mater research

Annual Report

2021

materresearch.org.au

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Forewords

Mater established its Research Advisory Board in March of 2021 and I am delighted to provide an introduction to this annual report on its behalf.

We would like to acknowledge the enormous contribution to medical science by so many Mater researchers ably led by Professors Maher Gandhi and Allison Pettit.

Mater Research has had a very productive and successful year, rising to the challenge of COVID-19 and again excelling in peer reviewed grant awards. 2021 was a stellar year for the Stillbirth team, led by Prof Vicki Flenady. Amongst notable achievements were a $2M grant from the Department of Health to roll out the safer baby bundle and successful NHMRC Centres for Research and Investigator grant applications. In recognition of her contributions, Vicki was invited to represent Australia on the World Health Organisation forum on stillbirth

The pandemic has demonstrated to the broader community and government the value of science and medical research and Mater's researchers have risen to the COVID challenge. Dr Mitchell Sullivan and A/Prof Katharina Ronacher are leading respective laboratory-based initiatives to target the SARS-CoV-2 virus and A/Prof Kym Rae is building a consortium to understand factors that will increase vaccine uptake in expectant mothers from the indigenous community. Yet, despite the pandemic, the devastating human impact of other diseases has not decreased and Mater Research has maintained its critical research programs in mother and baby research, chronic diseases, cancer, neuroscience and healthcare delivery and innovation. This would not have been possible without the continued strong support of the Mater Foundation and the donors who so generously support it.

Mater's research is maturing and a number of projects are being translated into clinical practice or commercial development, including a start-up company, based on A/Prof Sumaira Hasnain and her team's work to reverse liver damage, which attracted $1.3M in seed funding; a new theranostic is moving into clinical trials in ovarian cancer patients; novel treatments for the life-threatening complications of diabetes and an early diagnostic for their detection; and combination therapy options to improve outcomes in melanoma and cervical cancer.

The Research Advisory Board congratulates the students who have achieved success in awards, attesting to their skills and dedication as well as the support of their supervisors and mentors. We look forward to continued success in 2022.

Dr Carrie Hillyard, Research Advisory Board Chair

Mater Foundation is delighted to play a role in connecting and enabling the community to directly support world-class medical research. The real beneficiaries of Mater Research's work are the community, who benefit through improved health.

Mater research delivers real benefits to patients. This is evidenced through many successes, and no more so than the 118 new research studies approved in 2021. Of those, three quarters were clinical studies aimed towards translation and implementation of research into better health outcomes with the remaining being discovery-based research using clinical samples or data.

The commitment and focus to improving the lives of others through discovery, refining, and translating medical research is evidenced by the 54 clinical trials testing an intervention like a new drug or treatment pathway and 34 cohort studies designed to observe predictive risk factors or health outcomes over time. Mater Research's work is truly bench to bedside, aligned to Mater's clinical specialists, and supported by Mater Education's focus on embedding improved clinical practice. This unique combination of researchers, clinicians, and educators ensure the generous support received from the community's generosity delivers tangible health benefits to patients.

This Annual Report demonstrates the exceptional researchers, facilities, collaborations, and research programs, however most of all it demonstrates Mater Research's focus on empowering people to live better lives through improved health and well-being.

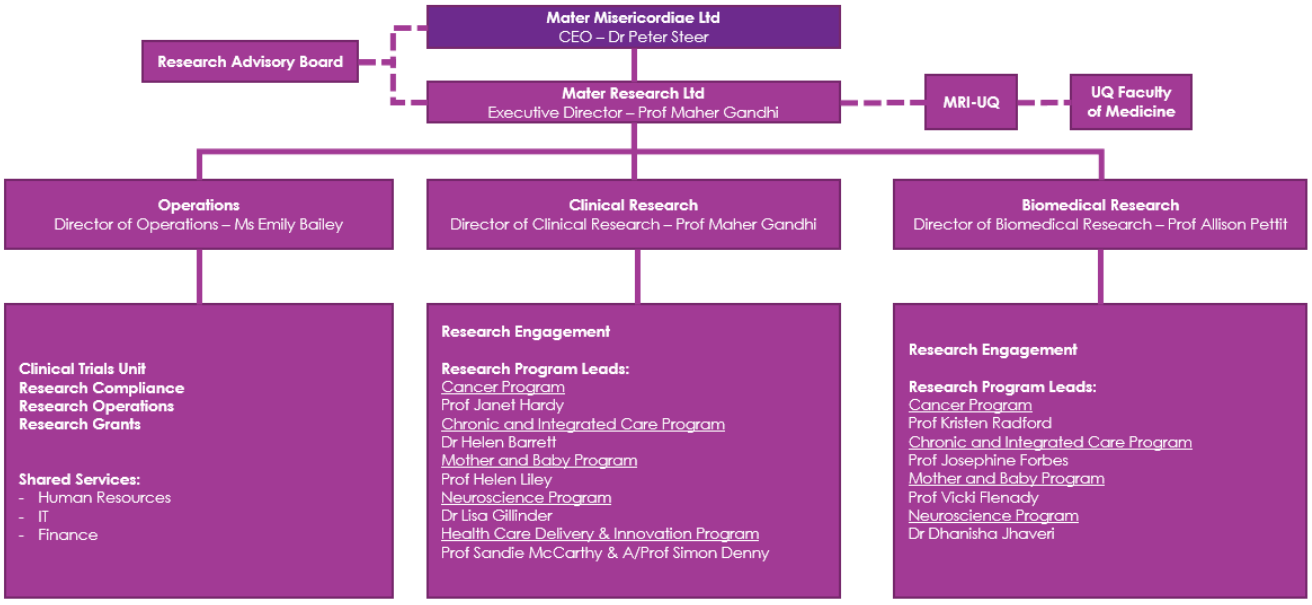
Mr Andrew Thomas, Executive Director Mater Foundation

About Us

Mater Research is a recognised leader in medical research and the research arm of Mater. Our bench to bedside philosophy sees us working across Mater Health's hospitals and health services, and our partners The University of Queensland, the world-class Translational Research Institute (TRI) and Health Translation Queensland. We are committed to working closely with Mater Health, Mater Education and our growing network of partners and collaborators to turn scientific discovery into the best possible treatment, care, and outcomes for patients and our broader community.

Our strong track record of successful grant applications and fellowship recipients is underpinned by the significant financial support of Mater Foundation. Millions of dollars are contributed each year funding pilot trials and projects, vital infrastructure and resources, student scholarships, backfilling clinical time to enable more clinician-led research, fellowships for our senior researchers and flexibility to sustain research beyond short-term grants.

With expertise across all facets of medical research—study design, ethics and governance, data collection, biobank management, analysis, and implementation science—we are responsible for robust management of all research and clinical trials at Mater. We also maintain a broad external focus, horizon scanning national and international high quality research to reduce duplication of effort and wasted resources, working alongside Mater Education and Mater Health to support prompt and efficient translation of research into clinical care.



Mission and Vision

Vision

To translate our research discoveries and integrate them into improved healthcare.

Mission

To **discover** new knowledge central to the Mater mission, **translate** this knowledge into practice and **integrate** these research outcomes into improved healthcare and educational practices across Mater.

Mercy Values

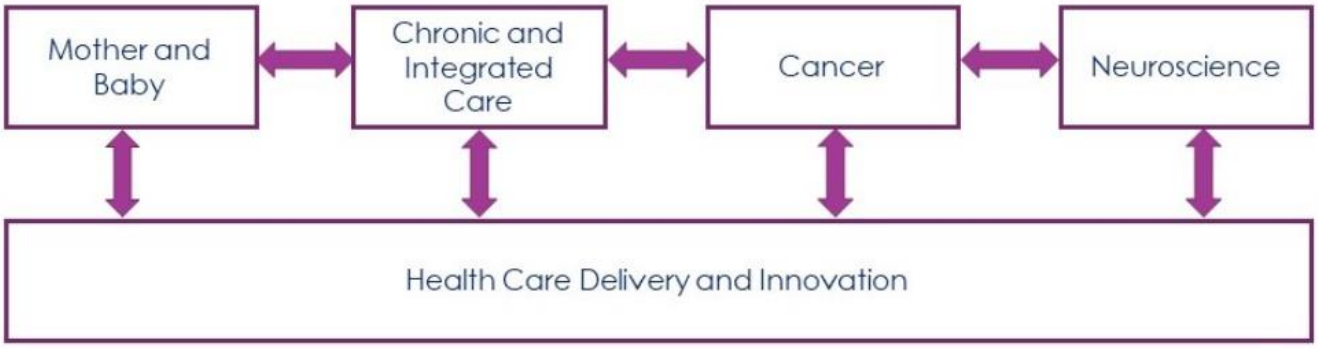
Mater Research wholeheartedly commits to the Mater Values:

- We honour and promote the dignity of human life and of all creation
- We act with compassion and integrity
- We strive for excellence.

Mater Research

In addition to the Mercy Values, working across our five research programs Mater Research is committed to upholding the values relating to our scientific, medical and management mission:

- Integrity - we conduct ourselves and our work honestly and ethically to build a culture of excellence.
- Innovation - developing and extending knowledge to improve health.
- Inspiration - educating and imparting knowledge to inspire each other and future generations.
- Engagement - fostering and encouraging teamwork, collaboration and commitment to the community.



Our History

The establishment of a medical research institute at Mater Hill was a long-term goal of the Sisters of Mercy and the Mater Health Services Governing Board. This desire and commitment culminated in July 1998 with the formation of the Mater Medical Research Institute, a development funded by the Sisters of Mercy and their supporters. The Governor-General officially opened the institute in March 1999. In 2006, Mater Research incorporated and became a National Health and Medical Research Council (NHMRC) accredited independent medical research institute.

Mater Research commenced operation in 1998 with 10 staff. Since then, it has experienced significant growth, creating an internationally competitive institute with many original programs attracting top scientists from around the globe.

Mater Research has documented significant outputs in publications, patents, student achievements, collaborations, peer-reviewed funding and other significant funding.

The initial scientific focus for Mater Research was cancer immunology, however the research has grown to seed and attract other independent scientific teams. The institute now has five Research Programs, closely integrated with the clinical services at Mater Health.

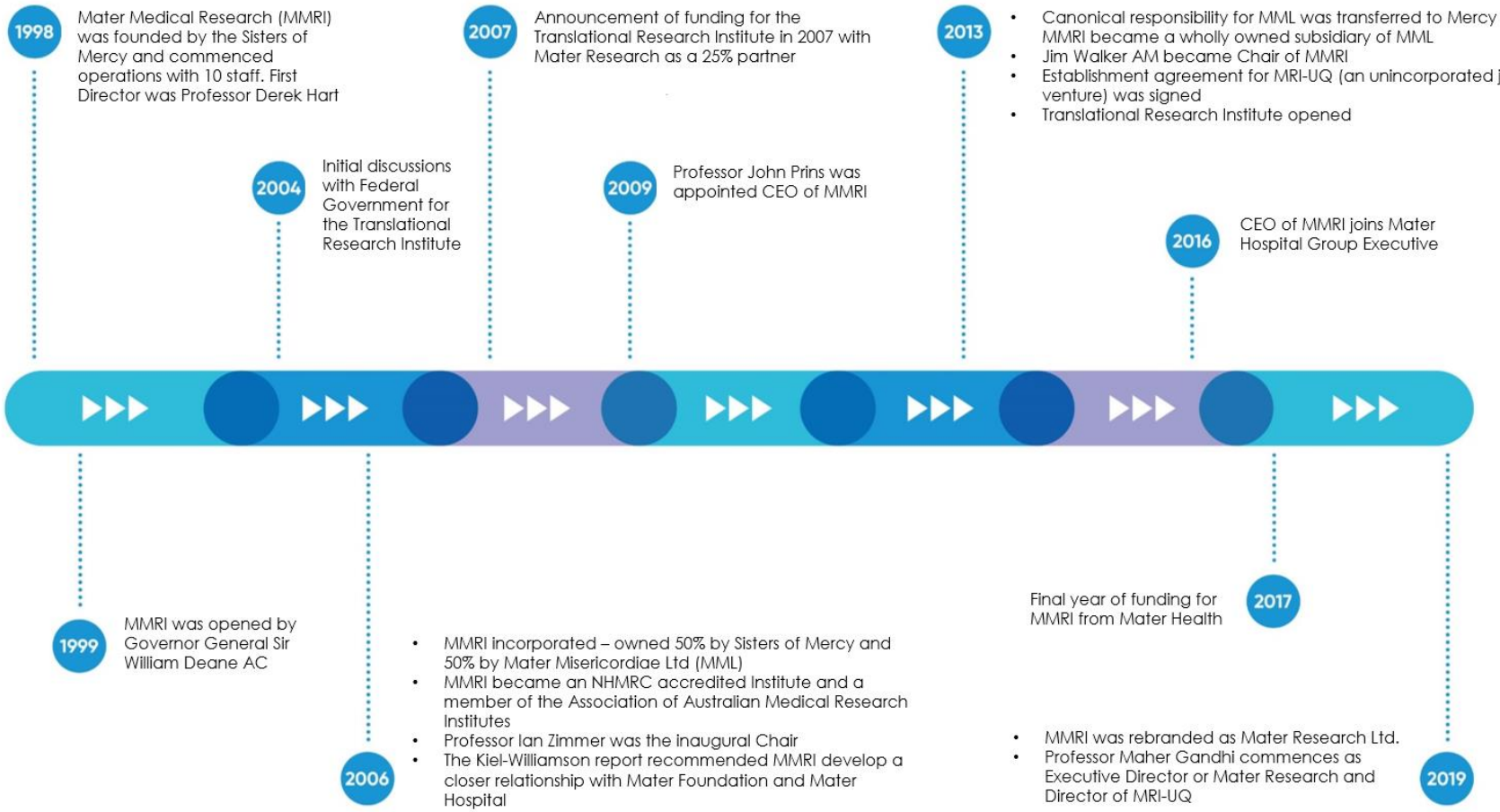
The expansion of the research themes at Mater Research is in part a result of the close and effective working relationship established between Mater Research and Mater Health. Working together on significant joint ventures, confirms the link between medical research and its clinical application and this relationship continues to strengthen.

Mater Research has also proved its capacity to attract funding for ongoing developments and is a proud partner in the TRI, a $354 million facility built on the Princess Alexandra Hospital site. With access to this infrastructure since January 2013, Mater Research has continued to grow rapidly both on the Mater campus and in the purpose-built TRI providing world class facilities for our biomedical research, including access to small-medium clinical grade manufacturing facilities.

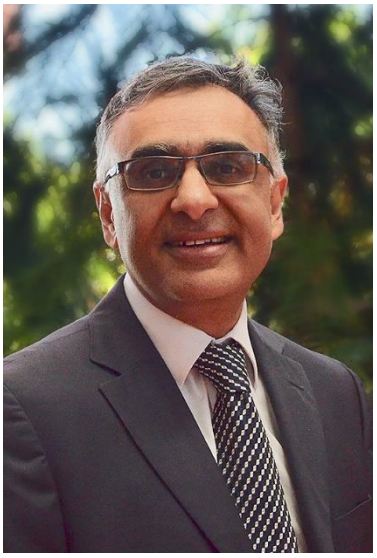
The University of Queensland, a global top 50 university, has been an affiliate organisation from the institute's inception and is an increasingly important partner. In 2013, Mater Research and The University of Queensland formalised a long-standing relationship to form the Mater Research Institute – The University of Queensland (MRI-UQ). Merging the clinical expertise and high-quality health care of Mater with the research, education and training strengths of The University of Queensland provides strategic and operational benefits to both organisations to benefit healthcare. The collaborative alliance between Mater Research and The University of Queensland means that Mater Research is also a full institute within The University of Queensland Faculty of Medicine.

On 23 April 2013, canonical sponsorship for Mater was transferred to Mercy Partners, which means Mater Research is now owned by Mercy Partners.

2016 saw Mater Research integrate further within Mater, the CEO joining the Mater Hospital Group Executive. In 2019 MMRI was rebranded as Mater Research Ltd and Professor Maher Gandhi was appointed as the Executive Director of Mater Research and MRI-UQ. In 2020 the research programs were enhanced with new leadership and alignment to reflect the changing needs of the community.


1998
Mater Medical Research (MMRI) was founded by the Sisters of Mercy and commenced operations with 10 staff. First Director was Professor Derek Hart
2004
Initial discussions with Federal Government for the Translational Research Institute
2007
Announcement of funding for the Translational Research Institute in 2007 with Mater Research as a 25% partner
2009
Professor John Prins was appointed CEO of MMRI
2013
Canonical responsibility for MML was transferred to Mercy Partners. MMRI became a wholly owned subsidiary of MML
Jim Walker AM became Chair of MMRI
Establishment agreement for MRI-UQ (an unincorporated joint venture) was signed
Translational Research Institute opened
2016
CEO of MMRI joins Mater Hospital Group Executive
1999
MMRI was opened by Governor General Sir William Deane AC
2006
MMRI incorporated – owned 50% by Sisters of Mercy and 50% by Mater Misericordiae Ltd (MML)
MMRI became an NHMRC accredited Institute and a member of the Association of Australian Medical Research Institutes
Professor Ian Zimmer was the inaugural Chair
The Kiel-Williamson report recommended MMRI develop a closer relationship with Mater Foundation and Mater Hospital
2017
Final year of funding for MMRI from Mater Health
2019
MMRI was rebranded as Mater Research Ltd.
Professor Maher Gandhi commences as Executive Director or Mater Research and Director of MRI-UQ

Executive Director Report



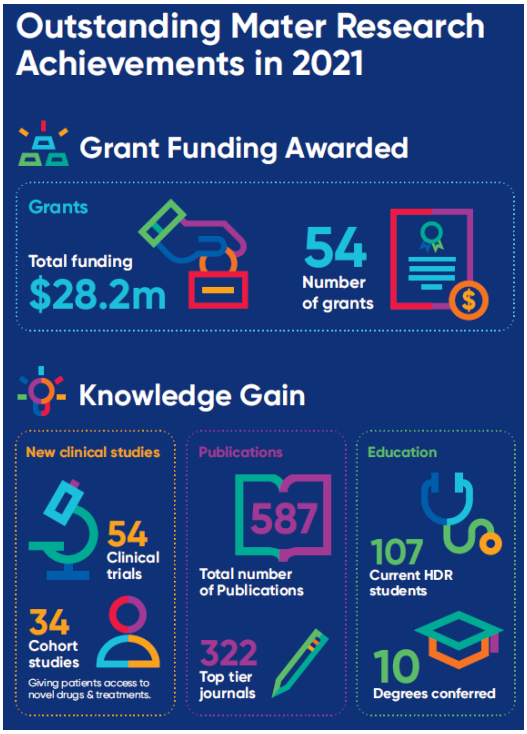
I hope you find this report as inspiring as I do. In these pages you will witness Mater Research's drive, passion and commitment to discovery, translation and integration. With this we serve the Mater community through cutting-edge health and medical research.

At Mater Research we know that our researchers are our core strength. Combined with our partnerships with The University of Queensland, the Translational Research Institute and Health Translation Queensland, we collectively leverage our networks to translate our findings to make a difference. In these pages, you will see numerous examples that illustrate this well.

Examples range across the health spectrum, including such diverse discoveries as the one by Freddy Beker's group that improved neurodevelopmental outcomes result by incorporating smell and taste into the feeding of preterm babies (*JAMA Pediatrics*); the characterization of new cancer cell enzymes that can be targeted by novel immunotherapies in malignancies of the breast and ovaries (published by John Hooper's team in *Nature Chemical Biology)*; the ground-breaking discovery that we are NOT what we eat – (by Jake Grattan and colleagues in *Cell*), i.e. patients with Autism develop an altered gut microbiome and not the other way round; the continued success of JETRA including securement of substantial venture capital for Sumaira Hasnain's intellectual property to tackle obesity related liver disease; and the first psychosocial analysis of the burden of inflammatory bowel disease in young Australians by Simon Denny from the Mater Young Adult Health Centre.

The list goes on and on…

These and other successes have seen our institute grow and our reach expand. The breadth of these achievements is indeed a cause to celebrate. This has occurred despite the backdrop of considerable pressure on the sector due to limited research funding and philanthropy. Yet 2021 yielded our highest ever total for external international and national peer-reviewed grants – thereby bucking the national trend of diminishing funding returns and increasing competition for scarce research dollars.



Mater Research, like all around us, have had to struggle with the myriad of challenges that the pandemic has brought forth. Despite lockdowns, cessation in overseas higher degree student recruitment, supply chain issues and stop/start accrual to clinical trials, our overall productivity was largely maintained.

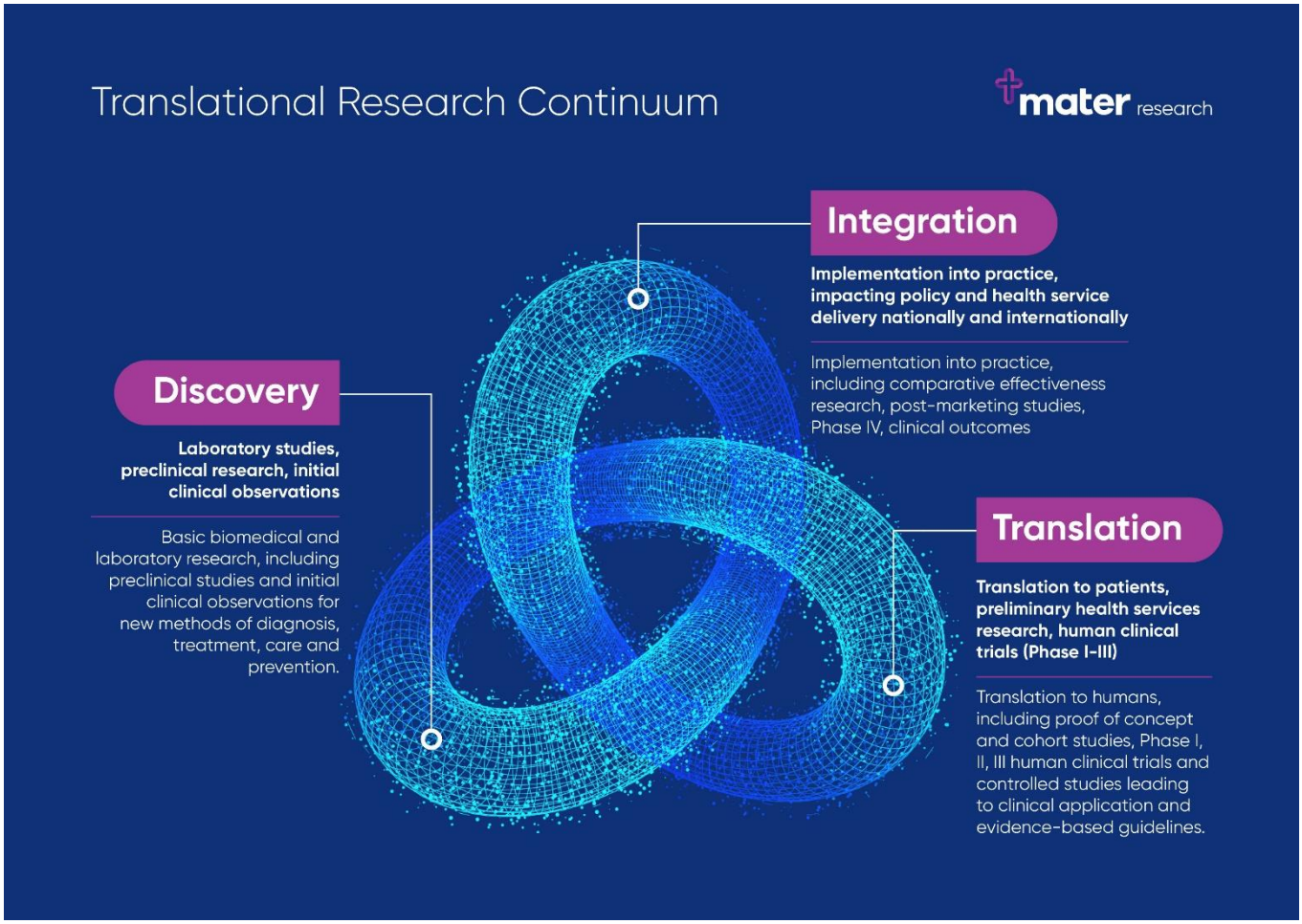
2021 could not have been navigated without the tenacity and leadership of my fellow executives Professor Allison Pettit and Emily Bailey, to the ongoing dedication of all of our research and professional staff, and the support of the Research Advisory Board and Mater Foundation. No one should take their commitment for granted, and I sincerely thank each and every single one of them.

As you can see, our research is having a global impact. I invite you to immerse yourself in our 2021 Mater Research Annual Report. I trust that you will be amazed and enlightened, and by the end feel as confident as I do, that 2022 will continue our upward trajectory.

Our Strategy

To achieve health impact through integrated research excellence:

- Develop the quality and output of researchers in Mater-relevant areas of focus.
- Enhance Mater's expertise in areas of excellence through high-quality research.
- Ensure the balance of research across discovery, translation and integration is aligned with Mater's strategy.
- Establish and maintain a strong culture of collaboration.
- Develop links with academic institutions and commercial agencies.
- Prioritise internal and external partnerships in areas of strategic focus.



In keeping with the values of Mater's founding Sisters of Mercy, Mater Research's five research priorities are borne of the most pressing health issues in the community. Each of our four health area/consumer targeted Programs (Mother & Baby, Chronic & Integrated, Cancer, Neuroscience) have activities across the spectrum of the discovery through translational research continuum with clear intent to solve significant health challenges. The enabling platform Program of *Health Care Delivery and Innovation* is well positioned to facilitate research integration within Mater's clinical services and lead innovation of healthcare delivery to set new standards of 'best practice'.

Our Programs

Mother & Baby

This program is focused on optimising the care of women and their babies during pregnancy and following delivery. Ongoing research activity is directed toward improving the clinical management of complications before, during and after pregnancy, optimising the care for premature and unwell neonates, and examining the relationship between fetal development, early life experience and life-long health. This program is home to the prestigious NHMRC funded Stillbirth Centre of Research Excellence. It also supports the Queensland Family Cohort Study, a landmark research project to track health across Queensland families.

Group Name	Group Leader
Centre of Research Excellence in Stillbirth	Professor Vicki Flenady
Critical Care of At Risk Newborns Research	Professor Helen Liley
Developmental Molecular Genetics Group	Dr Sandy Richardson
Genesis Maternal Fetal Medicine Research	Professor Sailesh Kumar
Indigenous Health Research	Associate Professor Kym Rae
Neurodevelopmental Follow-up and Outcomes Research	Associate Professor Samudragupta Bora
Pregnancy and Development Research	Professor Vicki Clifton

Program Leaders: Professor Vicki Flenady (Health Services) and Professor Helen Liley (Clinical)

Research Highlight: Mother & Baby Program

Dr Friederike Beker

Dr Friederike Beker is a Senior Staff Specialist in Neonatology at Brisbane's Mater Mothers' Hospital and a Mater Researcher in the Neonatal Critical Care Unit group. Enabled through a 2016 Betty McGrath Fellowship that allowed clinical back-fill and pursuing PhD studies, Dr Beker is exploring the role of taste and smell in premature baby development. Seven years ago, her partner, Chef Jan Gundlach suggested that even preterm infants could taste and would probably appreciate food. Hence, Dr Beker conducted a clinical trial with the question: For preterm infants, do regular smell and taste of milk with tube feeding, compared with routine care, improve nutrition and other clinical outcomes?

"We found very premature babies who were allowed to smell and taste milk at the same time as they were being tube fed, recorded slightly larger head circumference measurements and body length at 36 weeks compared to babies that didn't get the sensory stimulation."

Knowledge impact: In this randomized clinical trial of 396 preterm infants, regular exposure to the smell and taste of milk with tube feeding compared with routine care did not increase weight at discharge. This contrasts with a similar study also recently published (PMID: 31062377), identifying that site-specific factors may affect the outcome of this intervention. However, smell and taste of milk did improve head circumference and length at 36 weeks' postmenstrual age which has been previously associated with better long-term neurodevelopmental outcomes in pre-term infants. Consequently a 2-year neurodevelopmental follow-up of trial participants is underway to investigate this possible benefit. This Mater led and financed clinical trial has been published in the highly respected Journal of the American Medical Association (JAMA) Pediatrics. The publication of trial results received attention from media, social media and the neonatal community around Australia and beyond. Dr Beker was invited speaker to Cool Topics Neonatology in 2021 to present the study results to an international audience.

Community impact: This research is actively informing whether the simple intervention of introducing smell and taste of food should be incorporated into the regular care of very preterm babies. Effective interventions at this early stage in this vulnerable patient group have potential to have life-long implications for the health and wellbeing of the impacted families.

Chronic & Integrated Care

This program is focused on studying the pathophysiology and management of chronic diseases and using this information to direct discovery of new therapies and preventative strategies to address unmet needs. Research is currently being conducted into Type 1 and Type 2 diabetes and associated complications, inflammatory bowel diseases, chronic respiratory and infectious diseases, chronic liver disease and cardiovascular and renal disease.

Group Name	Group Leader
Genetics, Genomics and Transcriptomics Research	Professor Kim Summers
Glycation and Diabetes Complications Research	Professor Josephine Forbes
Hormones and Metabolism Research	Dr Helen Barrett
Immunopathology Research	Associate Professor Sumaira Hasnain
Infection, Immunity and Metabolism Research	Associate Professor Katharina Ronacher
Inflammatory Bowel Diseases Research	Associate Professor Jake Begun
Macrophage Biology Research	Professor David Hume
Stem Cell Biology Research	Professor Jean-Pierre Levesque

Program Leaders: Professor Josephine Forbes (Biomedical) and Dr Helen Barrett (Clinical)

Research Highlight: Chronic & Integrated Care Program

Professor David Hume & Dr Katherine Irvine

"This is basic science research, but it has clear implications for understanding the lifelong health impacts of low birth weight and prematurity in human infants"

Professor David Hume and Dr Katharine Irvine co-lead the Macrophage Biology group. Their program of research is focussed on the biology of cells of the innate immune system called macrophages and their functions in development and disease.

Much of their research deals with the role of the macrophage growth factor colony stimulating factor 1 and its receptor in controlling normal physiology and disease. The team is working with sophisticated experimental tools to elucidate the biological impact of this signalling axis in macrophages including: i) preclinical animal models with mutations in the colony stimulating factor 1 receptor gene that inhibit macrophage development, and ii) a novel stable form of colony stimulating factor 1 that stimulates macrophage development.

Knowledge impact: Different kinds of mutations in the colony stimulating factor 1 receptor gene in humans cause a spectrum of diseases ranging from a severe postnatal developmental defect and infant mortality to an adult-onset neurodegenerative disease. Prof Hume and Dr Irvine's research showed that the loss of colony stimulating factor 1 receptor function severely compromises postnatal growth and development of the skeleton and multiple organ systems including the liver, leading to early mortality. In a separate study they have provided new insights into the mechanisms underlying neurodegeneration in adult-onset human disease. Very surprisingly, all of the detrimental impacts of genetic mutation in colony stimulating factor 1 receptor could be reversed by transfer of normal bone marrow cells in the early postnatal period. Unexpectedly this cell therapy even restored fertility in these animals. Some of these exiting findings have recently been published and have been used toward gaining grant funding from the Australian Research Council (ARC). Complementing these studies that highlight the fundamental role of macrophages in growth and development, the team is investigating whether colony stimulating factor 1 could be used to promote tissue regeneration. They have demonstrated striking impacts of treatment on liver fibrosis and regeneration, and gained project funding from the NHMRC and Metro South Hospital and Health Service to pursue this translational research.

Community Impact: Building on many years of discovery research of the Hume & Irvine team, these novel results provide evidence that the postnatal expansion of the innate immune system is a key event in normal development; and could provide opportunities for correcting chronic disease tissue damage and neurodegenerative disease. Translating these preclinical animal data into human health, this suggests a new avenue for using cell-based therapy to correct deficiencies in postnatal growth and development (low birth weight, failure to thrive) and immune cell function.

Cancer

Researchers within this program study the biological basis of solid and blood borne malignancies, and approaches to improving diagnostics. The continuing outcomes of this research are discovery, development and trialling of new therapies and diagnostics, as well as improving all aspects of the management of cancer for all patients, including palliative care.

Group Name	Group Leader
Blood Cancer Research	Professor Maher Gandhi
Bones and Immunology Research	Professor Allison Pettit
Cancer Biology Research	Professor John Hooper
Cancer Immunotherapies Research	Professor Kristen Radford
Palliative Care Research	Professor Janet Hardy
Smiling for Smiddy Cell Cycle Melanoma Research	Professor Brian Gabrielli
Stem Cells and Cancer Research	Associate Professor Ingrid Winkler
Translational Bioinformatics Research	Dr Adam Ewing

Program Leaders: Professor Kristen Radford (Biomedical) and Professor Janet Hardy (Clinical)

Research Highlight: Cancer Program

Dr Thomas Kryza

Dr Thomas Kryza is a Research Officer in the Cancer Biology Research Group led by Prof John Hooper.

Enabled through recent prestigious funding from the National Breast Cancer Foundation's "Love Your Sister" initiative, Dr Kryza's goal is to discovery new methods for earlier diagnosis of breast cancer and better treatments for women who have this disease.

His research is focused on understanding the causes of breast and other cancers and the development of innovative molecules that can be used to deliver radioactive particles and drug payloads specifically to cancer cells so that they can be more easily and accurately be detected for diagnosis and so that patients have more effective treatments. Dr Kryza collaborates closely with breast cancer clinician researchers from Mater's Pathology Department, in particular Dr Cameron Snell.

"Our project has the potential to revolutionise the clinical management of breast cancer by improving both detection and treatment to significantly improve the quality of life and survival of breast cancer patients.

Because this agent is already in clinical testing for ovarian cancer, if the research team can demonstrate it is also applicable to breast cancer, it will hopefully be available to patients faster."

Knowledge impact: In a key breakthrough for the field, in an article published in the prestigious journal *Nature Chemical Biology*, Dr Kryza and Prof Hooper reported the development of novel tools to revolutionise how cell enzyme networks are studied in cancer and other debilitating diseases. The work will allow the identification of cancer-enriched molecules that promote the most aggressive forms of cancer that spread (metastasize) to other organs in the patient's body. Importantly, these molecules have the potential to be used positively for both earlier diagnosis and more effective treatment of cancer.

Community impact: From their research discoveries over the last 20 years, the team led by Prof Hooper is currently conducting a clinical trial testing one of their new biological agents for the ability to act as a 'Trojan Horse' to specifically deliver radioactive payloads to ovarian cancer cells. This kind of "precision medicine" is expected to lead to better patient survival rates with patients experiencing fewer toxic side effects.

Neuroscience

This program focuses on the genetics and pathophysiology of diseases of the brain and nervous system and seeks to improve the life-long management across the spectrum of neurological disease, intellectual disability and mental health conditions. A strategic partnership with UQ's Queensland Brain Institute provides a nexus to world-class research calibre (people, technology, infrastructure).

Group Name	Group Leader / Clinical Lead
Cognitive Health Genomics	A/Prof Jake Gratten
Cognitive Neurology	Professor Peter Nestor
Neurodevelopmental Research	Associate Professor Paul Dawson
Epilepsy Research	Dr Lisa Gillinder
Genome Plasticity and Disease Research	Professor Geoffrey Faulkner
Neuroimmunology Research	Dr Andrew Swayne
Neural Stem Cell Biology Research	Dr Dhanisha Jhaveri

Program Leaders: Dr Dhanisha Jhaveri (Biomedical) and Dr Lisa Gillinder (Clinical)

Dr Dhanisha Jhaveri

Prof Geoffrey Faulkner

A/Prof Paul Dawson

Prof Peter Nestor

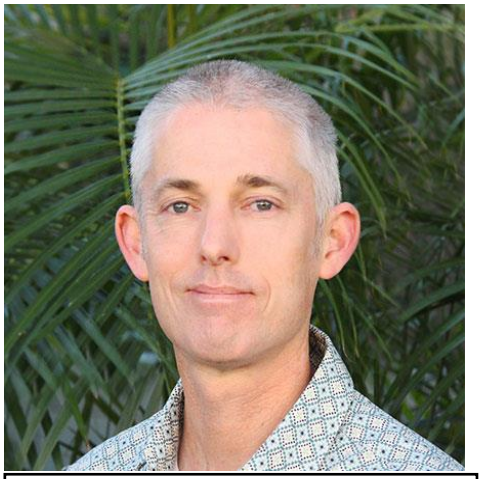
A/Prof Jake Gratten

Dr Lisa Gillinder

Dr Andrew Swayne

Research Highlight: Neuroscience Program

A/Prof Jake Gratten



A/Prof Jake Gratten is the leader of the Cognitive Health Genomics group at Mater Research. A/Prof Gratten has authored more than 50 publications, including many in high-ranking journals such as *Nature Genetics*, *Nature Neuroscience* and *Cell*. As lead investigator, he has received competitive funding from NHMRC, including a recent Ideas grant, and Autism CRC Limited, the world's first national cooperative research centre effort focused on autism.

A/Prof Gratten and his team perform research on the genomics of neurodevelopment and neurodegeneration with the aim to improve understanding of the causes of psychiatric and neurological disorders such as autism, schizophrenia, Parkinson's disease (PD) and multiple sclerosis (MS). The ultimate purpose is to advance the diagnosis, treatment, and prevention of neurological illnesses, improve the quality of life for affected individuals and reduce associated health care costs. Using his recent NHMRC Ideas funding, Jake wants to understand the genetic basis of PD and identify new drug targets to treat this devastating neurodegenerative condition affecting 1% of Australians aged 60-years and over.

"I made the decision to focus my research career on the genomics of mental health because I am driven to make discoveries that translate into improved quality of life and treatment options for the many people living with psychiatric and neurological disorders."

Knowledge impact: In a large Australia wide study A/Prof Gratten's team, in particular PhD student Chloe Yap, examined genetic material from stool samples of 247 children, including 99 children diagnosed with autism. The researchers found changes in the gut microbiome of people on the autism spectrum appear to be due to restricted eating behaviour which is more common among autistic children due to sensory sensitivities or restricted and repetitive interests. Published in prestigious journal *Cell*, the data suggested that behaviour and dietary preferences affect the microbiome, not the other way around.

In another study, published in the prestigious journal *Nature Communications*, A/Prof Gratten and national collaborators used genomic analyses to assess a potential link between MS and inflammatory bowel disease (IBD), as these diseases frequently co-occur but the underlying biological mechanisms remain unclear. This study sheds light on the biological basis of MS-IBD comorbidity and addresses one of the major challenges for doctors in immunology and gastroenterology clinics, i.e. how to treat patients with both MS and IBD, because commonly prescribed medications for MS can exacerbate IBD symptoms and vice versa.

Community impact: The autism study's findings (*Cell* paper) have challenged the growing popular belief that the gut microbiome drives autism. Given it is the most comprehensive study of its kind, it provides compelling evidence that experimental use of microbiome-based interventions such as faecal microbiota transplants and probiotics, that had growing interest for treating autistic behaviours, are unlikely to be effective. The research by A/Prof Gratten's team has attracted broad community interest as evidenced by a recent article in The Economist

https://www.economist.com/science-and-technology/can-an-upset-gut-microbiome-cause-autism/21806337

Health Care Delivery & Innovation

This program focuses on facilitating research that improves the care and wellbeing of people accessing health services at Mater Health and across the nation, through the development and design of robust, effective, multidisciplinary clinical questions that translate into effective practice and policy. This activity has impact across all the Mater Research Programs and Mater Health disciplines. This program brings together education, health economics and implementation science, with active consumer input to address research topics of relevance to the community. Many Mater Clinicians and educational specialists also actively undertake health services research across Mater campuses.

Group Name	Group Leader
Allied Health Research	Dr Liisa Laakso
Living Well with Cancer Research	Professor Sandie McCarthy
Mater Young Adult Research	Associate Professor Simon Denny
Queensland Centre for Intellectual and Developmental Disability	Dr Cathy Franklin

Program Leaders: Professor Sandie McCarthy and Associate Professor Simon Denny

Prof Sandie McCarthy

A/Prof Simon Denny

A/Prof Liisa Laakso

Dr Cathy Franklin

Research Highlight: Health Care Delivery & Innovation Program

Associate Professor Simon Denny

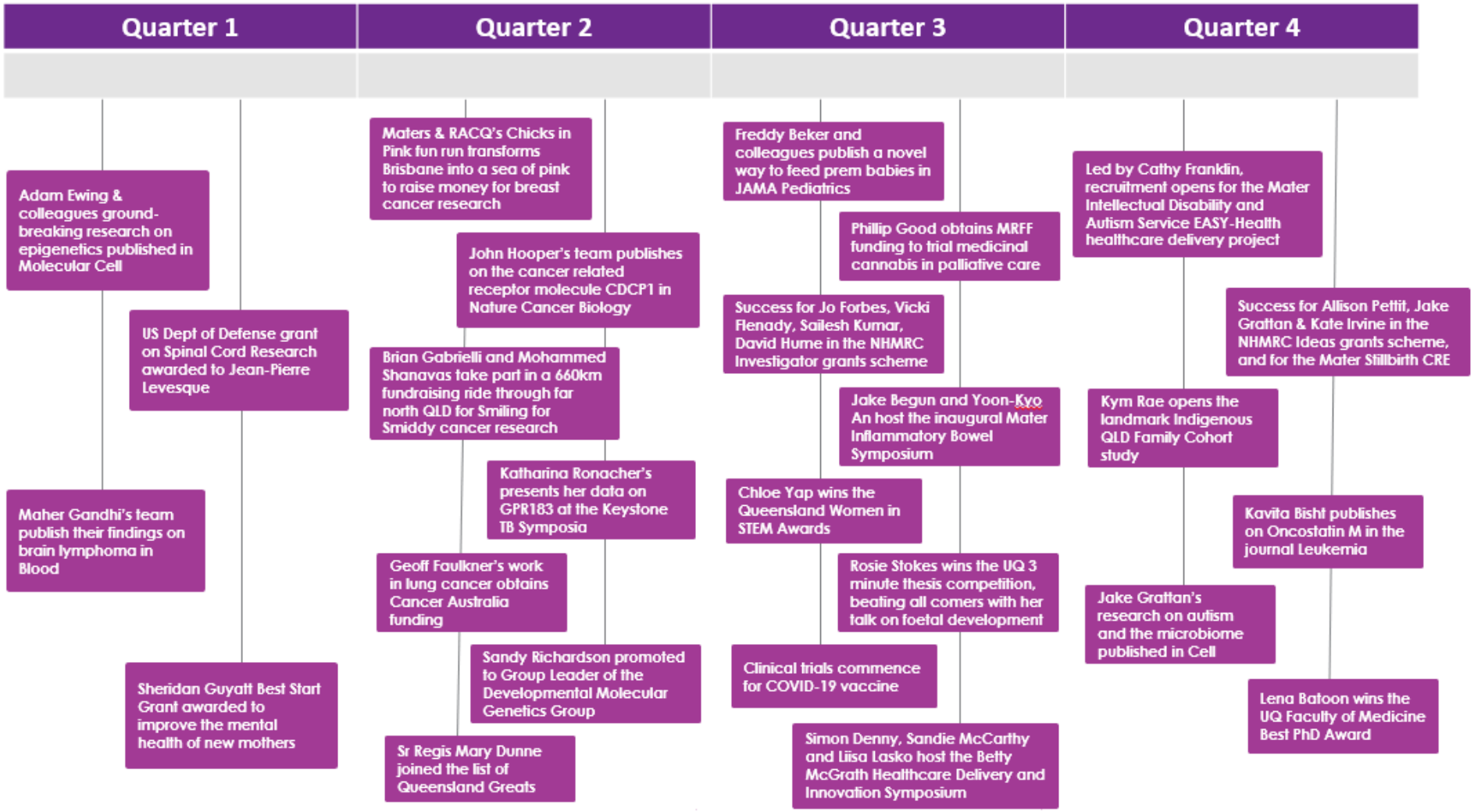
Associate Professor Simon Denny is the Director of the Mater Young Adult Health Centre (MYAHC) and is a Program Co-Leader of the Health Care Delivery & Innovation research program at Mater Research. Associate Professor Denny's research is currently focused on understanding how health services can help young people struggling with complex health issues that are impacting on their wellbeing. Associate Professor Denny has authored over 80 publications and has received more than $10m in competitive funding from the national and international institutions. Associate Professor Denny and his team integrate with many other research programs of Mater and work collaboratively across Australia and New Zealand. His research contributions have been recognized with international awards, editorials and invitations to present at international conferences. He is currently Chair of the Adolescent and Young Adult Medicine Committee for the Royal Australasian College of Physicians.

"I believe that by helping young people during their critical adolescent years we can ensure that they lead healthier and happier lives as adults"

Knowledge impact: In a published study (Intern Med J 2021) Associate Professor Denny's team examined the psychosocial burden of inflammatory bowel disease (IBD) in young people aged 15-25 years attending MYAHC, a tertiary specialist health centre for adolescents and young adults in Brisbane. The aim was to describe the impact of IBD on psychosocial well-being in young people and to compare well-being in the IBD cohort to well-being among young people with other chronic conditions, with a view to identifying characteristics and challenges unique to those with IBD. When comparing surveys from 51 young people with IBD with 210 young people with other chronic diseases, young people with IBD reported higher depressive symptoms, worse illness perceptions and lower internal locus of control.

Community impact: The results indicated that early recognition and treatment of depression and other psychosocial comorbidities within integrated pathways of care is crucial in improving the standard of care in adolescents and young adults with IBD. These interventions are likely to improve the course of IBD and their overall health and well-being.

Our Year At A Glance



Research Advisory Board

The Research Advisory Board is established to provide independent strategic advice on clinical research or scientific related matters to the Mater Research Executive Leadership and Mater Chief Executive Officer.

Advisory Board Chair

Dr Carrie Hillyard is Chairman of Fitgenes Limited and a director of the Academy of Technology and Engineering (ATSE). Previously, she was a co-founder of venture fund, CM Capital Investments, a director of several of its investee companies and led its Life Sciences group for 14 years. Dr Hillyard served as Deputy Chair of the Mater Research Board from 2007 – 2020.

Advisory Board Member

Professor Denise Doolan is Deputy Director of the Australian Institute of Tropical Health and Medicine at James Cook University, and Director of the James Cook University Centre of Molecular Therapeutics. She is a member of the national expert advisory panel The Australian Medical Research Advisory Board.

Advisory Board Member

Professor Frank Gannon was the Director and CEO of QIMR Berghofer Medical Research Institute from 2011 to 2020 and has been the Director General and board member of Science Foundation Ireland (The Irish Research Funding Agency) since 2007.

Advisory Board Member

Professor John Savill has been Executive Director of the Melbourne Academic Centre for Health (MACH) since July 2019, having served in the United Kingdom as an honorary consultant in renal and acute medicine from 1990 to 2018.

Advisory Board Member

Professor Karen Moritz was appointed the Director of the Child Health Research Centre in 2016 and in 2021 became the Associate Dean of Research at the UQ Faculty of Medicine.

Students

Record numbers of HDR students and student accolades have substantially contributed to Mater Research's success in 2021. Many of the HDR students hosted at Mater Research are enrolled through The University of Queensland representing a significant mutual benefit of our partnership. A summary of those achievements and activities over the past year are listed below.

Student metrics

- HDR students: Total 107 (52 clinical and 55 biomedical)
  Conferrals: 10 PhD (5 clinical and 5 biomedical)
- Honours students: Total 17 (includes 2 current students mid-21 to mid-22)
  Degrees awarded: 13 First Class and 2 Second Class

PhD Student accolades

- Rosie Stoke, Winner 2021 Faculty of Medicine and 2021 University of Queensland 3MT & 2021 Asia Pacific 3MT semi-finalist. First Prize Oral Presentation 2021 University of Queensland Medical Student Research Conference and Showcase
- Lena Batoon, The inaugural "PhD Graduate of the Year" University of Queensland Faculty of Medicine.
- Jennifer Stables, Winner – 2021 PA Hospital Symposium Researcher of the Year
- Chloe Yap, 2021 Queensland Women in STEM Prize
- Andrew Swayne, Winner 2021 Dr Laurence Catley Research Student Prize
- Tom Mullins, Winner 2021 Dr David Serisier Student Training Award
- Liam O'Brien, Winner 2021 Mater Research HDR Biomedical Prize
- Aleysha Martin, Recipient of a NHMRC PhD scholarship 2021-2023
- Cheng Xiang Foo, Queensland Finalist for the 10xGenomics Illumina Awards

Activities of the Mater Student Research Committee: meeting monthly - Prof Brian Gabrielli (Chair), Dr Kylie Alexander (Dep. Chair), Ms Sarah Doyle (student recruitment and administration officer), A/Prof Paul Dawson (Head of Education), Dr Norbert Kienzle, Prof Liisa Laakso, Dr Christine Andrews, Dr Thomas Kryza, Dr Camille Guillerey, and student reps Jennifer Stables, Thomas Mullins, Madeline Gough, Haressh Sajiir.

- Reviewed 38 new student applications (18 PhD and 20 Honours)
- Future Leaders Symposium at TRI
- Student Information Event at TRI and virtual, to attract new students in 2022
- Mater Research 3MT
- Social events, including Monthly Mater Research Mixer at Brewhouse, and 3-monthly morning teas
- Mater Research Honours student presentation events mid- and end-of-year

New initiatives and recognition

- Developed/implemented an effective process to capture and share student information with the University of Queensland Research Partner Managers to expedite the University of Queensland Mater student research agreements process.
- Weekly 'Happy Wednesday" email to all Mater Research students and supervisors to communicate important Mater, The University of Queensland and TRI student-specific updates, as well as maintain morale during the covid pandemic.
- As a result of the year-on-year growth of the Mater HDR student cohort (reaching 100+ in 2021), The University of Queensland Faculty of Medicine appointed A/Prof Paul Dawson as the Director of HDR to review and approve MRI-UQ HDR student online submissions/requests to The University of Queensland Graduate School.
- For contributions to the success of the Mater Research student cohort activities and outcomes in recent years, Prof Brian Gabrielli, Ms Sarah Doyle and A/Prof Paul Dawson were nominated by Mater Research for the 2021 The University of Queensland Faculty of Medicine Service Excellence Award.

Director Operations Report

Emily Bailey

Collaboration is central to success in research, and our Operations team at Mater Research aim to bring that same collaborative focus to our support for the back-of-house functions of the Institute. Throughout 2021, we have endeavoured to stop and think about the way we support research and researchers and ensure we're continuing to provide this support efficiently and effectively. In some instances, change will come through Mater-wide systems upgrades such as the new Dynamics 365 Finance system which will roll-out in 2022. In other areas our teams are working to develop different ways of conducting our business, such as extensive work undertaken by our Compliance team to develop a more streamlined approach to entering into agreements with our local University partners, and our Grants team continuing to improve our capture of research grant data and support more efficient post-award establishment. Since January 2021, the median time from grant announcement to establishment (issue of Grant Record Letter) has reduced significantly. There is more work to be done, but we're heading in the right direction. Alongside our focus on continuous improvement, our support teams have also had to adapt to the constantly changing research environment that the COVID-19 pandemic has created.

The past twelve months has also seen considerable change amongst the staff of Mater Research's Operations team. In February, Dr Maree Knight stepped down as Director of Operations after 12 years with Mater Research, to take on a new role as Director of Innovation across the Mater group of companies. This change has afforded me the privilege, and challenge, of joining Mater Research to lead the Operations portfolio.

In March, our Clinical Trials Unit (CTU) Manager, Anne Tremellen, moved to a new organisation after 37 years' service to Mater first as a midwife and later as a midwifery researcher, and then supporting the development of the CTU for Mater Research from 2017. This change saw us welcoming Amrit Hayer to the CTU Manager role from May 2021.

In December 2021 we also farewelled Norbert Konecki, Manager of our IT team, after 23 years of dedicated service to Mater Research. Throughout 2021, Norbert was instrumental in helping me to understand the complexities of the Mater Research IT network, and in developing a new Data Storage infrastructure solution for Mater Research which will be rolled out in mid-2022.

After almost a year working with the teams in the Operations portfolio, I am excited to welcome 2022 and continue to improve the way we support research and researchers at Mater Research.

Director Biomedical Research Report

Professor Allison Pettit

As per Mater Research's strategy, our biomedical discovery research activity has established intent to address significant health challenges and continue to deliver on this in 2021. Many of these research projects are enhanced through clinical collaborations within Mater Health and beyond and utilise clinical samples, large clinical/population datasets, or preclinical models of disease. Significant progress has been made by many teams toward discovery of novel pathogenic mechanisms, identification of new therapeutic targets and development of new treatments/diagnostic. This has all be aided by the state-of-the-art facilities at TRI giving Mater researchers streamlined access to enabling core facility platforms and infrastructure that underpin innovative biomedical research approaches.

Progress has been made toward translation of biomedical discoveries made at Mater Research including:

- Prof Kristen Radford and her team's ongoing development of a targeted cancer vaccine.
- A/Prof Sumaira Hasnain's team continuation of vital pre-clinical research for biotech company Jetra Therapeutics, to support the development of a potential new treatment to reverse obesity-related liver disease. Jetra Therapeutics is a spin-off company from The University of Queensland which holds the license for a patent protected discovery on which this new treatment is based and was made by A/Prof Hasnain and several other Mater Researchers.
- Facilitated through MRFF success, Prof John Hooper's team is developing a new theranostic with plans for this to be trialled in ovarian cancer patients in 2023.
- A new Australian collaborative Autism CRC study, led by Mater Research's A/Prof Gratten challenged the growing popular belief that the gut microbiome drives autism, providing compelling evidence that experimental use of microbiome-based interventions that had growing interest for treating autistic behaviours, are unlikely to be effective.
- Prof Forbes' team continue to work with biotech industry partners to develop innovative treatments for complications of diabetes. They also ruled out a non-invasive approach as an early diagnostic for early detection of people with diabetes who are at risk of developing life-threatening complications but continue to search for improved early predictors of complications.
- Prof Gabrielli is working closely with biopharmaceutical companies to explore combination therapy options to improve outcomes in melanoma and cervical cancer.

I've been privileged to lead Mater Research's internationally competitive biomedical research workforce in 2021 and through providing an enabling environment, have endeavoured to support them in their continuing success of delivering knowledge and health impacts.

Career Track Fellows

Mater Research recognises that for full-time health researchers the period between postdoctoral research and establishment of research independence is often challenging. Premature transition to independence can lead to problems associated with inadequate resources and investigators can struggle with the challenges of recruiting and managing a research team. Newly formed smaller teams are vulnerable to the vagaries of grant funding, with this economic instability impacting productivity. Consequently, it is important to provide high potential emerging investigators with a pathway to progressively build stepwise independence in a supportive environment that provides a high level of mentoring and exposure to research leadership mechanisms and research group management responsibilities. This is the purpose of Mater Research's Career Track Fellow (CTF) program. Previous CTFs who have transitioned to independence include A/Prof Sumaira Hasnain, Dr Adam Ewing and Dr Sandy Richardson. Mater Research is current mentoring five CTFs:

Dr Ran Wang (Stem Cells and Cancer Research Program) focuses her research on diseases that arise as a result of inflammation or infection in the gut and lungs, such as ulcerative colitis and lung fibrosis. She has particular interest in understanding why inflammation happens, and the associated consequences to the surrounding tissue (e.g. tissue damage) and other organs (e.g. osteoporosis, muscle wasting). Her longer-term goal is to exploit this knowledge to devise novel therapeutic strategies for treat gut inflammation as well as complications induced by the inflammation.

Dr Camille Guillerey (Cancer Immunotherapies Research Group) is currently focused on Natural Killer cells, a population of immune cells that recognise and kill cancer cells. She is interested in understanding how Natural Killer cells interact with other immune cells to develop protective immune responses since improved basic knowledge of immunological processes will help design new therapies for various human pathologies such as cancer, infectious disease or autoimmune disorders. In addition, Camille aims to identify mechanisms that may prevent Natural Killer cells from eliminating cancer cells and apply these findings to develop new treatments for childhood leukemia.

Dr Seth Cheetham (Genome Plasticity and Disease Research Group) is a molecular biologist and biochemist with a focus on molecular mechanisms of gene regulation. He has a long-term interest in the functions of the so-called 'junk' DNA—noncoding DNA regions scattered randomly throughout the genome with no obvious function— and its role in human biology. He is investigating whether pseudogenes contribute to cancer development and progression.

Dr Mitchell Sullivan (Glycation and Diabetes Complications Research Group) believes that by investigating the processes involved in how our bodies store the sugar in our tissues, it will be possible to unravel the origin and potential treatments of metabolic diseases such as diabetes. He has a keen interest in the role of a molecule named glycogen, which is a readily mobilized storage form of blood-sugar present in tissues like the liver and kidneys.

Dr Katharine Irvine (Macrophage Biology Research Group) is developing research projects investigating the role of macrophages in the progression and complications of chronic liver disease, as well working on new collaborations in area of Chronic Diseases with Mater's clinical team. She has a strong focus on clinical and translational research and hopes to deliver research outcomes that will benefit patients and change healthcare practice.

Equity, Diversity and Inclusion Committee

The gender equity initiative was formalised at Mater Research in 2016 and has evolved to encompass diversity and inclusion more broadly. The aim of our Committee is to promote the embracement of diverse backgrounds, experiences, and identities across Mater Research. The past year has been a challenging one, as we navigated a global pandemic. Our priority in the past 18 months has been to embed the equity, diversity and inclusion Committees' presence and increase our commitments and accountability at Mater Research.

In the past year we have:

Continued efforts to promote diversity

- Reached gender/career stage balance on the EDI committee
- Auditing and reporting on diversity considerations for Mater Research led symposia
- Improve capacity in cultural training by sponsoring attendance to BlackCard Program

Increased awareness and brought initiatives to bolster equity

- Helped bring the vacation care program to TRI for parents
- Led the assessment of Strategic grant for Outstanding Women
- Led the first in Australia screening of 'Picture a Scientist'
- Organised the International Women's Day Function
- Five EDI committee members committed to join the first responder network which provides a safe and supportive environment for survivors of sexual assault and/or harassment

What we would like to do next:

This year our aim to provide workshops to help researchers recognise and mitigate bias, practice self-care, explore their diverse identities, engage in allyship and to encourage senior researchers to leverage their influence to mentor and sponsor Early/Mid-career researchers.

Each one of us has a role to play in building a more equitable, inclusive, and diverse work environment, and we are committed to promoting this at Mater Research. To ensure we are as impactful in these efforts as possible, we welcome any feedback you may have. You can reach us at any time on ediresearch@mater.uq.edu.au or come see us in person.

Mater Research Showcase & Future Leaders Symposium

The Showcase and the Future Leaders Symposium are the highlights in the Mater Research events calendar. They provide Mater Research's best biomedical, clinical and health care researchers an opportunity to share their research outcomes using a broadly accessible communication approach. It is also an opportunity to thank key Mater Research staff for their passionate dedication throughout the year via the Mater Sisters of Mercy Medals and other prizes. The Research Engagement Team successfully navigated the ever-changing COVID-19 safe plan requirements with the events proceeding as planned via a mix of in person and video presentations and communal networking sessions.

The events are important platforms for early career researchers (ECR) and students to hone their presentation skills so their research advancements and impacts can resonate with the community. To assist with this, Mater Research, together with Mater Foundation, invest in the BRIDGE program, which is designed to train researchers in communicating their discoveries to a lay audience.

The Mater Research Future Leaders Symposium was held at the Translational Research Institute on 25 Oct 2021. This event celebrated the work of the up-and-coming leaders of Mater's biomedical and clinical research fields. A highlight of this event was the selection of Mater Research Early Career Researcher Seeding Grants, that were judged via a competitive process of a written project proposal and a persuasive presentation to an audience of dignitaries and donors; the two successful grants were subsequently presented at the Mater Research Showcase. Likewise, higher degree research students and Early Career Researchers competed for a number of awards and prizes based on their effective presentation skills and/or career track records. A full list of winners can be found in the Awards sections of this report.

The annual Mater Research Showcase, held at TRI in Brisbane on 10 Nov 2021, was a wonderful opportunity to celebrate the outstanding, world-class research contributions and achievements of our emerging and established biomedical and clinical researchers. More than 120 people attended the Showcase in person, including the State Assistant Minister for Health and Regional Infrastructure, Julieanne Gilbert MP, Mater Group, Foundation, Education, Health, and Research Executives, Mater Board and Mater Research Advisory Board members, TRI and University of Queensland Executives, Mater Research Program and Group Leaders, and researchers and staff. Numerous people also attended online.

Indigenous Songwoman Maroochy performed the Welcome to Country ceremony, after which senior research presentations were delivered by A/Prof Paul Griffin and Professors Vicki Flenady, Sandie McCarthy and Geoff Faulkner. Brisbane Sister of Mercy and member of the Mater Misericordiae Limited Board, Sr Sandra Lupi RSM, delivered a special reminder of the First Nations people who were the first scientists in Australia, and then spoke about the Sisters of Mercy who pioneered research at Mater from the early 1900's onwards. Sr Sandra also presented one of the highlights of the Showcase - the Mater Sisters of Mercy Medals.

Awards

Internal Awards

Betty McGrath Seeding Grants – Health Care Delivery & Innovation
Dr Grace Branjerdporn, 'Effectiveness and cost-effectiveness of an electronic mindfulness-based intervention to improve maternal mental health in the peripartum: A randomised controlled trial'.
Dr Peter Collins, 'Digital-health enhanced Mater Malnutrition Model of Care in supporting patients with chronic obstructive pulmonary disease (COPD): from hospital-to-community transition'.
Dr Lisa Gillinder, 'Language in Epilepsy Assessment Program – LEAP Project'.
Ms Bronagh McAlinden, 'Investigating inter-rater reliability for the use of lung ultrasound by physiotherapists in premature infants with Respiratory Distress Syndrome'.
Dr Kym Warhurst, 'Engaging with clinicians to identify and reduce unwarranted clinical variation in maternity care'.

Betty McGrath Seeding Grants – Education
Ms Sharon Clipperton, 'Development and evaluation of a faculty development program for Translational Simulation'.
Dr Erich Schulz, 'Teaching tip lifting to medical students — An adaptive three arm effectiveness RCT to improve intravenous cannulation first time success: Flatten and Advance while Lifting the Tip (FALT) Trial'.

Dr Laurence Catley Clinical Student Prize – Dr Andrew Swayne

Early Career Researcher Prize – Dr Katie Brooker

Early Career Researcher Seeding Grants
Dr Kavita Bisht, 'Delineating the role of oncostatin M on pathobiology of myeloproliferative neoplasms and aging'. (Biomedical)
Dr Katie Brooker, 'Evaluation of an online module to improve medical student knowledge and self-efficacy to support Autistic patients'. (Clinical)

Higher Degree Research Biomedical Prize – Mr Liam O'Brien

Dr David Serisier Student Training Award – Mr Thomas Mullins

Mater Family Wellbeing Service Best Start Grant
Ms Angela Lane, 'Application for funding for completion of Graduate Certificate in Perinatal Infant Mental Health'.
Dr Constanze Schulz, 'Developing a new perinatal mental health service'.
Dr Julanne Frater, '"The Other Half" – Perinatal Mental Health Services for Fathers and Partners – Keeping the family in mind as a matter of routine care in the perinatal period'.
Ms Sheridan Guyatt, 'Supporting mothers to develop skills in mindfulness, relaxation, breathing, movement, exercise and infant play through a group intervention: A Physiotherapy approach to improving the mental health of postnatal women'.

Publication Recognition Scheme
Prof Josephine Forbes –Clinical Award (Round 1)
Dr Danielle Borg – Clinical Award (Round 1)
Dr Seth Cheetham – Biomedical Award (Round 1)
Thomas Kryza – Biomedical Award (Round 1)
Prof Vicki Flenady – Clinical Award (Round 2)
Dr Friederike Beker – Clinical Award (Round 2)
Dr Yuanhao Yang – Biomedical Award (Round 2)
Ms Chloe Yap – Biomedical Award (Round 2)

Sisters of Mercy Medals
Ms Amanda Sands – The Sister Madonna Josey Medal
Dr Sandy Richardson – The Sister Michaeleen Ahern Medal
Dr Adam Ewing – The Sister Regis Mary Dunne Medal
Dr Lucy Burr – The Sister Eileen Pollard Medal

Special Award – Dr Maree Knight

Strategic Grant for Outstanding Women – A/Prof Kym Rae

External Awards

Australian Health Research Alliance (AHRA) Women's Health Research, Translation and Impact Network (WHRTN) EMCR Award – Dr Danielle Borg

Flying Scientist – Dr Lena Batoon

Franklin Women Teresa Anderson Award – Dr Kavita Bisht

Fresh Scientists - Mr Liam O'Brien; Dr Andrew Swayne

Mater People Awards
A/Prof Sumaira Hasnain – Mater Research Excellence
Dr Julie Cichero – Mater Leadership (Emerging Leader)

Member of the Order of Australia – Prof Claire Jackson (AM)

Women in Technology
Professor Josephine Forbes – Outstanding Achiever Science Award (winner)
Ms Chloe Yap – Emerging Achiever Award (highly commended)

Queensland Women in STEM – Ms Chloe Yap (judges award)

The University of Queensland Faculty of Medicine PhD Student of the Year Award
Dr Lena Batoon (winner)
Dr Josh Tobin (runner-up)

2021 Grant Successes (Lead Investigators only)

National Health Medical Research Council
Prof David Hume, Investigator grant, 'Regulation and function of the macrophage colony-stimulating factor receptor (CSF1R)', $3,427,015.
Prof Vicki Flenady, Investigator grant, 'Preventing stillbirth and neonatal death and improving care after loss', $ 3,372,570.
Prof Josephine Forbes, Investigator grant, 'Designing and translating novel therapies for diabetes and kidney disease', $2,372,570.
Prof Sailesh Kumar, Investigator grant, 'Novel approaches to preventing perinatal death and disability from birth asphyxia', $2,174,514.
Prof Vicki Flenady, Centres of Research Excellence, 'Centre of Research Excellence in Stillbirth' $2,500,000.
Prof Allison Pettit, Ideas grant, 'Increasing hematopoietic stem cell niches post transplantation through enhancing bone marrow macrophage resilience and regeneration mechanisms', $935,616.
Dr Jake Gratten, Ideas grant, 'Understanding the aetiology of Parkinson's disease through integrative cellular genomics', $837,064.
Dr Katharine Irvine, Ideas grant, 'Macrophage-driven lipid metabolism in health and disease – mechanisms and therapeutic opportunities', $656,972.

Medical Research Futures Fund
A/Prof Phillip Good, 'Medicinal Cannabis (MedCan 3) - randomised, multicentre, double blind, placebo-controlled trial to assess THC/CBD (1:20) to relieve symptom burden in patients with cancer' $1,526,796.

The University of Queensland (UQ)
Dr Jodi Saunus, Research Support Package, 'Development of new diagnostic and therapeutic agents for breast cancer and generate new knowledge about the mechanisms of metastasis', $124,378.
Dr Danielle Borg, Research Support Package, 'Examining the role of the microbiome in child obesity', $105,341.
Dr Katie Brooker, Research Support Package, 'Development and implementation of a health assessment tool for Autistic people with intellectual disability' $90,180.
Dr Amelia Fotheringham, Research Support Package, 'Examining new therapies for the prevention of type 1 diabetes', $90,180.
Dr Camille Guillerey, Foundation Research Excellence Award, 'Unleashing innate immunity against Leukaemia', $63,467.
A/Prof Sumaira Hasnain, AID project seed fund, 'Evaluation of the levels of IL-22 in children with respiratory infection', $50,000.
Dr Yu-Chen (Enya) Chen, Research Support Package, $45,090.
Dr Joshua Tobin, Research Support Package, $45,090.
Dr Lena Batoon, Research Support Package, $45,090.
Dr Md Moniruzzaman, Research Support Package, $45,090.
A/Prof Sumaira Hasnain, Australian Infectious Diseases Centre Near-Miss Award, 'Targeting Immunopathology in Chronic Infectious and Inflammatory Diseases', $40,000.

Translational Research Institute (TRI)
Dr Kavita Bisht, Leading Innovations through New Collaborations grant, 'Identifying mechanism and new therapies to treat anaemia of inflammation in Inflammatory Bowel Diseases' $50,000.
Dr Reuben Beer, Leading Innovations through New Collaborations grant, 'Linking Advanced Neuroimaging, Disease State and Clinical Measures in Multiple Sclerosis: A multi-disciplinary and multi-institutional research approach', $50,000.
Dr Sandra Richardson, Leading Innovations through New Collaborations grant, 'DNA methylation in circulating free fetal DNA: A potential biomarker to predict fetal growth', $50,000.

Overseas Agencies

A/Prof Jake Begun, US Department of Defense, 'Drugs from Bugs: Developing New Inflammatory Bowel Disease Drugs from Gut Bacteria-Derived Bioactives', $2,323,910 (AUD).
Prof Jean-Pierre Levesque, US Department of Defense, 'Investigate the mechanisms of neurogenic heterotopic ossifications', $1,927,892 (AUD).
A/Prof Jake Begun, Pfizer, 'Study of Tofacitinib for the treatment of chronic PouchiTis ? capital (STOPit)', $56,232 USD.
Prof Brian Gabrielli, Melanoma Research Alliance, 'Enhancing tumour immune detection by targeting replication stress', $373,900 USD.
Dr Josh Tobin, American Society of Hematology Global Fellowship, 'Applying Measures of Immune-Fitness in Follicular Lymphoma', $150,000 USD

Industry, Government, and other funding

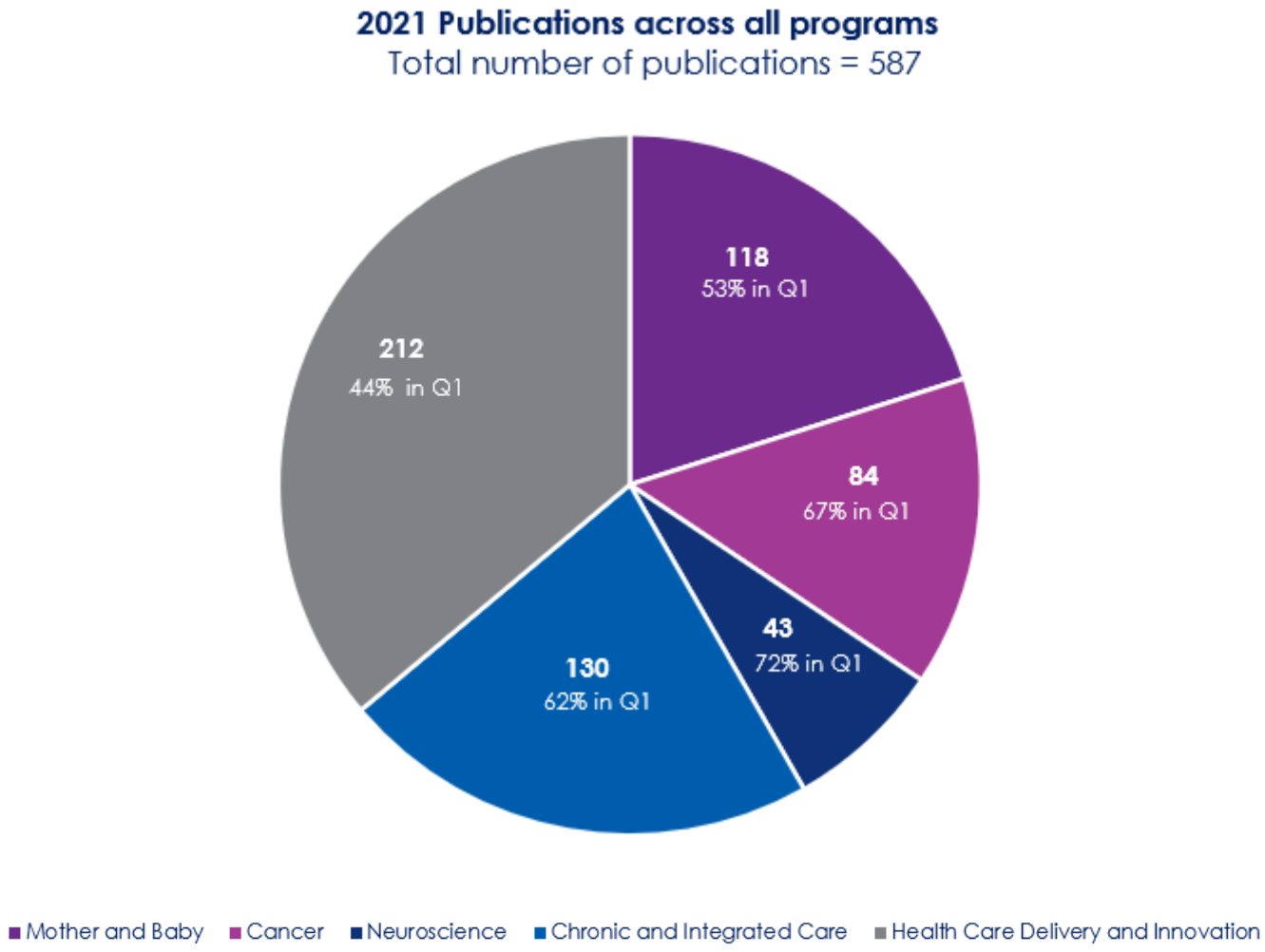
Dr Jake Gratten, Autism Speaks, 'A Big Data Approach in Understanding Restricted and Repetitive Behaviours in Autism: Linking Taxonomy to Etiology', $5,000.
Prof Geoff Faulkner, Cancer Australia, 'Long-read genetic and epigenetic profiling in lung cancer for precision medicine', $567,596.
Dr Camille Guillerey, Cancer Australia, 'Utilising cord blood-derived Natural Killer cells to prevent post-transplant relapse in Childhood Leukaemia', $198,742.
A/Prof Paul Dawson, Cerebral Palsy Alliance, 'SuPreme Study: towards a sulphate therapy to reduce the rate of cerebral palsy among preterm' $250,000.
Prof Sailesh Kumar, Cerebral Palsy Alliance, 'Predicting and preventing fetal compromise in labour for small-for-gestational-age infants', $75,000.
Dr Dhanisha Jhaveri, Dementia Australia, 'Cholinergic regulation of adult hippocampal neurogenesis and cognitive functions', $75,000.
Prof Vicki Flenady, Department of Health Australia, 'Adaptation and Cultural Specification of Safer Baby Bundle Health (20/21-E21-4084)', $2,131,443.
Dr Helen Barrett, Diabetes Australia Research Program, 'Assessing hyperglycaemia in women pregnant after bariatric surgery', $60,000.
A/Prof Katharina Ronacher, Diabetes Australia Research Program, 'Harnessing Oxidised Cholesterols to Reduce Susceptibility to COVID-19 in Obesity and Diabetes', $70,000.
Prof Sailesh Kumar, Ferring Research Institute, 'Machine learning and artificial intelligence techniques to develop predictive models for late gestation adverse perinatal outcomes', $48,489.
Prof Jean-Pierre Levesque, FibroGen, 'Quantify the effect of FG-6874 on hematopoietic stem cell mobilization and transplantation', $193,907.
A/Prof Sumaira Hasnain, Gastroenterological Society of Australia (GESA) Dr Falk Pharma Research Grant, 'Can Interleukin-24 be Targeted to Reduce Fibrosis in Inflammatory Bowel Disease?', $30,000.
Dr Emi Khoo, Gastroenterological Society of Australia, 'Celtrion IBD Fellowship', $30,000.
Dr Yonghua Sheng, Gastroenterological Society of Australia, 'Targeting MUC1 Cell Surface Mucin to sensitise colorectal cancer to therapy', $30,000.
Dr Yonghua Sheng, Gastroenterological Society of Australia, 'Examining the Therapeutic Potential of MUC1 Inhibition in Inflammatory Bowel Disease', $30,000.
Dr Ran Wang, Gastroenterological Society of Australia, 'Development of a Novel Inhibitor of IL-23p19 for Inflammatory Bowel Disease', $22,727.
A/Prof Jake Begun, Janssen Cilag, 'Development of an Australian intestinal ultrasound (IUS) education', $50,000.
A/Prof Sumaira Hasnain, Jetra Therapeutics, 'Development of IL-22 fusion proteins for treatment of fatty liver disease', $300,034.
Prof Josephine Forbes, Juvenile Diabetes Research Foundation, 'Innovative delivery methods for the biologic soluble RAGE to prevent Type 1', $600,084.
Dr Sahar Keshvari, The Liver Foundation - Professor Pauline Hall Research Fellowship, 'Therapeutic Application of Macrophage Colony Stimulating Factor (CSF1) for Liver Regeneration', $120,000.
Dr Tegan Triggs, Royal Australian and New Zealand College of Obstetricians and Gynaecologists Women's Health Foundation, 'Reducing emergency caesarean birth for fetal distress in women with small or poorly grown infants using Sildenafil Citrate – The RidStress 2 Randomised Controlled Trial', $60,000.
Prof Vicki Flenady, Queensland Government, 'Improve 2', $63,060.
Dr Josh Tobin, Snowdome Fellowship, 'The Development of Biomarker-Directed Immunotherapy in Advanced Stage Follicular Lymphoma Patients', $200,000.

Dr Christine Andrews, Stillbirth Foundation, 'Improving the capacity of researchers and bereaved parents to co-design and translate research together: "A Guide to Research for Bereaved Parents"', $19,673.
Ms Siobhan Loughnan, Stillbirth Foundation, 'Caring for parents in a subsequent pregnancy after stillbirth: Availability of services across Australia and a social return on investment analysis', $47,858.

Publications

Knowledge dissemination via peer-reviewed publication underpins research and health care advancements. Publications are currency in research and the number, quality, reach and impact are key measures used to rank a researcher's calibre.

In 2021 a total of 587 publications were authored by Mater and Mater-affiliated researchers; this number is a record 34% increase in publications compared to 2020. More than half (322) of these publications were published in the highest ranked journals for their field (top tier, also labelled Q1) after vigorous peer review processes.



% Percentage of Quartile 1 (Q1) publications for each Program

Publications are assigned to a Program based on content (title/abstract) versus researcher primary affiliation

Publications in 2021 (01 Jan – 31 Dec)

*Arranged in ascending order by author last name

1. Adams, A.G., et al., A comprehensive assessment of poststroke social cognitive function. Neuropsychology, 2021. 35(5): p. 556-567.
2. Albertella, L., B. Farrant, and S. Denny, "Improving the quality of care for adolescents and young adults on an adult medical ward". Intern Med J, 2021.
3. Alharbi, M., et al., Extracellular Vesicle Transmission of Chemoresistance to Ovarian Cancer Cells Is Associated with Hypoxia-Induced Expression of Glycolytic Pathway Proteins, and Prediction of Epithelial Ovarian Cancer Disease Recurrence. Cancers (Basel), 2021. 13(14).
4. Alif, S.M., et al., Cancer and mortality in coal mine workers: a systematic review and meta-analysis. Occup Environ Med, 2021.
5. Alisjahbana, B., et al., Screening diabetes mellitus patients for pulmonary tuberculosis: A multisite study in Indonesia, Peru, Romania and South Africa. Transactions of the Royal Society of Tropical Medicine and Hygiene, 2021. 115(6): p. 634-643.
6. Alshyyab, M.A., et al., Strategies and interventions for improving safety culture in Australian Emergency Departments: A modified Delphi study. Int J Health Plann Manage, 2021.
7. Alwash, S.M., H.D. McIntyre, and A. Mamun, The association of general obesity, central obesity and visceral body fat with the risk of gestational diabetes mellitus: Evidence from a systematic review and meta-analysis. Obes Res Clin Pract, 2021. 15(5): p. 425-430.
8. An, Y.K., Common mistakes with steroids. J Gastroenterol Hepatol, 2021. 36 Suppl 1: p. 30-31.
9. Andrews, C., et al., Evaluation of an online education module designed to reduce stillbirth. Aust N Z J Obstet Gynaecol, 2021.
10. Ang, C.W., et al., Mesoporous Silica Nanoparticles Improve Oral Delivery of Antitubercular Bicyclic Nitroimidazoles. ACS Biomater Sci Eng, 2021.
11. Axelsen, S.M., et al., Intrahepatic cholestasis of pregnancy: Association with glycaemic control in gestational diabetes. Diabet Med, 2021: p. e14574.
12. Bailey, A., et al., Absolute cardiovascular disease risk score and pharmacotherapy at the time of admission in patients presenting with acute coronary syndrome due to coronary artery disease in a single Australian tertiary centre: a cross-sectional study. BMJ Open, 2021. 11(2): p. e038868.
13. Balaam, S., et al., Alcohol and Breast Cancer: Results From the Women's Wellness After Cancer Program Randomized Controlled Trial. Cancer Nurs, 2021.
14. Banun, V.J., et al., Protein Nanoparticles for Enhanced Oral Delivery of Coenzyme-Q10: in Vitro and in Silico Studies. ACS Biomater Sci Eng, 2021.
15. Barrett, H.L., et al., Capillary Triglycerides in Late Pregnancy-Challenging to Measure, Hard to Interpret: A Cohort Study of Practicality. Nutrients, 2021. 13(4).
16. Bartho, L.A., et al., Analysis of mitochondrial regulatory transcripts in publicly available datasets with validation in placentae from pre-term, post-term and fetal growth restriction pregnancies. Placenta, 2021. 112: p. 162-171.
17. Batoon, L. and L.K. McCauley, Cross Talk Between Macrophages and Cancer Cells in the Bone Metastatic Environment. Front Endocrinol (Lausanne), 2021. 12: p. 763846.
18. Batoon, L., et al., Osteal macrophages support osteoclast-mediated resorption and contribute to bone pathology in a postmenopausal osteoporosis mouse model. J Bone Miner Res, 2021. 36(11): p. 2214-2228.
19. Batoon, L., et al., Treatment with a long-acting chimeric CSF1 molecule enhances fracture healing of healthy and osteoporotic bones. Biomaterials, 2021. 275: p. 120936.
20. Baumann-Birkbeck, L., et al., Can a virtual microbiology simulation be as effective as the traditional Wetlab for pharmacy student education? BMC Med Educ, 2021. 21(1): p. 583.
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