



**SAHMRI**  
South Australian Health &  
Medical Research Institute

**ANNUAL REPORT 2014**



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**Founding Members**



**Capital Support**



**Research Partners**





# SAHMRI's vision is "To transform research into health"

South Australia has a strong history of contribution to health and medical research. The South Australian Health and Medical Research Institute (SAHMRI) was incorporated in December 2009 as the state's first independent flagship health and medical research institute after a review conducted by Professor John Shine and Mr Alan Young AM, the Review of Health and Medical Research in South Australia, recommended the establishment of a flagship research institute to increase South Australia's health and medical research capacity.

In response to this recommendation, the Federal Government's Health and Hospitals Fund provided a \$200 million grant to build our research facility. SAHMRI's founding members are the South Australian Minister for Health and Ageing, the South Australian Treasurer, the South Australian Minister for Science and Information Economy, the University of Adelaide, Flinders University and the University of South Australia.

SAHMRI's purpose is to translate research into health outcomes. Our research focuses on improving the prevention, treatment and diagnosis of some of the greatest health issues that face our community, including chronic disease, obesity, diabetes and cardiovascular disease.

We currently have over 400 researchers in the building, who are committed to transforming innovative health and medical research into practical benefits for patients and the community. We have recruited the most talented researchers from across Australia and overseas who are collaborating across our seven research themes:

- Aboriginal Health
- Cancer
- Healthy Mothers, Babies and Children
- Heart Health
- Infection and Immunity
- Mind and Brain
- Nutrition and Metabolism

SAHMRI is a powerful investment in the health and quality of life of all South Australians. Through collaboration and innovation, SAHMRI will lead the way in new discoveries, treatments and improved health for the entire community. In response to the growing need for improved, affordable and more accessible health care, SAHMRI will focus on delivering real health reform back to the community.

SAHMRI will:

- Be a vibrant, globally-recognised institute that fosters discovery and harnesses dynamic collaborations to deliver health outcomes and community impact
- Fundamentally improve the quality of life for all people, through innovative, world-class and ground-breaking health and medical research
- Provide a clear focal point for health and medical research in the State.



# CHAIRMAN'S REPORT

**It is my pleasure to introduce to you the 2014 South Australian Health and Medical Research Institute (SAHMRI) annual report.**

We couldn't have asked for a better or more successful first year in the new SAHMRI facility.

The quality of the research being conducted is outstanding and the number of the new research grants that we have been awarded is a true testament to our research capability.

From the energy I experience in the teams as I move around the building, to the community engagement, 2014 has been a wonderful 12 months for us.

I have been involved with SAHMRI since its inception, and what a journey it has been. We have already come so far in such a short amount of time, and I am enormously proud of the team at SAHMRI and their achievements to date.

This is only the beginning of a bright future for health and medical research in South Australia and beyond.

For me, SAHMRI is emblematic of a transformed South Australia.

It is a great demonstration of people working together to make a difference – collaborating for the greater good. Through collaborations, partnerships, shared knowledge and health benefits to the community, SAHMRI has already begun benefiting all researchers, all institutes and all community members across Australia and potentially the world.

SAHMRI is also a demonstration of innovation, bringing together creative and hardworking people from around the world to seek out

solutions that can be practically translated to the benefit of all South Australians. Benefits measured in improving the overall health and wellbeing of all people across the state. Measured by the new treatments, medicines and medical devices that will be spawned. Measured by new businesses and employment opportunities it will generate. Measured by its role in reducing the per capita cost of health care in the state.

The SAHMRI model is already attracting attention at the community level with hundreds of people touring the SAHMRI facility every month, as well as at the national level, with over \$40 million of new research grants having been won – and we have only been here for 12 months.

During 2014 we also attracted funding from some of the state's leading philanthropists, which have enabled the purchase of state of the art equipment and facilities, and our Founding Ambassador and Corporate Champion programs have gone from strength to strength.

However, in order to achieve all of our goals, we must continue to attract and foster the best research minds in the world to work in our facilities, and resource them with the best possible equipment, technology and continued learning opportunities.

The journey has just begun, and I am excited to think of what the future holds for this organisation – we are already in discussions for the development of a second SAHMRI facility!

Thank you for believing in our vision of 'transforming research into health'.

**Raymond Spencer**



# EXECUTIVE DIRECTOR'S REPORT

**It's hard to believe that a year has passed since we opened the doors of our magnificent building for the first time, with the Prime Minister of Australia, the Hon Tony Abbott MP and also the Premier of South Australia, the Hon Jay Weatherill MP.**

With over 1,000 people in attendance, our first year got off to a great start. I distinctly remember the Prime Minister saying, "In the end, (SAHMRI) doesn't even belong to Adelaide or South Australia. It belongs to humanity, because all of humanity will benefit from the work done in this building." The Prime Minister made a great point – all of the community, be it in South Australia, Australia, or internationally - everyone can say that SAHMRI will improve the quality of their lives.

The Hon Jay Weatherill MP said that the new SAHMRI facility is a symbol of the state's growing ambitions. With the development of South Australia's new Health and Biomedical Precinct surrounding us, we know South Australia is destined for an incredible future.

I was appointed Executive Director of SAHMRI in October 2011, and so much has changed for our organisation in that time. It feels like only yesterday that I was taking guests on tours of this building as a construction site.

Now, look at us. Over 400 people are now working in the building, including groups from our partner organisations, the state's three universities and CSIRO, and there are already plans well underway for a second SAHMRI facility in collaboration with Flinders University. As you can see, we are rapidly evolving and changing.

Collaboration and innovation have been the main drivers in making SAHMRI work. We work closely with the state's three universities, our Research Partners, CSIRO and EMBL Australia, and major funder, Cancer Council SA. We will continue to develop and nurture these relationships, and we wouldn't be here today without their support – they have played a critical role in our initial success.

2014 was a huge year in SAHMRI's history. It was our first full year in our new, fully operational research facility.

In March this year, we opened our public tours program and by May they were fully booked for 2014. We are continuing the tours into 2015 as a result of their incredible popularity. We are seeing at least 100 people through the doors each Friday for these tours and enjoy the opportunities to engage with the general public.

In September, we recruited our seventh (and final) Theme Leader, Professor Chris Proud, who is heading up our Nutrition and Metabolism Theme. We now have completed the recruitment of our research leadership and are getting on with the business of research excellence. We have already achieved some fantastic research grant successes but we need to ensure ongoing research excellence and impact on health to repay the trust and resources that have been invested in us.

Over the past year we have also signed the South Australian Aboriginal Health Research Accord, developed by the Wardliparingga Aboriginal Research Unit in response to a call by the South Australian Aboriginal community. The Accord is a first of this kind, and was developed through a series of consultations with Aboriginal Elders, organisations and community members.

In June we held our Scientific Launch, where our research was showcased over two days at the Adelaide Convention Centre to over 300 people.

It's safe to say that 2014 was a wonderful year at SAHMRI, and this is only the beginning for our organisation. I am really looking forward to seeing what the future holds for SAHMRI, building on the foundations laid in 2014.

**Professor Steve Wesselingh**



L-R Top to Bottom: Mr Spencer, Mr Young, Professor Barber, Professor Hopwood, Professor Lloyd, Ms Reynolds

## SAHMRI BOARD OF DIRECTORS

### **Mr Raymond Spencer**

#### *Non-executive Chairman*

Mr Spencer was appointed to the Board as Chairman on 21 December 2009. He is also Chairman of South Australia's Economic Development Board, and Chairman or board member of a number of public and private companies. Raymond is a Partner and Member of the investment committee in three US based venture funds.

### **Mr Alan Young AM, MSAA, SAFin, AFPA (Snr), FAICD, SIA (aff), C.UnivFlin**

#### *Non-executive Deputy Chairman*

Mr Young was co-author of the Shine Young Report, a review of health and medical research in South Australia commissioned by the South Australian Government. Mr Young is Co-Founder and Joint Managing Director of Baker Young Stockbrokers Limited. He is also the current Founder/Chair of Belvidere Winery, Chair of the Australian Central School of Art, Vice Chair of Solstice Media Ltd, Co-Founder/Chair of Flinders Medical Centre Foundation, Founder/Chair of Flinders Bio Medical Enterprises Pty Ltd, Director of Signostics Inc, Director of Hub IT Pty Ltd, and Member of the Business Development Advisory Panel of St Vincent de Paul (SA) Inc.

In 2009 in the Queen's Birthday honours, Mr Young was awarded the order of Australia for service to the

community, particularly through business advisory roles within health, medical research and educational organisations including in the visual arts. In 2013 he was made a Companion of Flinders University, an award recognising his contribution to the university through his commitment to medical research and the visual arts. Mr Young was appointed to the Board on 21 December 2009.

### **Professor Michael Barber FAA, FTSE, BSc (hons), PhD, FAICD**

#### *Non-executive Director*

Professor Barber is Vice Chancellor and President of Flinders University. He is a member of the SA State Advisory Council of the Committee for Economic Development of Australia. Professor Barber was appointed to the Board on 21 December 2009.

### **Professor John Hopwood AM, FAA, Dip.App.Chem, PhD, FRCPA (Hons)**

#### *Non-executive Director*

Professor Hopwood is the Director of the Group's Lysosomal Diseases Research Unit. He is also an affiliate Professor in the Department of Paediatrics at The University of Adelaide and the Department of Pharmacy at the University of South Australia. Professor Hopwood was appointed to the Board on 21 December 2009.



L-R Top to Bottom: Ms Roache, Professor Wesseling, Professor Beilby, Professor Evans, Mr Swan

**Professor David Lloyd BSc (Hons), PhD, C.Chem, FRSC**

*Non-executive Director*

Professor Lloyd is Vice Chancellor and President of the University of South Australia and is a member of South Australia's Economic Development Board. Professor Lloyd is a biochemist who holds a Bachelor of Science (Honours) in Applied Chemistry and a PhD in Medicinal Organic Chemistry from Dublin City University, and was also a Post-Doctoral Research Fellow at Trinity College Dublin. He is a Fellow of the Royal Society of Chemistry, and was the inaugural Chair of the Irish Research Council. Professor Lloyd was appointed to the Board on 29 November 2013.

**Ms Loretta Reynolds LLB, BEc, FAICD, SFFin**

*Non-executive Director*

Ms Reynolds has been a partner with Thomson Geer Lawyers since 1998 and was elected as Chairman of that firm's Board of Partners in 2007. She has completed the FINSIA Graduate Diploma in Applied Finance Investment. She has a Bachelor of Law and a Bachelor of Economics from The University of Adelaide and is a fellow of the Australian Institute of Company Directors and a Senior Fellow of FINSIA. Ms Reynolds was appointed to the Board on 6 May 2014.

**Ms June Roache BAcc, GradCertMgt, FAICD, FCPA, FAIM**

*Non-executive Director*

Ms Roache is the Chief Executive and a Board Member of SA Lotteries and is Vice President of the World Lottery Association and Immediate Past Chairman of the Asia Pacific Lottery Association. She is a Fellow of the Australian Institute of Company Directors, CPA Australia and the Australian Institute of Management. Ms Roache is currently on the board of Business SA, ForestrySA, Essential Services Commission of SA and is Chairman of the Adelaide Football Club's Professional Standards and Integrity Committee. Ms Roache was appointed to the Board on 6 May 2014.

**Professor Steve Wesseling BMBS, FRACP, PhD**

*Executive Director*

Professor Wesseling is the Executive Director of the Group and Leader of SAHMRI's Infection and Immunity Theme. He is an Infectious Diseases Physician with research interests in Neurovirology, HIV and vaccine development. Professor Wesseling was appointed to the Board on 1 February 2011.

**Professor Justin Beilby MBBS, MD, MPH, FRACGP, DRCOG, DA**

*Non-executive Director*

Professor Beilby was appointed to the Board on 21 December 2009. He is Executive Dean, Faculty of Health Sciences at The University of Adelaide, Chair of Central Adelaide Hills Medicare Local and a member of the Novita Board. Professor Beilby resigned from the Board on 22 August 2014.

**Professor Allan Evans PhD**

*Non-executive Director*

Professor Evans was appointed to the Board on 5 October 2012. He is a Professor in Pharmaceutics and Provost & Chief Academic Officer at the University of South Australia. He is also the Director of UniSA Health and a Director of CPR Pharma Pty Ltd. Professor Evans resigned from the Board on 29 November 2013.

**Mr David Swan BHSc, GDEM**

*Non-executive Director*

Mr Swan was appointed to the Board on 20 October 2012. He is the Chief Executive of the South Australian Department for Health and Ageing. He is a Director of Health Workforce Australia and the National E-Health Transition Authority (NEHTA) and an Associate Fellow of the Australian College of Health Service Executives. Mr Swan resigned from the Board on 23 January 2014.

# SAHMRI RESEARCH THEMES



Aboriginal Health



Cancer



Healthy Mothers, Babies & Children



Heart Health



Infection & Immunity



Mind & Brain



Nutrition & Metabolism



Lysosomal Diseases Research Unit (LDRU)



Population Health



# ABORIGINAL HEALTH

**Professor Alex Brown**  
Theme Leader

## THEME RESEARCH FOCUS

Wardliparingga has established a research program to tackle the toughest of research areas - Aboriginal disparities in health. Research focuses on why Aboriginal people die younger, receive different access to treatments and have poorer outcomes and why they get heart disease, diabetes and other conditions at higher rates than non-Aboriginal people in Australia. The goal is to change that picture through high quality and culturally sensitive research. The drive is to see research results translated into real services and outcomes for the community. Wardliparingga has extensive collaborations with the Aboriginal community in South Australia (SA), including with almost every Aboriginal community controlled health organisation in SA.

## ACHIEVEMENTS IN 2014

### Grant success

After the success of 2013, 2014 saw one substantial NHMRC project grant submitted by Wardliparingga and was successful:

(Predicting Renal Ophthalmological Heart & Endocrine Complications in Aboriginal Community (PROPHECY) Study) – now known as The Aboriginal Diabetes Study. This is a large cohort study of Aboriginal people in South Australia seeking to understand the patterns of diabetes prevalence and its complications.

Grant Period: 2015-2019  
Total funding \$2,466,324

## Other funding success

(Australian Department of Health – ESSENCE II) – developing indicators and targets for Aboriginal cardiovascular standards of care and engaging with Medicare Locals for improving cardiovascular care and services for Aboriginal people (\$355,000).

(Next Steps Project – Priorities for Aboriginal Health Research). In partnership with the Aboriginal Health Council of SA, Wardliparingga conducted a project where staff in every community controlled health organisation in SA were interviewed to understand their priorities for research. The findings are guiding the research within Wardliparingga and broadly in the sector.

## RESEARCH HIGHLIGHTS

Signing of the South Australian Aboriginal Research Accord. In September, SAHMRI, the three SA universities, the Aboriginal Health Council of South Australia and the Council of Aboriginal Elders of South Australia signed an historic agreement to conduct Aboriginal health research in a manner consistent with nine principles:

**PRIORITIES:** Research should be conducted on priorities arising from and endorsed by the Aboriginal community to enhance acceptability, relevance and accountability.

**INVOLVEMENT:** The involvement of Aboriginal people and organisations is essential in developing, implementing and translating research.

**PARTNERSHIP:** Research should be based on the establishment of mutual trust, and equivalent partnerships, and the ability to work competently across cultures.

**RESPECT:** Researchers must demonstrate respect for Aboriginal knowledge, Aboriginal knowledge systems and custodianship of that knowledge.

**COMMUNICATION:** Communication must be culturally and community relevant and involve a willingness to listen and learn.

**RECIPROCITY:** Research should deliver tangible benefits to Aboriginal communities. These benefits should be determined by Aboriginal people themselves and consider outcomes and processes during, and as a result of, the research.

**OWNERSHIP:** Researchers should acknowledge, respect, and protect Aboriginal intellectual property rights and transparent negotiation of intellectual property use and benefit sharing should be ensured.

**CONTROL:** Researchers must ensure the respectful and culturally appropriate management of all biological and non-biological research materials.

**KNOWLEDGE TRANSLATION:** Sharing and translation of knowledge generated through research must be integrated into all elements of the research process to maximise impact on policy and practice. Significant consultation with the Aboriginal community was undertaken and an in-depth review of relevant literature and policies completed to ensure the Accord met the needs of the Aboriginal community and aligned with national and international best practice for conducting Aboriginal health research.

The South Australian Aboriginal Health Research Accord provides a voice for Aboriginal communities to inform researchers, universities and institutes on how they would like health research to be conducted in their communities. It is important to note that the Accord does not supersede the principles and objectives of existing national statements or ethics guidelines (such as NHMRC or AIATSIS). Rather, the Accord complements these and provides an account of the South Australian Aboriginal community's expectations of how research with, for and by Aboriginal people should be developed and conducted. We feel that the Accord can and should apply to all health or medical research that directly involves Aboriginal and Torres Strait Islander peoples. These principles must be considered for any research project that includes Aboriginal participation. Importantly, in following the principles of the

Accord, it is also likely that the researcher is also fulfilling their ethical obligations as outlined in the NHMRC Guidelines for Ethical conduct in Aboriginal and Torres Strait Islander Health Research.

#### CROSS THEME COLLABORATIONS

- Heart Health Theme - joint project NHMRC grant - AC Omega 3 randomised controlled trial
- Healthy Mothers Babies and Children Theme - joint planning for research in Aboriginal maternal and child health
- Nutrition and Metabolism Theme - collaboration on diabetes and dietary interventions
- Infection and Immunity - Wardliparingga welcomed Associate Professor James Ward to share space with the team and collaborate on important infection and immunity issues within the Aboriginal community.

#### AWARDS AND RECOGNITIONS

- Professor Alex Brown - International Diabetes Federation Award
- Dr Odette Gibson - Health Services Research and Policy Fellowship (Health Services Research Association of Australia and New Zealand)
- Dr Carol Davy - Health Services Research and Policy Fellowship (Health Services Research Association of Australia and New Zealand)

- Kootsy Canuto - Heart Foundation Scholarship and CMV Scholarship
- Kim Morey - CMV Scholarship

#### NUMBER OF STAFF AND STUDENTS

A total of 35 staff were employed within Wardliparingga during 2014. There were 14 Aboriginal or Torres Strait Islander staff equating to 40 per cent of the team. Wardliparingga had five students.



# 35

**STAFF EMPLOYED WITHIN THE THEME**



# 2.46m

**FUNDING GRANTED TO THE ABORIGINAL DIABETES STUDY**



# CANCER

**Professor Tim Hughes**  
Theme Leader (Effective February 2015)

## THEME RESEARCH FOCUS

The biggest development in cancer therapy over the past five years has been the movement towards Precision Medicine, where therapy is specifically tailored to the patient and their disease, rather than a one size fits all approach. This often involves advanced technologies including genomics, proteomics and functional imaging to identify the specific characteristics of an individual cancer.

## ACHIEVEMENTS IN 2014

The Leukaemia Research Group moved into the Cancer Theme at SAHMRI in January 2014. Since then they have recruited four additional cancer research groups, covering Myeloma, GI, Prostate and also Stem Cell Research and employing 69 scientists and support staff. All groups are closely linked to the University of Adelaide. This Theme is one arm of the South Australian Comprehensive Cancer Consortium (SACCC), which includes excellent cancer research groups across the state. All of the cancer research groups in South Australia have benefited enormously from the Beat Cancer Project, a joint funding initiative of the Cancer Council of South Australia and SA Health, which provides \$4 million annually to support all aspects of cancer research in the state.

The most readily measurable output from the Cancer Theme is the number and quality of scientific papers that are published

in international journals. Published papers are the main mechanism for disseminating improvements in diagnosis, monitoring and treatment of cancer. A total of 60 papers have been published by the SAHMRI Cancer Theme groups in 2014. This includes papers in the highest impact journals (e.g. New England Journal of Medicine and Cell). The team has made important contributions to the dramatic progress being made internationally in relation to our understanding of the mechanisms of cancer development, our capacity to control cancer progression and where possible to cure it. The leaders of the research groups: Professor Deb White, Associate Professor Lisa Butler, Professor Andrew Zannettino, Professor Stan Gronthos and Dr Dan Worthley are all leaders in their fields in Australia and have received both national and international recognition for their achievements.

## RESEARCH HIGHLIGHTS

In the Leukaemia Research Group, Professor Deb White is utilising the cutting edge facilities in the Genomics Suite established at SAHMRI thanks to a major donation from David Gunn, a local philanthropist. This is enabling her team to rapidly identify the key cancer-driving targets in new cases of childhood acute lymphoblastic leukaemia (ALL) sent to SAHMRI from all over Australia. This is a massively challenging project that grew out of the seminal discoveries of Dr Charles Mullighan.

The Stem Cell Research Group, headed by Andrew Zannettino, studies multiple myeloma; a blood disease characterised by the clonal proliferation of plasma cells. Myeloma is frequently preceded by a premalignant monoclonal gammopathy of uncertain significance (MGUS) stage. The factors that trigger the progression from MGUS to myeloma remain unknown; however, studies in collaboration with Gareth Morgan (Arkansas, US) and Dr Charles Mullighan (Tennessee, US) suggest that both intrinsic genetic changes and extrinsic factors play a role in disease progression. Using state of the art genomics (David Gunn Facility, SAHMRI), the laboratory's research is focused on detecting key signalling pathways deregulated during disease development and on determining the micro environmental changes that occur during myeloma development. It is anticipated that these approaches will enable the identification of new molecular markers of disease risk and lead to the design of novel therapeutics.

The Mesenchymal Stem Cell (MSC) Laboratory, headed by Professor Stan Gronthos, examines the transcriptional and epigenetic factors that regulate MSC self-renewal, proliferation and differentiation. In addition, research efforts have focused on identifying the factors central to MSC mediated regulation of haematopoiesis, angiogenesis and immune cell

modulation. Importantly, many of these molecular processes are considered underlying mechanisms that influence tumour cell development. Clinically, MSC are considered as novel therapeutic agents with the potential for repairing damaged connective tissue due to trauma, disease or congenital conditions. Together with Professor Andrew Zannettino and commercial partner, Mesoblast Ltd, this group is moving forward into Phase II/III human clinical trials for orthopaedic, cardiovascular, immunotherapy and cancer applications. Continuing research into the basic properties of MSC will help develop effective and safe therapeutic strategies in the future for a wide variety of clinical indications.

Prostate cancer is a major public health issue in Australia and a leading cause of morbidity and mortality in men. Two of the most important issues in prostate cancer research are the need to develop more effective and targeted therapies for metastatic prostate cancer, and to improve the ability to distinguish indolent from aggressive forms of prostate cancer at diagnosis in order to prevent unnecessary over-treatment. Research performed by the Prostate Cancer Research Group, led by Associate Professor Lisa Butler, is making significant impacts on these key priority areas in the field. A cornerstone of her research has been the development of a novel pre-clinical model of prostate

cancer that utilises human tissue cultured as explants, enabling generation of data that few others in the world are able to achieve. This model is being used to assess the clinical potential of new drugs which target heat shock protein 90 (Hsp90), and is improving selection of drugs which progress to clinical trials.

The chief contribution of Professor Dan Worthley's research has been to identify a new connective tissue stem cell in the bone, that we called osteochondroreticular (OCR) stem cells as well as new intestinal reticular stem cells (iRSC) within the connective tissues of the bowel. Discovering these two new connective tissue stem cells has improved our understanding of normal tissue physiology and has provided new cellular targets for treating skeletal and intestinal disorders, such as bowel cancer.

### CROSS THEME COLLABORATIONS

**Metastatic Disease:** Most cancer patients die because their cancer spreads from a primary site to other tissues in the body. Once escaping the primary site, 70 per cent of all tumours will spread to bone. This raises the question, 'why is bone a preferred destination for cancer cells?' Collaborative studies between Professor Andrew Zannettino and Professor Dan Worthley and international partners in the United States (Columbia University, New York) and the United Kingdom (Oxford

University) have revealed that a protein, termed Gremlin1, which is made by non-cancer stromal stem cells within bone, represents a key protein that supports cancer growth.

Saethre-Chotzen syndrome is characterised by premature fused coronal sutures, and other skull/skeletal malformations, which are the result of a mutation in the gene *Twist-1*. Surgical intervention is the only treatment option to ensure optimal cognitive and skeletal development. Studies undertaken by Professor Stan Gronthos in collaboration with Professor Andrew Zannettino will identify the key molecular signalling components that regulate craniosynostosis that may help identify gene targets for drug therapy.

Mesenchymal stem cells (MSC) give rise to osteogenic populations including osteoprogenitors, osteoblasts and mature bone cells called osteocytes; that are vital for bone formation during development. Studies by Professor Stan Gronthos and Professor Andrew Zannettino are investigating the molecule family of EphB tyrosine kinase receptors and their ephrinB ligands during bone development and remodelling.

Associate Professor Lisa Butler's group is currently collaborating with Professor Dan Worthley to improve pre-clinical models of

disease for both prostate cancer and gastrointestinal cancer, by developing parallel explant tissue and organoid systems. As part of the Movember Revolutionary Team Award program, she also collaborates with co-investigator Professor Gary Wittert (Nutrition and Metabolism Theme) on the role of obesity in prostate cancer risk and with Dr Martin Snel (Lysosomal Diseases Research Unit) for mass-spec imaging studies to visualise lipid biomarkers in human prostate tissues.

### AWARDS AND RECOGNITIONS

- Professor Tim Hughes was recognised as one of the top one per cent of cited scientists internationally by Thompson Reuter.
- Program Grant awarded to Professor Tim Hughes (with Professor Angel Lopez and Professor Michael Parker) in 2014 achieved highest ranking.
- Professor Deb White awarded Australian Society for Medical Research (ASMR) Leading Light for 2014.
- Professor Deb White awarded The Hughes Foundation (USA) Grant for her work in paediatric ALL and resistance (Nov 2014)
- Professor Deb White appointed to the Assigners Academy for the NHMRC Project Grants (2013-2014).
- Professor Andrew Zannettino appointed to the Assigners Academy for the NH&MRC (2014).
- Professor Andrew Zannettino was appointed to another term as scientific reviewer for the CSIRO Science and Industry Endowment Fund.
- Professor Andrew Zannettino was appointed to the board of management for the Robinson Research Institute.

- Professor Andrew Zannettino was appointed to the Scientific Committee of the Bone Health Foundation for another term.
- Professor Andrew Zannettino was appointed to the board of management for the Colgate Australian Clinical Dental Research Centre.
- Professor Dan Worthley was awarded a 2014 NHMRC Project grant as Chief Investigator (CIA) \$531,935.
- Professor Dan Worthley was appointed as Principal investigator ECMS Research Support Scheme, University of Adelaide.
- Chung Kok awarded Mary Overton Fellowship 2014-2016.
- Dr Melissa Cantley received a SA Young Tall Poppy Science award.
- The Premier of South Australia, the Honourable Jay Weatherill MP, officially opened the Australian Cancer Research Foundation (ACRF) Innovative Cancer Imaging and Therapeutics Facility on November 17 2014.
- The official opening of The David R Gunn Genomics Suite on Level 5 on Thursday, 27 November 2014.

### NUMBER OF STAFF AND STUDENTS

The theme includes 69 staff across all groups, including 25 employed by SAHMRI and 44 associated with the University of Adelaide. 28 students worked with the Cancer Theme in 2014.



69

STAFF EMPLOYED WITHIN THE THEME



28

STUDENTS WORKED WITH THE THEME



60

PAPERS PUBLISHED BY THE THEME IN 2014



# HEALTHY MOTHERS, BABIES AND CHILDREN

**Professor Maria Makrides**  
Theme Leader

## THEME RESEARCH FOCUS

The Healthy Mothers, Babies and Children Theme aims to unlock the potential of children and young people through supportive interventions during early life. The theme has a particular strength in the evaluation of nutritional interventions and are using these strengths to deliver nutritional strategies to reduce the risk of preterm birth, improve the health and developmental outcomes of children who are born premature and to minimise the risk of allergy development in young children who are at higher hereditary risk of allergic disease.

## ACHIEVEMENTS IN 2014

The SAHMRI Healthy Mothers, Babies and Children Theme, in partnership with the Women's and Children's Health Research Institute and based at the Women's and Children's Hospital, has a suite of ongoing clinical trials, all of which are making good progress.

In the area of neonatal nutrition, the theme completed the seven year follow up of the premature infants who participated in the DINO trial and received extra DHA, an omega or n-3 fatty acid, while they were in the neonatal nursery. The study showed that the developmental advantage of DHA supplementation that we saw at 18 months of age had been significantly diluted by school age. The DINO trial also suggested a possible benefit of n-3 fatty acids to the reduction of chronic lung

disease, which commonly occurs in very premature infants. As a result of these observations they embarked on a larger study to conclusively assess whether n-3 DHA administration in the most premature infants can reduce the risk of lung disease. The last two years have seen 13 collaborative research centres established across Australia, New Zealand and Singapore. Recruiting is progressing well and the group expect to reach their recruitment target of 1,250 infants in 2015.

The iodine related studies have highlighted that the mandatory iodine fortification of bread flour has resulted in an increase of iodine status of the South Australian pregnant women. Ongoing studies will determine whether iodine intake during pregnancy is associated with the developmental outcome of young children who live in an otherwise well-nourished society.

Other pregnancy related studies relate to the effects of the omega or n-3 fatty acids on preventing prematurity and supporting the growth and developmental outcomes of children. The DOMInO trial is suggesting that supplementation with DHA during pregnancy in women with mostly normal pregnancies will not affect growth or improve developmental outcomes of children born at term, but will prolong the duration of gestation. The newest study, the ORIP study, will answer the

question of whether omega-3 supplementation in pregnancy can reduce the risk of premature delivery.

Two studies of infant egg allergy made strong progress in 2014, and both will come to fruition in 2015. The STEP study continued to grow its cohort of infants, with over 700 babies participating. STEP will determine whether early introduction of egg as a solid food will help prevent egg allergy. The CAKE study, on the other hand, is designed to determine whether exposure to baked egg can assist in alleviating egg allergy in children who are already egg allergic. Both studies will make an important contribution in the prevention and treatment of egg allergy that now affects about nine per cent of young Australian children.

## RESEARCH HIGHLIGHTS

Pregnant women are encouraged to increase their fish intake during, yet avoid types that might be high in mercury. In the confusion, many pregnant women restrict their fish intake, and instead use prenatal fish oil supplements that are marketed to improve child development. These supplements have become widely used in Western countries, although it remains unclear whether they actually improve the developmental outcomes of children.

DOMInO is the largest trial of fish oil supplementation during pregnancy to assess child development. Women were asked to take capsules of either fish oil or a placebo through the last half of their pregnancy, and then followed up the children when they turned four years old. Measures of overall child development, language and complex cognitive skills in 646 children revealed no benefits of fish oil supplementation in pregnancy.

DOMInO is the first study to be able to provide strong evidence for the long-term effects of fish oil supplementation in pregnancy. This research, published in the esteemed Journal of the American Medical Association, will help pregnant women make informed choices about their supplement use, and health care professionals to set evidence-based nutritional guidelines.

### CROSS THEME COLLABORATIONS

An exciting new collaboration with the Wardliparingga Aboriginal Research Unit was formed for maternal and child focused research. This collaboration aims to bring together a wide range of expertise in Aboriginal health and maternal / child health so we can shape a dynamic research program based upon community health priorities for Aboriginal families in urban, rural and remote South Australia. A steering committee was established midway through 2014 and met numerous times

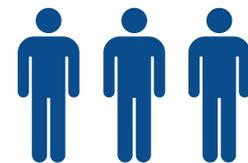
to plan the inaugural Aboriginal Babies, Children and Families Workshop to be held in the SAHMRI Auditorium. It was a huge success, bringing together researchers, clinicians, health care workers, policy makers, community members and elders from urban and regional South Australia. The focus was to share ideas, discuss priorities, showcase successful research, and identify where there are gaps in research/practice so we can begin to pave the way forward for community-led research in the South Australian maternal and child health space.

### AWARDS AND RECOGNITIONS

- Professor Maria Makrides was invited to deliver the lead lecture in a closed NIH workshop (September 2014) with the purpose of assessing clinical trials that may be required to allow the Food and Drug Administration to make a ruling on whether the US food supply should be fortified with iodine.
- Carmel Collins received a special commendation as part of the Unsung Hero Awards of South Australian Science for her work exemplifying the aims and objectives of Science Week.
- Jacqueline Gould Semi-Finalist for 2014 Young Investigator Awards presenting outcomes of DOMInO Randomised Controlled Trial.

### NUMBER OF STAFF AND STUDENTS

A total of 33 staff, from different disciplines, that work collaboratively between SAHMRI and WCHRI. One student was awarded PhD in 2014 and the Theme has six ongoing PhD students.



33

STAFF EMPLOYED WITHIN THE THEME



1250

INFANTS RECRUITED IN THE DINO TRIAL



# HEART HEALTH

**Professor Steve Nicholls**  
Theme Leader

## THEME RESEARCH FOCUS

The Heart Health Theme's broad research agenda focuses on three main areas including (i) vascular disease, (ii) heart structure and function and (iii) rhythm disorders. These areas have been selected on the basis of their health importance in the community and reflecting areas of research strength in South Australia. The theme has also incorporated the Stroke, Sleep Health and Renal researchers from within the state, given their primary connection with cardiovascular health.

## ACHIEVEMENTS IN 2014

Members of the Heart Health theme have been awarded the following NHMRC grants:

- Professor Stephen Nicholls / Professor Stephen Worthley – Project Grant - Coronary Artery calcium score: Use to Guide management of Hereditary Coronary Artery Disease (CAUGHT-CAD) \$2,652,448.
- Professor Prash Sanders / Professor Stephen Nicholls – Project Grant - Cardiac Resynchronisation Therapy and AV Node Ablation for Atrial Fibrillation in Heart Failure \$3,149,632.
- Associate Professor Peter Catcheside – Project Grant - Clarifying the pathogenic role of arousal-hyperventilation in obstructive and central sleep apnoea: Testing fundamental

pathophysiological mechanisms and a strategic new treatment \$402,616.

- Dr Peter Psaltis – New Investigator Grant - A study of the origins of macrophages in healthy and atherosclerotic vasculature focusing on a novel population of resident adventitial macrophage progenitor cells (AMPCs) \$451,126.
- Dr Simon Koblar – Project Grant - Helping stroke physicians choose who to thrombolyse - the "Targeting Optimal Thrombolysis Outcomes" (TOTO) study \$1,031,671.

The Cardiac Innovation Centre – Medical Education group coordinated two very successful meetings in March and November this year. The meetings were for interventional cardiologists from around the country and the content included current and evolving topics of the Cath Lab.

The Heart Health weekly seminars have been well attended. The workshops focused on exercise, nutrition, stroke, sleep and rhythm disorders. We had a number of interstate speakers which included Professor Philip Barter and Professor Jonathan Kalman.

110 papers were published by Theme members during 2014, including articles in the Journal of the American Medical Association

(JAMA) and Circulation. Professor Nicholls was an author of 34 of these publications.

## RESEARCH HIGHLIGHTS

Professor Nicholls and his team in Heart Health are excited to have been awarded the leadership and operational control of an international multicentre study titled:

*A Phase II Multi-Center, Double-blind, Placebo-controlled, Dose-focusing Trial Of CER-001 In Subjects With Acute Coronary Syndrome CER-001 Atherosclerosis Regression ACS Trial (CARAT study).*

The study is assessing the impact of ten intravenous infusions of CER 001 (this is a HDL mimetic) vs. placebo in 292 patients, given at weekly intervals, on atherosclerotic plaque volume as measured by coronary Intravascular Ultrasound (IVUS) administered to subjects presenting with Acute Coronary Syndrome (ACS) with significant plaque volume. Changes to plaque volume will be measured via a second coronary IVUS that will be undertaken at the end of the course of infusions.

The study has sites in Australia, Hungary, Netherlands and the United States. Recruitment is expected to commence mid 2015. This is a huge win for SAHMRI and the Heart Health team; it is rare for international studies to be coordinated from Australia. The study budget is just over \$20

million, and about 15 per cent of this will remain within SAHMRI to cover costs associated with the operation of the trial including imaging core lab services, project management, site management and monitoring (Australia), data management and IT services and infrastructure.

#### **CROSS THEME COLLABORATIONS**

During this year, the Theme has continued its strong connections with the Aboriginal Health Theme, who they work closely with on an NHMRC funded Omega 3 project.

The Academic Research Organisation (Adelaide Clinical Research) that sits within Heart Health has spent time meeting with all of the themes to discuss potential collaborations. They have established a working agreement with the CSIRO to provide monitoring services for a CSIRO led clinical trial.

#### **AWARDS AND RECOGNITIONS**

Rajiv Mahajan was awarded his PhD with a Dean's commendation. Rajiv has also been appointed to the Leo J. Mahar Lecturer position at the University of Adelaide.

Dr Rajeev Pathak was awarded the Eric Prystowsky Clinical Research Award for his work on Aggressive Risk factor REduction STudy for Atrial Fibrillation (ARREST-AF): implications for Ablation Outcomes at the Heart Rhythm Society's (HRS) 35th Annual Scientific Sessions in

San Francisco (May 2014). The award promotes excellence in clinical research through the fellow with the highest scoring abstract in the Clinical Electrophysiology & Catheter Ablation category.

Dr Karlea Kremer of the Stroke Research Group was awarded the 'Elizabeth Penfold Simpson Prize' from the Brain Foundation (Australia). This prize recognises the best piece of original neuroscience research (in any field) within the last two years. The work Dr Kremer undertook was substantially conducted in South Australia. The award was presented in Sydney and is worth \$20,000. Dr Karlea Kremer has donated this award to furthering stem cell research for stroke.

#### **NUMBER OF STAFF AND STUDENTS**

The theme includes 120 staff across all groups, including 47 associated with The University of Adelaide and six with Flinders University. Twenty PhD and four Honours students worked with the Theme's research teams in 2014.



# 120

**STAFF EMPLOYED WITHIN THE THEME**



# 24

**STUDENTS WORKED WITH THE THEME**



# 110

**PAPERS PUBLISHED BY THE THEME IN 2014**



# INFECTION & IMMUNITY

**Professor Steve Wesseling**  
Theme Leader

## THEME RESEARCH FOCUS

The Infection and Immunity has three major research areas:

- Microbiome Research
- Biomedical Informatics
- Infectious Diseases Research – Aboriginal Health

### *Microbiome Research*

The focus of SAHMRI Microbiome Research is to investigate the ways in which the human microbiome influences health and disease. The research spans in vitro investigations that examine the mechanistic basis of pathological processes, to clinical interventional studies and randomised controlled trials of novel therapeutics. Researchers within the group employ a range of high throughput omics technologies, combined with systems biology approaches, to investigate host-microbiota interactions. The ultimate aim of the research is to translate insight gained from investigation of the human microbiome into tangible health benefits.

### *Biomedical Informatics*

The primary research interest of the Lynn EMBL Australia Group, lead by Associate Professor David Lynn, is investigating the regulation of the innate immune system from a genome-wide or systems level perspective. To do this on the wet-lab side, the group employs in vitro and in vivo (mouse) experimental models coupled with systems biology approaches to investigate the regulation of innate and, more recently, adaptive immunity. Recently, the group has become particularly

interested in the interplay between the microbiome and the immune system and this is becoming a major focus for the lab. They are currently investigating how dysregulation of the (mouse and human) neonatal gut microbiome impacts subsequent immune responses (e.g. to childhood immunisations). The Lynn Group is also developing a strong interest in vaccine non-specific effects (effects vaccines have on mortality and morbidity not explained by explained by the prevention of the targeted diseases) and how certain vaccines can epigenetically train innate immune cells to be more responsive to subsequent unrelated antigens.

On the bioinformatics side, the Group leads the development of InnateDB.com, an internationally recognised systems biology platform for the computational analysis of innate immunity networks/pathways. Recently, Associate Professor Lynn has also expanded his interest in network biology into the cancer signalling area, and lead the computational biology aspects of €12 million European Commission funded project, investigating how to model and subsequently therapeutically target networks in cancer. To facilitate this work the group has developed several novel pieces of (freely available) software for network and pathway visualisation and analysis.

### *Infectious Diseases Research – Aboriginal Health*

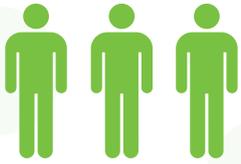
The work of this Group aims to address the long standing and disparate rates of sexually transmitted infections blood borne viruses, and other infectious diseases prevalent in the Australian Aboriginal population.

### ACHIEVEMENTS IN 2014

Associate Professor Geraint Rogers was recruited in March 2014 to lead the Microbiome Research Group. Laboratories and offices were established at the Flinders Medical Centre, and a fully operational microbiomics research unit was in place by September, 2014. A research programme was then developed to draw on an international, national, and regional collaborative research network, which aimed to combine the strengths of both the Infection and Immunity team, and the wider SAHMRI research community.

In 2014, the profile of SAHMRI Microbiome Research was promoted through the acceptance of invitations to address both national and international scientific meetings, collaborate on advisory boards, and publish commentaries and editorials. In addition, Microbiome Research published ten peer-reviewed research papers in 2014 and had abstracts accepted at meeting in Australia, Asia, and Europe.

Efforts to establish a basis for the ongoing expansion SAHMRI Microbiome Research included the preparation and submission



11

STAFF EMPLOYED  
WITHIN THE THEME



700,000

\$ OF FUNDING SECURED  
FOR INTERNATIONAL  
COLORECTAL PROJECT



12

STUDENTS WORKED  
WITH THE THEME

of funding applications, to both government funding bodies and charitable organisations. Several of which have been successful.

A major focus in 2014 was to complete recruitment for positions in the group. Associate Professor Lynn hired two wet-lab postdoctoral fellows and a laboratory technician and has established a new wet-lab at SAHMRI. This was a significant undertaking as all the necessary equipment, fridges, freezers, reagents etc had to be purchased and set-up from scratch. Additionally, three members of Associate Professor Lynn's former group in Ireland relocated to SAHMRI in 2014. These researchers which include a senior computational biologist, a senior software developer and a bioinformatics research assistant make up the computational biology side of Associate Professor Lynn's group and focus on developing new tools and bioinformatics resources for the analysis of complex biological data and in particular network biology data. The recruitment of these staff was facilitated by funding from The European Commission, which formally approved the addition of SAHMRI as a partner and beneficiary to the PRIMES project, a 13 partner FP7 funded project (~Eur12 million) which is investigating network rewiring in colorectal cancer. David's group leads the computational biology aspects of this project. >\$700,000 in funds will be transferred to SAHMRI to fund this project in

Associate Professor Lynn's group over the next two and a half years.

### RESEARCH HIGHLIGHTS

While only fully operational as a research facility for a relatively short period in 2014, Microbiome Research initiated a number of exciting projects. These span a number of different clinical contexts.

In a collaborative research partnership with a number of Menzies Research Centre, Microbiome Research developed a novel analytical approach to assessing the bacteria in the middle ear of children with chronic suppurative otitis media. This was used successfully to characterise the middle ear microbiome of Aboriginal children in remote communities, resulting in two peer-reviewed publications, and a presentation at the Australian Otitis Media Conference. This work laid the foundation of a large-scale, longitudinal study of paediatric ear disease that we are now undertaking in remote Aboriginal communities in South Australia.

Building on research undertaken previously by Associate Professor Geraint Rogers, SAHMRI Microbiome Research initiated a number of studies, focusing on identifying prognostic markers of long-term chronic lung disease outcomes. This work used next generation sequencing technologies to characterise bacterial dynamics in the lungs of patients with bronchiectasis that spanned periods of changing

respiratory health, or therapy. This novel work led to the discovery of a number of specific microbiome markers that were more accurate predictors of disease course than any of the existing microbiological measures. This work was published in the Annals of the American Thoracic Society. In parallel, the group used similar techniques to assess whether microbiome analysis could identify patients who would benefit most from, or experience adverse outcomes with, long-term macrolide therapy. Again, we were able to identify specific microbiome markers that can now be used to stratify chronic lung disease patients for treatment. This work was published in both Lancet Respiratory Medicine and the International Society for Microbial Ecology Journal.

Finally, the group initiated, in partnership with the Infection and Immunity EMBL Group and the Women's and Children's Hospital, a study to identify long-term health determinants for preterm infants. This work included sequencing-based analysis of the gut microbiome in infants born very prematurely, and the correlation of these data with markers of immune development and function, and clinical outcomes. This work represents a highly novel approach to the investigation of morbidity and mortality in a highly vulnerable patient populations, and has formed the basis for an NHMRC Project Grant application.

In their first months of life, Australian infants and infants

worldwide receive vaccinations providing protection from many serious infectious diseases. Vaccination is second only to clean water in reducing infectious disease burden, preventing an estimated six million deaths per year globally. However, vaccine efficacy can vary substantially among individuals and clinical trials show consistently lower vaccine immunogenicity in developing world populations. This study hypothesises that the gut microbiome is a key factor contributing to variation in vaccine responses. Using an established mouse model, the group will investigate whether dysregulation of the neonatal gut microbiome (dysbiosis), driven by either maternal antibiotic treatment or maternal diet, leads to impairment of subsequent antigen-specific antibody responses to vaccination. In addition to generating specific immunity, it is becoming increasingly appreciated that vaccines can also elicit both beneficial and deleterious nonspecific responses; defined as effects vaccines have on morbidity and mortality not explained by the prevention of the targeted diseases.

This paradigm shift challenges the conventional wisdom that vaccines are solely disease-specific interventions and last year The World Health Organisation identified this as a priority area for research. An emerging mechanism for these effects is that vaccines alter (or 'train') innate immunity by epigenetically reprogramming innate immune cells. In this study we will determine for the first time, the genome-wide extent of vaccine-induced epigenetic changes in monocytes and NK cells isolated from mice post-vaccination with vaccines associated with either beneficial or deleterious nonspecific effects and will establish whether the microbiome can influence this programming.

## CROSS THEME COLLABORATIONS

Microbiome Research is a highly collaborative group, with ongoing research partnerships with researchers in Mind and Brain, Healthy Mothers, Babies and Children, Nutrition and Metabolism, Heart Health, and Wardliparingga Aboriginal Health established in 2014. These collaborations have resulted in a number of manuscripts in preparation, and several funding applications to support ongoing work. In addition, the group has hosted placements for students from other SAHMRI themes.

*The impact of the neonatal microbiome on specific and nonspecific vaccine responses:*

Collaborators: Associate Professor Geraint Rogers (SAHMRI Director of Microbiome Research), Associate Professor Helen Marshall (Director of the Adelaide University Vaccinology and Immunology Research Trials Unit); Professor Steve Wesselingh (Executive Director at SAHMRI and Head of Infection and Immunity), Professor Graeme Young (Professor of Global Gastrointestinal Health at Flinders University).

*Transcriptional reprogramming of immunity in preterm infants receiving the nutritional supplement docosahexaenoic acid (N3RO clinical trial):*

Collaborators: Professor Maria Makrides (Theme Leader: SAHMRI Healthy Mothers, Babies and Children); Professor Robert Gibson (Professor of Functional Food Science, University of Adelaide); Associate Professor Irmeli Penttila (Head of the Nutrition and Mucosal Immunology Laboratory, WCHRI); Dr. Andrew McPhee (Director, Neonatal Services); Associate Professor Geraint Rogers (SAHMRI Director of Microbiome Research)

## AWARDS AND RECOGNITIONS

2014-2016 Australian Hotels Association (SA) - Hotel Care Community Projects. Funding for High Performance Computing Infrastructure for Bioinformatics at SAHMRI. (\$150,000).

2014-2019 EMBL Australia Group Leader Funding (Award AUD\$3 million). Role: PI [http://www.emblaustralia.org/Research/Lynn\\_Group.aspx](http://www.emblaustralia.org/Research/Lynn_Group.aspx)

2014-2014 NC3Rs (UK) CRACK IT Challenge 16. Virtual Infectious Disease Research. Phase I award (£84,561). "Modelling of the molecular interactions between host and pathogen" Role: Co-PI.

[http://www.crackit.org.uk/crack/2013/2013\\_challenges/Challenge16-virtualallab](http://www.crackit.org.uk/crack/2013/2013_challenges/Challenge16-virtualallab)

2011-2016 European Commission FP7-HEALTH-2011 Project# 278568. "PRIMES: Protein interaction machines in oncogenic EGF receptor signalling." (Total award €11,999,640) (Award to me €1,075,221 of which The European Commission contributes €809,666). Role: Co-PI. <http://cordis.europa.eu/fp7/health/>

## NUMBER OF STAFF AND STUDENTS

Microbiome Research Team - in addition to Associate Professor Rogers, the group employed two early career postdoctoral researchers in 2014. In 2014, Microbiome Research recruited two PhD students (Flinders University, APA scholarships), as well as supervising two undergraduates, two masters students, a ID registrar, and a PhD practicum placement. In addition, Associate Professor Rogers continued to supervise three PhD students based at other institutions.

Biomedical Informatics – six staff and three students (one PhD and two Honours).



# MIND & BRAIN

**Professor Julio Licinio**  
Theme Leader

## THEME RESEARCH FOCUS

Research at the Mind and Brain Theme is distributed along three arms, with multiple projects.

### *Arm 1: Our Clinical Translational Research Arm has nine active projects:*

1. Genomics and pharmacogenomics of depression, using DNA sequencing technologies to identify genetic variants associated with the diagnosis of major depressive disorder or with antidepressant treatment response. We conduct a depression genetics project based at SAHMRI, funded by an NHMRC project grant (CIA M-L Wong) and are also part of a national collaborative depression pharmacogenomics network, based at QIMR Berghofer funded by NHMRC (CIA N. Martin).
2. Chronic Myeloid Leukaemia (CML) and Mental Health Outcomes, a collaboration with the SAHMRI Cancer Theme and Royal Adelaide Hospital, which examines the neuropsychological effects of CML treatment.
3. Depression and Lifestyle, in collaboration with Flinders University - Using Internet based apps for researching depression and genetics.
4. Mental Health, Diet and

Nutrition, which represents a collaboration with CSIRO and the SAHMRI Nutrition and Metabolism Theme. This study aims to understand how an individual's past history of mental health and overall brain function affect their success in weight control.

5. The Biology of Chronic Fatigue Syndrome (CFS) Symptoms. This study looks at leptin, interleukin 6 and clinical symptoms of CFS - Mason Stannet Grant.
6. Health Omnibus Survey. This project is a multi-centre collaborations to investigate the relationship of trauma and adult depression.
7. Developing an Australian Genetic Database for Depression AusGDB - NHMRC Project Grant.
8. Project Discovery - Molecular imaging of the spinal cord.
9. AUGREO: An Australian – German Registry for Early-Onset Obesity, which includes ongoing studies to elucidate genetically-based obesity driven by hormones, such as leptin.

### *Arm 2: The Pre-clinical Translational Research arm has six active projects:*

1. Genomics and pharmacogenomics of depression, studying and validating in the lab genes involved in depression and antidepressant treatment response, including studies on antidepressant-induced gene methylation.
2. Mechanisms by which the microbiome and inflammatory mediators affects depression-related behaviours; this is a collaborative effort with SAHMRI's Infection and Immunity Theme and MIT - Massachusetts Institute of Technology.
3. Effects of antidepressant medications and stress on weight gain - NHMRC Project Grant.
4. The role of stress in cancer initiation and progression.
5. Inflammation and progression of Alzheimer's disease (in an animal model) - Mason Stannet Grant.
6. Stress induced hippocampal atrophy. The hippocampus is a brain region that and plays vital roles in memory, learning, emotion and neuroendocrine regulation. We are studying mechanisms by

which hippocampal volume is decreased in chronic stress and depression.

### **Arm 3: The Wellbeing and Resilience Centre has four current projects:**

1. Ageing and Wellbeing Project: an analysis of the City of Port Adelaide Enfield in the Local Government Wellbeing and Ageing prototype has provided the opportunity for a small group of local residents to participate in a project to measure and build wellbeing.
2. Automotive Workforce in Transition project: The flow on effect of the closure of the G.M. Holden - amalgamation of two baseline measurements datasets for companies providing their employees with wellbeing and resilience skills training.
3. Resilience Futures. This project was created to increase wellbeing and resilience through interventions targeted at disadvantaged youth.
4. Limestone Coast Ageing and Wellbeing Project. This will foster wellbeing and resilience in the elderly through standardised interventions in a defined geographical area.

### **ACHIEVEMENTS IN 2014**

The Mind and Brain Theme launched research in three areas that are new to the Theme, including Alzheimer's disease, chronic fatigue syndrome and resilience and wellbeing.

The Theme is the headquarters for three Nature Publishing Group medical research journals: Molecular Psychiatry (Impact Factor [IF] = 14.496), Translational Psychiatry (IF = 5.620) and The Pharmacogenomics Journal (IF = 4.229). In 2014 Molecular Psychiatry achieved, for the sixth consecutive year, the highest impact journal of any medical research journal published in the entire Asia-Pacific region, and the highest in the field of psychiatry worldwide.

### **RESEARCH HIGHLIGHTS**

The staff of Mind and Brain have had a number of significant highlights in the past 12 months:

#### **PUBLICATIONS:**

The theme has published 12 peer-reviewed publications.

#### **NEW STAFF:**

June 2014: Dr Chenglong Yu, Research Fellow in Biostatistics, joined the Mind and Brain Theme from University of Illinois, Chicago (UIC). Dr Yu now works on multiple research projects in the area of functional genetic variants and environmental factors in depression.

August 2014: Michael Musker, RN, PhD joined us as the Bellberry Research Fellow. He is leading a number of clinical research studies in the Mind and Brain Theme.

#### **HOSTED EVENTS:**

27 June 2014: The Mind and Brain Theme hosted the first Translational Neuroscience Day with 200 people attending.

27 June 2014: The Mind and Brain Theme awarded the first Samuel Gershon Medal for Lifetime Achievement in Translational Neuroscience. The medal was awarded to Professor Sam Berkovic for his exceptional work on the field of epilepsy. The medal is named in honour of Professor Samuel Gershon, one of the fathers of the field of translational neuroscience worldwide. Professor Gershon is an Honorary Fellow, SAHMRI Mind and Brain Theme.

June 2014: The Wellbeing and Resilience Centre held 'Building Wellbeing and Resilience in Society' panel discussion event on July 25 2014, with Professor Ilona Kickbusch (Director, Global Health Programme, Graduate Institute of International and Development Studies, Geneva), David Engelhardt (Director of Business Intelligence, Department for Education and Child Development) and Gabrielle Kelly (Director, SAHMRI Wellbeing and Resilience Centre)

## CROSS THEME COLLABORATIONS

The Mind and Brain Theme has a number of collaborative research projects within SAHMRI, partner institutions, government bodies and international institutions.

Depression Genomics and Pharmacogenomics is a local and national collaborative effort, with partners at SAHMRI-EMBL Australia, University of Adelaide, Flinders University, Deakin, University of Sydney and QIMR Berghofer.

Project Discovery (Molecular Imaging of the Spinal Cord) is a partnership with the Neil Sachse Foundation for collaborative research with the SAHMRI Molecular Imaging and Therapy Research Unit (MITRU) and the Royal Adelaide Hospital (RAH) Spinal Unit.

The Microbiome, Inflammation and Behaviour Project is aimed at elucidating the mechanisms by which the microbiome and inflammatory mediators affects depression-related behaviours; this is a collaboration with SAHMRI's Infection and Immunity Theme and MIT - Massachusetts Institute of Technology.

AUGREO: An Australian – German Registry for Early-Onset Obesity, includes ongoing clinical and lab-based studies to elucidate obesity driven by hormones. This includes a collaboration with the Nutrition and Metabolism Theme, Australian National University, and the University of Dresden in Germany.

The Depression and Lifestyle project involves a collaboration with partner institution Flinders University Associate Professor Bidargaddi is Associate Professor (eHealth), Flinders University and Head Mental Health Informatics Research Unit, SA Health. He is assisted by Ms Gabby Jones (Country Health SA Local Health Network, SA Health). The Mental Health, Diet and

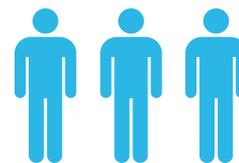
Nutrition Project is a partnership with CSIRO Nutrition (Associate Professor Grant Brinkworth) and the SAHMRI Nutrition and Metabolism Theme.

The Chronic Myeloid Leukaemia (CML) and Mental Health Outcomes Study examines the neuropsychological effects of medication during CML treatment and represents a collaboration with the SAHMRI Cancer Theme and Royal Adelaide Hospital.

Health Omnibus Survey involves a collaboration with several partner institutions, including researchers from University of Adelaide (Discipline of Medicine, Discipline of General Practice, Discipline of Obstetrics and Gynaecology), SA Government Department of Health and Ageing, Cancer Council SA, Drug and Alcohol Services of SA, CSIRO Nutrition, Carer's Association.

## NUMBER OF STAFF AND STUDENTS

A total of eight staff were employed within the Mind and Brain Theme during 2014.



8

STAFF EMPLOYED WITHIN THE THEME



12

PAPERS PUBLISHED BY THE THEME IN 2014



# NUTRITION & METABOLISM

**Professor Chris Proud**  
Theme Leader

## THEME RESEARCH FOCUS

Our research concerns the links between nutrition, metabolism and human health. It includes the mechanisms and consequences of obesity, metabolic syndrome and type-2 diabetes (T2D), the regulation of appetite, the roles of gut hormones, pain-sensing in the gut and the molecular mechanisms of nutrient signalling. It encompasses epidemiology, clinical research and clinical trials, the use of pre-clinical models of disease, and in vitro studies on cells, genes and proteins.

## ACHIEVEMENTS IN 2014

Major events in 2014 included the establishment of Theme and the move of Theme members from the University of Adelaide and CSIRO into their new space in the SAHMRI building. The inaugural Theme Leader, Professor Chris Proud, and members of his team arrived from Southampton, UK. CSIRO established their Nutrition and Health Research unit on the ground level of SAHMRI. CSIRO also completed a NHMRC funded two year dietary intervention in people with T2D, and performed five human clinical studies (including food substantiation activities for industry). Dr Patrick Hughes was invited to join The Genes in Irritable Bowel Syndrome Research Network Europe, a trans-European initiative which aims to standardise approaches to investigating Irritable Bowel Syndrome.

New grants awarded during 2014 (with CIA listed) include: a Movember/PCFA grant for \$3.25M

to Associate Professor Lisa Butler for basic and clinical research into prostate cancer; Project Grants from the National Heart Foundation (Dr Phil Tully; \$75k), the Meat and Livestock Association (Dr Zumin Shi; \$50k) and the Royal Adelaide Hospital Foundation (Dr Leonie Heilbronn; \$100k). Dr Richard Young and Dr Grigori Rychkov were awarded NHMRC Project Grants. Associate Professor Damien Keating and Dr Richard L Young were awarded about \$0.75M worth of funding by Pfizer.

75 papers were published by Theme members during 2014, including articles in Nature Communications, Cell Reports and FASEB Journal.

## RESEARCH HIGHLIGHTS

Professor Gary Wittert showed that storage-type lower urinary tract symptoms (LUTS) in men, commonly thought to relate to the prostate, are associated with additional factors in particular obesity and related conditions such as sleep apnoea, depression or anxiety, hypertension, and impaired glucose tolerance. LUTS is a risk for developing T2D and cardiovascular disease. Progression or remission of LUTS depends on the presence or absence, respectively, of the same lifestyle factors responsible for cardio-metabolic disease. This work is cited in the 2014 European Urology guidelines for LUTS.

Associate Professor Leonie Heilbronn followed up on the accumulating evidence that children conceived by IVF have

altered health profiles compared to non-IVF peers, including increased fatness, blood pressure, blood glucose/triglycerides and insulin resistance. She observed gender-specific consequences of fertility treatments in mice, in particular that males conceived by IVF show worse glucose tolerance.

Associate Professor Amanda Page investigated how food intake is regulated by signals that originate from gastric vagal afferents (GVAs), nerves that run from the stomach to the hind-brain. (i) The activity of GVAs align with the light dark cycle, an effect that is abolished in high fat diet-induced obesity (HF-DIO) and re-established/prevented by restricted feeding. (ii) The dampened response in GVA satiety signalling in HF-DIO is due to disruption in activation of the ion channel TRPV1.

Associate Professor Stuart Brierley discovered that oxytocin receptors are up-regulated on pain-sensing neurons in disease states and that novel oxytocin agonists inhibit pain. With industry collaborators, he showed how linaclotide reduces pain in Irritable Bowel Syndrome patients with constipation (IBS-C). Linaclotide is now an approved drug for treatment of IBS-C in the USA and Europe.

Associate Professor Grigori Rychkov's current research focuses on defining the basic molecular mechanisms that control the activation and regulation of store-operated Ca<sup>2+</sup> channels and transient receptor potential

(TRP) channels in non-excitabile and excitable cells, establishing their roles in oxygen sensing, mechanosensing, and generating responses to hormones and neurotransmitters.

Dr Richard Young's research revealed that detection and uptake of dietary sugars from the gut is abnormal in patients with T2D and obese subjects, contributing to poor clinical outcomes. With support from the pharmaceutical industry, he showed that the gut has increased capacity to release signals that impair metabolic control in subjects with obesity and metabolic syndrome.

Dr Patrick Hughes demonstrated that monocyte-macrophages are the predominant immune cell-type that secretes opioids in humans, and that opioid levels in these immune cells are reduced in IBS patients. He also showed that immune-derived opioids from humans affect chronic gut pain, and that colonic nerves chronically upregulate opioid receptors after recovery from inflammation.

Dr Zumin Shi found, based on a five-year follow-up of 1253 Chinese adults, that inadequate riboflavin intake is common and increases the risk of anaemia. When riboflavin intake is adequate, there is no association between iron intake and anaemia.

### CROSS THEME COLLABORATIONS

Professor Gary Wittert forged new collaborations with Professor Alex Brown, Aboriginal Health Research Theme. They jointly supervised a Masters student working in Aboriginal men's health who was successful in obtaining a National Heart Foundation PhD scholarship (2015-) to extend his studies; Associate Professor Lisa Butler (Cancer Theme) linking nutrition, lipid metabolism and prostate cancer leading to the award of a \$3.25M Movember/PCFA grant; Dr Caroline Miller (Population Health) in studying sugar-sweetened beverages and Professor Julio Licinio (Mind and Brain Theme) in investigating the connections between diet, cognitive function and positive psychology in adolescent obesity.

Professor Proud established several collaborations within SAHMRI, with the Lysosomal Diseases Research Unit and the Mind and Brain Theme being two examples.

### AWARDS AND RECOGNITIONS

Dr Miaoxin Chen received the Dean's commendation for his doctoral thesis. Dr Stephen Kentish was awarded an NHMRC Peter Doherty Early Career Fellowship. Dr Stuart Brierley was invited to deliver talks at conferences in Australia, the USA and Argentina.

Members of the Theme served on numerous national and international committees, including those of the Australasian

Neurogastroenterology and Motility Association, the Australian Neuroscience Society and the Australia and New Zealand Obesity Society, or grant awarding panels, e.g. NHMRC.

### NUMBER OF STAFF AND STUDENTS

The theme included, in addition to the principal investigators, 50 staff, including 25 associated with the University of Adelaide and 22 with CSIRO. Six PhD and Honours students worked with the Theme's research teams in 2014.



50

STAFF EMPLOYED WITHIN THE THEME



75

PAPERS PUBLISHED BY THE THEME IN 2014

# LYSOSOMAL DISEASES RESEARCH UNIT (LDRU)

## THEME RESEARCH FOCUS

In 2014, the LDRU relocated to SAHMRI from SA Pathology at the Women's and Children's Hospital. The LDRU's research focus has been on paediatric lysosomal storage disorders, with a view to improving diagnosis, prognosis and treatment for these inherited conditions. In 2014, whilst retaining its core strength in paediatric lysosomal disorders, the Unit started to plan a strategic realignment of its research platform to take advantage of new and important connections being made between lysosomal dysfunction and common late-onset health problems such as dementia, stroke and heart disease.

## ACHIEVEMENTS IN 2014

The Unit continued its work in several areas: the CNS Therapeutics Group evaluated novel therapeutic strategies for treating brain changes in models of MPS IIIA, a neurodegenerative lysosomal storage disorder, and to examine how the disease affects the brain's structure/function; studies continued to both characterise a naturally occurring model of neuropathic Gaucher disease and to further examine links between Gaucher mutations and the development of Parkinson's disease in carriers of Gaucher disease; the Lysosomal/Endosomal Biology Section investigated a method by which to treat MPS IIIC, a neurodegenerative lysosomal storage disorder that is refractory to all current treatment methods;

the LDRU's Mass Spectrometry Facility relocated into a purpose-built laboratory in SAHMRI, and continued to support research programs across the Unit and to establish itself as a core facility in SAHMRI; and the Confocal Microscopy Facility was established.

The Unit appointed Dr Tim Sargeant to head its Neurobiology Section. Tim will move to Adelaide from Cambridge in January 2015 to take up this role, and will study the contribution of the lysosomal network to late-onset neurodegenerative disorders such as dementia, with a particular emphasis on Alzheimer's disease.

Staff attended and presented at the following conferences and workshops: Neurodegenerative Diseases Expo; the Australian and New Zealand Laboratory Animal Association Conference; the Australasian Extracellular Vesicles Conference; International conference on lysosome biology; International conference Mucopolysaccharidoses; APA Family and Patient Support Forum; the Gordon Conference on Lysosomal Diseases; the Metabolomics Workshop; and the Lorne Genome Conference.

## RESEARCH HIGHLIGHTS

The CNS Therapeutics Group established a new genetically-modified mouse line and commenced characterisation studies; the Group also completed a large in vivo study examining

a new approach for treating neurodegeneration in MPS IIIA (Sanfilippo syndrome).

The Lysosomal/Endosomal Biology Section identified a previously unknown mechanism by which the protein deficient in MPS IIIC is transported within cells. This unexpected but important finding will be further evaluated in 2015, with a view to developing a novel method by which to deliver effective treatment for this and other similar conditions.

## CROSS THEME COLLABORATIONS

A collaboration was established with Professor Simon Koblar (Stroke Research Programme), Professor Stephen Nicholls, Professor Prash Sanders and Professor Matthew Worthley (Heart Health) to investigate selected stroke/heart disease patients to determine the frequency of late-onset lysosomal enzyme deficiency as a cause of pathology.

A collaboration with Professor Chris Proud (Nutrition and Metabolism Theme) was started to examine the effect of lysosomal dysfunction on cell signalling.

A collaboration was ongoing with SAHMRI's Preclinical, Imaging and Research Laboratories (PIRL) to characterise a naturally occurring model of neuropathic Gaucher disease.

Collaborations were established between the Mass Spectrometry Facility and Professor Deb White and Associate Professor Lisa Butler (Cancer Theme), Professor Prash Sanders (Heart Health Theme) and Professor Simon Koblar (Stroke Research Programme).

#### AWARDS AND RECOGNITIONS

- Dr Adeline Lau was awarded a CASS Foundation Travel Award (Post-doctoral Early Career Researcher) to attend and present at the Gordon Conference on Lysosomal Diseases in Texas in 2015.
- Lauren Whyte was awarded an Australian Postgraduate Award PhD Scholarship to commence her studies in Alzheimer's disease in the Unit in 2015.
- Meghan Setford was awarded a 2014 Australian and New Zealand Laboratory Animal Association Conference Scholarship For First Time Presenters, to attend and speak at this meeting. The Scholarship was awarded on the basis of Meghan's scientific abstract and was the only one awarded to an Australian attendee outside the host city.

#### NUMBER OF STAFF AND STUDENTS

There are 23 staff working in the LDRU, along with one PhD student.



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**STAFF EMPLOYED  
WITHIN THE THEME**



**RELOCATED FROM WCH  
TO SAHMRI**

# POPULATION HEALTH

## THEME RESEARCH FOCUS

The Population Health Research Group focuses on the science that underpins population-level interventions to prevent and reduce the impact of non-communicable diseases (NCDs) including cancer and heart disease. The group has significant programs of research in tobacco control, obesity prevention and excess alcohol consumption, as well as in cancer survivorship. The group also administers two cancer registries. With expertise in behavioural science, economics and public health, they work on the science behind social marketing campaigns to support quitting smoking and healthy eating. They also undertake research that informs healthy public policy, including plain tobacco packaging, smoke-free environments and policies that would create an environment to help arrest Australia's increasing obesity rates. The Group also provide evidence and support to programs working to reduce the disproportionate tobacco-related burdens among disadvantaged groups. The group work in partnership with government policy staff, non-government agencies and community agencies to advance services for the community and to inform policy directions to improve health.

## ACHIEVEMENTS IN 2014

During 2014, the team produced 10 journal publications, across a number of areas including alcohol, tobacco and unhealthy

foods, and 12 government reports relating to tobacco control. They also delivered four conference presentations at the World Cancer Congress and the Australian and New Zealand Obesity Society Annual Scientific Meeting.

## RESEARCH HIGHLIGHTS

A particular focus for the Population Health Research Group in 2014 was research evaluating Australia's world leading public health policy, plain packaging of tobacco products.

## CROSS THEME COLLABORATIONS

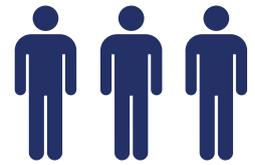
The Population Health Research Team sits within SAHMRI Cancer Theme and the Heart Health Theme. The team collaborates on many projects with the School of Population Health, University of South Australia.

## AWARDS & RECOGNITIONS

Dr Caroline Miller, who leads the Population Health Research Group, was appointed as a Senior Research Fellow in the Heart Health and Cancer Themes in early 2014. She was also awarded the Ray James Award from the Australian Health Promotion Association.

## NUMBER OF STAFF

The Team has seven staff, two PhD students and two public health interns.



# 7

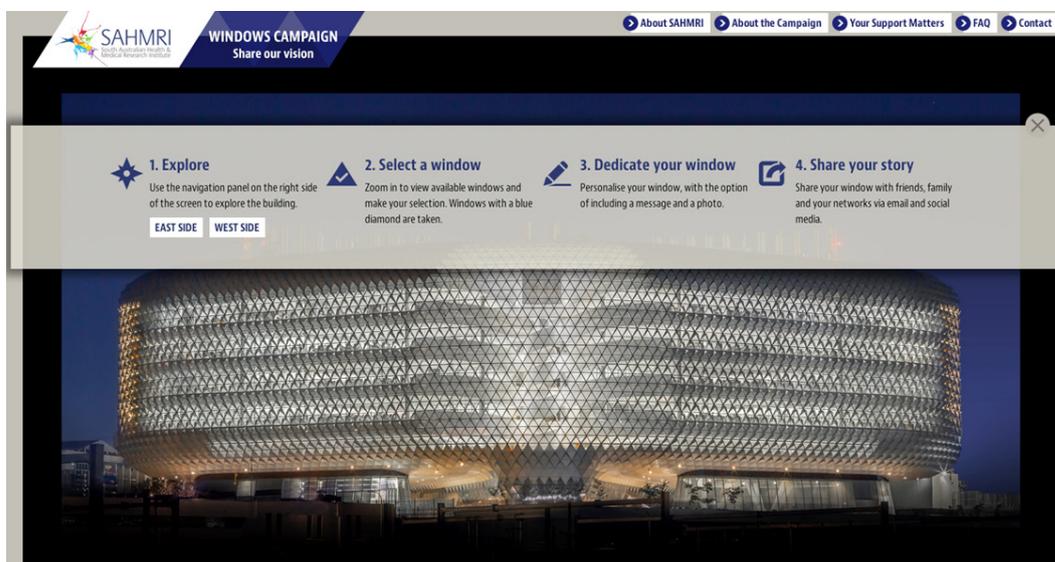
STAFF EMPLOYED  
WITHIN THE THEME



# 10

PAPERS PUBLISHED BY  
THE THEME IN 2014

# SAHMRI 2014 HIGHLIGHTS



## SAHMRI Windows Campaign - Buy a Piece of SAHMRI!

SAHMRI is for sale! Well, the windows of the building are, anyway.

Members of the community can now own a piece of the iconic SAHMRI research facility in the west end of Adelaide by purchasing a virtual window. The windows can be dedicated to the memory, or in recognition, of a loved one, family member, friend or colleague.

The Windows Campaign was designed with the community in mind and presents the perfect opportunity to become involved with SAHMRI by supporting the work of our research teams.

100% of the funds raised from the SAHMRI Windows Campaign will be used to support research programs, build research capacity and purchase the state-of-the-art equipment that SAHMRI's research teams need.

The cost of a window is \$100 for individuals, and \$1,000 for corporates and other organisations. All donations to SAHMRI over \$2 are tax deductible.

To buy a window at SAHMRI and to learn more about the Windows Campaign, please visit [www.sahmriwindows.com](http://www.sahmriwindows.com).

## SAHMRI Scientific Launch

SAHMRI held its inaugural Scientific Launch from 23 - 26 June.



The poster features the SAHMRI logo (South Australian Health & Medical Research Institute) on the left, a large architectural sculpture of a building facade in the center, and a portrait of Tony Jones on the right. Text on the poster includes: 'COMMUNITY DAYS REGISTER TO SEE INSIDE THE SAHMRI FACILITY AND HEAR FROM OUR LEADING RESEARCHERS WWW.SAHMRI.COM', 'Q & A FAT VS SUGAR HOSTED BY JOURNALIST TONY JONES', and 'SCIENTIFIC LAUNCH MONDAY 23 TO THURSDAY 26 JUNE 2014 ADELAIDE CONVENTION CENTRE NORTH TERRACE, ADELAIDE SA'. A vertical rainbow-colored bar is on the far left.

### Community Days:

We had over 600 people through the doors on Monday and Tuesday, 23 and 24 June. The interest and knowledge of SAHMRI by these members of the public was amazing, and it is evident that there is a huge amount of excitement among the community about SAHMRI.

We have received a lot of very good feedback on the days, and we would like to thank all the staff who volunteered their time and helped make this component of the Scientific Launch so successful.

### Q&A – Fat vs Sugar with Tony Jones:

SAHMRI's Q&A event on Tuesday 24 June had a fantastic turnout of more than 1,800 people. Tony Jones did a wonderful job of hosting, and our panelists gave insightful, in-depth and relevant (and at times, humorous!) answers to the questions both from Tony, and from our audience.

'Fat vs Sugar' is currently a very hot topic in the media and within the community, and I think our attendees found it very informative.

We received countless comments on social media saying that attendees 'didn't want the evening to end'.

Our hashtag for the night, '#sqanda', was trending in Australia for four hours on Tuesday night, a sign of the community's engagement with our event.

Thanks also to our volunteers who helped ensure that the event ran smoothly.

### Keynote Speaker and Workshop Days:

We had over 500 people attend the Keynote Speaker and Workshop Days of the Scientific Launch at the Adelaide Convention Centre on 25 and 26 June. It was wonderful to see many of our staff at the presentations over the two days. The international speakers gave fantastic talks and were very involved and engaged in the workshops.



## ACRF Innovative Cancer Imaging & Therapeutics Facility Officially Opened

On Tuesday, 18 November, the Honourable Jay Weatherill MP, Premier of South Australia, officially opened the Australian Cancer Research Foundation (ACRF) Innovative Cancer Imaging and Therapeutics Facility at the South Australian Health and Medical Research Institute (SAHMRI).



The Facility will enable ground-breaking cancer research to be conducted by providing investigators with access to biomedical imaging technologies. Such technologies include: advanced flow cytometry, magnetic resonance imaging (MRI), computed tomography (CT), positron emission tomography (PET) and single photon emission computed tomography (SPECT).

Equipment purchased thanks to funding from the ACRF will give researchers and their collaborators the capacity to rapidly translate basic biomedical research discoveries to novel cancer therapies.

“ACRF is thrilled to support the cutting-edge cancer imaging research being conducted by SAHMRI’s scientists. This facility will enable discoveries and the development of improved treatment protocols that will bring hope to patients with all types of cancers,” said Dr Ian Brown, Chief Executive of the ACRF.

SAHMRI’s Executive Director, Professor Steve Wesselingh, said that this gift from the ACRF is invaluable.

“The Facility enables the collaboration between specialists and researchers, who are working together in the pursuit of better treatments, cures and even ways to prevent cancer in its many manifestations.

“We are thrilled to have received this funding from the ACRF. Thanks to the combined funds from the ACRF, the Health Services Charitable Gifts Board, the Beat Cancer Project and the Detmold Group, we have been able to purchase specialist-imaging equipment located in our two dedicated facilities of SAHMRI North Terrace. This equipment will be used in pre-clinical testing of novel potential therapies for a diverse array of diseases and conditions - not just cancer - including depression, stroke and heart disease, immune dysfunction and metabolic disease.

“Our work in the Cancer theme would not be possible without this assistance from the ACRF. It has enabled us to relocate an entire laboratory to the new facility and continue their excellent work, with access to state of the art equipment.”

### **About the ACRF:**

The Australian Cancer Research Foundation (ACRF) is dedicated to funding research in Australia that has the power to make significant breakthroughs in cancer diagnosis and treatment. It does so by awarding multi-million dollar grants, stimulating Australia’s best scientists to embark on ground-breaking research projects that speed up the cancer discovery process – ultimately working to save lives by saving time.

## Official Opening of the David R Gunn Genomics Suite



The David R Gunn Genomics Suite on Level 5 of the SAHMRI facility was officially opened by Mr Gunn on Thursday, 27 November.

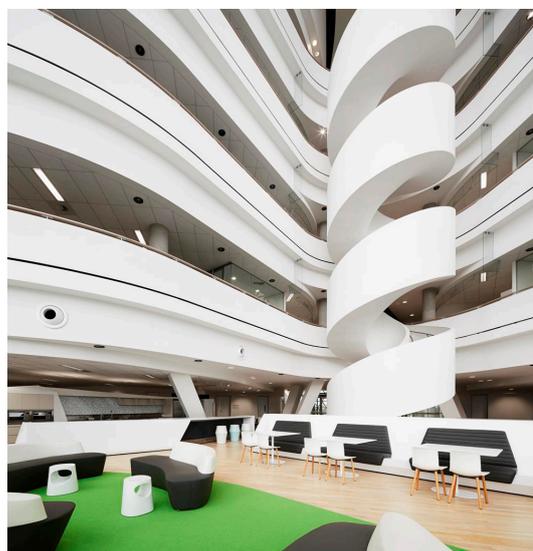
Mr Gunn's generosity is the largest single donation SAHMRI has received so far and has enabled SAHMRI to establish the state of the art Genomics Suite.

This suite houses the latest DNA sequencers of which the largest is capable of generating a terabase of DNA sequence data in a single run!

This facility will be available to local researchers to help understand the complex genomic landscape of diseases, including cancer and brain disorders.

## SAHMRI Wins Award at Interior Design Best of Year in New York

We are thrilled to announce that SAHMRI won an Interior Design Best of Year Award on Friday, 5 December. The architects responsible for the design of the SAHMRI facility, Woods Bagot, explained that Interior Design gave out two awards for the healthcare category – one for architecture and one for interiors, and SAHMRI received the award for architecture.



## We are One! SAHMRI Celebrates First Year in the Building



November 29 2014 marked one year since the Grand Opening of the South Australian Health and Medical Research Institute (SAHMRI) facility, opened by the Prime Minister of Australia, the Hon Tony Abbott MP and the Premier of South Australia, the Hon Jay Weatherill MP.

Now with over 400 people in the building, including groups from our partner organisations, such as the state's three universities and CSIRO, and plans for a second SAHMRI facility, the organisation is rapidly evolving. Collaboration and innovation have been the main drivers in SAHMRI's success.

Professor Steve Wesselingh, Executive Director, SAHMRI, says the past twelve months have been full of success and achievements for SAHMRI.

"From transitioning to a fully-functioning research institute, to many research funding successes, and fantastic community support, 2014 has certainly been a year to remember," he says.

"Highlights have included: appointing all seven of our research theme leaders, receipt of some significant grants, holding our inaugural Scientific Launch week, the signing of the South Australian Aboriginal Health Research Accord (an Australian first) and the launch of our Windows Campaign.

"Of course we wouldn't be where we are today, without the generous support of the Federal Government, the State Government, our Founding Ambassadors and Corporate Champions, and we would like to acknowledge and thank all these contributors on this very exciting milestone for our organisation."

SAHMRI also works very closely with the state's three universities, Research Partners, CSIRO and EMBL Australia and Major Funder, Cancer Council SA. These relationships continue to be developed and nurtured, and have played a critical role in SAHMRI's success.

Professor Wesselingh says that time flies when you're having fun.

"I was appointed Executive Director at SAHMRI in October 2011, and so much has changed for our organisation in that time. It has been an incredible journey thus far, and this is only the beginning. I am so proud to lead the team we have built here at SAHMRI, and if our first year in the building is anything to go by, I am confident that we have a very bright future ahead."

# DONATIONS

## 2014



### SAHMRI gratefully acknowledges our generous supporters

Throughout the year our research work has been generously supported by people who are committed to seeing the best researchers using the best equipment to come up with the best interventions and therapies for people suffering chronic disease.

Donations are directed to specific themes and projects, according to the wishes of the donor. Their interest may well be based upon personal experience in one of the areas of SAHMRI research. As a result, gifts have been either used to purchase equipment, fund scholarships/Fellowships or in general support a designated theme or project.

SAHMRI gratefully acknowledges key supporters in the following areas:

#### Leaders in Philanthropy

Raymond & Tina Spencer  
David Gunn  
Detmold Group  
Wyatt Trust  
James & Diana Ramsay Foundation  
Australian Cancer Research Foundation

#### Founding Ambassadors

Alan Young AM & Sue Young  
Hon Tom Gray  
David & Kathie Simmons  
McMahon Services  
Alister & Sue Haigh  
David & Leann Willson  
In Memoriam Professor GJ Fraenkel

Colin & Lib Dunsford  
David & Nicole Crawford  
Ahrens Group  
Frank Agostino  
Professor John Hopwood AM & Barbara Hopwood  
Nick & Nikki Heywood-Smith  
The Grosset Gaia Fund  
The Melissa White Family  
Jill Hammond, Amanda Buttery, Belinda Buttery  
Josh & Cathy Simons

#### The Innovators

CMV Foundation  
Leukaemia Foundation  
Harvey Foundation  
Heart Foundation

#### Corporate Champions

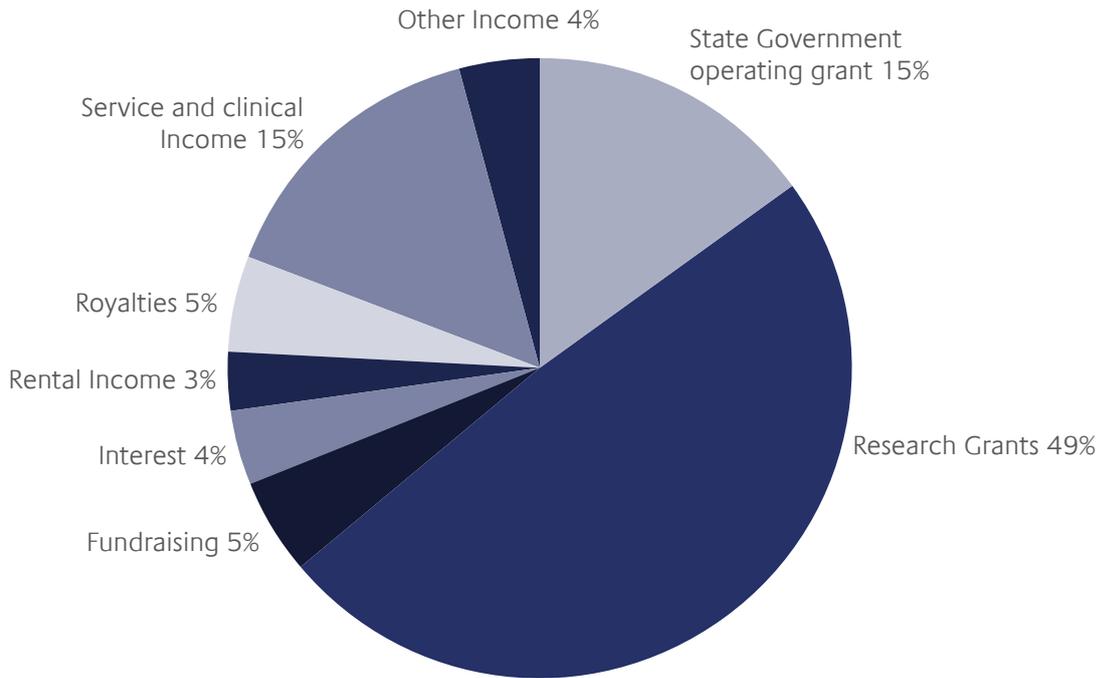
<i>Diamond</i>	Bellberry Limited AHA (SA)
<i>Platinum</i>	GE Healthcare Statewide Super
<i>Gold</i>	Commonwealth Bank of Australia Ricoh Australia

Thanks to our generous supporters, SAHMRI researchers are able to extend their work using innovative and collaborative methods!

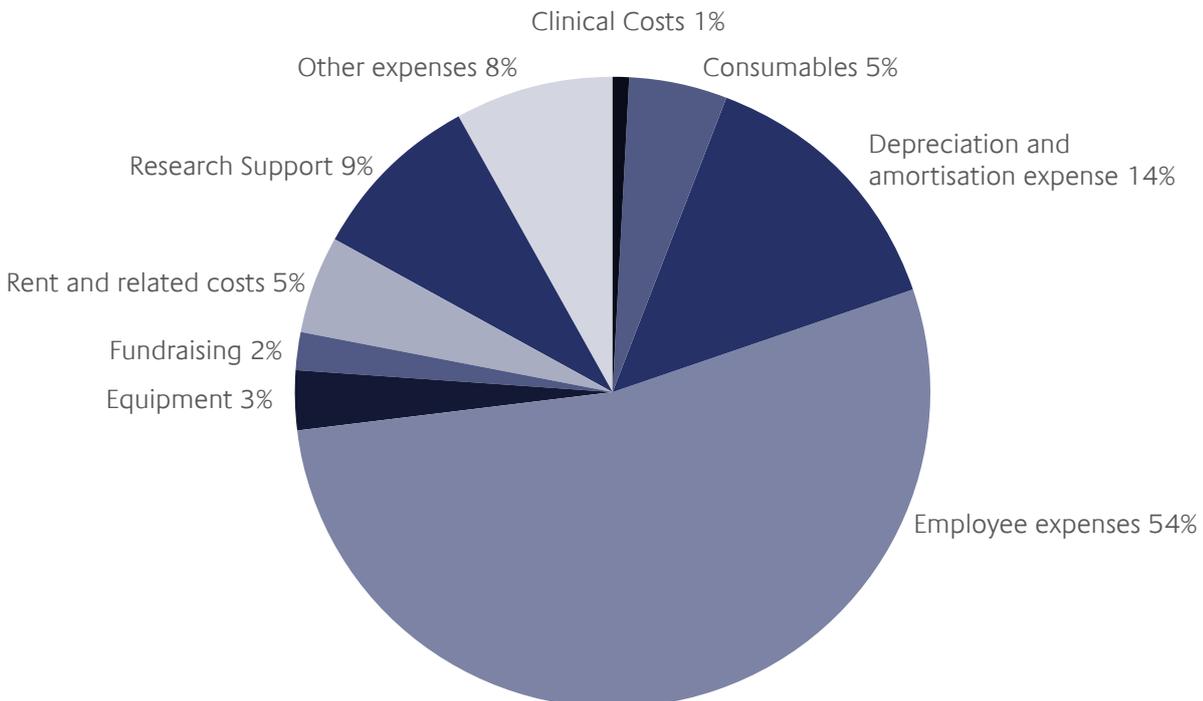
# FINANCIAL PERFORMANCE

## FINANCIAL YEAR 2014

### INCOME



### EXPENDITURE



# Consolidated Statement of Profit or Loss and Other Comprehensive Income

For the year ended 30 June 2014

	2014 \$	2013 \$
<b>Operating revenue and other income</b>		
State Government operating grant	5,262,000	4,686,361
Research Grants	16,751,077	8,271,099
Fundraising	1,787,623	237,138
Interest	1,394,137	1,570,623
Rental income	882,295	-
Royalties	1,772,894	-
Service and clinical income	5,292,201	3,345,963
Other income	1,232,059	974,418
<b>Total operating income</b>	<b>34,374,286</b>	<b>19,085,602</b>
<b>Operating expenses</b>		
Clinical costs	(117,975)	(17,917)
Consumables	(1,814,631)	(595,851)
Depreciation and amortisation expense	(4,856,672)	(1,122,800)
Employee expenses	(18,634,864)	(9,600,804)
Equipment	(912,741)	(369,333)
Fundraising	(572,058)	(269,633)
Rent and related costs	(1,761,374)	(1,103,913)
Research support	(3,067,711)	(3,953,556)
Other expenses	(2,874,262)	(1,377,725)
<b>Total operating expenses</b>	<b>(34,612,288)</b>	<b>(18,411,532)</b>
<b>Results from operating activities</b>	<b>(238,002)</b>	<b>674,070</b>
<b>Non operating grants</b>		
Commonwealth Government capital grant	16,000,000	154,285,420
State Government contributions	-	43,904,408
<b>Total non operating grants</b>	<b>16,000,000</b>	<b>198,189,828</b>
<b>Finance income and costs</b>		
Finance income	22,092	-
Finance costs	(329,676)	-
<b>Net finance costs</b>	<b>(307,584)</b>	<b>-</b>
<b>Surplus for the year</b>	<b>15,454,414</b>	<b>198,863,898</b>
Income tax expense	-	-
<b>Surplus after income tax</b>	<b>15,454,414</b>	<b>198,863,898</b>
<b>Other comprehensive income for the year</b>		
<b>Items that will never be reclassified to profit or loss:</b>		
Contribution from members	39,474,462	703,250
<b>Items that are or may be reclassified to profit or loss:</b>		
Net change in fair value of available for sale financial assets	(29,603)	-
<b>Other comprehensive income for the year</b>	<b>39,444,859</b>	<b>703,250</b>
<b>Total comprehensive income for the year</b>	<b>54,899,273</b>	<b>199,567,148</b>



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Medical Research Institute

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