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Welcome

2013 has been another productive and pleasing year for Mater Research. The continued development and, in some cases, formalisation of our relationship with key internal and external partners has been the highlight.

Closest to ‘home’ has been the support and collaboration of both Mater Health Services and Mater Foundation. This has been fundamental to our success and our Mission to undertake research that benefits patients. Our research themes align well with the clinical strengths of Mater and, as evidence supporting the integration and collaboration, two-thirds of our research publications this year originated out of the clinical environment.

A major advance in the growth and development of Mater Research has been the formalisation of our alliance with The University of Queensland, formally known as Mater Research Institute – The University of Queensland (MRI-UQ). By undertaking much of our research activity as an institute of The University of Queensland, we gain the benefit of being part of a global top 100 university. Conversely, the university benefits from a closer alignment to Mater and the clinical challenges that will provide advantages for our collaborative research approach. Another advance for Mater Research has been the commissioning of the Translational Research Institute (TRI) building at the Princess Alexandra Hospital campus. Mater Research is a 25 per cent shareholder in TRI and now has approximately 100 researchers in this exceptional, state-of-the-art, facility.

We continue to grow in all aspects of the organisation. A particularly pleasing example is the growth in the number of Research Higher Degree students, now numbering more than 70. These students, many of whom are also clinically trained, are undertaking PhDs or Honours programs in a huge range of health-related areas and represent the future of Mater and medical research. We are privileged that this elite cohort has chosen Mater Research and Mater Health Services staff to be their supervisors and Mater Research to be their home for up to four years.

We have also done well in the competitive world of research funding. The most prestigious and competitive funding comes from the Federal Government’s National Health and Medical Research Council (NHMRC). In 2013 the national success rate for applications was under 17 per cent, yet Mater Research succeeded with more than 30 per cent of applications. Mater Research ranked 18th nationally in funds allocated, ahead of many large universities. The funding was for both research projects and for support of researchers, both key to our long-term success.
To bolster the clear success of our existing staff, we have continued to recruit researchers from around the globe. Many of these recruits have joint clinical and research appointments and roles, further ensuring that our research will always be of relevance to those in need. In keeping with Mercy principles, we continue to invest in research areas that may not be popular but that are very important health issues. These include palliative care, stillbirth, intellectual impairment and autism. We again highlight the terrific financial and other support from Mater Foundation and Mater Health Services who provide us this opportunity.

Finally, we wish to acknowledge Professor Ian Zimmer who stepped down as Chair recently, Ian has led the Mater Research Board for seven years with aplomb, humour and integrity and has been a major driver of the success we are enjoying. We wish Ian all the very best for the future, and we will endeavour to capitalise on the strong foundations he has provided.

Jim Walker AM, Chairman, Mater Research Board
John Prins, CEO/Director, Mater Research
Research performance 2013

In 2013 Mater Research continued to grow; the upward trend in attracting external funding continued with more than $8.2 million awarded, up from $6 million in 2012.

In October we secured grants for the future, with National Health and Medical Research Council (NHMRC) awarding $6.5 million in new funding for 2014 Project Grants and Fellowships.

Mater Research published 292 peer-reviewed journal articles in leading clinical and scientific journals including The Journal of the American Medical Association, Cell and The Lancet. The high quality and quantity of these publications enables researchers and scientists from all across the world to learn from our discoveries, and strengthens Mater Research’s national and international reputation in the field of health research.

This year also saw Mater Research attract a number of new recruits, including many international researchers. This influx of talent has brought new research opportunities, broadened our researcher network and strengthened our culture of research excellence.
Mater Research theme structure

Mater Research coordinates its research areas into four broad, multi-disciplinary themes which encapsulate multiple aspects of basic research, clinical departments and hospitals. The themes are Understanding and Preventing Disease, Improving Treatment of Disease, Mothers and Babies Health, and Healthy Development.

The focus of the Understanding and Preventing Disease research theme is 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. The focus of the Improving Treatment of Disease Research theme is to design and trial ways to more appropriately diagnose and classify disease, and to predict treatment outcomes for individual patients. The focus of the Mothers and Babies Health theme is to link exceptional care to high quality basic, clinical and translational research, focused on improving all aspects of health for mothers and babies. And the focus of the Healthy Development research theme is to increase understanding of the complex interplay between events during pregnancy and early life, genetics and environment on the healthy development of children.

<table>
<thead>
<tr>
<th>1. Understanding and Preventing Disease</th>
<th>2. Improving Treatment of Disease</th>
<th>3. Mothers’ and Babies Health</th>
<th>4. Healthy Development</th>
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<td>1. Immunity, Infection and Inflammation</td>
<td>5. Individualising Medical Care</td>
<td>12. Maternity Care to meet the Needs of Mothers and Babies</td>
<td>15. Early Human Growth and Development (Origins of Health and Disease)</td>
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<td>4. Disease Prevention</td>
<td>8. Improving the Management of Chronic Disease and Disabilities</td>
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<td>18. Sleep and Breathing</td>
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<td>10. Musculo-Skeletal and Neural Therapies</td>
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Centre for Translating Research into Practice (TRIP)

Centre for Nutrition and Exercise
Researchers among ‘Ten of the Best’

The outstanding work of two teams at Mater Research was highlighted in the 2013 National Health and Medical Research Council (NHMRC) publication ‘Ten of the Best’.

For the past eight years, the NHMRC has published ‘Ten of the Best’ to highlight outstanding Australian research projects that are directly contributing to the prevention, diagnosis and treatment of health issues facing Australians.

The two research teams, led by Associate Professor Ingrid Winkler and Dr John Duley, undertook research to improve health outcomes for people affected by cancer.

Associate Professor Ingrid Winkler has discovered the molecular switch the body uses to make bone marrow stem cells either go to sleep, which means they are resistant to chemotherapy, or wake up and regenerate the blood and immune system.

“For patients, this research has the potential to make chemotherapy treatment less dangerous, so they have the best possible chance to be cured of their cancer,” Associate Professor Winkler said.

Dr John Duley’s research developed a simple genetic test to predict which patients will suffer serious adverse side effects from the chemotherapy drug fluorouracil.

“Although fluorouracil is an old drug, it is very cheap and effective, so it is still widely used,” Dr Duley said.

“Helping to prevent injury, or even death, of cancer patients arising from chemotherapy would be very satisfying for all of our team.”

Mater Research CEO Professor John Prins said the inclusion of two Mater Research projects in ‘Ten of the Best’ was a major achievement.

“It is extremely exciting for two Mater Research projects to be included and to receive this acknowledgement for the amazing work that is being carried out here at Mater,” Professor Prins said.
TRI officially opened

A unique partnership between medical and research visionaries was realised in 2013 when Governor-General Quentin Bryce officially opened the new Translational Research Institute (TRI) in October.

Led by co-inventor of the cervical cancer vaccine, Professor Ian Frazer AC, TRI is a joint venture between four leading research institutes, including Mater Research.

Director of Research at TRI Professor Frazer envisaged that bringing researchers from different backgrounds together in a world class facility would maximise the opportunity for innovative thinking and drive progress.

Mater researcher Professor Jo Forbes, who works at TRI, confirmed there are numerous advantages bringing together researchers from Mater Research, The University of Queensland, Queensland University of Technology and Princess Alexandra Hospital within the one institute.

“TRI gives us scale; from looking at tiny microscopic structures to health economics that give better patient care,” Professor Forbes said.

“Importantly, it allows us to do team science and assists us to tackle complex health issues that have far-reaching impact.”
The Translational Research Institute at Woolloongabba brings together researchers from Mater Research along with The University of Queensland, Queensland University of Technology and Princess Alexandra Hospital.
An international research project led by Mater Research scientist Associate Professor Geoff Faulkner was included in the prestigious scientific journal Cell.

The paper entitled *Endogenous Retrotransposition Activates Oncogenic Pathways in Hepatocellular Carcinoma* investigated new types of genetic abnormalities in tumour cells, which could ultimately lead to improved cancer therapies and help identify individuals at risk of liver cancer.

Associate Professor Faulkner said that about 20 per cent of patients with liver cancer have these pieces of mobile DNA—called retrotransposons—that can mutate into genes known to prevent tumour growth.

“For technical reasons, retrotransposon mutations are often very hard to detect. To find them, we had to develop a new technology to track each retrotransposon ‘jump’ in DNA taken from tumour cells,” Associate Professor Faulkner said.

“We found retrotransposon mutations were relatively common in liver tumours; this opened up an entirely new line of enquiry for the disease.”

The research could present new options for cancer detection in patients and may also support future clinical studies.
Collaborating for stronger research

In August 2013, Mater Research and The University of Queensland formalised a long-standing relationship to form the Mater Research Institute – The University of Queensland (MRI-UQ).

The MRI-UQ is a collaborative alliance between Mater Research Institute and The University of Queensland, providing considerable strategic and operational benefits to both parties.

The collaboration will see The University of Queensland become the administering institution of the majority of Mater Research’s external funding for its current research activity. In turn, nominated University of Queensland researchers will have access to both clinical and laboratory environments at Mater Health Services. A collaborative approach will be taken towards research, education, marketing and fundraising.

CEO and Director of Mater Research Professor John Prins said that the partnership provides an exceptional opportunity for clinicians and researchers from Mater Research and The University of Queensland to work together to benefit healthcare.

“Merging the clinical expertise and high-quality health care of Mater with the research, education and training strengths of UQ is a way to increase efficiency, reduce duplication and combine our world class research, training and health care,” Professor John Prins said.

Mater Research Deputy Director Professor Mike McGuckin echoed these sentiments citing numerous advantages to formalising the partnership with the university.

“This historic partnership is a great opportunity for our researchers to utilise the sophisticated equipment, resources, and knowledge, across a closely located world top 100 university,” Professor McGuckin said.
Respiratory study shared in prestigious journal

A study led by Mater Research respiratory specialist Dr David Serisier was published in one of the world’s most prestigious international peer-reviewed medical journals—The Journal of the American Medical Association.

Dr Serisier’s study investigated low-dose macrolide antibiotics in bronchiectasis, a disease state characterised by widening of the airways, mucosal thickening, and bronchial inflammation. Sufferers are usually dogged by a chronic cough, impaired lung function and infection-related exacerbations that often require long hospital stays.

Dr Serisier said the results of his study showed that the rate of pulmonary exacerbations per patient each year was 1.29 in patients treated with erythromycin, compared with 1.97 in those given placebo: a 43 per cent relative reduction in the exacerbation rate.

“The reason I initiated my research on the effects of erythromycin on non-CF bronchiectasis was because of the unmet need for effective therapies for this condition,” Dr Serisier said.

“I had a hypothesis and a strong suspicion that my therapy would be effective.”

Dr Serisier said the support he received was instrumental in facilitating the study.

“Mater had the local capacity to undertake the study and I had a great research team,” he said.
Six million steps toward better healthcare

Mater Research successfully secured more than $6 million in National Health and Medical Research Council funding in 2013 to support a number of research projects.

This success in the competitive arena of research funding is particularly significant because Mater Research secured funding from more than 30 per cent of the grant applications submitted in 2013. This exceeds the national grant success rate of 17 per cent and ranks Mater Research within the Top 20 organisations nationally in terms of research funding awarded.

The funding will be used to undertake projects that focus on improved health outcomes including:

- **Understanding and treating inflammatory disease**: focuses on inflammatory bowel disease, respiratory inflammatory disease and diabetes and seeks better treatments for patients.
- **Mucins in gastrointestinal disease**: looks at how defensive molecules on the surface of the gut protect people from developing cancer.
- **Discovering new drugs to facilitate blood stem cell transplantation in cancer patients**: attempts to improve the effectiveness of bone marrow transplant for leukaemia and lymphoma patients.
- **Characterisation of novel hormone receptors**: explores how hormones produced by fat cells control your metabolism and how a regulated diet contributes to metabolic disease, including diabetes and cardiovascular disease.
- **My baby’s movements**: investigates whether a mobile phone app will enhance management of decreased fetal movements in late pregnancy and thereby reduce the risk of stillbirth.
- **Blocking mobile DNA activity in induced pluripotent stem cells**: investigates potential DNA changes during stem cell transplantation and ways to prevent this occurring to make stem cell therapy safer.
- **Mobile DNA reveals new liver cancer risk factor genes**: continues research into the discovery of a previously unrecognised form of DNA damage in liver cancer which could lead to new treatment approaches.
Associate Professor John Hooper at Mater Research.
World class care and facilities

Autism Spectrum Disorder is one of the most severe, prevalent and heritable neurodevelopment disorders, affecting at least one in 100 children.

Mater Research will share in $31 million Federal Government funding for a world-first program to assist Australians living with Autism Spectrum Disorder.

The funding will be used to establish a Cooperative Research Centre (CRC), hosted by The University of Queensland, and will draw on the expertise of researchers across Australia and around the world.

The research aims to:

- ensure early diagnosis, coupled with targeted early intervention strategies
- enable education in an appropriate environment by skilled professionals
- provide the best chance to find a meaningful and fulfilling place in society through higher education, employment and better opportunities for long-term social relationships.

Mater Research Deputy Director Professor Mike McGuckin said Developmental Paediatrician Dr Honey Heussler and Developmental Disorders Team Leader Dr Paul Dawson were instrumental in putting together Mater’s portion of the bid.

“Both Dr Heussler and Dr Dawson will utilise the funding to pursue clinical and basic science research in autism,” Professor McGuckin said.

Mater Research joins 10 essential participants in the Cooperative Research Centre. These are Griffith University, La Trobe University, The University of Western Australia, Autism Spectrum Australia, AEIOU, Autism Queensland, Queensland University of Technology, Curtin University, University of New South Wales, and the Department of Education, Employment and Training Queensland.
Women’s healthcare research recognised

Mater Researcher Associate Professor Vicki Flenady was awarded the Women’s Healthcare Australasia 2013 Medal of Distinction for her contribution to improving the care of women and babies.

Associate Professor Flenady is the Director at the Translating Research into Practice Centre and Co-Program Head at the Optimising Outcomes for Mothers and Babies at Risk Program.

Recently Associate Professor Flenady received her PhD on the subject of a systematic approached to stillbirth from a clinical epidemiological perspective and her commitment to excellence in the care of mothers and babies has been recognised via a number of awards. Her research has been extensively published and cited in international journals including the prestigious The Lancet and she has been involved in a number of reports and guidelines related to fetal mortality.

Associate Professor Flenady said that she was honoured to be recognised for her contribution to improving the care of women and babies, and feels privileged to be one of the people at the forefront of research into sustaining babies’ lives.

“I love the work we do with parents who have had stillborn babies as it brings real perspective and understanding to my research,” Associate Professor Flenady said.

“When every mother can hold her healthy newborn baby, my job will be done.”
Excellence Rewarded

The contributions of Mater Researchers were recognised in late 2013 at the annual Awards for Research Excellence.

The Sr Regis Mary Dunne Medal for outstanding research contribution was awarded to Associate Professor Geoff Faulkner.

Dr Paul Dawson received the Sr Madonna Josey Medal for outstanding contribution to the operation of the Institute and Dr David Serisier was recognised with the Sr Eileen Pollard Medal for incorporating research into clinical care provision.

Dr Kyle Upton received the Early Career Research Award, Joanna Rackoczy received the Scientific Research – Research Higher Degree Student Award and Sara Mayfield received the Clinical Research – Research Higher Degree Student Award.

Dr Paul Dawson was among those recognised at the annual Mater Research Awards for Research Excellence.
## Financials

### Financial Outcomes 2013

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<th>Revenue</th>
<th>2013</th>
<th>%</th>
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<td>Grant Income</td>
<td>$7,591,890</td>
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<td>Government Infrastructure Funding</td>
<td>$1,721,545</td>
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<td>Commercial Funding</td>
<td>$120,500</td>
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<td>Mater Health Services Infrastructure Funding</td>
<td>$3,000,000</td>
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<td>Donations and Bequests</td>
<td>$5,504,024</td>
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<td>Other Income</td>
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<td>Research Support expenses</td>
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<td>Research and development expenses</td>
<td>$9,710,138</td>
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<td><strong>TOTAL</strong></td>
<td><strong>$21,697,396</strong></td>
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2013 Revenue streams by type

- Grant Income: 37%
- Donations and Bequests: 27%
- Mater Health Services Infrastructure Funding: 14%
- Commercial Funding: 1%
- Government Infrastructure Funding: 8%
- Other Income: 13%
- Other Income: 13%

2013 Expenditure streams by type

- Research and development expenses: 45%
- Research Support expenses: 39%
- Administration expenses: 16%
ERA rankings

These rankings were developed by the Australian Research Council for use in evaluating research performance. Rankings as follows:

A* – typically an A* journal would be one of the very best in its field.
A – the majority of papers in an A journal will be of very high quality.
B – journals with a solid, though not outstanding, reputation.
C – quality, peer-reviewed journals that do not meet the criteria of the higher fields.
NR – not ranked by ERA (either a new publication or a non-peer reviewed publication)
Publication list

2013 was a strong year for Mater Research, with 292 publications in national and international literature. More than 40 per cent of these publications were in ERA classification A* or A journals representing the highest quality of health research journals, indicating the international relevance of our research. Highlights of the year include Mater Research-led studies being published in Cell, The Lancet and The Journal of the American Medical Association.


Publication list continued


Publication list continued


Gray, P. H. (2014) In infants born extremely preterm, aspirin or NSAID use during pregnancy are associated with increased risk of quadriparetic cerebral palsy. Evid Based Nurs. 17, 16-7.


Publication list continued


Publication list continued


Mater Research patents

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Mater Research Board

Mater Research would like to thank our committed board and committee members for their hard work throughout 2013.

Jim Walker AM (Chair)
Professor Ian Zimmer (Chair until June 2013)
Dr Carrie Hillyard (Deputy Chair)
Professor Perry Bartlett
Dr John O’Donnell
Professor Geoff Kiel
Professor David McIntyre
Professor Debbie Terry
Stephen Denaro (Company Secretary)
Mater Research

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