chair) and the MMRI Board, the Mater Board and the Congregational Leadership team. Our achievements would have been much less without this.

Professor John Prins
CEO/Director

Deputy Director of Research

2010 was a year involving major change in the way health research was conducted across the Mater campus. Following a review of health research at Mater, the Mater Health Services and MMRI boards resolved to incorporate all health research conducted at Mater under the auspices of MMRI. This change in strategic direction necessitated a reorganisation of the structure of MMRI, with all research now to be conducted within four major health research themes: understanding and preventing disease, improving treatment of disease, mothers and babies health, and healthy development.

The concept is that within these themes researchers from basic biomedical science through to applied clinical research will work together across many disciplines to conduct research aimed at resolving significant health problems. Within each theme there are several more specific research programs, each of which in turn has several research groups within.

Under this new organisation MMRI aims to lift the impact of its research and to ensure rapid translation of research findings into clinical practice. To facilitate the latter we have established a specific Centre for Translational Research into Practice to help ensure our research, and the latest international research findings, are implemented into healthcare. Our ultimate goals are to improve the quality of life for patients at Mater and make a significant contribution to international efforts to more generally improve human health. I thank all researchers at Mater for their contribution to the development of the new structure, especially those who have agreed to take on leadership roles.

Associate Professor Michael McGuckin
Deputy Director of Research

In 2010 our researchers continued their productivity with over 50 international biomedical science and clinical publications and over 100 presentations to national and international health conferences. In 2010 we have recruited three new biomedical research groups to MMRI and appointed a large number of Mater-based clinical researchers to MMRI, significantly adding to our research base and supporting MMRI’s plan to grow in size significantly over the next five years.

Our external grant funding also continues to grow providing the financial basis for the growth of our research. 2011 promises to be a productive and exciting year for MMRI researchers. Finally, I would like to thank the MMRI executive and support staff for their help and guidance in my new role as Deputy Director of Research, and the members of my research team for their patience in dealing with my altered contribution to our research.

Associate Professor Michael McGuckin
Deputy Director of Research
To increase understanding of the fundamental, biological and environmental basis of common diseases affecting children and adults in order to help better diagnose and treat disease. To apply new knowledge to define individuals at risk of disease, and design and test new strategies to prevent disease.
Our research in understanding and preventing disease

Whilst improved health care has been a major contributor to increased quality of life over the last century, many diseases still present substantial challenges to modern health care. Developing a deeper understanding of the genetic, environmental and biological basis for these diseases is the key to developing more effective treatments.

Clinical and basic science researchers in the understanding and preventing disease theme are together tackling some of the major challenges facing our health care system. Our research is focused in several areas that present major challenges in both the developed and developing world including; metabolic and cardiovascular diseases, infectious and inflammatory diseases and cancer.

Disease prevention remains the best way to prevent morbidity and to reduce health care expenditure. Therefore we intend to use our increased knowledge of the fundamental basis of disease to design appropriate strategies to prevent disease.

Clinicians and researchers fight lung disease

Dr David Serisier, a respiratory specialist at Mater Adult Hospital is working with Associate Professor Mike McGuckin, MMRI’s Director of Research and Dr Rohan Lowry from Mater Pathology to investigate the debilitating lung disease, bronchiectasis.

Bronchiectasis is a common lung disease characterised by chronic mucus production with frequent, recurring episodes of respiratory infections that significantly affects the wellbeing of patients, the need for frequent visits to health care providers and repeated antibiotic courses.

“Recent evidence suggests that an old drug, erythromycin, has ‘new tricks’ including the ability to modulate inflammation and immune function in people with inflammatory lung diseases,” Dr David Serisier said.

“We are evaluating the ability of low-dose erythromycin to improve symptoms and quality of life by modifying inflammation and mucus production in patients with bronchiectasis,” he said.

As part of the study, patients (and healthy volunteers) are undergoing bronchoscopies to collect lung samples which then undergo scientific evaluations in the laboratory at MMRI and an assessment of the clinical pathology at Mater Pathology. This will hopefully improve the common understanding of both the airway abnormalities in bronchiectasis and the mechanism by which erythromycin and other macrolides might have positive effects.

MMRI is one of the few research institutes which truly integrates research and clinical health care, as is highlighted by this clinical trial. Working together, Mater clinicians, pathologists and researchers have the resources to achieve greater outcomes for patients into the future.

Respiratory specialist, Dr David Serisier
Understanding and preventing disease: Theme Leader Associate Professor Jon Whitehead

1. Immunity, Infection and Inflammation Program—Prof Timothy Florin, Dr David Serisier.
2. Metabolic and cardiovascular disease program—A/Prof Jon Whitehead, Dr Mark Harris.
3. Cancer biology program —A/Prof John Hooper, A/Prof Nigel Waterhouse.

Diseases under study
- Bronchiectasis
- Cancers including Leukaemias
- Crohn’s disease
- Cystic Fibrosis
- Diabetes
- Gastrointestinal infection
- Heart attack
- Obesinity
- Respiratory infection
- Stroke
- Ulcerative colitis

Supporters of our research

Mary’s Mission
Mary Lakey’s diagnosis with ovarian cancer, over three years ago, has motivated her to become involved in raising funds for Mater.

Following surgery and treatment for cancer, Mary made the decision to raise funds to support ovarian cancer research at Mater Medical Research Institute (MMRI).

Each year in Australia 1500 women are diagnosed with ovarian cancer and 850 die of the disease.

Researchers at MMRI are researching the development of a simple blood test that detects ovarian cancer in its early stages.

According to Associate Professor Mike McGuckin, if scientists are able to develop a screening test that picks up the cancer at stage one, when it is restricted to the ovaries, there is a 90 per cent survival rate.

For Mary, this research is vital—the driving force behind her tireless fundraising efforts.

“I have five children including two daughters, two daughters-in-law and five granddaughters. They are the reason I’m involved in raising funds for ovarian cancer research.”

Each year Mary and her committee, which consists of a group of her close friends, hold fundraising events. During 2010 Mary’s committee raised over $35 000 for research into early detection and treatment of ovarian cancer at Mater.
Our research in improving treatment of disease

Improved health care has been the major contributor to increased quality of life over the last century. However, there are still considerable challenges to providing effective and efficient health care.

Health care professionals and scientists in the improving treatment of disease theme are working together to improve the quality of life of patients with a broad range of diseases, disorders and injuries.

Individualising medical care by utilising the power of the genomic age and the latest diagnostic techniques is a key component of our plans for optimising outcomes for individual patients. Our researchers are combining this philosophy with the development of new treatments to identify, through clinical trials, the best ways to treat disease.

Sadly, many in the community suffer from diseases, injuries and developmental disorders for which curative treatments are not available. Through research we are determined to optimise the management of these patients to maximise their quality of life.

Research highlight

Understanding the biology of the stem cells critical to developing better treatments

The Haematopoietic Stem Cell (HSC) team led by Associate Professor Jean-Pierre Levesque and Dr Ingrid Winkler have shown how the local micro-environment surrounding adult stem cells in the bone affects their behaviour in two papers published in the prestigious journal Blood.

The first paper, published in August 2010, shows that stem cells reside in a special niche. It appears the stem cells prefer an environment that is low in oxygen concentration and that manipulating the oxygen concentration will affect the behaviour of the stem cells.

Published in December 2010, the second paper explains how the bone marrow macrophages (specialised white blood cells) are pivotal to maintaining the stem cell niche and bone formation. The loss of these macrophages leads to the stem cells moving out into the blood and stops bone formation.

"Using this new knowledge to manipulate the micro-environment within the bone marrow has important implications for bone marrow transplantation as well as bone formation and is a potential novel therapeutic approach for leukaemia and bone diseases," Associate Professor Jean-Pierre Levesque said.

Understanding the biology of stem cells is critical to developing better treatments for blood diseases including leukaemia and lymphoma and also for protecting the normal bone marrow during chemotherapy for other cancers.

Haematopoietic Stem Cell researchers, Dr Ingrid Winkler and Associate Professor Jean-Pierre Levesque
BMA turns blue for prostate cancer

Research to improve treatment of prostate cancer received a welcome boost in 2010 thanks to a partnership with BHP Billiton Mitsubishi Alliance (BMA).

Prostate cancer is the most common cancer in Australian men. Shockingly, eight men die of prostate cancer every day.

With a mostly male workforce BMA thought it was fitting to get involved in raising money for prostate cancer research through Mater Foundation’s Talking PC campaign.

“We have seen an extraordinary level of staff engagement with many of our sites holding annual fundraising events and painting mine trucks blue as a reminder of the importance of regular health checks,” BMA’s head of Health, Safety, Environment and Community, Aidan Hayes said.

Through a company donation, on-site fundraising and matched-giving BMA contributed more than $132,000.

These funds will help researchers like Associate Professor John Hooper and his team to better understand how prostate cancer develops to improve diagnosis and treatment.

“One of the areas we are focusing on is understanding the molecular events that underpin prostate cancer—how the cancer starts and spreads around the body. Our aim is to identify proteins that promote prostate cancer, allowing us to diagnose the disease earlier, and to develop new anti-cancer drugs,” Associate Professor Hooper said.

Supporters of our research

BMA staff support Talking PC

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<thead>
<tr>
<th>Improving treatment of disease: Theme Leader Professor Janet Hardy</th>
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<tbody>
<tr>
<td>1. Program for individualising medical care—Prof Deon Venter, Dr John Duley, Dr Ross Norris.</td>
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<td>2. Program for improving acute care—Dr Jeff Pressnell, Dr Andrea Schibler.</td>
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<td>3. Program for improving the management of chronic disease and disabilities—Prof Anne Chang.</td>
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<tr>
<td>4. Program for improving the management of cancer—Prof Janet Hardy, A/Prof Lawrence Catley.</td>
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<tr>
<td>5. Biological therapies program—A/Prof Jean-Pierre Levesque, Prof Kerry Atkinson.</td>
</tr>
<tr>
<td>6. Musculo-skeletal and neural therapies program—Dr Fiona Hinchliffe, Dr Michael Murphy, Dr Valda Biezaitis.</td>
</tr>
</tbody>
</table>

Diseases under study

- Cancer
- Heart disease and stroke
- Obesity
- Diabetes
- Injuries
- Prostate cancer
- Ovarian cancer
- Melanoma
- Myeloma
- Ulcerative colitis

To link exceptional care to high quality basic, clinical and translational research, focused on improving all aspects of health for mothers and babies. To increase knowledge of the influential events during pregnancy and early life that impact on healthy development and disease later in life and to apply that knowledge to prevent disease.
Mater Medical Research Institute (MMRI) as a host of the International Stillbirth Alliance (ISA) in 2010 secured funding from the Bill & Melinda Gates Foundation to reduce the stillbirth rate, focusing on low and middle income countries, with measurable positive outcomes by 2020.

The grant—for US$264,003—will support lead researcher Associate Professor Vicki Flenady and an international team of experts in maternal and child health to oversee the production of a series of six papers on stillbirth to be published in world-renowned medical journal *The Lancet* in early 2011.

An estimated 3.2 million stillbirths occur each year, yet stillbirths remain invisible, they are not counted in Millennium Development Goals, not routinely tracked by the United Nations and invisible in the Global Burden of Disease. Almost all (99 per cent) of these deaths occur in low and middle income countries.

Associate Professor Flenady said, “The purpose of producing the six papers for *The Lancet* is to reduce unacceptable rates of stillbirth worldwide and improve overall maternal and newborn health outcomes.

“The reality is that papers alone, even in *The Lancet*, will not produce the degree of change needed. It requires getting the news out in many ways to many audiences and especially reaching country level policy makers in a way they can relate to,” she said.

The project team consists of international experts—from Australia, South Africa, Pakistan, United States of America, United Kingdom and Norway—working with key global organisations, including the World Health Organisation, to effect change.

“This funding would not have been possible without the amazing support we received from within MMRI, specifically Nicole Shively, Irene Gerard, Bernard Ho, Kate Reynolds and Sonia Evans. The people behind the scenes at MMRI really help make the research happen,” Associate Professor Flenady said.

The overall goal is to bring together epidemiology, evidence for interventions, costing estimates and policy analysis to guide decision making and promote action with measurable change by 2020. These papers will call for action and will list a number of specific goals the international stillbirth community must aim to achieve by 2020 in order to create such measurable change.
Mothers and babies health: Theme Leader Professor David McIntyre

1. Program for maternity care to meet the needs of mother and babies—Prof Sue Kildea, Dr Michael Beckmann.
2. Program for optimising outcomes for mothers and babies at risk—A/Prof Vicki Flenady, Dr Scott Petersen, Dr Shelley Wilkinson.
3. Program for the critical care of at-risk newborns—Dr Helen Liley, Dr Judith Hough.

Diseases under study
- Infertility
- Gestational diabetes
- Pre-eclampsia
- Neonatal infection
- Stillbirth

Supporters of our research

Terry Armstrong—A long walk

Shaving your head after a gruelling 110 kilometre walk wouldn’t appeal to most. But for Jimboomba Police Officer Terry Armstrong and his father, they couldn’t think of a better way to support Mater Foundation and research to help babies and children.

Terry’s passion for fundraising began with Bluey Day in 1998—a day where Emergency Services workers shaved their head to raise money for sick children.

Thirteen years later, Terry and his father now organise their own head shave at the end of a 3-day 110 kilometre walk through Jimboomba and surrounding areas to raise money for Mater Mothers’ and Mater Children’s Hospitals and research at MMRI.

Every year, along with the walk and head shave, Terry organises a series of fundraising events with the help of his father, other family members and other officers from Jimboomba Police Station. He hosts regular family fun days and barbecues at Bunnings Warehouse at Browns Plains, golf days and a motorcycle ride with the Ulysses group.

During 2010, Terry raised over $30 000 for patient and research programs helping babies and children at Mater.

To increase understanding of the complex interplay between events during pregnancy and early life, genetics and environment on the healthy development of children.

To gain a greater understanding of the physiological, environmental and psychological challenges of children as they transition to adulthood.
Our research in healthy development

A healthy childhood is the basis for life-long health. In fact, it is becoming apparent that the health of the mother and the events that occur during pregnancy influence life-long health. Together our basic science and clinical researchers in the healthy development theme are studying these links and determining how events during fetal development can lead to disorders such as autism.

Many children are born with genetic diseases and disorders which will represent a life-long challenge to their quality of life. Our researchers are dedicated to developing new treatments and better management of these children to improve their quality of life and ensure they can transition successfully to adulthood.

Childhood and adolescent mental health is a crucial element of ensuring healthy development to adulthood. Our Kids in Mind program is dedicated to using research to underpin improved mental health services for children and adolescents confronted with challenges to their mental health.

Research highlight

World first study into Jet-Fuel Exposure Syndrome at MMRI

Mater Medical Research Institute (MMRI) will undertake a multi-million dollar research study into the health implications of working with aviation turbine fuels and F1-11 desel/reseal agents.

MMRI will receive almost $3 million in Australian Department of Defence funding to undertake the world-first three year study into Jet Fuel Exposure Syndrome (JFES).

The world-first study aims to determine the biological basis for the syndrome affecting Air Force personnel exposed to chemicals during maintenance on aircraft, but has wider ramifications for those exposed to fuel chemicals occupationally and via substance abuse.

JFES is suffered by many workers on the F1-11 desel/reseal project but also with any aviation fuel. The desel/reseal project involved stripping and resealing the lining of F1-11 fuel tanks, this work was undertaken in extremely confined spaces using high strength, toxic agents.

The full health affects of this work are yet to be fully understood and the JFES Study aims to look at possible DNA changes in the workers and what may be causing them.

This study is a collaborative project between the Defence Centre for Occupational Health and MMRI, which is being led by Professor Francis Bowling, Director of Biochemical Diseases at Mater Children’s Hospitals.

“The JFES study aims to explore the health issues of workers to find the cause of their ongoing health problems. It is possible that the outcomes of this study may also assist non defence personnel, especially children who have long term health issues from substance abuse including petrol sniffing,” Prof Bowling said.

“The molecular changes that occur in those affected by JFES persist in their cells many years after exposure. “From an understanding of these changes we hope that we may be able to protect the health of workers.”

Professor Bowling will be supported by three Mater colleagues—Professor Deon Venter, Associate Professor Nigel Waterhouse and Professor Brett McDermott and an external collaborator, Dr Mervyn Thomas.
A lasting legacy

One research project under the healthy development theme is looking at how to improve outcomes for children and adolescents who require spinal surgery due to scoliosis—a deformity of the spine.

Each year in Australia more than 500 children are diagnosed with scoliosis and undergo corrective spinal surgery.

The Paediatric Spine Research Group (PSRG) is a collaborative research project between Mater Children’s Hospital and Queensland University of Technology.

According to Associate Professor Clayton Adam, one of the major projects PSRG is working on is the use of computer simulations to predict the outcomes of scoliosis surgery.

“These models are the first of their kind worldwide and are already being trialled in a clinical setting. Ultimately the aim is to allow surgeons to run different ‘what-if’ scenarios on patient-specific computer models which are created from a single preoperative CT scan,” Associate Professor Adam said.

This research has received significant support from the Marian and EH Flack Trust which was constituted under the Will of Edwin Harold Flack, who died on 10 January 1935.

Mr Flack was ahead of his time in regards to philanthropy—giving away significant amounts of money during his lifetime. When he died the majority of his estate was left in trust for charitable purposes, in perpetuity.

Today the Trust supports institutions conducting medical research, welfare, social and family support and aged care. PSRG has received two grants from the Marian and EH Flack Trust, $25 000 in 2009 and a further $25 000 in 2010.
Education through engagement

Partnership inspires next generation

Somerville House is a day and boarding school for girls which neighbours Mater Health Services in South Brisbane. This year MMRI had the opportunity to help students who were studying science as part of their Higher School Certificate by assisting them to undertake a project with MMRI researchers and then present their findings.

Supporting students in learning about research through this program has been rewarding and successful, not only for students but also for the researchers who had the opportunity to pass on some of their knowledge and passion. This success is evident in one of these students, Grace Yeung, who so enjoyed her time at MMRI that she chose to spend her break between finishing high school and starting university assisting Associate Professor Jon Whitehead with his research.

Higher education

MMRI provides an excellent environment for training in biomedical research and clinical application. Committed to the future of research and fostering students to reach their full potential, MMRI has world class facilities supported by internationally recognized staff with long established clinical links. In 2010 MMRI had 33 students completing postgraduate studies, including 23 PhD students, five Honours students and five Masters students.

Community engagement in the lab

As a philanthropic institute, MMRI relies on support from Mater’s fundraising arm, Mater Foundation. Part of the fundraising activities undertaken to promote research are public tours of MMRI’s laboratories and presentations by the Director of Research.

Many of the institute’s strongest supporters have had their lives touched by Mater in some way, whether their child is a Mater baby, or they have participated in a MMRI research trial or have had a family member treated at Mater.

The tours give visitors a chance to have a behind the scenes glance at the important work MMRI is undertaking which may one day be applied in hospitals around the globe to help save lives and relieve suffering.

MMRI researcher wins prestigious science award

In 2010, MMRI researcher Dr Hannah Cullup was recognised for her contribution to science, receiving a Young Tall Poppy Science Award.

The award, presented at the 2010 Premier’s Science and Innovation Reception, recognises researchers early in their careers who have achieved significant scientific milestones and have demonstrated their willingness and ability to engage people in science.

Dr Cullup’s research is committed to developing a new therapy to prevent graft versus host disease (GVHD).

Current immunosuppressive drugs given to patients aim to prevent the disease, but they also remove the T cells which can fight infections and kill cancer cells.

“I am delighted to receive a Young Tall Poppy Award,” Dr Cullup said.

“It is a great feeling of achievement to be acknowledged for not only the day-to-day laboratory research, but also for communicating how important science is in our everyday lives to school children and the general public.”

This award is part of the Tall Poppy Campaign run by the Australian Institute of Policy and Science and awardees are committed to engaging the wider community about science, and specifically encourage youth to consider a career in science.

Dr Hannah Cullup receives the Young Tall Poppy Science Award from Premier Anna Bligh and Queensland Chief Scientist Professor Peter Andrews.
The outcomes of 2010 reflect the growth which MMRI is currently experiencing. As we look to the future we hope to continue this trend. With outstanding researchers, administration and scientific support staff we are confident that MMRI will continue to exceed expectations.

The year at a glance

MMRI financial summary 2010

Revenue
Total revenue for 2010 was $12.28 million, up from $10.26 million in 2009.
- Grant income of $3.34 million
- Government infrastructure funding of $695,000
- Mater Health Services Infrastructure funding $2.21 million
- Donations and bequests $3.29 million
- Other income $2.69 million

2010 Revenue streams by type

Expenditure
Total expenditure for 2010 was $11.5 million, up from $9.78 million in 2009, the increase in expenditure reflects the growth of MMRI in 2010.
- Research and development $4.35 million
- Scientific support expenses $4.09 million
- Administration expenses $3.06 million

2010 Expenditure streams by type

- Administration expenses 27%
- Scientific support expenses 35%
- Research and development expenses 38%
- Other income 21%
- Grant income 27%
- Government infrastructure funding 6%
- Special Funding 1%
- Health services infrastructure funding 18%
- Donations and bequests 27%


Hardy, JR and Bowler, SD Central sleep apnea in cancer patients on opioids. J Pain Symptom Manage, 40: e3-5.


Linden, SK and McGuckin, MA, Microbes at the host surface, in Current Research, Technology and Education Topics in Applied Microbiology and Microbial Biotechnology, Méndez-Vilas, A, Editor. 2010, Formatex Badajoz, Spain. p. 591-596.


### MMRI publications 2010


### Current patents

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<tr>
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<td>Dendritic cell-specific antibodies and methods for their preparation</td>
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<td>MMRI-5</td>
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<td>PCT/AU2003/001038</td>
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<td>MMRI-6</td>
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<td>PCT/AU2005/001864</td>
<td>10-Dec-04</td>
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<td>Improved treatment &amp; prophylaxis</td>
<td>PCT/AU2008/001810</td>
<td>10-Dec-07</td>
<td>Australia</td>
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<td>United States</td>
<td>Application</td>
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<td>MMRI-72</td>
<td>Improving adiponectin levels</td>
<td>AU2010033551</td>
<td>9-Aug-10</td>
<td>Australia</td>
<td>Application</td>
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MMRI’s research would not be possible without the support of the community. Thank you to all those who supported MMRI in 2010.

**MMRI Donor List 1 January 2010 to 31 December 2010 ($10,000+).**

- Arrow Energy
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- Fundraising efforts of David and Marion Roberts
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