The Institute

basil hetzel institute for translational health research

Research Report 2015

Translational health research creating positive outcomes for thousands of South Australians

the hospital research foundation

Front cover image: Master of Philosophy (Surgery) Student Dr Hannah Gostlow shows primary school children how to use the laparoscopic surgical simulator. (Photo: James Devine)

This page: BHI researchers fundraising for THRF at The Longest Table lunch, see p141 for more information.

Design: thisbigdesign

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Director's Report

2015 has been a challenging year for research within the Australian scene. The NHMRC success rates were down to only 13%, the options for non-NHMRC funding are decreasing and universities are under severe pressure with respect to their research budgets. At the same time, within South Australia the new Royal Adelaide Hospital is powering ahead with an opening date for late 2016. The SAHMRI research facility is slowly reaching capacity and the opportunity to perform important translational research remains viable within the Central Adelaide Local Health Network. With the move of all breast cancer surgery to The Queen Elizabeth Hospital creating the largest breast cancer unit within Australia, the opportunity to develop high volume translational research has increased even further.

In order for the Basil Hetzel Institute to remain relevant and successful it will be important to link more closely with the clinical groups, both at the new Royal Adelaide and The Queen Elizabeth Hospital in order to develop significant projects based on the volume of clinical challenges being faced by the Network. The closure of the old Royal Adelaide Hospital during 2016 will also provide an opportunity to welcome groups unable to be housed at the new Royal Adelaide Hospital which will have no wet laboratory research facilities. A new medical school being built adjacent to the hospital will have some facilities but not nearly enough and many groups will need to be absorbed into the BHI.

The support of The Hospital Research Foundation has been invaluable during the last twelve months and continues to provide an underpinning of the work being conducted within The Institute. It provides valuable seed support for research projects and, as such, there will hopefully be ongoing reward for early success brought by the groups enjoying this initial support.

As the Australian economic situation continues to be put under pressure the community must look to new initiatives that will bring intellectual property as well as health benefits. Medical research is something that South Australia and Australia generally excel at and the BHI can be an important part of this going forward.

Guy Maddern
Director of Research
The Basil Hetzel Institute for Translational Health Research
The Queen Elizabeth Hospital

Significant Impact Publications 2015

SIGNIFICANT IMPACT PUBLICATIONS

Ageing

Impact Factor: 4.9

Kaehr R, Visvanathan R, Malmstrom T, Morley J. Frailty in Nursing Homes: The FRAIL-NH Scale. *Journal of the American Director's Association*. 2015;16(2): 87-89.

The *Journal of the American Director's Association* is not only the second highest impact factor geriatrics and gerontology clinical journal but is also a journal dedicated to research focused on nursing homes. Early detection through screening will allow clinicians and staff to tailor interventions to improve outcomes for nursing home residents. However, there had been no frailty screening tool designed with the nursing home resident in mind till this paper. The idea for such as screening tool blossomed from a conversation between Professors Morley and Visvanathan here in Adelaide. The screening tool is easy to administer and researchers are currently investigating its performance.

Cancer

Impact Factor: 35.3

Dashti SG, Chau R, Ouakrim DA, Buchanan DD, Clendenning M, Young JP, Winship IM, Arnold J, Ahnen DJ, Haile RW, Casey G, Gallinger S, Thibodeau SN, Lindor NM, Le Marchand L, Newcomb PA, Potter JD, Baron JA, Hopper JL, Jenkins MA, Win AK. Female Hormonal Factors and the Risk of Endometrial Cancer in Lynch Syndrome. *Journal of the American Medical Association*. 2015 Jul 7;314(1):61-71.

Lynch syndrome is a highly penetrant genetic condition which predisposes to colorectal and endometrial cancer (cancer of the lining of the uterus), among other sites. In women who carry a Lynch syndrome mutation, the only prevention strategy for endometrial cancer has been hysterectomy when families have been completed. This paper investigates other prevention avenues. The work arises from a long-term, ongoing, multinational study, funded by the NIH, and initiated in 1997, of families ascertained on colorectal cancer from USA, Canada, Australia and New Zealand, and the factors which potentially modulate their risk. In this study, it was found that factors reported to decrease the risk of endometrial cancer in the general population (use of oral contraceptives, having at least one full term pregnancy, and late age at menarche), also decreased the risk of endometrial cancer in women who carry Lynch syndrome mutations. The findings would allow information to be given to mutation carriers as to the modulation of risk from hormonal influences.

Impact Factor: 5.1

DeNichilo MO, Panagopoulos V, Rayner TE, Borowicz RA, Greenwood JE, Evdokiou A. Peroxidase enzymes regulate collagen extracellular matrix biosynthesis. *The American Journal of Pathology*. 2015;185:1372-84.

This paper shows for the very first time that peroxidase enzymes, such as myeloperoxidase and eosinophil peroxidase, play a fundamental role in regulating the recruitment of fibroblast and the biosynthesis of collagen extracellular matrix at sites of normal tissue repair and fibrosis, with enormous implications for many disease states where infiltrating inflammatory cells deposit peroxidases.

Cardiovascular Disease

Impact Factor: 45.2

Stewart S, Ball J, Horowitz JD, Marwick TH, Mahadavan G, Wong C, Abhayaratna WP, Chan YK, Esterman A, Thompson DR, Scuffham PA, Carrington MJ. Standard versus atrial fibrillation-specific management strategy (SAFETY) to reduce recurrent admission and prolong survival: pragmatic. Multicentre, randomised controlled trial. *Lancet*. 2015;385(9970):775-784.

Lancet is one of the highest ranked general medical journals. This report documented the benefit of an outreach program for management of patients with atrial fibrillation.

Impact Factor: 3.0

Chong, C.-R., Drury, N.E., Licari, G., Frenneaux, M.P., Horowitz, J.D., Pagano, D., Sallustio, B.C. Stereoselective handling of perhexiline: Implications regarding accumulation within the human myocardium. *European Journal of Clinical Pharmacology*. 2015; 71(12): 1485-1491.

This is the first clinical study to investigate the uptake of the individual isomers of perhexiline into the heart, and to demonstrate that although perhexiline is used as an equal mixture of two isomers, they may have different effects on heart function in humans. The work is the result of an international collaboration with colleagues in the UK and formed part of the research programme for two PhD students.

Impact factor: 14.3

Pasupathy S, Air T, Dreyer RP, Tavella R, Beltrame JF.Systematic review of patients presenting with suspected myocardial infarction and nonobstructive coronary arteries. *Circulation*. 2015 Mar10;131(10):861-70.

Myocardial infarct patients without significant coronary artery disease constitute an intriguing subgroup referred to as Myocardial Infarction with Non-Obstructive Coronary Arteries or MINOCA. We have conducted an extensive literature review to establish a systematic review, which provides the first comprehensive overview of MINOCA. Our systematic review examined the available evidence from 28 publications regarding the prevalence, clinical risk factors, and 12-month prognosis in patients with MINOCA; 46 publications were evaluated for the major underlying pathophysiological attributes of this condition. The overall prevalence of MINOCA was calculated at 6% with a median patient age of 55 years and 40% women. In comparison with patients with MI associated with obstructive coronary artery disease, those with MINOCA were more likely to be younger and female and less likely to have hyperlipidaemia, although other cardiovascular risk factors were similar. Of the publications investigating the potential mechanisms responsible for MI in MINOCA, only 24% of patients had features consistent with a subendocardial infarct on cardiac magnetic resonance imaging, 33% of patients had features of myocarditis and 26% had no detectable myocardial abnormalities. Coronary artery spasm was inducible in 28% of MINOCA patients, and there was evidence of an inherited thrombotic disorder in 14%.

Impact Factor: 3.0

Boult M, Howell S, Cowled P, De Loryn T, Fitridge R. Self-reported fitness of American Society of Anesthesiologists class 3 patients undergoing endovascular aneurysm repair predicts patient survival. *Journal of Vascular Surgery*. 2015;62:299-303.

The *Journal of Vascular Surgery* is the highest ranked specialist vascular surgery journal and is widely read by vascular surgeons and researchers worldwide. This publication introduces a simple and practical new method of assessing surgical and survival risk for patients undergoing endovascular aneurysm repair. Patients are asked whether then can walk 1 km or climb two flights of stairs. The answers to these questions divides patients into “fit and unfit” categories and the unfit patients are approximately 3 times more likely to die up to three years after the operation. An important use of the results of this study is that patients with good self-reported fitness could proceed directly to surgery but surgeons might choose to discuss treatment options with less fit patients, therefore improving understanding and communication of risks, benefits and alternatives to surgery.

Chronic Disease

Impact Factor: 55.9

Campbell BC, Mitchell PJ, Kleinig TJ, Dewey HM, Churilov L, Yassi N, Jannes J et al. Endovascular therapy for ischemic stroke with perfusion-imaging selection. *New England Journal of Medicine*. 2015;372(11):1009-18.

An Australian consortium that includes Associate Professor Jim Jannes published the report of their EXTEND-IA clinical trial of endovascular therapy in the prestigious *New England Journal of Medicine* in 2015. EXTEND-IA was a randomized controlled trial of intra-arterial reperfusion therapy extended with Intra-Arterial intervention. The extended therapy after standard dose intravenous tPA within 4.5 hours of stroke onset utilised dual target imaging to select appropriate candidates for the additional endovascular therapy. The publication of the EXTEND-IA study, along with several other clinical trials that supported endovascular therapy, created a landmark moment in clinical history. Endovascular therapy been described as the most important event in stroke since the introduction of tPA in 1995*. It is now considered to be the new ‘gold standard’ of treatment for appropriately selected stroke patients within 4.5 hours of stroke onset.

The *New England Journal of Medicine* is the number 1 ranked journal in the category 'General and Internal Medicine' and is published in the United States on a weekly basis. It is the oldest continuously published medical journal (established in 1812) and one of the most prestigious peer-reviewed journals in the world.

* Donnan GA, Endovascular therapy: the dawning of a new era. *International Journal of Stroke.* 2015;10:463.

Clinical Sciences, Health Services and Population Health

Impact Factor: 55.9

Peake SL, Young PJ, Chapman M on behalf of the TARGET Investigators. Permissive Underfeeding or Standard Enteral Feeding in Critical Illness. *New England Journal of Medicine*. 2015 Sep 17;373(12):1173-1174.

Nutrition therapy is an essential standard of care for all Intensive Care patients who are mechanically ventilated and remain in ICU for more than a few days. Enteral nutrition (via a nasogastric tube) is usually initiated within 24 hours of ICU admission. There is no agreement amongst doctors around the world about the amount of calories that should be given to critically ill patients. This Letter to the Editor, published in the *New England Journal of Medicine* is in response to a study conducted by Arabi et al. comparing permissive underfeeding (40-60% calorie goals) to standard feeding in critically ill adults. The results of Arabi's study support the conclusion that marked permissive underfeeding is not associated with a lower mortality than standard feeding practices that, effectively, also result in underfeeding according to current recommendations. This letter highlights the questions that remain globally in relation to nutrition in the critically ill and the need to establish whether achieving the currently recommended caloric goals, as compared to standard-care underfeeding, improves outcomes.

TQEH and RAH intensive care research teams are the lead sites and investigators are preparing to conduct a large, multicentre, randomized, double-blind trial in 4,000 patients, to determine whether the delivery of more calories by using a concentrated enteral nutrition solution can result in improved survival and functional outcomes for critically ill patients in Australia and New Zealand. (The Augmented Versus Routine Approach to Giving Energy Trial [TARGET]; ClinicalTrials.gov number: NCT02306746). The investigators were awarded a total of $4,734,236 in project grants from the NHMRC and NZ HRC to conduct this research. The trial is due to commence in early 2016.

The *New England Journal of Medicine* has the highest impact factor of all medical journals; publication of the Arabi study and of our Letter to the Editor by this prestigious journal emphasizes the world-wide significance of nutrition in the management of critically ill patients.

BHI PhD student Jason Gummow, Virology Laboratory.

Impact Factor: 17.2

Whittle S, Buchbinder R. In the clinic. Rotator cuff disease. *Annals of Internal Medicine*. 2015 Jan 6;162(1):ITC1-15.

This paper was an invited review on rotator cuff disease. The *Annals of Internal Medicine "In The Clinic"* series is designed to provide expert, evidence-based reviews of clinical conditions commonly seen by generalists, and is developed in conjunction with the American College of Physicians' electronic point-of-care clinical support tool, SmartMedicine. Rotator cuff disease accounts for a high burden of disability in adults. This article was a comprehensive review of contemporary evidence-based investigation and management of this important condition.

Impact Factor: 10.4

Hill CL, March LM, Aitken D, Lester SE, Battersby R, Hynes K, Fedorova T, Proudman SM, James M, Cleland LG, Jones G. Fish oil in knee osteoarthritis: a randomised clinical trial of low dose versus high dose. *Annals of Rheumatic Disease*. 2015 Sep9. pii: annrheumdis-2014-207169. [Epub ahead of print]

Highest impact factor publication for original research. This paper reports the results of an investigator led, multi-centre, double-blind randomised controlled trial of high dose fish oil (4.5g omega-3 fatty acids) vs low dose (0.45g) in knee osteoarthritis (the FOSTAR study). Fish oil and its omega-3 active ingredients (EPA, DHA) are widely marketed and used for "joint health", with the perception that "more is better". Our study, which was published in the top-ranked Rheumatology journal, demonstrated that this is not in fact the case. The National Heart Foundation recommends an omega-3 daily intake of 0.25-0.5mg/day for cardiovascular health, and our study demonstrates that taking more than this does not improve knee osteoarthritis pain, function or structural progression. The importance of this work was recognised in an accompanying Editorial.

Both of the above papers were the subject of an accompanying Editorial.

Impact Factor: 3.4

Thiruvenkatarajan V, Van Wijk R, Rajbhoj A. Cranial nerve injuries with supraglottic airway devices: a systematic review of published case reports and series. *Anaesthesia*. 2015;70(3):344-359.

Thiruvenkatarajan et al published a systematic review in the journal *Anaesthesia* in 2015 on neuropraxia in relation to laryngeal mask airway devices. This was the most comprehensive review on the subject ever published. It received special editorial attention. It focussed attention on often overlooked and underreported side-effects and complications on cranial nerves in relation to supraglottic airway use.

Impact Factor: 6.0

Hnin K, Nguyen C, Carson KV, Evans DJ, Greenstone M, Smith BJ. Prolonged antibiotics for purulent bronchiectasis in children and adults. *Cochrane Database of Systematic Reviews* 2015, Issue 8. Art. No.: CD001392. DOI:10.1002/14651858. CD001392.pub3.

The *Cochrane Database of Systematic Reviews* is one of the highest ranked journals in Evidence Based Medicine research (ranked 11 out of 151 journals in the medicine, general and internal category). This study evaluated the effectiveness of prolonged antibiotic use among children and adults with bronchiectasis, which is a chronic respiratory conditions characterised by abnormal dilation of the airways. The investigation found that prolonged antibiotic use more than halved the odds of disease exacerbation (with 275 fewer exacerbations per every 1000 people treated in the antibiotic arm compared with the control arm) and hospitalisation (50 fewer hospital admissions per 1000 people). However, the risk of emerging drug resistance did increase more than threefold. Considering that publications from this journal are frequently used to underpin policy, practice and provide recommendations for future evaluations and research, these findings have the potential to influence the standard care patients receive in hospitals.

Impact Factor: 8.3

Raju RS, Guy GS, Majid AJ, Babidge W, Maddern GJ. The Australian and New Zealand Audit of Surgical Mortality – Births, deaths, and carriage. *Annals of Surgery*. 2015;261(2):304–308.

The report in the *Annals of Surgery* of the outcomes associated with the Australian and New Zealand Audit of Surgical Mortality is the first international publication associated with a national surgical mortality review process. This audit is unique now in the world as it covers all surgical deaths, in both public and private hospitals. It provides data which helps to identify trends and issues in the care of surgical patients, highlighting problems such as DVT prophylaxis, delay in transfers and deaths due to poorly resourced surgical procedures. It has been collected on the basis of all states in Australia contributing to the cost and the national coordination of the Royal Australasian College of Surgeons enables the publications to be generated. It provides the gold standard approach that other countries are looking at following.

Drug and Vaccine Development

Impact Factor: 4.4

Gummow J, Li Y, Yu W, Garrod T, Wijesundara D, Brennan A, et al. A multiantigenic DNA vaccine that induces broad hepatitis C virus-specific T-cell responses in mice. *Journal of Virology*. 2015;89:7991–8002.

This work describes an increase in immunogenicity of several hepatitis C virus antigens encoded in our patented DNA vaccine platform. This platform is based on a bicistronic DNA vaccine which encodes an immunogen and a cytolytic protein that results in cross presentation of the immunogen and increased immunity. This study describes for the first time that multiple antigens can be encoded in the DNA and that these antigens are highly immunogenic. The *Journal of Virology* is published by the American Society for Microbiology and is recognised as the premier journal in which to publish original research articles.

Impact Factor: 8.4

Liang XW, Grice JE, Zhu Y, Liu D, Sanchez W, Li Z, Crawford D, LeCouter D, Cogger D, Liu X, Xu Z, Roberts MS. Intravital multiphoton imaging of the selective uptake of water-dispersible quantum dots into sinusoidal liver cells. *Small*. 2015;11(14): 1711-1720.

The results from this study could help design Nanoparticles targeting the specific types of liver cells and choose the fluorescent markers for appropriate cellular imaging. *Small* continues to be among the top multidisciplinary journals covering a broad spectrum of topics at the nano- and microscale at the interface of materials science, chemistry, physics, engineering, medicine, and biology.

Inflammatory Disease

Impact Factor: 4.7

Thomas N, Dong D, Richter K, Ramezanpour M, Vreugde S, Thierry B, Wormald PJ, Prestidge CA. Quatsomes for the treatment of Staphylococcus aureus biofilm *Journal of Materials Chemistry B*. 2015, 3, 2770-2777.

This new nanoparticle has been shown to have anti-biofilm and biofilm-dispersal properties. It also has the potential for drug delivery as it can incorporate lipophilic molecules into its mantle and hydrophilic molecules into its core. The manuscript is the product of a very fruitful collaboration between the ENT department and research teams at the University of South Australia. The *Journal of Materials Chemistry B* covers all aspects of the production of materials or the properties or applications of materials related to materials for healthcare and biomedicine.

BHI PhD student Zelalem Mekonnen, Virology Laboratory.

Themes

Ageing

Cancer

Cardiovascular Disease

Chronic Disease

Clinical Sciences, Health Services and Population Health

Drug and Vaccine Development

Inflammatory Disease

AGEING

Research Group

Adelaide Geriatrics Training and Research with Aged Care Centre

Adelaide Geriatrics Training and Research with Aged Care Centre

TQEH DEPARTMENT **AGED & EXTENDED CARE SERVICES**

The Adelaide Geriatrics Training and Research with Aged Care (GTRAC) Centre has a strong focus on translational research and clinical education with research strengths focusing on the geriatric syndromes including but not limited to frailty, malnutrition, falls and fractures, dementia and polypharmacy. The GTRAC centre spans multiple locations including the 'hub' at The Queen Elizabeth Hospital (i.e. the Aged & Extended Care Clinical Services) and our 'spoke' aged care campus at Resthaven, Paradise.

We have an international reputation for research in the areas of frailty, under-nutrition and sarcopenia. In 2015, we led and secured a National Health and Medical Research Council (NHMRC) Centre of Research Excellence bid: Frailty Trans-disciplinary Research To Achieve Healthy Ageing. We are also linked to the NHMRC Centre of Research Excellence (CRE) 'Translating Nutritional Science To Good Health' where Professor Visvanathan is an Associate Investigator.

In March 2015 four NHMRC Advanced Health Research and Translation Centres were announced. The South Australian Advanced Health Research and Translational Centre was one of these. This collaboration is between the three South Australian Universities, SAHMRI, SA Health and other health and research institutions including the Adelaide G-TRAC Centre.

Key Findings in 2015

During 2015 we developed for the first time globally a screening tool for frailty (FRAIL-NH) that is designed specifically for use in nursing homes. We are now in the process of validating this tool for clinical use. We have also contributed to the development of an international consensus definition for nursing homes. An agreement on this definition will help researchers combine and contrast research findings.

Outcomes for the community

Our vision is for older consumers and carers to experience improved health and well-being. Our mission in partnership with consumers, aged care providers and other key stakeholders is to pursue innovative education, research and health programs with the aim of increasing the capacity, knowledge and skills of the clinical workforce which in turn will translate into high quality health and aged care for older people.

GROUP MEMBERS

Research Leaders:
Renuka Visvanathan, Solomon Yu

Lecturers:
Jeanine Teo, Neha Mahajan, Khai Tham, Pazhvoor Shibu, Shailaja Nair, Faizal Ibrahim, Kareeann Khow,Tsung Woo, Michelle Kee, Haresh Arunasalam, Siti Nawi, Donna Preston

Postdoctoral Researcher:
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Sharmalar Rajendran

External Collaborators:
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Research Achievements

DR RUTH TEH

Preventing Falls with iPad Technology

Researchers at TQEH are leading the way using iPad technology to prevent falls.

Thanks to part-funding from The Hospital Research Foundation, Dr Ruth Teh from Aged & Extended Care Services at TQEH has been trialling a computer program within the Geriatric Evaluation & Management Unit and the Acute Medical Unit at the hospital, which aims to reduce falls.

"The program exists on an iPad which nurses within the wards can carry with them to undertake falls assessments," explained Dr Teh.

"Fall risk assessments are important because they alert hospital staff to appropriate patient treatment, and also help inform patients when and where they are likely to fall. Currently, the assessment forms are paper based, but because of business and competing interests of nurses, unfortunately these assessments are not always undertaken. In addition, the bedside poster visual cue requires the sticking of dots on paper to indicate high and low falls risk and then pasting the poster by the bedside so adherence was poor."

"Having the assessment on the iPad means it's much quicker and easier for staff to complete the assessment. The iPad talks wirelessly to a printer, so nurses can easily print out an A4 poster which details the patients' falls risk and post it at the patient's bedside. In this way, anyone treating the patient is easily notified of their fall risk and can give appropriate care."

The program was trialled on the two wards at TQEH over a period of 11 weeks – which collectively saw 550 patients.

"We noticed that nurses became much more vigilant in completing the risk assessment and placing the poster at the bedside," explained Dr Teh.

Dr Ruth Teh says this research will provide the right type of resources for people like Acute Medical Unit patient, Mr Englehardt.

Although it's too soon to tell if there was a reduction in the number of falls, Dr Teh is pleased with the clear side benefits of the intervention; a raised awareness of falls risk. The intervention has improved awareness amongst staff, patients and families.

"This will hopefully translate into a reduction in falls in hospital, but also at home as patients and families are more aware about risk of falling and the activities that are most likely to result in a fall."

Acute Medical Unit patient Mr Gilbert Englehardt suffered a fall at home in the early hours of the morning in January 2015. He had previously suffered a stroke, which Dr Teh says increases falls risk.

"For patients like Mr Englehardt with a high fall risk, we want to develop a printed handout for patients to take home when they are discharged from hospital. The handout will include reminders about how to lower your risk of falling, like wearing good shoes, making sure the lights are on, etc."

"It's all about improving awareness to prevent falls."

Research Achievements

PROFESSOR RENUKA VISVANATHAN

Solving a Global Problem

Researchers based at The Queen Elizabeth Hospital (TQEH) are paving the way to tackle the global public health issue – frailty.

English is a challenging language. A single word often has several meanings and must be heard or seen in context to be understood. The word 'run', for example, has 396 definitions in the Oxford English Dictionary; and in the digital age, we can have a virus, but so can our computer.

Professor Renuka Visvanathan who is Director of Aged & Extended Care Services (Geriatric Medicine) at TQEH as well as Director of the Adelaide Geriatrics Training and Research with Aged Care (GTRAC) Centre explains that 'frailty' is that sort of word.

"Most readers immediately associate it with being old and fragile (really, really old) or, if more youthful, with being very, very weak. However, for someone working in geriatrics, 'frailty' has an important and specific medical meaning," Professor Visvanathan said.

"It is gradually being understood that frailty is distinct from disability and illness. The research in this emerging field indicates that frailty has another meaning and that it is a state of vulnerability arising from impairment of multiple physiological functions.

"Frailty doesn't happen to everyone. But when it occurs, it can be characterised by many symptoms and signs including but not limited to a loss of muscle mass and strength (sarcopenia), decreased mobility and less endurance, slower movements and less activity.

"Frailty may not be recognised in the early stages, and by the time it is picked up by clinicians, patients or carers, it may actually be too late to treat. Frailty may influence the way we live as we age, but it's important to understand that is not irreversible."

> It is projected that by 2050, four million Australians aged 70 years and older will either be frail or at-risk of frailty.

"As a nation, we simply can no longer afford to do nothing when timely intervention is likely to be both cost effective and personally rewarding. Although our understanding is still imperfect, it appears that if frailty can be tackled before the collective damage makes an individual vulnerable to serious health problems and an unhealthy old age, both those who are ageing and the whole of society will benefit," Professor Visvanathan said.

That's where a new five-year grant from the National Health and Medical Research Council (NHMRC) has enabled action to take place. Led by the South Australian team, Professor Visvanathan says that thanks to past funding from THRF, this exciting grant has been able to become a reality.

"This trans-disciplinary national team of collaborators on this NHMRC grant are from geriatrics, general practice, orthopaedic surgery, rehabilitation medicine, nursing, geriatric pharmacotherapy, gero-kinesiology, health economics, knowledge translation and geography," she said.

"This international frailty research network will work collectively as a global network to solve a problem that affects the whole world – this is a global problem. This team will build capacity by training the next generation of clinical and research experts in frailty."

Associate Professor Solomon Yu, Deputy Director of the Aged & Extended Care Services (Geriatric Medicine) at TQEH completed his PhD, supported by THRF, in late 2014 and will also continue his research relating to muscle mass as an early career clinician researcher with this centre.

"The members of the team will lead research to define and map the extent of frailty, develop and test a new health economics model for frailty, test the implementation of a screening pathway for general practice and develop new interventions to treat frailty," Professor Visvanathan said.

"This funding is timely given the ageing population. It will support vital research that will contribute to Healthy Ageing and help older people live longer with a higher quality of life."

CANCER

Research Groups

Acute Myeloid Leukaemia Research Group

Breast Biology and Cancer Unit

Breast Cancer Research Unit

Colorectal Cancer Research Group

Liver Metastasis Research Group

Solid Cancer Regulation Group

Acute Myeloid Leukaemia Research Group

TQEH DEPARTMENT **HAEMATOLOGY AND MEDICAL ONCOLOGY**

The aim of this group is to discover Acute Myeloid Leukaemia (AML) genes. High through-put, massively parallel next generation DNA sequencing methods are used to sequence the exome of AML patients. Analysis of 97 Australian AML patients identified 75 rare and novel coding variants affecting genes from the Fanconi Anaemia, Homologous Recombination Repair and other DNA repair pathways.

Key findings in 2015

Meta-analysis of combined AML and healthy cohorts showed enrichment in AML of mutations affecting DNA repair pathway genes in patients who developed AML. Our results suggest that mutations affecting DNA repair pathway genes contribute to AML predisposition and progression.

Outcomes for the community

AML patients with mutations in DNA repair gene pathways may be suitable for targeted therapy. AMLs with defective DNA repair may be sensitive to agents that inhibit alternative DNA repair pathways.

GROUP MEMBERS

Research Leader:
James X Gray

Postgraduate Student:
Kyaw Ze Ya Maung

External Collaborators:
Richard D'Andrea and Sarah Bray, Centre for Cancer Biology, University of South Australia; Debora Casolari

Breast Biology and Cancer Unit

TQEH DEPARTMENT **HAEMATOLOGY AND MEDICAL ONCOLOGY**

The Breast Biology and Cancer Unit was established at the BHI in 2011. The goal of the research is to better understand the biological mechanisms that underpin breast cancer risk factors including menstrual cycling, pregnancy and mammographic density to aid in the prevention and early detection of breast cancer.

Key findings in 2015

- Hormones estrogen and progesterone critically affect expression of key genes used to diagnose breast cancer subtypes *in vitro* (Need et al., 2015).
- Immune cells and inflammatory mediators are altered in breast tissue with high mammographic density suggesting that an under-appreciated aspect of increased susceptibility of highly dense breast tissue to cancer might be associated with inflammation (Huo et al., 2015; and Sun et al., in preparation).

Outcomes for the community

New insights into breast cancer risk and new opportunities to reduce women's risk of breast cancer.

GROUP MEMBERS

Research Leader:
Wendy Ingman

Postdoctoral Researchers:
Pallave Dasari, Eleanor Need, Danielle Glynn

Postgraduate Students:
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Research Assistant:
Leigh Hodson

Research Nurse:
Kathy Mildren

BHI Collaborators:
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External Collaborators:
Rik Thompson, University of Melbourne; Fiona Pixley, University of Western Australia; Kara Britt, University of Melbourne; Sarah Robertson, University of Adelaide; Simon Barry, University of Adelaide; Mark Moore, Calvary North Adelaide Hospital

the hospital research foundation

A Mother Touched by Cancer
Sandra's Story

When she was diagnosed with breast cancer at the age of 43, loving mother of two Sandra Kanellos was shocked. After suffering from back pain and being advised to have a routine mammogram, this wasn't the news she was expecting to hear.

"The doctors told me I had breast cancer. I just sat there stunned. I didn't know how to react," Sandra remembers.

"They say you don't need mammograms until you're 50!

"All of a sudden, I felt this rush of heat run through my body and I thought to myself – okay I can do this."

With little time to process the sudden news, Sandra had surgery at TQEH before she began chemotherapy lasting until December.

Unfortunately her own illness wasn't the end for Sandra's family. Her mum found out two months later she also had breast cancer and her cousin tragically passed away from stomach cancer earlier in the year.

"We haven't had a lot of disasters like this happen, but from 2013 our family has been slammed."

Since the day she was told, Sandra took the diagnosis in her stride despite having to miss milestone moments in her son George's last year of primary school.

"In the beginning you think it's not fair," Sandra said.

"I like being involved so it was hard to not be able to help out with George's last year of school.

"But then I thought to myself, why should I be privileged enough not to have cancer?"

Now two years cancer free Sandra has a passion for life. She puts it down to the dedication of breast cancer researchers and the support of hospital staff at TQEH.

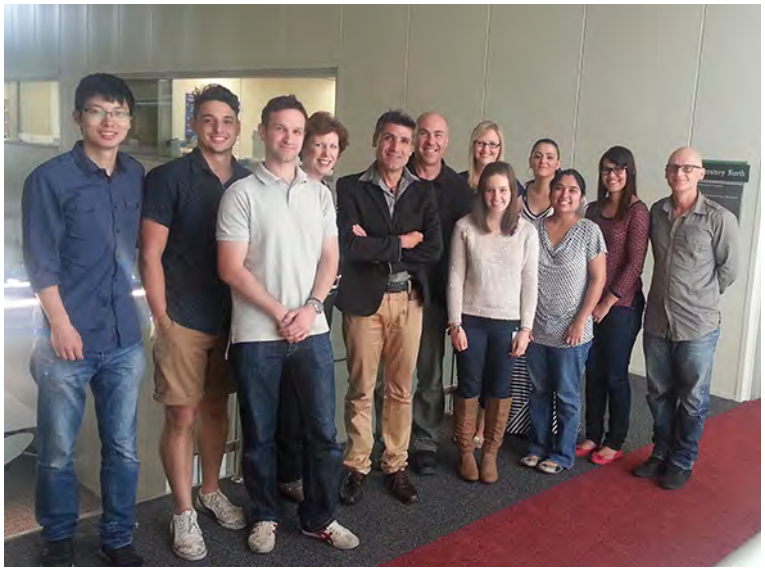
"I was very lucky with the support I received at TQEH. The nurses and doctors were my rock and I couldn't have got through it without them," she said.

"With how my family has been affected by cancer in the last few years, I now more than ever strongly believe in the importance of medical research."

"The hardest thing was telling my children who were quite young at the time; Katerina was 15 and George, 13. It was a shock for them."

Breast Cancer Research Unit

UNIVERSITY OF ADELAIDE **DISCIPLINE OF SURGERY** / TQEH



The Breast Cancer Research Unit's primary research interest is in Breast Cancer and bone Metastasis.

Breast cancer is the most common cancer in women that metastasises to bone. Despite recent advances, our knowledge of why bone is such a fertile "soil" for tumour cells to home to the bone remains poor. Our research aims to provide vigorous preclinical data that will facilitate the translation of novel therapeutics to clinical trials for bone metastases.

Key findings in 2015

We have identified a novel method of treating both cancer progression and metastasis, by targeting the body's natural immune response. Myeloperoxidase (MPO) and eosinophil peroxidase (EPO), well known for their anti-microbial activity, are released in high quantities by infiltrating immune cells in a variety of tumour types, including breast cancer. Our laboratory has shown for the first time that peroxidases are causatively involved in modulating the cancer microenvironment to promote blood vessel development and extracellular matrix biosynthesis. These processes are major hallmarks in cancer progression and as such identify peroxidases as drugable targets for cancer therapy.

Outcomes for the community

Our research provides vigorous preclinical data that will facilitate the translation of novel therapeutics to clinical trials for bone metastases.

GROUP MEMBERS

Research Leader:
Andreas Evdokiou

Postdoctoral Researchers:
Mark DeNichilo, Irene Zinonos and Gagan Kaur

Research Assistants:
Bill Panagopoulos and Shelley Hay

Postgraduate Students:
Bill Panagopoulos, Bill Liapis, Aneta Zysk, Alexandra Shoubridge, Christopher Defelice and Ye Wang

BHI Collaborators:
Benedetta Sallustio, John Horowitz, Andrew Foreman, Sarah Vreugde, Ehud Hauben, Jenny Hardingham,

External Collaborators:
Dusan Losic, David Findlay, Gerald Atkins, Peter Anderson, Andrew Zannettino, University of Adelaide, Lisa Butler, SAHMRI; Vladimir Ponomarev, Memorial Sloan Kettering Cancer Center, New York; Mike Rogers, The Heart Institute, Sydney; Andreani Odysseos, University of Cyprus

Research Achievements

BILL PANAGOPOULOS

Breast Cancer Research Finds New Functions for Old Enzymes

One in eight Australian women will be diagnosed with breast cancer. It's a common and devastating disease. There are numerous factors that can increase your risk of breast cancer and researchers at the BHI are investigating ways to reduce these risks.

Thanks to a grant from THRF researchers at the BHI are well on the way to discovering a new therapy to stop the spread of breast cancer.

Working with Professor Andreas Evdokiou, Head of Breast Cancer Research Unit at the BHI, PhD student Vasilios (Bill) Panagopoulos is looking at the enzyme, peroxidase, and how it contributes to tumour growth and the spread of breast cancer.

"I originally worked in a private biotech company where we discovered that these peroxidase enzymes, which have been known for a long time to have anti-bacterial properties, could assist with wound healing," Bill said.

"Wound healing and cancer share similar characteristics. The problem is that a wound knows when to stop and has an 'off' switch once the healing is done – whereas cancer doesn't have this 'off' switch, resulting in its continuous growth and spread.

"When I came over to the BHI to work for Andreas, he applied this knowledge to cancer research – suggesting that with collagen being a hallmark in cancer growth and spread, perhaps these enzymes which are present in high levels in cancer could be playing a more sinister role than scientists originally thought."

Bill believes there is a general misconception within the community that cancers contain just tumour cells but explains that a vast array of cells exist within the tumour. These include fibroblasts (the main building cells within a tumour), immune cells and endothelial cells, which make blood vessels – this process is called angiogenesis.

"If there is an increase in angiogenesis within a tumour, this leads to an increase in blood flow, delivering oxygen and nutrients to feed the growing tumour, while also providing avenues for tumour cells to try and escape through the blood vessel system and circulate somewhere else in the body," he said.

PhD Student Bill Panagopoulos says his research could lead to a new therapy for breast cancer to accompany current treatments.

With this in mind, Bill has found that peroxidases also promote angiogenesis and by looking at these two rationales, angiogenesis and the regulation of collagen production, has made some breakthroughs in the lab.

> "I've been able to find that peroxidases do indeed promote tumour growth and enhance the spread of cancer to other parts of the body."

Bill is now looking at ways to stop the regulation of collagen production and the angiogenesis promoted by peroxidases and contributing to the growth and spread of breast cancer.

"We're now talking to potential collaborators who are developing specific drugs which could target and inhibit peroxidases with no side effects for patients."

Hopeful he can see this research through to a patient-based clinical trial; Bill says that this potential new therapy could be used in conjunction with chemotherapy or radiotherapy.

"It's been really exciting in terms of the progression of the work from where it started to where it is now and I hope I can continue to follow it through," he said.

Colorectal Cancer Research Group

TQEH DEPARTMENT **HAEMATOLOGY AND MEDICAL ONCOLOGY**

The Colorectal Cancer Research Group headed by Professor Tim Price began work at The Queen Elizabeth Hospital in 2007 and moved to new laboratories in Basil Hetzel Institute in 2008. In 2014, the group incorporated the newly established SAHMRI Colorectal Cancer Node, and now works on a comprehensive program in colorectal cancer spanning prevention, development and treatment.

Key Findings in 2015

- The novel aquaporin 1 inhibitors AqB013 and AqB050 almost completely abolish VEGF–induced angiogenic capacity in a cell line model (H Dorward, et al, submitted for publication).
- We assessed the prognostic and predictive impact of extended RAS and PIK3CA gene mutation status in patients receiving capecitabine plus or minus bevacizumab (±mitomycin C) in the randomised phase III MAX study. Of KRAS exon 2 wild-type patients, 10% had additional RAS mutations. Neither all RAS gene mutation status nor PIK3CA mutation status was prognostic for progression-free or overall survival, or predictive of bevacizumab outcome in patients with advanced CRC (Price et al., 2015).
- A subtype of bowel polyps, the sessile serrated polyp, has been found to be the most numerous type in young adults. These polyps have previously been associated with obesity diabetes and smoking in older adults. We have also excluded spiral bacteria as a causative agent for these polyps.

Outcomes for the Community

- Identification, development and clinical trial of new therapeutic agents for the treatment of colorectal cancer.
- Development of new cancer biomarkers of drug resistance and therapeutic targets to optimise personalised medicine approaches.
- Further understanding of the molecular mechanisms underlying colorectal cancer so that pre-cancerous polyps can be used as markers of risk for both patients and their relatives.
- Identification of risk factors in groups of under-recognised colorectal cancer patients including young adults to improve early detection in primary healthcare settings.

GROUP MEMBERS

Research Leaders:
Tim Price, Joanne Young, Jenny Hardingham and Amanda Townsend

Postgraduate Student:
Yoko Tomita

Research Assistants:
Joe Wrin, Hilary Dorward, Wendy Uylaki

BHI Collaborators:
Andreas Evdokiou, Lorraine MacKenzie, Betty Sallustio, Ilmars Lidums, Peter Hewett

External Collaborators:
Dan Worthley, Andrea Yool, Oliver Frank, University of Adelaide; Stephanie Wong, RAH; Andrew Ruszkiewicz, Hamish Scott, SA Pathology; Susan Parry, NZ Familial GI Cancer Service, Auckland City Hospital; Christophe Rosty, Envoi Pathology; Aung Ko Win, University of Melbourne; Graeme Young, Flinders University; Sina Vatandoust, Flinders Medical Centre; David Roder, University of South Australia; Benjamin Thierry, University of South Australia; Neil Tebbutt, Austin Health; Cameron Platell, St John of God, Subiaco; Nicola Poplawski, Women's and Children's Hospital

Research Achievements

DR JENNY HARDINGHAM

Stopping Bowel Cancer Spread

Researchers at the BHI are working to combat the second biggest cancer killer of Australians – bowel cancer.

In 2015 BHI Researcher Dr Jenny Hardingham has been collaborating on a new project with researchers at the University of Adelaide to identify a way of stopping the spread of bowel cancer to other parts of the body, which is when it becomes most deadly.

Dr Hardingham and her team at the BHI have developed small molecule drugs which affect tumour cells and their ability to migrate by targeting a water channel on the surface of the tumour cells.

"In order to be able to migrate through tissues, cells have to be able to become deformable, so they have to change shape and volume and the way they do that is by the influx and efflux of water," Dr Hardingham said.

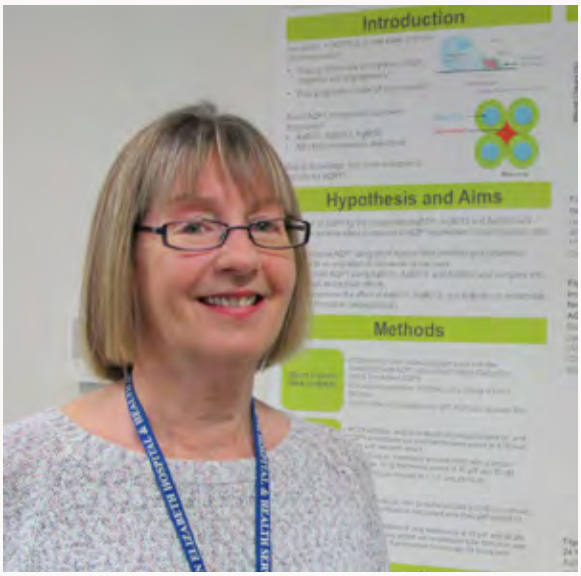
"If you target this particular channel and block water flow then the cells remain rigid and they can't move through the tissues.

> "It's really going back to basic mechanisms of how tumour cells move around the body causing secondary (metastatic) tumours.

"Currently the work we've been doing is on cell lines in culture in the lab so the next step is to go to an in vivo, pre-clinical model of bowel cancer."

This therapy has life-changing potential. If researchers can stop the spread of the cancer, patients are more likely to be cured by surgery and will not have the fear of cancer being found later in other parts of the body.

The team has also been working with a group from the University of South Australia to detect cancer cells in the bloodstream before they start a tumour in another part of the body.



Dr Jenny Hardingham, Colorectal Cancer Research Group.

These cells are very rare with only 1 found in 10 million white blood cells. The team at Uni SA have developed a nanoscale surface to trap tumour cells and detect them using their new imaging technology.

A pilot study on patients' blood samples is currently underway to detect circulating tumour cells. If proven, this will help diagnose patients earlier and hopefully provide them with chemotherapy treatment before the secondary cancer develops.

"Stage two bowel cancer patients aren't usually given chemotherapy after surgery because it has been thought they are at a low risk of recurrence," she said.

"We now know that up to 25 per cent of patients in that class actually do go on to get metastatic disease so for that group of people it's a major issue.

"If you can detect the tumour cells in circulation right back at the time they were initially diagnosed they would be followed much more closely."

If successful, the development of this test has the potential to save countless lives.

Liver Metastasis Research Group

UNIVERSITY OF ADELAIDE **DISCIPLINE OF SURGERY** / TQEH

Colorectal cancer (CRC) is a major cause of morbidity and mortality throughout the world and is the second most common cancer in both men and women in Australia. The majority of CRC related deaths are attributable to liver metastasis - the most critical prognostic factor observed in CRC patients. To date there is no validated clinical test to predict metastatic risk in CRC patients and to allow informed selection of preventive treatment regimens.

Ongoing research projects

Immune checkpoints in metastatic colorectal cancer diagnosis and prevention

The aim of this project is to investigate the association between specific immune mediators and distinct CRC disease progression patterns using proteomic and immunological assays. To this end, we created a biobank of >250 patient samples from New Zealand and South Australia, initiated a prospective clinical study, and performed proteomic analyses of candidate predictive biomarkers in local (bowel and liver) and peripheral (plasma and serum) tissue samples from CRC patients. Our candidate biomarkers list include HLA-G, chemokines, and other immune mediators.

High HLA-G protein expression in tumour cells is associated with disease progression in colorectal cancer patients

The non-classical HLA protein HLA-G was shown to act as a negative regulator of anti-tumour immune responses through several mechanisms. In our retrospective clinical study, we characterised HLA-G expression using tumour tissue microarrays and plasma samples from CRC patients in different disease stages. We found that strong vs. moderate/none HLA-G expression by tumour cells is associated with significantly shorter disease-free survival (DFS) and overall survival (OS). Analysis of plasma soluble HLA-G levels in CRC patients (n=123) and healthy controls (n=13) found significant correlation between age and HLA-G levels, however we found no significant correlation between HLA-G levels and DFS or OS.

The nexus between excess viceral adipose tissue, liver composition and metastatic progression in colorectal cancer patients

It is unknown how obesity-induced changes in adipose tissue modulate liver composition, and how liver composition affects progression to liver metastasis in CRC patients. The aim of this project is to test the hypothesis is that adipokine dysfunction associated with visceral adiposity can induce changes in liver composition and in related local immune functions, leading to a permissive microenvironment for hepatic colorectal metastases invasion and growth.

GROUP MEMBERS

Research Leaders:
Guy Maddern, Tim Price and Joanne Young

Senior Medical Scientist:
Ehud Hauben

Research Officer:
Chandra Kirana

BHI Collaborators:
Doan Ngo, Jennifer Hardingham

External Collaborators:
Richard Stubbs, University of Otago, Andrew Ruszkiewicz, University of Adelaide; Miriam Canavese, Italy

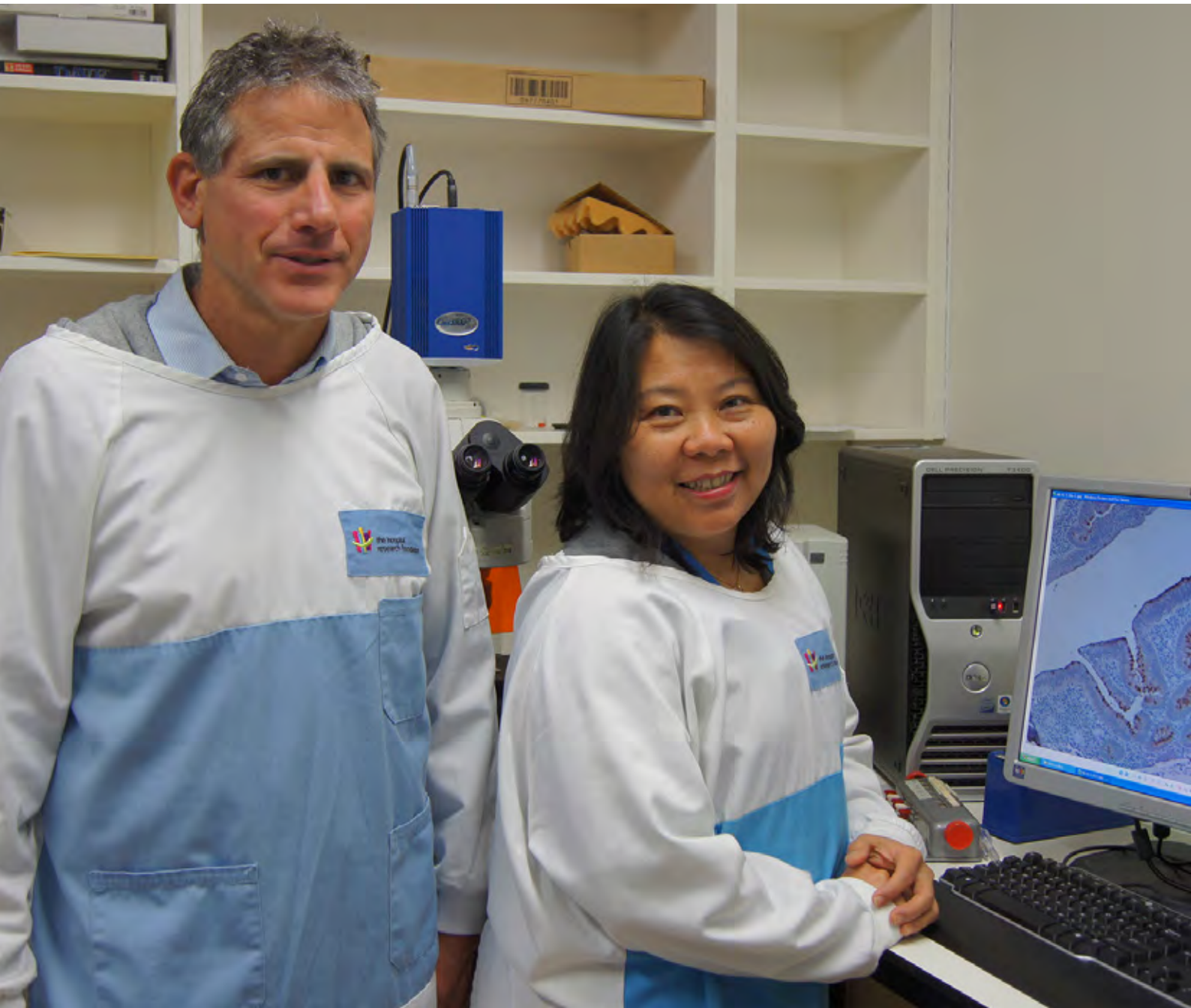
Biomarkers of hepatic colorectal metastasis: a prospective clinical study

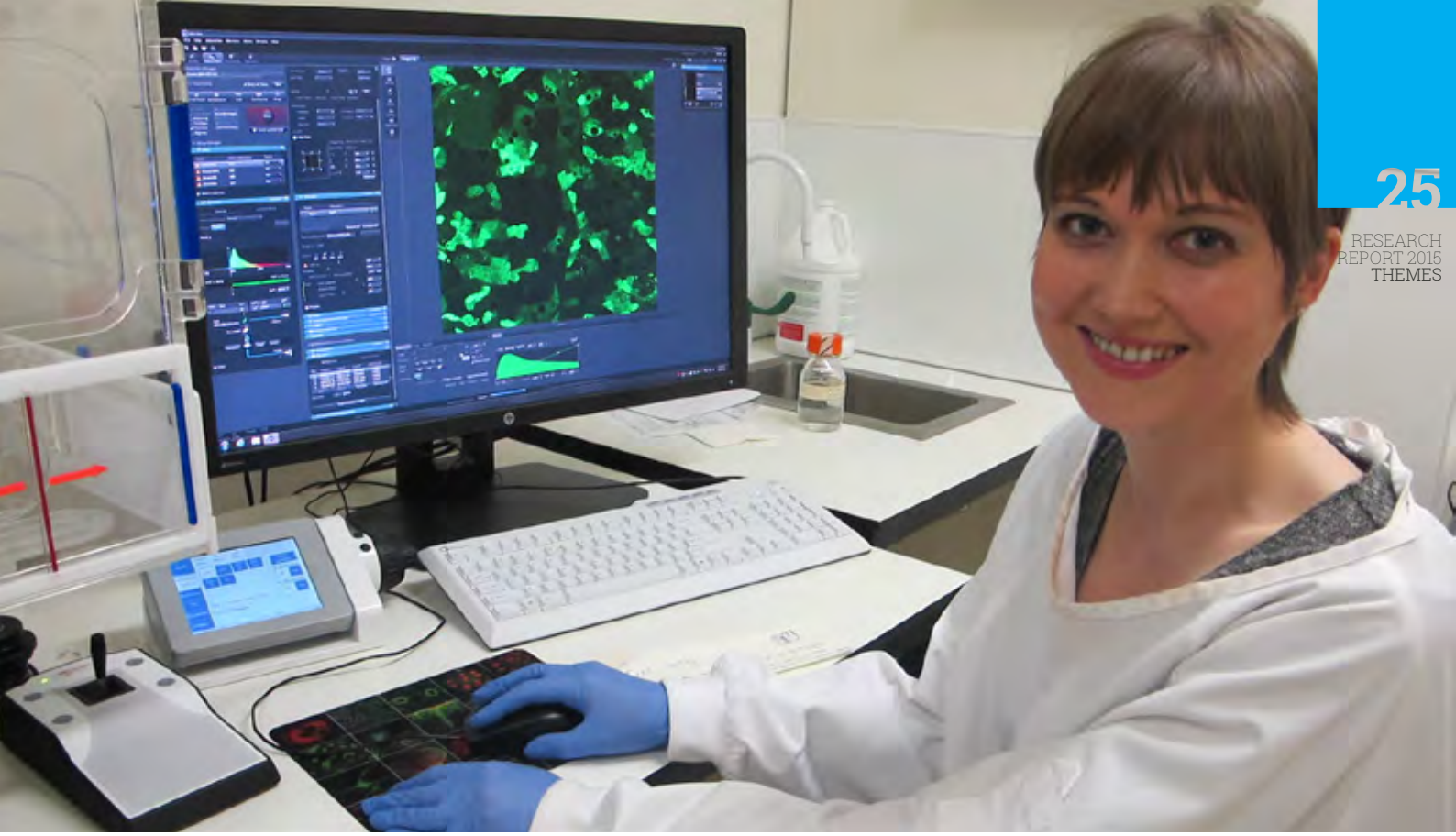
Our prospective clinical study at TQEH started in October 2015 and is based on the hypothesis that liver tissue together with its resident immune cells can be either susceptible or resistant to metastatic invasion. To test this hypothesis we are analysing core liver biopsies from patients undergoing colorectal tumour resection. To date, 15 patients have been included in this study, from which sets of samples were collected and stored for proteomic analysis.

Outcomes for the Community

A better understanding of at risk patients may lead to aggressive surveillance of those at 'increased risk'. Furthermore, systemic chemotherapy may be appropriate for patients in otherwise low risk categories who are found to have either more susceptible livers or biomarkers suggesting increase chance of metastatic disease.

Below: Dr Ehud Hauben and Dr Chandra Kirana, Liver Metastasis Research Group.





Solid Cancer Regulation Group

UNIVERSITY OF ADELAIDE **DISCIPLINE OF SURGERY** / TQEH

The Solid Cancer Regulation Group's primary research interest is in the role of the androgen receptor, and the interactions between stromal and cancer cells, in prostate and oesophageal cancers. Fibroblasts in solid cancers differ from normal fibrobalsts. We are defining the molecular differences, and growing oesophageal and prostate cancer cells and fibroblasts together, to understand how they influence each other's behaviour. We are studying in the role of the androgen receptor in these fibroblasts.

We are investigating the role of androgen responsive genes in oesophageal cancer and their potential as therapeutic targets. We have found that genes associated with male sex hormones are associated with a sixfold difference in survival. We are identifying these genes, and determining their function.

Key findings in 2015

In prostate cancer, androgen receptor in fibroblasts regulates the behaviour of cancer cells in coculture.

In oesophageal adenocarcinoma the expression of the androgen responsive gene FKBP5 is associated with a sixfold difference in survival.

Outcomes for the community

From our studies of the interactions between fibroblasts and cancer cells it is expected that improvements will occur in diagnosis, new biomarkers for survival will be identified and novel and more effective therapies will be developed which target the cross-talk between these cells.

Our studies of male sex hormone signalling in oesophageal cancer should lead to better prevention and treatment strategies. We anticipate that therapeutics which target these genes will improve survival.

GROUP MEMBERS

Research Leaders:
Paul A Drew, Eric Smith

Postgraduate Student:
Helen Palethorpe

BHI Collaborators:
Adrian Cummins, Grant Buchanan

External Collaborators:
Tim Underwood, University of Southampton, UK; Jun Feng Liu, Hebei Medical University, PRC; Wen Chung, University of Leicester, UK

CARDIOVASCULAR DISEASE

Research Groups

Cardiovascular Disease, Pathogenesis and Therapeutics Group

Clinical Pharmacology Research Group

Translational Vascular Function Research Collaborative

Vascular Surgery Research Group

Zinc and Cardiovascular Disease Research Group

Cardiovascular Disease, Pathogenesis and Therapeutics Group

TQEH DEPARTMENT **CARDIOLOGY UNIT**

The Cardiovascular Disease, Pathogenesis and Therapeutics Group's primary research interests are in cardiovascular disorders associated with ageing, new therapeutic modalities for heart disease, heart disease in women and heart disease in diabetes and in association with obesity.

Key findings in 2015

CVS disease with ageing. We are interested in the pathogenesis of aortic valve stenosis, increased stroke risk with ageing and the effects of stress on the ageing heart. We have demonstrated the association of increased thioredoxin-interacting protein (TXNIP) with several forms of heart disease in ageing subjects.

New therapeutics. We are investigating potential new therapeutic roles for derivatives of the "metabolic" anti-ischaemic agent perhexiline, including treatment of hypertrophic cardiomyopathy.

We are trying to develop means of increasing the efficacy of anti-aggregatory agents such as clopidogrel or ticagrelor.

Stress (Tako-Tsubo Cardiomyopathy) is a recently recognised cause of "heart attacks" in ageing women. We are trying to identify the precise cause and develop treatments to accelerate recovery.

Defective angiogenesis in diabetes and obesity. We are trying to determine the physiological role of a recently identified anti-angiogenic isoform of VEGF. It is possible that this plays a role in defective angiogenesis in the presence of diabetes or obesity.

Clinical Trials

The major role of the Cardiology Clinical Trials Department is to coordinate commercial companies' clinical research protocols for cardiac disorders. This includes, but is not limited to, ischaemic heart disease, (ie angina pectoris, myocardial infarction, microvascular angina), heart failure, electrophysiology and dyslipidaemia. Funding from clinical trials assists to support the Research Group in their projects. Whilst the primary role of the research coordinator is to run the commercial trials, it is not limited to this and coordinators participate strongly in "in-house" academic research projects.

Outcomes for the community

The overall objective of our work is to develop better understanding of cardiovascular disease states, especially those occurring with ageing, and to implement more effective treatments for these diseases. Specifically, our work has improved outcomes for patients with angina, heart failure and hypertrophic cardiomyopathy, and offers potential improvements for patients with diabetes, patients with stress cardiomyopathy and those with aortic valve disease.

GROUP MEMBERS

Research Leader:
John Horowitz

Postdoctoral Researchers:
Yuliy Chirkov, Doan Ngo, Aaron Sverdlov, Thanh H Nguyen; Saifei Lui

Laboratory Manager:
Irene Stafford

Research Assistant:
Tamila Heresztyn

Clinical Trials Staff:
Marilyn Black, Jeanette Stansborough, Greer Dymmott, Joanne McIntyre, Christine Anderson-Stanford

Postgraduate Students:
Nathan Procter, Vincent Goh, Chucks Ajaero, Ranjit Shah, Cher-Rin Chong, Vivek Nooney, Sven Surikow, Gnanadevan Mahadavan, Hasan Imam, Gao Ong, Nicola Hurst, Kuljit Singh, Rustem Dautov, Matthew Chapman

BHI Collaborator:
Benedetta Sallustio

External Collaborators:
Michael Frenneaux, University of East Anglia, UK; Raffaele de Caterina, Università degli Studi "G. D'Annunzio", Italy; Wilson Colucci, University of Boston, USA; Rebecca Ritchie, Baker IDI, Melbourne

Research Achievements

DR DOAN NGO

Tackling the Obesity Epidemic

The obesity epidemic has emerged as one of the most critical public health problems worldwide. Currently three in five Australians are overweight or obese*.

Commonly associated with the development of diabetes, high blood pressure, metabolic dysfunction and heart disease, obesity is an area in dire need of new and innovative ways to combat its prevalence. Dr Doan Ngo, who explained her career was born and bred at TQEH, is the 2015 recipient of THRF Mid-Career Research grant of $120,000 per annum for three years.

After a three-year stint working as a post-doctoral researcher at Boston University School of Medicine in the United States of America, Dr Ngo returned to TQEH in April 2015 to commence her research project investigating an innovative way to combat obesity.

Dr Ngo explained that obesity is associated with functional abnormalities in adipose tissue (fat tissue) that is linked to inflammation, metabolic and vascular dysfunction and insulin resistance.

"During my time in Boston working in research, I found a particular protein (known in medical terms as VEGF165b) that may be able to be manipulated and therefore change the health of the fat cells within the fat tissue," Dr Ngo said.

"Fat tissue has tiny blood vessels that intertwine between the fat cells and are critical to providing oxygen and nutrients to the growing fat cells during weight gain.

"Fat tissues have an incredible ability to expand and shrink as you gain and lose weight. When you gain weight, blood vessels are supposed to grow to accommodate the increasing number of fat cells in the body, this process is called angiogenesis.

"The problem is, when you get really obese the fat tissue expands but the blood vessels are then also meant to grow but can't and therefore increase the impairment of the growth in the tiny blood vessels that intertwine the fat cells.

Dr Doan Ngo wants to help combat obesity – an epidemic threatening Australian adults and children.

"I intend to find whether or not I can manipulate this particular protein and if that can affect the health of the fat cells to help the whole body's metabolic function," Dr Ngo said.

> "Obesity is such a major problem that is continuously on the rise affecting adults and children.

"Australia has one of the most obese populations in the world."

*Australian Institute of Health and Welfare www.aihw.gov.au

Research members of the Cardiovascular Disease, Pathogenesis and Therapeutics Group.

Clinical Pharmacology Research Group

TQEH DEPARTMENT **CLINICAL PHARMACOLOGY UNIT**

The Clinical Pharmacology Research Group's primary research interest is in the development of new therapies for heart disease.

Heart disease is the second leading cause of death in Australia, and the group is continuing its development of novel therapies for heart disease, based on understanding the mechanisms of action of older medications, such as perhexiline, which is a mixture of two closely related compounds (isomers). In 2015 we published the first clinical study investigating the uptake of the isomers into the heart and demonstrated that they have different effects on heart function. A new research collaboration also commenced with Professor Andreas Evdokiou, investigating novel therapies to protect the heart during cancer chemotherapy, and our group has now received new funding for this work in 2016 from the Cancer Council SA. Two new patent applications were also lodged, thanks to continuing support from Heart Metabolics, through Adelaide Research and Innovation.

Key findings in 2015

The isomers of perhexiline have different effects on the heart in humans. Therefore, it will be important to determine whether the current combined medication is the most effective form for the treatment of heart disease.

Outcomes for the community

Improved therapies for heart disease.

GROUP MEMBERS

Research Leaders:
Betty Sallustio

Research Officer:
John Licari

Postgraduate Student:
Cher-Rin Chong

Honours Student:
Helen Dimitroff

BHI Collaborators:
John Horowitz, Andreas Evdokiou

External Collaborators:
Nigel Drury, Birmingham Heartlands Hospital & University of Birmingham, UK; Michael Frenneaux, University of East Anglia, UK

Translational Vascular Function Research Collaborative

UNIVERSITY OF ADELAIDE **DISCIPLINE OF MEDICINE** / TQEH

Clinical disorders involving the coronary and peripheral circulation can be largely attributed to abnormalities within blood vessels thereby compromising the blood supply to these organs. The Translational Vascular Function Research Collaborative undertakes interdisciplinary basic, clinical and epidemiological studies into vascular dysfunction to improve our understanding of these disorders and develop new effective therapies. The research group includes both clinicians and medical scientists located at the Basil Hetzel Institute, the University of Adelaide Medical School, the Central Adelaide Local Health Network and the Northern Adelaide Local Health Network. The integrative nature of the group provides a unique opportunity to ensure that innovations are bidirectionally translated; ie as well as the traditional bench to bedside approach, innovations are derived from identifying patients with poor outcomes, understanding the contributing clinical attributes of these patients and returning to the laboratory to discover new therapies.

The multidisciplinary Collaborative consists of three sections that have combined meetings to optimise interdisciplinary input and translation: **Molecular Physiology, Clinical Physiology and Health Outcomes.**

Molecular Physiology

The current goals of this section are to:

(a) explore the molecular mechanisms responsible for the previously discovered sex differences in vascular reactivity, and

(b) develop an endothelial biopsy technique that will allow large-scale molecular studies in humans.

This group have previously discovered that women have hyper-reactive large and small blood vessels compared to men. This may contribute to some established clinical observations such as the increased in-hospital mortality in young women with an acute myocardial infarct and the higher post-operative mortality in women (of all ages) following coronary bypass grafting. Utilising isolated vessel preparations, these investigators are evaluating the various molecular mechanisms in the blood vessels of men and women in order to identify potential therapeutic targets that may ameliorate the health outcome gap between the sexes.

With the evolution of personalised medicine, there is a need to evaluate the biology of endothelial cells from individual patients so that therapies may be more specifically targeted to that patient. To this end, the Molecular Physiology section is developing a robust endothelial biopsy technique that will allow individuals with cardiovascular disease to have their endothelial molecular cell function assessed. This work is still in progress.

Key findings in 2015

- Women have hyper-reactive blood vessels to alpha agonists, which is influenced by the prostaglandin pathway.
- Endothelial biopsies are feasible and potential tool for personalised medicine.

Outcomes for the community

This research demonstrates that (a) the poor outcomes in women with cardiovascular disease could be modulated by therapies targeting the prostaglandin pathway, and (b) there is a real potential for capture of data for personalised medicine.

GROUP MEMBERS

Research Leaders:
John Beltrame, Peter Zalewski, David Wilson

Research Officer:
Amenah Jaghoori

Postgraduate Student:
Victor Lamin

External Collaborators:
Michael Worthington, James Edwards, Fabiano Viana, Robert Stuklis, Royal Adelaide Hospital

Clinical Physiology

The Clinical Physiology section of the Collaborative focuses upon the diagnosis and treatment of coronary vasomotor disorders. This includes coronary large vessel disorders such as vasospastic angina and coronary microvascular disorders including syndrome X, microvascular angina and the coronary slow flow phenomenon. The group has an international reputation and undertakes collaborative studies with the United States, Japan, Germany, Italy and the United Kingdom. As a co-founder of COVADIS (Coronary Vasomotor Disorders International Study group), the group has played a key role in establishing the international diagnostic criteria for vasospastic angina and ARE currently drafting a position paper for coronary microvascular dysfunction.

In addition to the above innovations, the Clinical Physiology section is an international leader in establishing the clinical attributes of MINOCA (Myocardial Infarction with Non-obstructive Coronaries). After creating the term MINOCA, this group has detailed the clinical characteristics of these patients in a systematic review, developed its diagnostic criteria, explored its potential causes and is contributing to an international position paper concerning the condition.

Key findings in 2015

- Contributed to the establishment of international diagnostic criteria for vasospastic angina.
- Provided the first description of an increased propensity to vasospastic angina amongst Indigenous Australians.
- Established MINOCA as an important clinical entity that requires diagnostic evaluation.
- Demonstrated a high prevalence of coronary vasomotor disorders amongst patients with chest pain and non-obstructive coronary arteries.

Outcomes for the community

The above clinical syndromes developed and investigated by the Clinical Physiology section of the Translational Vascular Function Research Collaborative translate into improved patient care. With clinician awareness of these conditions, patients are more appropriately diagnosed and treated whereas previously affected patients were undiagnosed or misdiagnosed.

GROUP MEMBERS

Research Leaders:
John Beltrame, Chris Zeitz, Sharmalar Rajendran, Margaret Artsall

Postgraduate Students:
David Di Fiore, Abdul Sheikh

External Collaborators:
Noel Bairey Merz, Hiroaki Shimokawa

Health Outcomes

The Health Outcomes section of the Collaborative focuses on the translation of evidence-based medicine and guidelines into quality health care, and the importance of patient reported outcome measures (PROMS).

Coronary Angiogram Database of South Australia (CADOSA) was established to provide a comprehensive data infrastructure of invasive coronary procedures in order to evaluate the delivery of quality health care thereby facilitating clinical improvement and supporting clinical coronary research. The CADOSA Registry now contains over 20,000 records, representative of public hospital clinical practice in the management of coronary artery disease. Moreover, the CADOSA Registry allows the bench marking of clinical practice not only within South Australia and nationally but also internationally. This unique Registry is attracting both national and international acclaim and continues to pioneer new innovations in clinical registry design and function.

An innovation developed by this group is the ACCESS Project (Assessment of Coronary artery disease using Computer tomography Effectively for Stable Symptoms), which endeavours to triage patients scheduled for invasive coronary angiography and refer those who are likely to have a normal angiogram to a non-invasive and less expensive investigation, namely coronary CT angiography. This novel project is made possible by a collaborative partnership between the Central Adelaide Local Health Network (CALHN), the Heart Foundation (SA Division) and the University of Adelaide, and has recently been awarded a prestigious NHMRC Partnership Project grant valued at $1.5 million, including contributions from CALHN and the Heart Foundation (SA Division). Utilising the innovative clinical and research resources within South Australia, we anticipate a major impact on cardiology practice with this project.

Key findings in 2015

- Compared to the United States, patients in South Australia undergoing percutaneous coronary interventions are more likely to have their procedure performed via a radial artery approach and are less likely to utilise potent antiplatelet agents such as glycoprotein IIb/IIIa inhibitors and bivalirudin.
- In the first comprehensive assessment of acute myocardial infarct performance measures in Australia, South Australian public hospitals have performed reasonably but there is the potential to optimise the quality of care delivered.

Outcomes for the community

For the first time in Australia, internationally established quality measures for coronary artery disease have been assessed and internationally benchmarked in preliminary analyses. These will be further developed and quality assurance programs established, thereby improving the quality of care delivered in South Australian Hospitals.

GROUP MEMBERS

Research Leaders:
John Beltrame, Rosanna Tavella, Isuru Ranasinghe, Margaret Arstall, Matthew Worthley, Chris Zeitz

Research Officers:
Bang Hoang, Carly Cliento, Michael Contibas, Rachel Jakobczak, Amenah Jaghoori, Meredith Matthews, Ellen Rees, Laura Simeone, Corrado Tavella

BHI Collaborators:
Peter Zalewski, Prue Cowled

External Collaborators:
John Spertus, Washington University; Chris Reid, Monash University; John Rumsfeld, American College of Cardiology; Harlan Krumholz, Yale University

Research Achievements

DR NATHAN PROCTER

Heart Researchers Find New Evidence of Stroke Risk

Cardiology researchers at TQEH have uncovered new evidence that relates to patients with new onset atrial fibrillation (AF) and their increased risk of stroke.

Dr Nathan Procter, a University of Adelaide researcher based at the BHI, has found that patients with new onset AF have changes in their blood and platelets which potentially put them at even higher stroke risk than chronic AF patients.

"By studying blood samples of patients with early onset AF, my research found there was impaired response to a particular signalling molecule that acts to limit the formation of blood clots, thus increasing the risk of inappropriate clot formation," Dr Procter said.

"Current methods of identifying AF patients at high risk of stroke focus on clinical presentation; reliable biochemical markers of stroke risk are still being investigated, which is what I examined in this study.

"This is a remarkable finding, as the physiological mechanisms as to why new onset AF patients are at particularly high risk of stroke are not completely understood," he said.

"Stroke is an incredible burden. Often if people survive there is a long road to recovery, with significant impact on family and friends," Dr Procter said.

> "I hope this finding can really increase the urgency of treating patients' risk of stroke when they are admitted to hospital with early onset atrial fibrillation."

Professor John Horowitz, Director of Cardiology and Clinical Pharmacology at TQEH, said "this tells us that we need to impress on treating doctors the likelihood that early anticoagulation (agents used to prevent the formation of blood clots), should be routine once AF appears.

"We plan to do a follow-up study in patients with stroke in collaboration with the TQEH Stroke Unit, primarily to further emphasize this point".

Dr Nathan Procter, Cardiovascular Disease, Pathogenesis and Therapeutics Group.

About Atrial Fibrillation

Atrial fibrillation (AF) is a type of arrhythmia, which means that the heart beats in an irregular fashion. This is caused by a disturbance of the electrical signals that control the steady rhythm of the heart, which we know as the 'heartbeat'.

Atrial fibrillation can be a frightening and uncomfortable disorder to have. Heart palpitations, an elevated heart rate (without exercise) and shortness of breath are just some of the symptoms of this disorder, which affects between 10 and 15 per cent of people over the age of 65.

Project Funding

Funding for this project has come from an NHMRC program grant awarded to Professor Simon Stewart, Director of the Mary MacKillop Institute for Health Research, Australian Catholic University, to investigate effective management strategies in AF patients, with support from THRF. Professor Stewart was formerly the head of Preventative Cardiology at the Baker IDI Heart and Diabetes Institute and was a co-supervisor for Dr Procter's PhD studies.

Vascular Surgery Research Group

UNIVERSITY OF ADELAIDE **DISCIPLINE OF SURGERY** / TQEH

The Vascular Surgery Research Group's primary research interest is in therapeutic approaches to abdominal aortic aneurysm repair.

The NHMRC funded EVAR trial aims to determine preoperative patient factors that may predict outcomes after endovascular repair of abdominal aortic aneurysms. Data collection was completed in 2015 and analysis of the final dataset is in progress. Two papers focussing on specific aspects of the analysis have been published in 2015 and a third has just been accepted for publication. Two ongoing national collaborations are investigating the biology of aneurysm expansion and, in a double blind placebo-controlled clinical trial, whether administration of telmisartan reduces the rate of expansion of aneurysms.

Key findings in 2015

A study examining the relationship between patient fitness and mortality has been published which showed that unfit patients are approximately 3 times more likely to die within a few years of surgery. We have also completed a study that developed a predictive model to identify which patients have a significantly elevated risk of dying within that first year after surgery. Surgeons could use this information to ensure that patients have understood and considered the risks and benefits of their elective EVAR prior to surgery. A paper about this study has recently been accepted for publication.

Outcomes for the Community

Improved preoperative discussion and informed consent before EVAR procedures so patients are better informed in making choices regarding their healthcare.

GROUP MEMBERS

Research Leaders:
Rob Fitridge, Prue Cowled, Margaret Boult

Clinical Research Fellow:
Joseph Dawson

Postgraduate Student:
Ben Thurston

Honours Student:
Clementine Labrosciano

Data Managers:
Tania De Loryn, Ruth Battersby

BHI Collaborator:
John Beltrame

External Collaborators:
Nicholas Dowson and Mary Barnes, CSIRO; Jonathan Golledge, University of Queensland; Allison Cowin, WCHRI

Professor of Vascular Surgery Rob Fitridge presented a BHI Talking Heads Seminar that was followed by The Longest Table lunch fundraiser for THRF.

Zinc and Cardiovascular Disease Research Group

UNIVERSITY OF ADELAIDE **DISCIPLINE OF MEDICINE** / TQEH

Dr Peter Zalewski has had a long-term research interest in the role of zinc and zinc deficiency in the body. The work began in the 1990s with his development of the first probe for zinc (named Zinquin) that enabled us, for the first time, to visualise and quantify the more dynamic, labile pools of Zn and elucidate their role in the regulation of disease processes such as apoptosis and inflammation. Of particular importance is the decline in zinc levels as we grow old and the public health impact of this on the many age-associated diseases. In this project, we are doing pioneer work to first establish the normal levels and functions of zinc in the linings of blood vessels and then to explore the mechanisms by which zinc deficiency predisposes the vasculature (especially arteries) to damage, inflammation and disease. Critical to these studies are the roles of Professor John Beltrame who is an internationally recognised leader in vascular research and has access to the appropriate clinical specimens and equipment. Also critical to the success are the key roles of post-doctoral scientists, initially Yann Chan and more recently Amenah Jaghoori who have the high levels of skills to perform the vascular function studies, as well as wide experience in vascular research from their PhD studies at the BHI. The major key finding has been that, in *ex-vivo* models at least, zinc protects our blood vessels against potent vasoconstrictors such as endothelin-1. We are now exploring the interaction between nitric oxide and zinc signalling pathways in the endothelial lining of the vessels. An important technical breakthrough this year has been the development of techniques to isolate endothelial cells from the surface of guide wires and catheters used during coronary angiograms and interventions at TQEH of patients with and without coronary artery disease.

Key findings in 2015

There are three major key findings:

- in an *ex-vivo* model, zinc protects human skin blood vessels against a potent vasoconstrictor known as endothelin-1. The zinc protection occurred at concentrations of available zinc that circulate in the blood stream suggesting the effect is physiological.
- We have obtained evidence for the presence of three members of the zinc transporter protein in the endothelial linings of the skin vessels.
- We have developed a technique to isolate endothelial cells from the linings of human arteries by detaching them from guide wires and catheters used in coronary angiograms and related procedures. This will enable us to study the relationship between zinc levels in arterial endothelium and cardiovascular disease.

Outcomes for the community

As we age, the zinc levels in our body decline and make us more susceptible to inflammatory and infectious disease. Our studies in blood vessels are providing the scientific evidence that zinc is important for protecting us against cardiovascular disease and that maintaining or restoring zinc levels in the body through either a well-balanced diet or via zinc supplements will help to minimize the risk of developing age-related pathological changes in our vasculature. The technique to isolate endothelial cells during coronary angiograms has a potential diagnostic role in coronary artery disease.

GROUP MEMBERS

Research Leaders:
John Beltrame, Peter Zalewski

Postdoctoral Research Officers:
Amenah Jaghoori, Yann Chan

BHI Collaborators:
Sue Lester

External Collaborators:
David Wilson, University of Adelaide; Sandra Hodge and Eugene Roscioli, SA Pathology

CHRONIC DISEASE

Research Groups

Endocrinology Research Group

End-Stage Renal Disease Research Group

Neurology Clinical Trials Research Group

Stroke Research Programme

The Health Observatory

Zinc and Diabetes Research Group

Endocrinology Research Group

TQEH DEPARTMENT **ENDOCRINOLOGY UNIT**

The Endocrinology Research Group has interests in:

- Diabetes and osteoporosis research
- Patient quality improvement studies to improve patient care

Nurse educators and dieticians in the Diabetes Centre are continuing to conduct the following patient care improvement oriented studies:

1. Insulin adjustment clinic data analysis with the view of assessing the effectiveness of the clinic work;
2. the Self Management and Review Type 1 Intensive Education (SMaRT1E), for the improvement of type 1 diabetes patient self-care.

Osteoporosis and associated fractures are a major cause of preventable disability and dependence for South Australians and a major cost to our community. Our strong links with the community organisation Osteoporosis Australia, the Royal Australian College of General Practitioners and the Medical Services of the central, northern and western suburbs of Adelaide enable us to review the management of osteoporosis in our community. Our combined services now see about 5,500 patients per year and we have two databases containing records for around 35,000 individuals. These databases are an important source of clinical data for investigating many aspects of the overall bone health of the communities that we service, the treatment options currently in use and of long term trends and changes.

Recently, we have implemented a system for assessing and reporting estimated total body percentage fat using soft tissue measurements from spine and femur bone density acquisitions. In the coming year we will be evaluating the usefulness of these measurements for assessing the impact of weight and body composition changes on bone density measurements and changes in bone mineral density.

Outcomes for the community

Our work in diabetes helps self-care of type 1 diabetes patients while the osteoporosis work mainly provides General Practitioners with information for understanding and treatment options of elderly patients.

GROUP MEMBERS

Research Leader:
David Jesudason

Research Scientist:
Jim Wang

Diabetes Centre Nurses:
Toni Willson, Mary Hodgson, Danielle Barrow, Chris Nitschke, Magdelena Kinasz, Michelle Hargreaves, Rosemary Wilson

Dietitians:
Connie Stanton, Claire Trimingham

External Collaborators:
Osteoporosis Australia, the Royal Australian College of General Practitioners, CALHN, NALHN

See also Endocrinology Research Group activity in the Clinical Sciences, Health Services & Population Health Theme, page 48

the hospital research foundation

Defying the Odds
Shaila's Story

Dr Shaila Kabir uprooted her life when she came to South Australia's Renal Transplant UNIT (SARTU) to receive a kidney from her husband Mohammed Islam despite the incompatibility of his blood type.

Married in their home country of Bangladesh, Shaila and Mohammed moved to Sydney soon after to pursue further study and career opportunities.

Kidney at just 10% function

Years later, suffering from foot cramps and severe tiredness, Shaila visited her local doctor who discovered her kidney was only functioning at 10 per cent.

"I was told I would need to be on dialysis within a year," Shaila said.

A transplant was inevitable for Shaila who was put on dialysis three times a week.

An additional hurdle

As the couple were in the process of obtaining their Australian citizenship, a kidney transplant could only come from someone they knew personally.

"As we weren't Australian citizens yet we couldn't go through the health care system so we had to find our own donor," Mohammed said.

Mohammed was not a direct match, but after returning to Bangladesh and having no luck finding a suitable donor there, the couple opted for an incompatible kidney transplant.

"I would do anything for my wife," Mohammed said.

The couple were transferred to Professor Toby Coates and his team at the SARTU who specialised in blood group incompatible kidney transplants not yet available in Sydney.

Conducted at TQEH, this process involved the removal of blood group antibodies from Shaila's blood to ensure she would successfully receive the kidney from her husband.

Success against the odds

The transplant was a noteworthy achievement as Shaila possessed significantly high levels of blood group antibodies and Mohammed had a rare blood type, being A positive with Type 2 Antigens.

After weeks of treatment Shaila's level of antibodies were deemed low enough and the transplant was completed successfully.

"We can't actually put into words how happy we were. I would do anything to help others going through the same thing as I went through," Mohammed said.

"We are so very thankful to Professor Coates."

"The doctors in Adelaide are the best in Australia, and the world"

A special gift

Having already defied the odds, Shaila made further history when she became the first woman to give birth after receiving an incompatible kidney. Shaila and Mohammed welcomed their daughter Manha in July 2012.

Now six years on from her transplant, Shaila continues to have regular check-ups and remains healthy and active with her young family.

End-Stage Renal Disease Research Group

TQEH DEPARTMENT **CLINICAL PHARMACOLOGY UNIT**

The End-Stage Renal Disease Research Group's focus is on improving the long-term success of kidney transplantation. The only "cure" for end-stage renal disease is kidney transplantation. Despite significant advances in immunosuppressive therapies to prevent rejection of the transplanted kidneys, the overall lifespan of a transplanted organ has not improved significantly in 30 years. This is partly because excessive exposure to some of the therapies used to prevent rejection can directly damage the transplanted kidney. Current clinical care involves measuring the levels of immunosuppressants in blood to ensure optimum exposure that minimises both rejection and drug toxicity. We have proposed that clinical outcomes may be significantly improved by measuring the levels of immunosuppressants directly at their sites of action: within the immune cells that cause rejection, and within the transplanted kidney.

Key Findings in 2015

We have now shown that measuring immunosuppressants within the immune cells is a much better predictor of the risk of rejection compared to measuring immunosuppressants in blood. In addition, measuring some immunosuppressants within the transplanted kidney may be a better predictor of damage to the transplanted kidney. This work was presented at the 2015 American Transplant Congress and the 2015 International Congress of Therapeutic Drug Monitoring and Clinical Toxicology.

In summary we have developed new methods for monitoring exposure to immunosuppressants following kidney transplantation and have shown that low exposure in immune cells is a strong predictor of the risk of rejection, whilst high exposure within the transplanted kidney may be related to damage of the kidney cells. In the future, this new monitoring may help enhance the lifespan of transplanted kidneys.

Outcomes for the Community

This research has the potential to improve the lifespan of transplanted kidneys.

GROUP MEMBERS

Research Leaders:
Betty Sallustio

Postgraduate Students:
Zaipul MD Dom, Rong Hu

Honours Student:
Martin Basic

BHI Collaborator:
John Horowitz

External Collaborators:
Andrew Somogyi and Janet Coller, University of Adelaide; Robert Carroll, CALHN

Neurology Clinical Trials Research Group

TQEH DEPARTMENT **NEUROLOGY UNIT**

The Neurology Clinical Trials Research Group undertakes clinical research of neurological disorders including stroke, epilepsy, dementia and multiple sclerosis.

Stroke

Clinical Trials conducted by the Neurology Unit have the goal of improving the safety and effectiveness of therapies for patients following stroke and Trans Ischaemic Attack or other neurological disease. These trials include the following:

- INSPIRE study: INternational Stroke Perfusion Imaging REgistry – an Australia-first databank of all information and data relevant to acute brain imaging.
- START-EXTEND Trial: Stroke imAging pRevention and Treatment (START) – Extend: Extending the time for Thrombolysis in Emergency Neurological Deficits.
- EXTEND-IA: Extending the time for Thrombolysis in Emergency Neurological Deficits – IntraArterial. A randomized controlled trial of intra-arterial reperfusion therapy after standard dose intravenous tPA within 4.5 hours of stroke onset utilizing dual target imaging selection.
- STOP-AUST: The Spot sign and Tranexamic acid On Preventing ICH growth – AUStralasia Trial.
- TASTE: Tenecteplase v Alteplase for Stroke Thrombolysis Evaluation Trial.
- SOCRATES: A randomised, double blind multinational study to prevent major vascular events with Ticagrelor compared to Aspirin (ASA) in patients with acute ischaemic stroke or TIA.

The majority of these trials are multi-centre studies; some are international, reflecting the importance of collaborations with external research groups.

Epilepsy

We have now completed all epilepsy trials. We continue to search for appropriate trials for our specific cohort of patients.

Dementia

The Memory Clinic and Clinical Cognitive Research Unit's continue to participate in many national and international studies. Dr Karyn Boundy is the Chairperson of the Australasian Consortium of Centres for Clinical Cognitive Research (AC4R) to facilitate clinical trials in memory conditions in Australasia and further simplify their administration with Mutual Acceptance of National ethics and Lead site approval for studies coming in 2015. She is also the South Australian and AC4R representative for Neurosciences Trials Australia – a clinical trials platform with "nodes" in each neurological subspecialty area to facilitate both investigator driven research and to attract pharmaceutical company early stage phase I – III research to Australia. Dr Boundy has spoken at local General Practitioner

GROUP MEMBERS

Research Leaders:
Jim Jannes, Karyn Boundy

Clinical Academic Neurologist:
Simon Koblar

Senior Consultant Neurologist:
Martin Robinson

Senior Visiting Neurologist:
Grant Purdie

Consultant Neurologists:
Cathy Short, Aaron Tan, Jessica Hafner, Roula Ghaoui

Clinical Research Trials:
Peter Cheung, Shelley Casey

Chief Clinical Neuropsychologist:
Tony Kneebone

Clinical Nurse Manager:
Kevin Webb

Nurses:
Lizzie Dodd, Sally Castle, Peta Toner

Epilepsy Nurse Practitioner:
Sharon Horn

division, national and international meetings about aspects of dementia management and diagnosis of less common dementias (such as frontal lobe and tauopathies), multiple sclerosis and updates in neurology for rural health doctors.

The Central Adelaide Local Health Network (CALHN) review of memory services by clinical lead Dr Cathy Short with the help of Ms Kerry McKinna and Ms Shauna Henderson will enable the delivery of an integrated multi-disciplinary service in the near future. The CALHN Memory Service has now been approved and space for the new service is being assessed. The satellite Neurology/Memory Clinic run by Dr Karyn Boundy has proven popular in Port Lincoln, Tumby Bay and Naracoorte in conjunction with Rural Health SA.

Various international publications have arisen from participation in the Prospective Research in Memory Clinics (PRIME), a database that studies all types of dementia patients attending Australian Memory Clinics with an upcoming paper submitted on Mortality in Mild Cognitive Impairment.

Applications have been successfully made to PBS/PBAC to simplify prescribing of Alzheimer Disease medications which are now streamlined and the criteria for ongoing usage have been simplified.

Alzheimer Symptomatic Trials

There has been a renewed interest in both Alzheimer symptomatic and disease modifying trials.

Lundbeck compound Lu AE58054, a selective serotonin receptor 6 (5-HT6 receptor) antagonist for patients with mild-moderate Alzheimer's disease. A new trial commenced recruitment in late 2015. This is a Phase III trial at TQEH and has been born from the original study done here in 2010/11.

Disease Modifying Trials in Alzheimer's Disease

Merck MK 8931 safety and efficacy in mild to moderate Alzheimer's Disease add on to all Alzheimer drugs is currently running. Recruitment completed (BACE inhibitor Phase III). This trial has been running for 18 months and has an extension which is due to run for a further 4 years.

The randomised, double blind WN28745 Marguerite Dementia trial for mild Alzheimer's disease patients using Gantenerumab has completed recruitment. We are now in the process of going through Ethics to increase dose and offer an Open Label extension to the already recruited patients.

Prodromal Alzheimer's Disease

There are several studies under review for future diagnostic (Amyloid PET scan) and disease modifying Anti amyloid monoclonal antibodies.The current study below is the first using this technique is being undertaken by the pharmaceutical company, Roche. Roche is studying the effects of RO4919832 on Cognition and Function in Prodromal Alzheimer's Disease for two years with open label extension to four years. This study is being conducted due to Gantenerumab having a preclinical profile consistent with AB reduction effect. Gantenerumab appeared to inhibit and reduce the accumulation of brain AB observed on positron emission tomography (PET) brain scans. This trial is awaiting approval for an Open Label extension and an Increase in dose as the original doses were found to be ineffective.

The frequent MRI Brain scans required in this study have identified new amyloid therapy related imaging abnormalities ARIA-H & ARIA-E, which have further enhanced our understanding of amyloid load and the effect of its removal.

Multiple Sclerosis (MS)

The treatment of MS benefited from another three PBS-reimbursed medications in 2015, principally Alemtuzumab (Lemtrada) infusion. We are pleased to have been involved in the pivotal and long term clinical trials with Lemtrada over the last 8 years under Dr Karyn Boundy. The long term association with Fingolimod, working on a long term extension trial for patients who were in the pivotal studies (protocol CFTY720D2399) has been completed this year. Dr Karyn Boundy has been involved in a world wide database of MS patients (MSBase) for the last few years. Many research papers have been published by authors from all over the world but have highlighted the MS outcomes in Australia.

Outcomes for the community

This research has the potential to provide improved therapeutics in dementia, epilepsy and multiple sclerosis for our patient populations.

Stroke Research Programme

TQEH DEPARTMENT **NEUROLOGY UNIT**

Stroke-related basic, clinical and applied research involves genetic, proteomic and clinical investigations into risk for stroke, stem cell therapy to repair the brain following stroke, inflammatory pathways involved in stroke, therapeutics and primary health stroke prevention research, as well as management.

Key Findings in 2015

A landmark change to the way that some stroke patients are treated, called Endovascular Therapy (or clot retrieval treatment), has been confirmed by the publication of the EXTEND-IA clinical investigator consortium that included A/Prof Jim Jannes of the Neurology Unit. This Australian consortium published the report of their clinical trial in the prestigious journal *New England Journal of Medicine* in 2015, with support in the same year by several other groups worldwide. This latest 'revolution in treatment' has been described as the most important event in stroke since the introduction of tPA, a clot-busting therapy, in 1995* [*Donnan GA, Endovascular therapy: the dawning of a new era. Int J *Stroke*. 2015;10:463].

Outcomes for the Community

The Stroke Research Programme is pursuing a series of investigations into better ways to enhance brain function after stroke and to help improve stroke outcome in patients. The publication by the Australian consortium that includes A/Prof Jim Jannes in the prestigious New England Journal of Medicine in 2015, along with several other clinical trials that supported endovascular therapy, is a landmark in clinical history. Endovascular therapy, a routine procedure available in the Stroke Unit, is now considered to be the new 'gold standard' of treatment for appropriately selected stroke patients within 4.5 hours of stroke onset.

GROUP MEMBERS

Research Leaders:
Simon Koblar, Anne Hamilton-Bruce

Clinical Associate:
Jim Jannes

Senior Medical Scientists:
Austin Milton, Mark Donk

Postdoctoral Research Fellows:
Karlea Kremer, Xenia Kaidonis

Postgraduate Students:
Fong Chan Choy, Michael Djukic, Kendall Goldsmith, Victor J Krawczyk, Elaine Leung, Anjali Nagpal, Jenny Sutton, Joshua Winderlich

Honours Students:
Tam M. Nguyen, Victoria Ludlow, Maria Gancheva

BHI Collaborators:
Sarah Appleton, Robert Adams

External Collaborators:
James Fawcett and Jessica Kwok, Cambridge Centre for Brain Repair, University of Cambridge; Janette Young, Richard McGrath, Caroline Adams, Susan Hiller, Svetlana Bogomolova, Mike Ridding, Michelle McDonnell and Jack Junyu Liang, University of South Australia; Lisel O'Dwyer, Flinders University; Susan Hazel and Jon Karnon, University of Adelaide

The Health Observatory

UNIVERSITY OF ADELAIDE **DISCIPLINE OF MEDICINE** / TQEH

Current research is focused in two major projects:

Sleep Health

Obstructive sleep apnea (OSA) is very common, with up to half of adults having some form of the condition. OSA has a large negative effect on a number of areas of health, including heart disease, diabetes, kidney disease, mental health, accidents and quality of life.

Dr Carol Lang is exploring the links between insomnia, OSA and depression. Ongoing work will examine the influence of inflammation, obesity and testosterone on these relationships.

Dr Sarah Appleton is examining the cross-sectional and longitudinal relationships between OSA and cardio-metabolic disease, quality of life and other health outcomes and the influence of obesity and age on these relationships.

In collaboration with colleagues at The Adelaide Institute for Sleep Health and the Woolcock Institute at Sydney University, current research projects aim to better identify who is at risk of adverse health outcomes from the large pool of people in the community who have some form of sleep apnea. This works includes determining if new markers of OSA on sleep studies (such as power spectral analysis, heart rate variability) can be used to improve the precision for identifying those at risk of adverse consequences. Work with other colleagues at Flinders University focuses on health economics analyses, including cost per Disability-Adjusted Life Year (DALY) and Quality-Adjusted Life Year (QALY) and decision analytic simulation studies for treatments of sleep apnea.

Cumberland.au - The Australian Health Care Modelling and Systems Design Collaboration

The Collaboration is an affiliate of the Cumberland initiative in the UK to encourage simulation and modelling of healthcare scenarios to improve quality of care delivery. It brings together many clinicians and modellers who have worked across Australia over the last 10-20 years. Cumberland.au recognises the importance and potential to apply the following to achieve reform in health: Systems thinking; Design thinking; Mathematical modelling (including the use of simulation), and Operations research.

Simulation modelling is a means of communicating and discussing the proposed changes to the healthcare system with stakeholder groups before any changes are made.

Some of the Collaborations current projects include:

- multi-method simulation modelling of Mental Health patient care across Adelaide
- simulation modelling for re-designing care in the ICU
- patient flow simulation in the Emergency Department
- patient flow simulation in acute cardiac care

GROUP MEMBERS

Research Leaders:
Robert Adams

Postdoctoral Research Fellows:
Sarah Appleton, Carol Lang, Tiffany Gill

Postgraduate Students:
Graham Tucker, Clare McNally, Rohan Dhillon, Hannah Newell, Yohannes Melaku

Honours Student:
Joule Li

Summer Vacation Student:
Ray Li

BHI Collaborators:
Catherine Hill, Renuka Visvanathan, Solomon Yu, Anne Taylor, Zumin Shi, Cherrie Galletly, Scott Clark, Nigel Stocks, David Gonzales, John Beltrame, Isuru Ranasinghe

External Collaborators:
Woolcock Institute, Sydney; Doug McEvoy, Nick Antic, Mark Mackay, Peter Catcheside and Andrew Vakulin, Flinders University of South Australia; Angela D'Rozario and Jong-Won Kim, University of Sydney; Patrick Hanly, University of Calgary; Don Campbell and Keith Stockman, Monash University; Shyamali Dharmage, University of Melbourne; Nigel Bean, Gary Wittert and Campbell Thompson, University of Adelaide

Key Findings in 2015

Our work has extended knowledge of what specific factors in OSA are associated with significant chronic health problems, independent of comorbid and confounding conditions. This includes the significant independent association of intermittent nocturnal hypoxia in OSA with incident type 2 diabetes, chronic kidney disease, depression and impaired glycaemic control in men without diabetes. We have also shown that OSA in rapid eye movement (REM) sleep, but not non-REM sleep is associated with long standing and recent onset hypertension, which has potentially major implications for clinical management. These findings together have highlighted the importance of sleep apnea in people with cardio-metabolic conditions and the potential role of nocturnal intermittent hypoxia in increasing mortality and morbidity.

Outcomes for the Community

Our work in OSA, a condition that to date goes largely undiagnosed, has identified a large burden of the disorder in Australian men that is associated with major cardiometabolic and psychiatric conditions. This work emphasises the need for clinicians managing OSA or diabetes (or hypertension, depression, kidney disease) to incorporate screening methods to ensure that a patient presenting with one disorder is assessed for the other in order to prevent avoidable morbidity.

Zinc and Diabetes Research Group

UNIVERSITY OF ADELAIDE **DISCIPLINE OF MEDICINE** / TQEH

The dietary metal zinc (Zn) is rich in pancreatic beta cells and critical for insulin synthesis and storage. Zn is lost from the pancreatic islets in type 2 diabetes (T2D) in both humans and animal models. Our studies in the db/db mouse model have shown loss of beta cell Zn was amongst the earliest steps in the onset of diabetes, preceding by several weeks the major rises in body weight and blood glucose levels. In animal models of T2D, Zn supplements given early have been shown to have promising effects, including attenuation of hyperglycaemia. The clinical implication of this is that there may be a window, early in onset of the disease, when restoring islet Zn levels by appropriate Zn supplementation, is capable of slowing the progression of the disease. We have also shown that, even in chronic diabetic db/db mice, Zn levels are unaffected in other islet cell types. It is not clear why beta cells preferentially lose Zn. However, new insights into islet Zn homeostasis are being gained from studies of islet Zn transporter proteins. Human and animal studies have shown the importance of ZnT8 for both Type 1 diabetes, where ZnT8 is an autoantigen, and T2D, where a polymorphism in ZnT8 is associated with increased risk. Our studies in db/db mice have shown that, very early in diabetes, ZnT8 is lost from the beta cells but retained in the alpha (and perhaps other islet) cells. Our findings now point to an important role for changes in islet Zn metabolism in the onset of Type 2 diabetes.

Key findings in 2015

We have confirmed previous findings that Zn is lost from the insulin-producing pancreatic islets in type 2 diabetes (T2D) in both humans and animal models. One of our important new findings was that the loss of Zn is amongst the earliest events in the onset of diabetes, preceding the major rises in body weight and blood glucose levels. We have also shown that the loss of zinc in diabetes was accompanied by early loss of a major islet zinc transporter protein known as ZnT8. Interestingly, islet cell types involved in secretion of glucagon and other hormones were able to retain their zinc levels and had normal levels of ZnT8. Thus, the changes in diabetes primarily affect insulin production.

Outcomes for the community

Zn is critical for the production of insulin by our pancreas. The major clinical implication of our findings is that there is a window, early in onset of diabetes, when pancreatic zinc levels fall and thus, restoring Zn levels by appropriate Zn supplementation in the early (prediabetic) stages of the disease may be capable of slowing its progression. We need now to understand better why Zn transporter proteins become defective in diabetes and whether new therapies can be developed to reverse these changes.

GROUP MEMBERS

Research Leaders:
Peter Zalewski, Toby Coates

Postgraduate Student:
Mariea Bosco

CLINICAL SCIENCES, HEALTH SERVICES AND POPULATION HEALTH

Research Groups

Anaesthesia Research Group
Endocrinology Research Group
Intensive Care Medicine Research Group
Psychiatry Research Group
Respiratory Medicine and Clinical Practice Unit
Rheumatology Research Group
Surgical Science Research Group

Anaesthesia Research Group

TQEH DEPARTMENT **DEPARTMENT OF ANAESTHESIA**

Our research has a clinical focus and involves regional anaesthesia, patient safety, and new applications of drugs. Research was focused on new techniques to provide safe and effective post-operative pain relief: efficacy of a simple and safe abdominal nerve block (TAP) procedure was assessed comparing intermittent bolus versus continuous infusion in patients having TAP catheters for postoperative pain relief. We are also studying the effects of sevofluorane on cardiac conduction (QTc interval) in diabetic patients and expect to publish on this in 2016. We published a systematic review on neuropraxia in relation to laryngeal mask airway devices, and are planning additional anatomical studies. A systematic review was done and submitted for publication on the effects of beta-blockade on analgesia, anaesthesia and postoperative nausea and vomiting. The findings may cause a paradigm shift in anaesthesia, as beta-blockade appears to significantly reduce analgesia and anaesthesia dosing, whilst reducing postoperative pain and nausea and vomiting. Further research focussing on this finding will follow.

Key Findings in 2015

Intermittent bolus versus continuous infusion TAP block trial patient recruitment was finalsed in November 2015. Analysis of data is in progress. Recruitment for the QTc interval trial was also finalised recently and we are awaiting analysis results. The systematic review on beta-blockade and anaesthesia showed a positive effect on analgesia, anaesthetic need and post-operative nausea and vomiting. These promising results warrant further study.

Outcomes for the community

This research will lead to improved outcomes and patient experiences after regional and general anaesthesia.

GROUP MEMBERS

Consultant Anaesthetists:
Anand Rajbhoj, Vasanth Rao Kadam, Rajesh Sethi, Venkatesan Thiruvenkatarajan, Thavarajah Visvanathan, Roelof Van Wijk, Richard Watts

Anaesthetic Registrars/RMOs:
Gilberto W.N. Arenas, William Curtis, Phuong Markman, Tuyen Tran

Endocrinology Research Group

TQEH DEPARTMENT **ENDOCRINOLOGY UNIT**

Our research has a clinical and a population focus and includes diabetes and osteoporosis research, extending clinical endocrine knowledge through clinical trials and patient quality improvement studies to improve patient care.

Clinical Trials

TQEH is the Adelaide site of the NHMRC multi-centre double-blind, randomised, placebo-controlled trial titled Testosterone intervention for the prevention of diabetes in high risk men: a randomised trial (T4DM). 120 patients have been successfully recruited after screening over 3,000 volunteers; participants have been positive in their feedback regarding trial participation. The data collected on the utility of screening for pre-diabetes to fulfil the inclusion criterion with fasting capillary blood glucose levels and fasting venous blood glucose levels has been analysed and prepared for publication. TQEH also conducts the body composition and bone density assessments for the T4DM trial participants.

A randomised controlled trial is also in preparation stage. This trial plans to review patients referred to our Insulin Adjustment Clinic (IAC). IAC subjects will be randomised to receive dietary input (face to face visits and dietician attendance at IAC clinic) versus no dietary input. The hypothesis to be tested is that subjects receiving dietetic input will achieve similar glycaemic control compared to those not receiving dietetic advice but will gain less weight, will take less extra insulin and have less hypoglycaemia. The significance of the study is to overcome the major drawback in diabetic patients and therefore limiting factor of effective utilisation of insulin therapy i.e. weight gain.

Epidemiological research

The group has been involved in North West Adelaide Health Study of diabetes and cardiovascular disease and has utilised the dataset for clinical and epidemiological studies. Dr Jason Tan has completed a study using data from the Men Androgen Inflammation Lifestyle Environment and Stress (MAILES) cohort to analyse the relationship between testosterone levels and the development of diabetes. The study led to several presentations and is prepared for publication. Using the same dataset, Ms Bhairavi Parimalanathan is also undertaking a study of the relationship between sleep (duration, stages, and REM sleep) and thyroid function as measured by T3, T4 and TSH levels.

A data audit undertaken by Dr Divya Srivastava, with Dr David Jesudasan and Dr Toby Coates is evaluating the change and possible development of bone disease after kidney transplant is also underway using data collated from the Kidney Transplant Unit at the Royal Adelaide Hospital. It is also expected that the analysis will provide an insight into the uptake of Kidney Disease Improving Global Outcomes (KDIGO) Clinical practice guidelines for chronic kidney disease-mineral and bone disorder (CKD-MBD).

Outcomes for the community

The research projects on testosterone and diabetes lead to better diabetes prevention. The study on insulin adjustment will help patients to make their own efforts in achieving better treatment outcomes.

GROUP MEMBERS

Research Leaders:
Gary Wittert and David Jesudason

Research Coordinators:
Rosemary Cox

Research Scientist:
Jim Wang

Research Registrar:
Jason Tan

Research Student (undergraduate):
Bhairavi Parimalanathan

External Collaborators:
Toby Coates, Royal Adelaide Hospital;
Divya Srivastava, SA Pathology

See also Endocrinology Research Group activity in the Chronic Disease Theme, page 37

Intensive Care Medicine Research Group

TQEH DEPARTMENT **INTENSIVE CARE MEDICINE**

The Queen Elizabeth Hospital Department of Intensive Care Medicine participates in and conducts research aimed at improving patient outcomes, answering pragmatic, relevant clinical questions that are of importance to the clinicians who provide patient care and also deliver more efficient and effective treatments in the Intensive Care Unit (ICU) that will not only benefit patients but also decrease costs, preserve resources and increase access to scarce critical care beds.

Four main studies relating to the treatment of patients with sepsis, nutritional support, antibiotic dosing and the effect of red blood cell transfusion in the critically ill were either ongoing or in preparation:

Adjunctive coRticosteroid trEatment iN criticAlly ilL patients with septic shock (ADRENAL STUDY)

1. Adjunctive coRticosteroid trEatment iN criticAlly ilL patients with septic shock (ADRENAL STUDY) is an NHMRC funded randomised blinded placebo controlled trial of hydrocortisone in 3,800 critically ill patients with septic shock. The purpose of this study is to find out whether adult patients admitted to the ICU with septic shock and who are given hydrocortisone will have an improved rate of survival 90 days later compared to those who received the placebo. The study commenced early in 2013 and TQEH continues to be a participating site.

GROUP MEMBERS

Research Leaders:
Sandra Peake, Bala Venkatesh

Research Coordinator:
Patricia Williams

External Collaborators:
ANZICS–CTG and The George Institute of Global Health

The Augmented versus Routine approach to Giving Energy Trial: A randomised controlled trial (TARGET NUTRITION STUDY)

This is a pivotal, 4000-patient, multi-centre, double-blinded, randomised, controlled, parallel-group, phase III clinical trial to determine if the enteral delivery of the full-recommended calorie (energy) requirement to critically ill patients improves 90 day survival benefit when compared to standard practice. Approximately 40 Intensive Care Units throughout Australia and New Zealand will participate in the study. TQEH is a lead site and the study will commence in 2016. Sandra Peake is co-chair of management committee. Patricia Williams is a member of the Management Committee.

The TARGET Nutrition Study is funded by a project grant from the NHMRC and the Health Research Council of New Zealand and follows the completion of a point prevalence study of energy prescription practices conducted in 2010 and a randomised, double-blind, feasibility study conducted in 2013 examining the use of a concentrated enteral nutrition solution to increase calorie delivery to critically ill patients. These data supported the conduct of a large, multicentre, randomized, double-blind trial to determine whether the delivery of more calories by using a concentrated enteral nutrition solution can result in improved survival and functional outcomes for critically ill patients.

GROUP MEMBERS

Research Leaders:
Sandra Peake, Marianne Chapman

Research Coordinator:
Patricia Williams

External Collaborators:
ANZICS-CTG and The Australian & New Zealand Intensive Care Research Centre, Department of Epidemiology and Preventive Medicine, School of Public Health and Preventive Medicine, Monash University.

SaMpling Antibiotics in Renal Replacement Therapy (SMARRT STUDY)

A large NHMRC funded, multicentre trial in critically ill patients who are prescribed renal replacement therapy (RRT) and piperacillin-tazobactam, meropenem, vancomycin, imepenem, and linezolid. The aim is to develop optimised antibiotic dosing guidelines for ICU patients with life-threatening infections that account for patient characteristics and the type of RRT they are prescribed. TQEH is the lead participating site in South Australia.

GROUP MEMBERS

Research Leaders:
Sandra Peake, Jason Roberts

Research Coordinator:
Patricia Williams

External Collaborators:
University of Queensland

STandaRd Issue TrANsfusion versuS Fresher red blood cell Use in intenSive care – a randomised controlled trial. (TRANSFUSE STUDY)

A multi-centre, randomised, double blind, controlled trial, testing the effect of the freshest available Red Blood Cells (RBC) compared to standard practice on mortality in 5,000 critically ill patients who require RBC transfusion. This study will determine the effect of transfusing the freshest blood in the inventory compared to transfusing the oldest blood in inventory (current standard of care). It will provide critically important information that will help blood banks implement the findings. The results of this study will impact transfusion policy worldwide and ultimately could save many thousands of lives each year. TQEH is a participating site; recruitment commenced in 2013 and is continuing.

GROUP MEMBERS

Research Leaders:
Sandra Peake, Jamie Cooper

Research Coordinator:
Patricia Williams

External Collaborators:
ANZICS-CTG; The Australian & New Zealand Intensive Care Research Centre, Department of Epidemiology and Preventive Medicine, School of Public Health and Preventive Medicine, Monash University; ANZIC Clinical trials group.

Outcomes for the Community

This research has the potential to deliver more efficient and effective treatments in the ICU that will not only benefit patients but also decrease costs, preserve resources and increase access to scarce critical care beds.

Psychiatry Research Group

UNIVERSITY OF ADELAIDE **DISCIPLINE OF PSYCHIATRY** / TQEH

Our research is focussed in 3 areas:

Cognition and Functioning in Psychiatry Research Group

This research group investigates neuropsychological factors that influence the practical capacity of individuals with psychiatric disorders, such as depression, anxiety or psychosis, to operate, function and perform on a daily basis. Two studies include:

- **The Cognitive Function and Mood Study (CoFaMS):** Investigate effects of depression and anxiety on a person's mental status and capacity by analysing psychological, and functional genetic differences in a healthy cohort and those suffering from mood and anxiety disorders.
- **The Cognitive and Functional Assessment of Psychosis Staging Study (CoFAPSS):** In current clinical practice it is impossible to predict individual course of psychotic illness or treatment response. This longitudinal study assesses patients at different stages of psychotic illness to develop accurate biomarkers of risk profile, transition between disease stages and potential for functional recovery.

Key Findings in 2015

- Genetic markers associated with lithium response (multi-national ConLiGen GWAS study).
- Proteomic analysis: B lymphocyte proliferation and ribosomal S26 transcripts as markers of cognitive impairment in remitted major depression.
- Symptom severity of depressive symptoms impairs social cognition performance in current but not remitted major depressive disorder.

Outcomes for the Community

This research will improve the early identification and personalised treatment of psychopathology and functional impairment associated with mood or psychotic disorders.

GROUP MEMBERS

Research Leaders:
Bernhard Baune, Tracy Air, Oliver Schubert, Scott Clark

External Collaborators:
Thomas G Schulze, ConLiGen Consortium

Epidemiological and Health Services Research Group

This research aims to:

- understand health care needs of people with mental health issues and to
- evaluate effectiveness and accessibility of services in addressing needs.

This includes identifying predictors that can help understand successes and failures of health service interventions. It aims to develop evidence based service delivery approaches that can address unmet needs in a cost-effective, equitable and easily accessible manner.

GROUP MEMBER

Research Leader:
Scott Clark

The Chronic Psychosis: Morbidity, Morality and Service use in South Australia study uses data linkage of existing information in public clinical services to provide a detailed understanding of treatment processes and outcomes in those with chronic psychosis treated with oral clozapine in comparison to long acting injectable (depot) antipsychotics. Goals include:

- the identification of local predictors of outcomes in chronic psychosis to inform the early safe use of clozapine over depot medication
- the identification of optimal broad physical health monitoring protocols to reduce morbidity and mortality
- the development of interventions designed to optimise the management of chronic psychosis that can be directly translated and implemented in local mental health clinics.

Key Findings in 2015

- The safe use of structured nurse-led clinics for clozapine monitoring.
- Episodes of myocarditis in long term clozapine use.
- The role of infection and inflammation in clozapine toxicity.

Outcomes for the Community

This research will improve quality of care for patients with treatment resistant schizophrenia treated with clozapine.

Trajectory Modelling Research

Our focus is on prediction of specific clinical and functional trajectories in major mental illness. Current diagnostic categories in mental illness are based largely on common symptomatology rather than an understanding of the underlying mechanisms of brain, cognitive and general day-to-day function. Illness and functional trajectories describe patterns of illness and impairment in individuals over time. This research group will apply probabilistic and growth mixture multi-variate modelling techniques to various multi-modal measures of patient history and biology to identify and predict specific illness and functional trajectories in mood and psychotic disorders.

Key Findings in 2015

- Use of Bayesian models to predict disease and functional outcomes in psychosis and high risk for psychosis groups.
- Use of Mixed Modelling to identify mood symptom trajectories in the perinatal period.

Outcomes for the Community

Early identification of mental illness and functional trajectories will lead to the development of early intervention strategies.

GROUP MEMBERS

Research Leaders:
Scott Clark, Oliver Schubert, Bernhard Baune

External Collaborators:
G Paul Amminger and Patrick D McGorry, University of Melbourne

Helping Others through Research
Earl's Story

When Earl Boaden landed his first job at the young age of 15 it didn't take him long to pick up smoking, what was then a social activity between co-workers.

At the time the dangers of smoking were not known, and being a young man excitedly entering the corporate world, Earl soon began picking up a cigarette to fit in with his co-workers.

By the time he was diagnosed with Chronic Obstructive Pulmonary Disease (COPD), Earl knew the damage to his lungs was irreversible, and unfortunately there was no going back.

A long term condition, COPD is the slow deterioration of the lungs resulting in shortness of breath as the normal flow of air through the airways reduces and inevitably leaves the sufferer to rely on an oxygen tank to breathe.

Now 72 years old Earl was diagnosed with COPD over twenty years ago and only recently has been prescribed an oxygen tank he must use when walking around.

Earl has been living with an oxygen tank since November 2013, but explained he struggled early to adjust to the change in his lifestyle. Always an avid gardener, he was particularly worried it would restrict his mobility and stop him being as active as he once was.

It was for this reason Earl was eager to help out with the ongoing trial of a portable oxygen tank being undertaken by The Clinical Practice Unit (Respiratory Medicine) at The Queen Elizabeth Hospital (TQEH) in the hope that this device would improve his mobility.

Trialling the portable oxygen concentrator (POC) for two months, Earl has been in contact with researcher Harshani Jayasignhe throughout the trial to give his feedback on the device.

"The POC helps deliver oxygen in a similar way oxygen cylinders work, helping them breathe more comfortably," said Harshani.

> "This trial was aiming to see if the POC was a suitable substitute to deliver oxygen to patients when they are mobile as the device is smaller, less heavy and more portable."

"Patient feedback like Earl's is vital as it provides an insight into how patients really feel about the device and it also provides us with an opportunity to take that feedback and improve upon the device to improve quality."

Deciding the POC wasn't for him at this point Earl, no stranger to medical trials after being involved in a number at TQEH over the years, will continue to give back to research with the hope of improving quality of life for others like him in the future.

Respiratory Medicine and Clinical Practice Unit

TQEH DEPARTMENT **RESPIRATORY MEDICINE AND CLINICAL PRACTICE UNIT**

The Respiratory Medicine Unit and Clinical Practice Unit is interested in research translation and evidence based medicine. Areas of interest include non-invasive ventilation, respiratory failure, asthma, chronic obstructive pulmonary disease (COPD), tobacco cessation and prevention, Indigenous health, pleural disease, depression, anxiety, thromboembolic disease, sleep apnoea, lung volume reduction procedures and pneumonia. The purpose of this work is to improve patient care, reduce hospital admissions, reduce health care expenditure and improve quality of life. This is done through exploring the barriers and facilitators for current practice, identifying optimal management techniques on a global scale, implementing this optimal management using an evaluative design (such as a randomised controlled trial), then disseminating the results for improved practice, policy and patient utilisation.

Key Findings in 2015

A study of inpatient smoking cessation called STOP (Smoking Termination Opportunity for inPatients) found significant improvements in long-term quit attempts over 24 months with a combination of Champix (varenicline tartrate) plus Quitline telephone counselling compared with Quitline counselling alone. This treatment was also found to be cost effective and is the only study in the world that has evaluated the medication in 1) a hospitalised cohort and 2) over a 24 month period.

Also in 2015, an evaluation of mandatory reporting for potentially unsafe drivers by health professionals found that almost 1 in 10 patients would avoid a diagnosis, lie to their doctor or doctor shop to avoid losing their drivers licence. This data calls into question the legislation requiring mandatory reporting by health professionals in South Australia, as patients who could be treated for conditions such as sleep apnoea, are going unmanaged for fear of losing their licence.

Outcomes for the Community

Our research on lung disease and asthma will lead to improved quality of life, disease management and patient care during hospital admission and outpatient visits. The research projects on smoking may lead to tobacco prevention among young people and successful long-term quit attempts by daily smokers.

The Respiratory Medicine and Critical Practice Unit with Minister Snelling.

GROUP MEMBERS

Research Leaders:
Brian J Smith, Kristin V Carson

Postgraduate Students:
Zafar Usmani, Kristin Carson, Harshani Jayasinghe), Zoe Kopsaftis, Justyna Pollak, Karen Royals, Kathy Lawton

Research Officer:
Joep Van Agteren

BHI Collaborators:
Mike Roberts and Lorraine MacKenzie, Therapeutic Research Centre; John Licari, Clinical Pharmacology Unit

External Collaborators:
Adrian Esterman, University of South Australia; Tim Schultz, The University of Adelaide; Gillian Gould, James Cook University; Matthew Peters, Concord Hospital; Anne Chang, Menzies School of Health Research; Vicki Clifton, Mater Research, Queensland; Heather Powell, John Hunter Hospital; Amanda Wilson, University of Newcastle; Christian Osadnik, Monash University; E. Haydn Walters, Menzies Research Institute; Richard Wood-Baker, University of Tasmania; Philippa Poole, Westmead Hospital; Peter Gibson, John Hunter Hospital; Michael Hensley, University of Newcastle; Kyi S Tin, Alice Springs Hospital; Khin Hnin, Flinders Medical Centre/ Repatriation General Hospital; Hooi Shan Yap, Flinders Medical Centre; Faisal Ameer, Royal Adelaide Hospital; Marjolein Verbiest and Mathilde Crone, Leiden University Medical Centre, Netherlands; Willem JJ Assendelft, Radboud University Nijmegen Medical Centre, Netherlands; John White, York District Hospital, York, UK; John Wright, Bradford Royal Infirmary, Bradford, United Kingdom; Karen Heslop and Anthony DeSoyza, Newcastle University, UK; Joanna Picot, University of Southampton, Southampton, UK; David, J Evans, Hemel Hempstead Hospital, Hemel Hempstead, UK; Michael Greenstone, Castle Hill Hospital, Cottingham, UK; Fiona Campbell, University of Sheffield, Sheffield, UK; Christine Bond, University of Aberdeen, UK; Josephine Lightowler Saint James's University Hospital, UK; Jadwiga Wedzicha, Royal Free and University College Medical School, UK; Christopher Cates, Saint George's Hospital, UK; Emma Welsh, Saint George's Hospital, UK; Christopher Wong, University of Oxford, UK; Lindsay Stead, University of Oxford, UK; Monaz Mehta, University of Oxford, UK; Nicola Lindson-Hawley, University of Oxford, UK; Brian Rowe, University of Alberta, Canada; Kourosh Sayemhiri, Fatemeh Sayemhiri and Milad Nazarzadeh, Ilam University of Medical Sciences, Ilam, Iran; Abel Wakai and Grianne McCabe, Royal College of Surgeons in Ireland, Ireland; Ronan O'Sullivan, Cork University Hospital, Our Lady's Children's Hospital, Ireland

Research Achievements

JOEP VAN AGTEREN

Working towards a tobacco free world by 2040

As a winner of THRF's 50th Anniversary Award, BHI researcher Joseph (Joep) van Agteren is hoping to give the community the power to fight for a healthier society, one mobile app at a time.

Teaming with Adelaide-based entrepreneur, James Stewart, Joep's 50th Awards grant will support Kick.it, a start-up Social Enterprise working on building a mobile application to help people stop smoking and get healthy together.

Kick.it has teamed up with Joep at the BHI to run focus groups and scientific trials and together they are very excited about being a winner in THRF's 50th Anniversary Awards.

Joep arrived in Adelaide from the Netherlands in May 2015 and joined the BHI to work in the field of respiratory medicine. He says that winning one of the THRF awards will help the team create the app in the way they envision it, without having to cut on essential elements or resources.

In his application, Joep discussed how smoking is the biggest cause of preventable illness and deaths worldwide.

"While most smokers are aware of the negative consequences, attempts to quit often fail. Encouragement of family and friends is very important, and the lack of a supportive environment makes it really difficult for smokers to kick the habit on their own," Joep said.

"We intend to change this forever by creating the first social network that is designed to help people stop smoking.

"This project is working with health professionals, current and ex-smokers, as well as researchers like me. Our research is at the forefront of clinical innovation and multi-disciplinary collaboration.

Joep van Agteren (right) with James Stewart, after receiving his THRF 50th Anniversary Award.

"All aspects of the application are deeply rooted in scientific evidence and as it will be freely accessible, it has the ability to influence the lives of millions of people."

Looking at the long term impact of this project, Joep says that research has shown that an eight per cent reduction in the prevalence of tobacco smoking in Australia would result in a reduction of 158,000 cases of disease, 5,000 deaths and 2.2 million lost working days, saving the health sector over $490 million.

To help get Kick.it to get to the app store faster, Joep was successful in asking for the votes of the community.

"Give your friends, your family and the community, the power to kick the habit. We want to shape the healthy society of the future," he said during the public voting phase of the THRF Awards.

Rheumatology Research Group

TQEH DEPARTMENT **RHEUMATOLOGY UNIT**

Rheumatological diseases affect a large sector of the population and lead to chronic pain, disability, reduced quality of life, and in many cases, shortened life span. The monetary costs are huge with respect to lost earnings, as well as direct health care costs. The Rheumatology Department strives to augment its clinical rheumatology services with research programs into the epidemiology, causation and complications of rheumatic diseases ("bedside to bench"), coupled with the evaluation of new generations of pharmaceutical agents for the treatment of arthritis (bench to bedside). These rheumatic diseases include Sjögren's syndrome, giant cell arteritis, polymyalgia rheumatica, osteoarthritis, scleroderma, rheumatoid arthritis, ankylosing spondylitis, gout and fibromyalgia.

Associate Professor Rischmueller leads one of the three largest rheumatology clinical trial units in Australia, and is a principal investigator on clinical trials for patients with a wide range of rheumatological diseases, including rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis, gout, scleroderma and osteoarthritis.

Key Findings in 2015

- Professor Catherine Hill and Dr Tiffany Gill, NHMRC Postdoctoral Fellow, published on the burden of low health literacy in people with musculoskeletal disorders and the relationship between fat mass and foot pain. This follows on from previous studies and publication in Lancet which identified musculoskeletal diseases one of the three most important diseases in terms of global disease burden.
- Advanced Trainee Dr Kimberley Ting's study on the prevalence of gout has been accepted for publication. This is the first such study in an Australian population.
- Professor Hill previously led NHMRC funded study, a multicentre RCT into the effects of fish oil supplementation on symptoms and structural progression over two years in knee, was published this year in the highest ranking Rheumatology journal, and was the subject of an accompanying editorial. Subsequent collaborations have resulted in three current NHMRC-funded multicentre Osteoarthritis trials into the role of statins, zolendronic acid, and Krill oil in knee Osteoarthritis.
- Dr Ting, Dr Whittle and A/Prof Hill published an important review demonstrating that a number of key study design principles are poorly reported in experimental animal research investigating potential treatments in rheumatology. This paper was also the subject of an accompanying editorial.
- The South Australian Giant Cell Arteritis (GCA) Registry established by Professor Hill has enabled publication of the first epidemiological investigation of GCA in Australia. 2015 publications include the relationship between temporal artery biopsy histology and clinical features.

Outcomes for the Community

Our research on rheumatic diseases has the potential to lead to improved disease management and patient care during hospital admission and outpatient visits and to improved quality of life for patients.

GROUP MEMBERS

Research Leaders:
Catherine Hill, Maureen Rischmueller

Consultant Rheumatologists:
Samuel Whittle, Simon Burnet, Fin Cai

Advanced Trainee:
Kimberley Ting

Chief Medical Scientist:
Sue Lester

Postgraduate Student:
Rachel Black

Research/Clinical Trial Assistant:
Mariea Bosco

Clinical Research Administrator:
Sarah Downie-Doyle

Clinical Trials Coordinator:
Carlee Schultz

Clinical Trials Nurse:
Aimee Cayzer, Sara White

Clinical Trial Assistant:
Janelle Marrett

Research Assistant:
Melissa Bubicich

BHI Collaborators:
Tiffany Gill, Discipline of Medicine, TQEH

External Collaborators:
Elizabeth Hoon, University of Adelaide

See also Rheumatology Research Group activity in the Inflammatory Disease Theme, page 68

the hospital research foundation

An Unexpected Journey of Inflammatory Disease

Sue's Story

Loving wife and piano teacher Susan (Sue) Beard has for the past three years been on a journey she didn't expect, after she was diagnosed with Giant Cell Arteritis (GCA) in November 2012.

GCA is an inflammatory disease of blood vessels most commonly involving large and medium arteries of the head, predominantly the branches of the external carotid artery (the major artery of the head and neck).

For Sue and her supportive husband Kent, GCA was a condition they knew nothing about upon diagnosis and one that had a large impact on their lives.

"Probably the most difficult part of this illness is that I haven't been able to continue with a number of my music students – it's like a small part of you dies," Sue said.

In August of 2012 Sue started to experience bad head and neck aches as well as increased tiredness and day and night sweats.

"I'm not a headache person, so I did think it was a bit unusual, but I didn't present to the doctor for a couple of months," she said.

"I was then admitted to Wakefield Hospital in November 2012. I went in on no medications – I came out on a pile of stuff!

Prescribed prednisolone, a steroid medication, Sue was unaware of the myriad of side effects this drug would give her. She has since battled with agitation, fogginess, muscle dystrophy, dryness of skin and overall tiredness.

"The prednisolone caused me to lose bone density – I'd lost six percent by March after my diagnosis. It also made my cataracts grow to the point that I couldn't see – I had to teach my students by ear before I had eye surgery," she said.

"Your world does become a bit smaller on this treatment. There is a bit of frustration that this drug makes you look quite well – when you are really not feeling that way."

Fortunately, Sue was referred to Professor Catherine Hill, a consultant rheumatologist at The Queen Elizabeth Hospital (TQEH) who wants to change the patient experience for those living with an inflammatory

disease and being treated with steroids over a long period of time.

"Up to 85 per cent of patients using steroids as a long term treatment will experience side effects and the dilemma for many of these people is that they are unable to stop using steroids because their symptoms cannot be controlled without them," Professor Hill said.

"Some side effects are easy for doctors to measure, such as blood pressure and blood sugar. However others, such as a change in body shape or mood swings, are much more difficult.

"We want to prioritise the patient experience and hope to inform the development of specific and accurate measurements of steroid side effects, which may change treatment methods."

Sue has had five relapses since being diagnosed with GCA and both she and her husband Kent are very thankful for the support of Professor Hill and her team at TQEH.

"The team at TQEH have been wonderful. I see Catherine monthly, or sometimes every second month, but she is always there when I need her," Sue said.

Sue also spent a year on tocilizumab, a drug currently in clinical trials in the United States and Europe.

"I was happy to do it in the hope that it might help me get off some of the prednisolone but also to help people experiencing a similar journey," Sue said.

For Sue, it's been the support of her husband Kent that has helped her through her GCA journey and just recently she made her first public piano performance since being diagnosed.

"I have a really wonderful husband! He has been with me right from the start of this journey, every step of the way."

Surgical Science Research Group

UNIVERSITY OF ADELAIDE **DISCIPLINE OF SURGERY** / TQEH

The Surgical Science Research Group has a number of projects underway:

Laparoscopic Simulation Skills Program: this project is investigating the efficacy and feasibility of a simulated laparoscopic skills course delivered in a Mobile Simulation Unit to junior doctors and surgical trainees at rural and metropolitan hospitals. Six South Australian and Victorian hospitals were visited in 2015. A further nine sites will be visited, and data analysed in 2016.

Surgery and Climate Change: An investigation of the interrelationship between the practice of surgery and climate change, first through a study of diseases and injuries that are climate change related, and second, through an examination of the carbon footprint of surgery: JW Smith and G Maddern The Influence of Climate Change on the Practice of Surgery (Mellen Press, Lewiston, 2015).

GROUP MEMBERS

Research Leaders:
Guy Maddern

Postgraduate Students:
Hannah Gostlow, Joseph Smith, Mau Wee, Kean Kuan

BHI Collaborators:
Peter Hewett, Surgery, TQEH; PJ Wormald, ENT, Surgery, TQEH

External Collaborators:
ASERNIP-S, Research, Audit & Academic Surgery Division, Royal Australasian College of Surgeons; Ashley Dennison and Wen Chung, University Hospital of Leicester, UK; Stephen Moratti, Department of Chemistry, Otago University, New Zealand

BHI PhD students Hilary Dorward and Jason Gummow practice on the laparoscopic surgical simulators, while volunteering at Science Alive! 2015.

Factors influencing transplant surgery: ex-vivo porcine pancreas normothermic perfusion preservation: A model of normothermic hemo-perfusion of the porcine pancreas with/without addition of the kidney as a dialysis organ was established. Four pancreases were harvested and perfused for 120 minutes with autologous whole blood at body temperature, two with parallel perfusion of the kidney and two without. The organs maintained a steady flow rate and perfusion pressure. Gross appearance of organ was stable but appears grossly ischaemic towards end of perfusion period. Histology demonstrated necrosis centred in acinar tissue but islet cells were preserved. pH was significantly alkalotic towards the end of the perfusion, likely due to pancreatic tissue damage. Addition of the kidney did not result in significant improvement of the acid-base environment in this small series.

Prevention of adhesion formation by Chitosan-Dextran (CD) in the pig model: Adhesion prevention properties of Chitosan Dextran (CD) gel were studied in a two-step model. Twelve pigs underwent a laparotomy, caecal resection, bowel abrasion and peritonectomy with six receiving the CD gel (treatment group) and six receiving saline (control group) respectively. They subsequently underwent laparoscopic adhesiolysis and intraperitoneal hernia mesh repair six weeks later, again receiving CD gel and saline respectively. The treatment group demonstrated reduced intraperitoneal adhesions during both stages. The CD gel may be effective in preventing adhesions in intraperitoneal mesh hernia repairs.

Outcomes for the Community

Chitosan

Current biosurgical solutions for abdominopelvic adhesion formation are suboptimal and thus the need for a more effective product remains, unfortunately no currently available method of treating and preventing adhesions is completely successful, particularly for blocking the mechanism of adhesion formation. As no agent has been shown to consistently block adhesion formation, there remains a need for a mouldable, robust and easy to use product that would be essentially 100% effective in all types of surgery. Therefore this study aims to identify whether ChitosanDextran gel will address this need, improving patients's quality of life, surgical outcomes, and reduce surgical and healthcare costs.

Ex-vivo pancreas

This study aims to develop an *ex-vivo* porcine pancreas normothermic perfusion system using a similar model. We hypothesise that normothermic perfusion of the pancreas will reduce ischaemic/reperfusion injury when compared to other methods of organ preservation. This will result in better organ preservation, improved islet isolation yield, and graft function after transplantation, which may lead to significant improvements in treatment of insulin-dependent diabetes and pancreas organ transplant outcomes.

Professor Basil S Hetzel, AC, with his wife Anne, after accepting an honorary doctorate from the University of Adelaide, 2015.

DRUG AND VACCINE DEVELOPMENT

Research Groups

Therapeutics Research Centre

Virology Laboratory

Therapeutics Research Centre

UNIVERSITY OF SOUTH AUSTRALIA **THERAPEUTICS RESEARCH CENTRE** / TQEH

The Centre's research interests cover a spectrum of therapeutics from the chemistry of drugs, the effects drugs have on the body and the effects the body has on drugs, through to how drugs can be best used to treat disease. Current special interests include defining drug disposition and effects by *in vitro* and *in vivo* by chemical analysis using chromatography and mass spectrometry as well as bio-imaging using confocal and multi-photon reflectance and fluorescence microscopy.

Key findings in 2015

- Published on the disposition and response in patients after various poisonings by drugs and different pesticides.
- We have established the ultimate dosing regimen (several publications) on the better use of antibiotics for the treatment of susceptible patients.
- We have published a number of papers on the impact of drug delivery systems in determining patient response.
- We have published a number of papers using real-time non-invasive imaging to understand the disposition of drugs and nanoparticles in the body.
- Working with clinicians from the RAH we have examined strategies to de-prescribe drugs and improve patient drug use.

Outcomes for the community

The Therapeutics Research Centre is working to improve patient outcomes by improved diagnosis and treatment with medicines. In particular:

- We have learnt how to better manage the overdosing and poisoning for patients in conjunction with the poison centres throughout Australia.
- We now understand how to better use antibiotics for the treatment of susceptible patients for the treatment of cancers and sepsis.
- We better understand the impact of drug delivery systems in determining patient response.
- Allayed community fears on adverse effects of nanoparticles on exposure during "in-use" conditions.
- We have helped patients to be taken off unnecessary drugs.

GROUP MEMBERS

Research Leader:
Michael Roberts

Postdoctoral Researchers:
Lorraine Mackenzie, Amy Holmes, Hauke Studier, Qian Zhang, Rina Kuswahyuning

Postgraduate Students:
Ana Macedo, Michael Pastore, Mahipal Sinnollareddy, Rachada To-a-nan, Fekade Sime

Honours Student:
Dalitso Mbewe

Virology Laboratory

UNIVERSITY OF ADELAIDE **DISCIPLINE OF SURGERY** / TQEH

The Virology Laboratory aims to develop novel vaccine strategies for hepatitis C virus (HCV) and human immunodeficiency virus (HIV).

The Virology laboratory has developed two novel vaccine delivery platforms 1) a cytolytic DNA vaccine platform and 2) a recombinant human rhinovirus (rHRV). These platforms are designed to elicit systemic immunity to HCV and systemic and mucosal immunity to HIV, respectively.

1) HCV vaccine development

The DNA vaccine platform is designed to result in necrosis of vaccine-targeted cells, a process which leads to an increase in inflammation and cross presentation of the encoded immunogen, resulting in increased immunogenicity and protection against challenge. At this stage, most studies have focussed on HCV, although one study examined the immunogenicity of the HIV gag protein. This platform has been patented and the patent is held by Adelaide Research and Innovation (ARI), the commercial arm of the University of Adelaide.

2) HIV vaccine development

We also developed a novel DNA vaccine which generates oligomers of the HIV Tat protein, which is essential for HIV replication and pathogenesis. Vaccination with this vaccine resulted in high titres of anti-Tat antibodies which neutralised Tat protein in a transactivation assay and protected mice against challenge with a chimeric HIV, EcoHIV.

The rHRV vaccine platform was developed to generate mucosal immunity to HIV. This vaccine is delivered via the intranasal route and as a result, generates pan-mucosal immunity, including immunity in the vaginal mucosa. Since 80% of HIV infections are transmitted across mucosal surfaces, this vaccine has the potential to protect against HIV infection in a majority of individuals at risk.

Key Findings in 2015

The strategy to generate the rHRV as a vaccine delivery vector was published early in the year, and recent studies have shown that this vaccine generates protective immunity against EcoHIV. In addition, the oligomeric Tat DNA vaccine was also shown to elicit protective immunity against EcoHIV.

The mechanism behind the increased immunogenicity of the cytolytic DNA vaccine platform was shown to result from the induction of necrosis in vaccine targeted cells, and the increased immunogenicity was shown to extend to multiple proteins encoded by the vaccine. Few if any other DNA vaccines encode multiple antigens, despite the fact that immune responses to several viral antigens are often required to generate protective immunity.

Outcomes for the community

Vaccine research is highly translational and although the work is still at the stage of preclinical studies, future grant applications are planned to address the urgent need to test these novel vaccines in human clinical trials.

GROUP MEMBERS

Research Leader:
Eric Gowans

Research Fellows:
Branka Grubor-Bauk, Judy Li, Danushka Wijesundara

Postgraduate Students:
Jason Gummow, Khamis Tomusange, Makutiro Masavuli, Zelalem Mekonnen, Harshwardhan Jagdale

Visiting Intern:
Sytze Jorritsma

INFLAMMATORY DISEASE

Research Groups

ENT Surgery

Rheumatology Research Group

Zinc and Inflammatory Disease Research Group

ENT Surgery

UNIVERSITY OF ADELAIDE **DISCIPLINE OF SURGERY** / ENT / TQEH

The Department of Otolaryngology Head and Neck Surgery research focus is on the cause and treatment of Chronic Rhinosinusitis (CRS). CRS is a common chronic disease affecting 1.8 million Australians with morbidity comparable to asthma, diabetes, cardiovascular disease and back pain. It is an extremely heterogeneous condition of largely unknown aetiology. Clinicians and scientists from our department are involved in cutting edge research exploring many of the proposed inciting causes. These include basic science studies investigating perturbations in the local microbiome of patients with this condition and characterisation of the immune changes in these patients. We also study resistant bacterial infections such as biofilms, intramucosal and intraosseous colonies and small colony variants, abnormalities of the mucosal barrier function, and abnormal inflammatory responses.

Dr Alkis Psaltis is the lead investigator on an international collaborative study evaluating geographical differences in the microbiome and antibiotic resistance patterns in health and disease in patients with Chronic Rhinosinusitis. Institutions involved include Stanford University, Harvard University, The Medical University of South Carolina and McGill University in North America as well as centers from India, China, South America, Europe and New Zealand. This world first study has already completed sample collection and is in the analysis phase. It is hoped that it will further our understanding of the role of commensal and pathogenic bacteria in CRS and possibly lead to novel probiotic treatments.

Through collaboration with industry, our department is also involved in safety and efficacy trials evaluating the use of Carrageenans in the prevention and treatment of viral and bacterial infection preceding the development of chronic rhinosinusitis. Carageenans belong to a family of linear sulphated polysaccharides that are extracted from red edible seaweeds. These substances have been shown to prevent viral adhesion and replication, an exciting step thought to be important in the development of CRS.

Key Findings in 2015

We have discovered several new treatments that are effective to fight infections with resistant superbugs. These are in different stages of development. Experiments are ongoing to study safety and efficacy *in vitro* and *in vivo*. 4 human clinical trials are scheduled to occur in 2016 assessing their potential to treat CRS.

We have discovered key mechanisms in which bacterial products affect the host mucosal structure and innate immune function. Experiments are ongoing to determine molecular mechanisms of action so that targeted therapies can be developed.

Outcomes for the community

ENT research is translational, aimed at discovering new and improved treatment strategies for CRS. CRS is one of the most frequently reported health conditions in Australia, comparable to asthma, placing a heavy economic burden on society. Consequently, new insights into CRS pathogenesis and the discovery of improved treatment strategies can have great impact not only on the individual wellbeing of the patient concerned, but also on the health system and society at large.

GROUP MEMBERS

Research Leader:
Peter-John Wormald

Clinical Researchers:
Alkis Psaltis, Guy Rees, Steve Floreani Joh Ling, Suresh Rajapaksa, Hashita Pant, David Close, Kien Ha

ENT Registrar:
Josh Jervis-Bardy

Rhinology Fellow:
Yi Chen Zhao

Clinical Nurse Operating Theatres:
S Hughes

Chief Scientist:
Sarah Vreugde

ENT Research Assistants:
Clare Cooksley, Amanda Drilling, Mahnaz Ramezanpour, Jonathon McGuane, Sophia Moraitis

Postgraduate Students:
Ahmed Bassiouni, Thanh Ha, Amanda Drilling, Judy Ou, Dijana Miljkovic, Katharina Richter, Chung Chan, Jae Murphy, Mian Li Ooi, Sakiko Oue, Ho Yin Lau

Honours Student:
Aaron Rayan

BHI Collaborators:
Andreas Evdokiou and Mark DeNichilo, Breast Cancer Research; Peter Zalewski, Discipline of Medicine, TQEH; Guy Maddern and Ehud Hauben, Discipline of Surgery, TQEH; Maureen Rischmueller and Sue Lester, Rheumatology Unit, TQEH

External Collaborators:
Clive Prestidge and Benjamin Thierry, Department of Nanomedicine, University of South Australia; Jim Mitchell and Peter Speck, Department of Microbiology, Flinders University; Stephen Kidd, Department of Microbiology University of Adelaide; Peter Hwang and M Costa, Department of ENT, Stanford University Medical School; Steve Moratti, Lyal Hanton and Brian Robinson, Otago University, Chemistry Department, New Zealand; Richard Douglas, Department of ENT Gillies Hospital, Auckland, New Zealand; Wytske Fokkens, Department of ENT, Academic Medical Centre, Amsterdam, The Netherlands; Rodney Schlosser Medical University of South Carolina; Sarah Wise, Emory University Atlanta; Satish Govindara Mt Sinai New York; B Woodworth, University of Alabama; I Witterick, University of Toronto; R Kern, Northwestern University, Chicago

Research Achievements

KATHARINA RICHTER

Research to treat Chronic Rhinosinusitis

German born and educated with research and work experience stints in New Zealand, Switzerland and Denmark, Katharina Richter is now hoping to change the lives of those suffering from chronic rhinosinusitis (CRS) through her PhD at the BHI.

With an interest in drug targeting and drug delivery, Katharina is undertaking research to develop new ways to treat biofilms, a thin and usually resistant layer of microorganisms (bacteria) that form on and coat various surfaces.

CRS is a persistent inflammation of the mucosa of the sinuses that lasts for over 12 weeks. Katharina explained that it is seen in people of all ages, from small children to the elderly.

"Officially, it affects around 10 per cent of the Australian population, but I believe this number is probably a lot higher," she said.

"CRS patients suffer for example from a constant blocked nose, headaches and can have difficulty breathing, smelling and tasting."

By examining the biofilms that form on the sinuses, Katharina is looking closely at the bacteria that live inside them.

"To treat an illness effectively you first have to work out the cause – with CRS, this is bacterial biofilms," she said.

"Bacteria hiding in the biofilms are often antibiotic-resistant, so I'm now looking at new ways to fight the bacteria.

"Specifically, I'm investigating two compounds that have indicated they may help kill the bacteria by a mechanism not shared by antibiotics.

"We now want to put these two compounds inside a gel that is already frequently used in the clinic after sinus surgery. This improves the healing process and could further help by killing the bacteria," Katharina said.

With a vibrant personality and a passion for making science entertaining, Katharina won the best presentation at TQEH Research Day in the junior PhD category in October 2014.

Katharina is excited about the possibility of developing a novel treatment strategy that will benefit the millions of Australians suffering from Chronic Rhinosinusitis.

> "When the research I'm doing in the lab can be translated for future use in the clinic to the benefit of patients – that's really amazing."

She also has a passion for exploring the world and ensuring her research is internationally collaborative.

In May 2015, supported by a THRF grant, Katharina undertook a research visit to the world's number 1 biofilm institute, the Costerton Biofilm Centre in Copenhagen, Denmark.

Due to complete her PhD in one more year, Katharina is very grateful for the support of the generous donors supporting THRF.

"My research would not be possible without support from THRF and I'm excited about the possibility of developing a novel treatment strategy that will really benefit the millions of Australians suffering from CRS."

Rheumatology Research Group

TQEH DEPARTMENT **RHEUMATOLOGY UNIT**

The group continues to develop and maintain a number of sample repositories to facilitate research into a range of chronic inflammatory diseases. Repositories include:

- The South Australian Sjögren's syndrome and other autoimmune disease sample repository and database
- The South Australian Giant Cell Arteritis sample repository and database
- The North West Adelaide Health Study DNA repository
- The Australian Scleroderma Interest Group (ASIG) national sample repository

The group has a number of significant collaborations:

- A/Prof Maureen Rischmueller and Sue Lester are part of the international SGENE consortium, genome which published the first genome-wide association study for this disease in Nature Genetics in 2013. Recruitment is currently on-going for a second genome wide association study to further refine these associations. Recent papers from this collaboration include the identification of a shared autoimmune disease IRF5-TNPO3 genetic susceptibility region and the identification of trisomy X as a risk factor for Sjögren's syndrome.
- Prof Hill has an NHMRC funded collaboration with A/Prof Alex Hewitt from the Centre for Eye Research Australia (CERA) for a genome wide association study for Giant Cell Arteritis. Patient recruitment and DNA were completed in 2015 and the project is now entering the genotyping phase.
- Prof Hill, A/Prof Rischmueller and Sue Lester are part of the Arthritis Genomics Recruitment Initiative in Australasia (AGRIA), which aims to collect DNA from Ankylosing Spondylitis, gout, Giant Cell Arteritis and Sögren's syndrome patients throughout Australasia. A paper from this collaboration, reporting an association between gout and variants of the apolipoprotein gene cluster, has recently been accepted for publication, and Sue Lester has just submitted a paper confirming the association between PTPN22, a shared autoimmune susceptibility gene and Giant Cell Arteritis.
- A/Prof Maureen Rischmueller is collaborating with Dr Fabien Vincent and Prof Fabienne Mackay from Monash University, focussing on the role of B cell activating factor of the tumour necrosis factor (TNF) family (BAFF) and the innate immune system in the pathogenesis of the Sjögren's syndrome, Systemic Lupus Erythematosus and Rheumatoid Arthritis.
- Dr Sam Whittle has formed a collaboration with Daniel Worthley on a NHMRC and NIH R01 funded translational project entitled "Adult Osteochondroreticular Stem Cells for Osteoarthritis". Other collaborators include Prof David Hunter and Prof Christopher Little (University of Sydney), Prof Stan Gronthos, & A/Prof Siddhartha Mukherjee (Columbia University).

The group also provides research training opportunities for undergraduates, advanced trainees and higher degree students.

GROUP MEMBERS

Research Leaders:
Catherine Hill, Maureen Rischmueller

Consultant Rheumatologists:
Samuel Whittle, Simon Burnet, Fin Cai

Chief Medical Scientist:
Sue Lester

Postgraduate Students:
Aden Lau, Karen Patterson, Tawa Al Rasheed

Undergraduate Students/Trainees:
Suman Murthy, Leanne Nguyen

BHI Collaborators:
Sarah Vreugde, ENT

External Collaborations:
International SGENE consortium; Alex Hewitt, Centre for Eye Research Australia; Arthritis Genomics Recruitment Initiative in Australasia (AGRIA); Fabien Vincent and Fabienne Mackay, Monash University, Dan Worthley, University of Adelaide; David Hunter and Christopher Little, University of Sydney; Stan Gronthos, University of Adelaide; Siddhartha Mukherjee, Columbia University

See also Rheumatology Research Group activity in the Clinical Sciences, Health Services & Population Health Theme, page 57

Zinc and Inflammatory Disease Research Group

UNIVERSITY OF ADELAIDE **DISCIPLINE OF MEDICINE** / TQEH

This group's major research interest concerns the mechanisms by which zinc is anti-apoptotic and anti-inflammatory. This has largely been done in the context of chronic inflammatory diseases of the lung (asthma and Chronic Obstructive Pulmenary Disease (COPD), in collaboration with Professor Sandra Hodge and Dr Eugene Roscioli, Lung Research Group, RAH). Sandra Hodge is internationally recognized for her work on translational COPD research. Dr Roscioli recently completed his PhD at the BHI.

COPD is a predominantly cigarette-smoke related, chronic inflammatory airways disease that affects one in 13 Australians aged 40 or over, is incurable and a leading cause of death. Both Sandra Hodge and Peter Zalewski have had long-term interests in the role of aberrant cell death mechanisms in the pathogenesis of lung inflammatory disease. Forerunner studies over the last decade from the Hodge group have shown that both increased rates of lung epithelial cell apoptosis and decreased clearance of dying epithelial cells by lung macrophages conspire to create a pro-inflammatory condition in the lung which fuels the chronic inflammation in COPD. Initial NHMRC funding to Zalewski and Hodge (2010-2012) led to the finding of a disturbance of zinc homeostatic mechanisms in lung macrophages exposed *in vitro* or *in vivo* to cigarette smoke extracts as well as significantly low bronchoalveolar lung fluid zinc levels in COPD patients who were current smokers, compared to COPD ex-smokers or healthy controls. The mechanisms which underlie the aberrant cell death in COPD are yet to be determined. A new clue is the process of autophagy, a normal cell response to cell stress conditions which allows cells to replace damaged organelles, but which becomes overactive and harmful in COPD leading to cell death.

We are now investigating the association of increased autophagy with COPD and smoking and will evaluate novel therapies that can reduce autophagy, including zinc-related drugs. Successful completion of the project will indicate novel therapeutic approaches for the treatment of this devastating disease, and has clear translational potential with great importance to human health.

Key findings in 2015

We are the first group to have shown disturbances of lung zinc homeostatic mechanisms to be a critical factor in both asthma and emphysema. Cigarette smoke, which causes and exacerbates lung inflammatory disease, resulted in a 2.5-fold decline in zinc levels in the lung bronchioles. This, in turn, caused the bronchial epithelial cells and lung macrophages to undergo excessive autophagy, a process which normally helps our cells to repair damage but which, in excess, leads to cell death and inflammation. Zinc supplements, *in vitro*, protected lung cells against this cigarette smoke toxicity.

Outcomes for the community

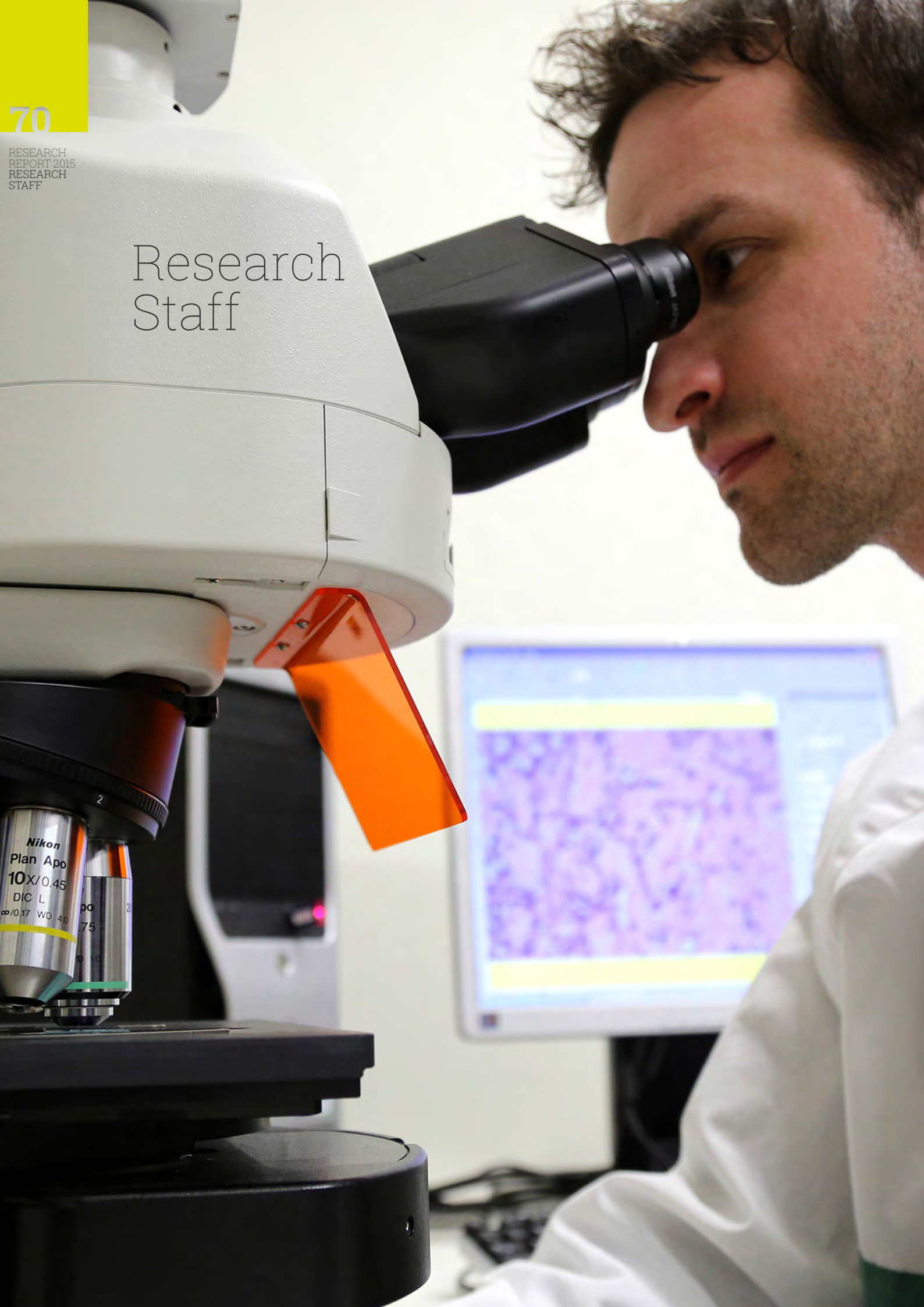
Our studies have allowed us to obtain the first measures of how much zinc is present in the fluids of our lungs. Low levels of lung zinc were found in patients with asthma and emphysema, especially in current smokers. More normal levels of zinc were found in emphysema patients who had given up smoking. This adds to other evidence that cessation of smoking can benefit patients with already established lung disease. We are now investigating novel therapies (including zinc-based strategies) that can reduce autophagy in diseased lungs.

GROUP MEMBERS

Research Leader:
Peter Zalewski

External Collaborators:
Eugene Roscioli, Sandra Hodge

Research Staff



Research Staff

AGED AND EXTENDED CARE SERVICES

Professor in Geriatric Medicine & Clinical Director

R Visvanathan PhD GradCertEd (Higher Ed.) FRACP FANZSGM MBBS ATCL

Clinical Associate Professor in Geriatric Medicine & Deputy Director

S Yu PhD FRACP MBBS LTCL (Deputy Director)

Clinical Senior Lecturers & Consultant Geriatricians or Physicians

J Ng FRACP MBBS (Head of General Medicine)

K Tham Dip PalMed FRACP MBBS

F Cai FRACP MBBS

P Shibu FRACP MD CCT UK MRCP MBBS

S Nair MPhil FRACP MBBS MRCP Fellowship Geriatric Medicine (Malaysia)

K Parasivam FRACP MBBS

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GTRAC Centre Academic (Psychologist): N Mahajan PhD MPsych MAPsychol BA

GTRAC Nurse Practitioner: D Preston

Research Nurse: C Smyth

Postdoctoral Fellow

J Dollard PhD, Grad Cert Public Health, BA (Honours in Pyschology)

Specialist Registrars in Geriatric Medicine

M Kee MBBS- Anemia in The Elderly

K Khow MBBS- Hip Fracture in the Elderly

T Woo MBBS- Sarcopenia and Quality of Life

S Nawi MBBS- Screening for Sarcopenia

DEPARTMENT OF ANAESTHESIA

Consultant Anaesthetists

A Rajbhoj FANZCA

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R Watts FRACGP

Anaesthetic Registrars/RMOs

GWN Arenas

W Curtis

P Markman

T Tran

CARDIOLOGY UNIT

Professor

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Senior Scientists

B Sallustio

Y Chirkov PhD

DT Ngo PhD

TH Nguyen PhD

AL Sverdlov PhD

Scientist

S Liu PhD

Laboratory Manager

I Stafford

Research Assistants

T Heresztyn

Trial Coordinators

M Black RN

J Stansborough RN

C Anderson-Stanford RN

J Rose RN

G Dymmott RN

E Jansen RN

J McIntyre RN

Administrative Staff

P Pachen

B Phillippo

D McCracken

ENDOCRINOLOGY UNIT

Head of Unit

D Jesudason MBBS, FRACP, PhD

Endocrinologists

N Laddipeerla MBBS, FRACP (Endo)

K Campbell MBBS, FRACP

L Gagliardi MBBS, FRACP, PhD

Senior Registrar

S de Sousa MBBS, FRACP

Registrar

T de Silva MBBS, FRACP

Scientists

J Wang BSc PhD MPH

C Seaborn BSc

E Robinson BSc

T4DM Clinical Trial staff

R Cox CN BN MN

Diabetes Centre Nurses

T Willson RN BNg (Hons) Grad Cert Health (Diab Man and Ed) CDE

M Hodgson RN RM BMid Grad Cert (Diab Ed)

D Barrow RN Grad Cert (Diab Ed)

C Nitschke RN RM Grad Cert (Diab Man & Ed)

M Kinasz RN B app sci (Food Science and Nutrition) Cert (Diab Man & Ed)

R Wilson RN

Dietitians

C Stanton BSc DipEd MND

C Roberts BSc MND

Administration

C Bouthémy (Dip.Hlth.Sc)

S Kour

V Watson

J Cocks

DEPARTMENTS OF HAEMATOLOGY AND MEDICAL ONCOLOGY

Head of Haematology and Oncology Unit/Clinical Research Program

TJ Price MBBS FRACP DHSc

Senior Haematologist

J X Gray, PhD, MD, FRACP, FRCPA

Chief Medical Scientist, SAHMRI Colorectal Cancer Node

JP Young MSc Grad Dip Biotech PhD

Principal Medical Scientist, Group Head Molecular Oncology Research

JE Hardingham BSc (Hons) PhD

Clinical Research Staff

AR Townsend MBBS FRACP (Translational Clinical Leader)

V Broadbridge MBBS FRACP

D Patel MBBS

L Lo MBBS

Grant Funded Scientists

J Wrin BSc

H Dorward BSc (Hons)

BREAST BIOLOGY AND CANCER UNIT

THRF Associate Professor in Breast Cancer Research Fellow; NBCF Research Fellow, and Research Leader

W Ingman PhD

Senior Research Officer

D Glynn PhD

Australian Breast Cancer Research Postdoctoral Fellow

P Dasari PhD

The Hospital Research Foundation Postdoctoral Fellow

E Need PhD

Research Assistant

L Hodson BSc(Hons)

Research Nurse

K Mildren RN

INTENSIVE CARE UNIT

Director

MS O'Fathartaigh MB Bch BAO FFARCS (Ire.) FFICANZCA

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SL Peake BM BS BSc(Hons) FJFICM PhD

JL Moran MB BS FANZCA FRACP FJFICM MD

S Moodie MB CHB FJFICM

K Lee MBBS MBus FACEM FJICM

S Jacobs MBChB FRCA FANZCA

D Clayton BSc MBBS FRCA FANZCA FCICM

J Raj MBBS MS

Research Coordinator

P Williams RN BN IntC

Research Project Officer

C Kurenda

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Michell Professor of Medicine

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Professorial Staff

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JD Horowitz MBBS PhD FRACP

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C Zeitz MBBS PhD FRACP

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I Ranasinghe MBChB

T Gill BAppSc(Physio) MAppSc(Physio) CertHlthEc PGradDip(Hlth Sc) MBA PGradDip (Biostats) PhD

C Lang BSc PhD

Postdoctoral Researchers

S Appleton BSc (Hons) PhD

K Rajopadhyaya BSc (Hons) PhD

Clinical Data Project Manager

R Tavella BSc(Hons) PhD

NEUROLOGY UNIT

Head of Neurology, Central Adelaide Local Health Network (CALHN) / Clinical Associate Professor

J Jannes BMBS FRACP PhD

Senior Visiting Neurologist

GH Purdie MBBS FRACP (retired July 2015)

KL Boundy MBBS FRACP

Senior Consultant Neurologist

MK Robinson MBBS FRACP

Professor of Neurology and Neuroscience / Clinical Academic Neurologist / Director of Stroke Research Programme (SRP)

SA Koblar BMBS FRACP PhD

Chief Clinical Neuropsychologist

AC Kneebone BA Dip App Psych MA PhD FAPS

Consultant Neurologist

C Short BSc MBBS FRACP

A Tan BMBS FRACP

J Hafner BMBS FRACP

R Ghaoui BMBS FRACP

Affiliate Associate Professor / Principal Medical Scientist / Co-Director of SRP

MA Hamilton-Bruce BSc MSc MBA PhD AFCHSE CBiol FRSB CSci FIBMS

Senior Medical Scientist

MB Donk BHSc

Chief EEG Technologist

J Pruszkowski Diploma in Medical Analysis

Neurology Secretary

JA Greutner Cert IV Bus Admin

Administrative Assistant (part-time)

R Richards

Memory Unit Secretary

K McKinna

Clinical Nurse Manager

KJ Webb RN BN

Epilepsy Nurse Practitioner

S Horn NP MNSc

Stroke Nurse

L Dodd RN BN

Transient Ischaemic Attack (TIA) Nurse

P Toner RN BN

S Castle RN

Clinical Research Trials

PCK Cheung RN

S Casey RN BN

Senior Medical Scientist for SRP

AG Milton BSc(Hons) Dip Comp Sci

Post-doctoral research fellows

K Kremer BBtech (Hons) PhD

X Kaidonis BSc (Biomed Sci) (Hons) PhD

DISCIPLINE OF PSYCHIATRY, UNIVERSITY OF ADELAIDE

Professor

BT Baune MD PhD FRANZCP

Clinical Academics

S Clark MBBS, PhD, BSC(Hons), FRANZCP

O Schubert MD, PhD, FRANZCP

Biostatistician

T Air BA(Hons); M.Biostatistics

RESPIRATORY MEDICINE AND CLINICAL PRACTICE UNIT

Professor

BJ Smith MBBS FRACP Dip Clin Epi PhD

Clinical Practice Unit Researchers

K Carson Cert III Lab Skills Dip Lab Med PhD

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J Van Agteren BSc MSc

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Z Usmani FRACP MBBS

A Roy FRACP MBBS

D Grosser FRACP MBBS

Advanced Trainees

V Tee MBBS

N Sulaiman MBBS

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V Coe BSc

N Elgar BSc (Hons) BTh

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F Cai MBBS FRACP

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S Downie-Doyle PhD

Clinical Trial Coordinator

C Schultz PhD

Rheumatology Infusion Nurse

L Wedding

Rheumatology Nurse

H Vanderhaak

Rheumatology Clinical Trials Nurses

A Cayzer

S White

Clinical Trial Assistant

J Marrett

Chief Medical Scientist

S Lester BSc(Hon)

Research Assistant

M Bubicich BSc(Hon)

Research/Clinical Trial Assistant

Mariea Bosco PhD

Secretary

M Devine

DISCIPLINE OF SURGERY, UNIVERSITY OF ADELAIDE

RP Jepson Professor of Surgery

G Maddern PhD MS MD FRACS FAAHMS

Senior Research Officer

E Smith PhD

Senior Medical Scientist

E Hauben PhD

Research Officer

C Kirana PhD

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C Baronian BHlthSc

A Bonnici BHlthSc

Technical Officers

M Smith

M Slawinski

B Hutchens

ENT SURGERY

Professor of Otorhinolaryngology Head & Neck Surgery and Head of Department

PJ Wormald MD FRACS, FCS(SA) FRCS(Ed)

Head of Clinical Services

A Psaltis MBBS FRACS PhD

Senior Lecturer

G Rees MBBS FRACS

Staff Specialists

S Floreani MBBS FRACS

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S Rajapaksa MBBS FRACS

H Pant MBBS FRACS

D Close MBBS FRACS

K Ha MBBS FRACS

Rhinology Fellow

Yi Chen Zhao MBBS FRACS

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J Jervis-Bardy MBBS, PhD

Chief Scientist, Otolaryngology Head & Neck Surgery

S Vreugde MD PhD

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C Cooksley BSc PhD

AJ Drilling BSc PhD

M Ramezanpour MSc PhD

J McGuane BSc PhD

S Moraitis BSc Hons

Clinical Nurse Operating Theatres

S Hughes RN

Secretary

L Martin

VIROLOGY LABORATORY

Professor

EJ Gowans MAPPSCI PhD

Research Fellows

B Grubor-Bauk BSc(Hons) PhD

J Li BSc(Hons) PhD

D Wijesundara BSc(Hons) PhD

BREAST CANCER RESEARCH UNIT

Michell-McGrath Breast Cancer Fellow & Research Leader

A Evdokiou BSc PhD

Postdoctoral Researchers

M De Nichilo PhD

I Zinonos PhD

G Kaur BSc(Hons), MSc(part time)

Research Assistant

V Panagopoulos BSc (Hons)

S Hay BSc

VASCULAR SURGERY RESEARCH GROUP

Professor

R Fitridge MBBS MS FRACS

Vascular Fellow

J Dawson MBBS ChM MD MRCS

Principal Medical Scientist

P Cowled BSc(Hons) PhD

Project Manager

M Boult BSc GIDM

Data Managers

T De Loryn MA, Dip Clin Psych

R Battersby BSc

THERAPEUTICS RESEARCH CENTRE, UNIVERSITY OF SOUTH AUSTRALIA

Professor

MS Roberts BPharm PhD DSc MBA FACP

Operations Manager

L Mackenzie BSc PhD

Postdoctoral Researchers

A Holmes BSc(Hons) PhD

H Studier BSc MSc PhD

Q Zhang BPharm PhD

R Kuswahyuning BPharm PhD

Research Students

Higher Degrees Awarded - PhD

Y Wang BSc (Engineering Student)
Synthesis of anodic alumina nanotubes for drug delivery and nanotoxicity study: Understanding of bio-nano interactions by a nanomaterial model
Supervisor: A Evdokiou (co-supervisor)
University of Adelaide PhD conferred August 2015, with Deputy Vice-Chancellor (Research) commendation

---

R Dautov MD FRACP
Effects of nitrite and nitroxyl on human vascular and platelet function
Supervisors: Horowitz JD, Chirkov Y, Rajendran S, Ngo D
University of Adelaide, PhD conferred January 2015

N Procter BSc(Hons)
Variability of nitric oxide signalling in atrial fibrillation : Potential modulation
Supervisors: Horowitz JD, Chirkov Y, Kennedy J, Ngo D
University of Adelaide, PhD conferred April 2015

S Liu MSc
Impaired tissue responsiveness to B-type natriuretic peptide in heart failure: biochemical bases
Supervisors: Horowitz JD, Ngo D, Chirkov Y, Stewart S.
University of Adelaide, PhD conferred May 2015

K Singh MBBS FRACP
Natural history and pathogenesis of Tako-Tsubo Cardiomyopathy
Supervisor: Horowitz JD
University of Adelaide, conferred Oct 2015, with Dean's Commendation for Doctoral Thesis Excellence

---

A Jaghoori BSc(Hons)
Sex-Dependent Differences in Vasomotor Responses of Older Male and Female Humans
Supervisors: Beltrame JF, Wilson D
University of Adelaide, PhD conferred July 2015

M Bosco BSc (Hons)
Investigations into the role of zinc and zinc transporters in the pathogenesis of type 2 diabetes in db/db mice
Supervisors: Coates T, Zalewski P, Drogemuller C
University of Adelaide, PhD conferred July 2015

E Leung MBBS BSc(Med) DCHFRACGP
Transient Ischaemic Attack: a primary care perspective of stroke prevention
Supervisors: Koblar S, Hamilton-Bruce A. Stocks N.
University of Adelaide, PhD conferred July 2015

K Carson
Advancing treatment options for tobacco cessation, prevention and related illnesses, with particular reference Indigenous populations
Supervisors: Smith B, Esterman A, Veale A, Peters MJ.
University of Adelaide, PhD conferred December 2015; Dean's Commendation for Doctoral Thesis Excellence

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A Drilling BBiotec (Hons)
Use of bacteriophage to treat Staphylococcus aureus sinusitis in a sheep model
Supervisors: Wormald PJ, Speck P
University of Adelaide, PhD conferred March 2015

A Bassiouni MD
Understanding the role of eosinophilic inflammatory load, fibrosis and remodeling in patients with refractory chronic rhinosinusitis (rCRS) and failure of surgical and medical treatment
Supervisors: Wormald PJ, Vreugde S
University of Adelaide, PhD conferred November 2015

FC Choy BSc(Hons)
The regulation of Npas4, a neural-specific transcription factor
Supervisors: Simon Koblar, Martin Lewis (SAHMRI)
University of Adelaide, PhD conferred December 2015

V Padhye MBBS

Management of major vessel haemorrhage in endonasal surgery

Supervisors: Wormald PJ, Vreugde S
University of Adelaide, PhD conferred July 2015

S Rajiv MBBS

The effect of chitosan dextran gel as a haemostatic and anti adhesion agent in the central nervous system and evaluation of haemostatic mechanisms in skeletal muscle tissue

Supervisors: Wormald PJ, Vreugde S
University of Adelaide, PhD conferred July 2015

FB Sime BPharm

Therapeutic drug monitoring of beta-lactam antibiotics in patients at high risk of therapeutic failure: a pharmacokinetic and pharmacodynamic investigation

Supervisors: Roberts MS, Roberts JA
University of South Australia, School of Pharmacy and Medical Sciences, PhD conferred October 2015

R Kuswahyuning BPharm

The role of formulations in skin delivery

Supervisors: Roberts MS, Roberts JA
University of South Australia, School of Pharmacy and Medical Sciences, PhD conferred May 2015

R To-a-nan BPharm MClinPharm

Variability in patient response to oral and transdermal medication

Supervisors: Roberts MS, Williams D
University of South Australia, School of Pharmacy and Medical Sciences, PhD conferred 2015

Higher Degrees Awarded - Masters

S Nair FRACP MRCP (UK) MBBS

Post-prandial Hypotension, Gait and Exercise In The Elderly

Supervisors: R Visvanathan, D Gentilcore
University of Adelaide, MPhil conferred July 2015

B Thurston MA, MSc, BMBCh, MRCS

Quantification of iliac artery calcification and its influence on outcomes following endovascular abdominal aortic aneurysm repair

Supervisors: Fitridge R, Cowled P
University of Edinburgh, MSc in Surgical Science awarded August 2015

Current Postgraduate Students - PhD

C McNally MPhil (Dent) GCHP Assoc DDH

Oral Health, General Health and Operative Risk in Hospitalised Older Patients

Supervisors: R Adams, R Visvanathan, S Liberali

A Daria Jadczak Dip Sports Science

Exercise in Older People

Supervisors: R Visvanathan, N Luscombe

A de Silva Jayatilaka BSc (Hon)

Activity Recognition for Preventing Malnutrition in Older People

Supervisors: R Visvanathan, D Ranasinghe, A Barbar

WMASB Wickramasinghe BSc (Hon)

Highly Accurate Human Activity Classifier to Mitigate the Risk of Falls in Elderly Based on Wearable RFID Technology

Supervisors: D Ranasinghe, R Visvanathan

K Sok Fun Khow MBBS

Fractures and Outcomes In Older People

Supervisors: Visvanathan R, Yu S

A Datta Gupta FAFRM

Lower Limb Spasticity

Supervisors: Visvanathan R, Koblar S, Cameron I

V Goh MBBS FRACP

Reverse genesis: does atrial fibrillation perpetuate dyshomeopathic origins?

Supervisors: Horowitz JD, Hii J

C Ajaero MBBS FMCP FRACP

Vascular "remodelling" from a physiological and biochemical point of view as a potential source of variable improvement post CRT insertion

Supervisors: Horowitz JD, Arstall M, Chan A, McGavigan A

R Shah MBBS FRACP

Assessment of progression of bicuspid aortic valve dysfunction and aortopathy: correlation with inflammatory activation and vascular endothelial function

Supervisors: Horowitz JD, Nguyen TH

C-R Chong BPharm

A pharmacological approach towards myocardial protection: new perspectives in acute and chronic cardiac disease

Supervisors: Horowitz JD, Sallustio B

V Nooney BPharm

Determinants of clinical response to platelet ADP receptor antagonists

Supervisors: Roberts M, Horowitz JD, Chirkov YY

S Surikow BSc(Hon)

The role of oxidative and nitrosative stress in the pathogenesis of Tako-Tsubo Cardiomyopathy-Tsubo Cardiomyopathy

Supervisors: Horowitz JD, Nguyen TH, Chirkov Y.

G Mahadavan MBBS FRACP

The pathophysiology and potential therapeutics of diastolic heart failure" (thesis submitted)

Supervisors: Frenneaux MP, Horowitz JD

G Ong MBChB

The natural history and treatment of Tako-Tsubo Cardiomyopathy

Supervisors: Horowitz JD, Chirkov Y

H Imam MedBiosc BPharm

Post-receptor signalling mechanisms and platelet responsiveness to ADP receptor antagonists

Supervisors: Horowitz JD, Chirkov YY

Z MD Dom BHSc(Hons)

Pharmacogenetics of renal transplantation

Supervisors: Sallustio BC, Somogyi AA, Coller JK

R Hu

Pharmacogenomics research on tacrolimus and mycophenolate mofetil among patients receiving kidney transplantation

Supervisors: Somogyi AA, Sallustio BC, Coller JK

Y Tomita MBBS FRACP MSc

Pharmacological Blocking of Aquaporin 1 to Restrict Tumour Angiogenesis and Metastasis in Pre-Clinical Models of Human Colon Cancer

Supervisors: Hardingham JE, Price TJ, Yool AJ

KZY Maung BSc (Hons)

AML Gene Discovery Project

Supervisors: Gray JX, Bray SC, Arceri CD, D'Andrea R

D Di Fiore MBBS MD FRACP

Vasospastic Angina: Clinical considerations in coronary artery spasm

Supervisors: Beltrame JF, Zeitz C

V Lamin

Mechanisms of serotonergic and α1-adrenergic vasoconstriction in the internalmammary artery of male and female patients

Supervisors: Beltrame JF, Wilson D

S Pasupathy BSc(Hons)

Novel clinical in-sights into myocardial infarction

Supervisors: Beltrame JF, Tavella R

AR Sheikh MBBS MD FRACP

Coronary and peripheral haemodynamic studies of patients with angina and normal coronary arteries

Supervisors: Beltrame JF, Zeitz C, Rajendran S

G Tucker

Statistical and methodological aspects of assessment of health-related quality of life

Supervisors: Adams R, Wilson D, Wittert G

R Dhillon

The longitudinal impact of psychiatric morbidity on physical health and service use

Supervisors: Adams R, Bidargaddi, Schrader G N

A Nagpal MBBS MD FRCA (UK)

TOOTH Stroke Study – Impact analysis of an early phase clinical stem cell study

Supervisors: Koblar S, Hamilton-Bruce A

J Winderlich BSc(Health Sci)(Hons)

Investigations into the mechanisms of action of stem cell therapy for stroke

Supervisors: Koblar S, Kremer K

M Djukic BHSc(Hons) GradCertBus(Acc) DPT (UniMelb)

Proteomic and genomic investigations in transient ischaemic attack

Supervisors: Koblar S, Chataway T, Hamilton-Bruce A, Lewis M

VJ Krawczyk BSocSc(Hum Serv) BA(Hons) GDipArtHist

Human-animal relations in organisations: identifying discourses for respectful engagements with animals

Supervisors: Caluya G (University of South Australia), Hamilton-Bruce A

K Goldsmith BA(Psychology)
MPH: Closing the stroke gap
Supervisors: Koblar S, Karnon J, Kleinig T

Z Usmani MBBS, FRACP
Treatment of anxiety in patients with chronic obstructive pulmonary disease
Supervisors: Smith B, Clifton V

H Jayasinghe B.Sc (BioS), B.Hlth.Sc(Hons)
Advancing the understanding of tobacco use, prevention, and cessation and related illnesses caused by smoking during pregnancy in Indigenous populations
Supervisors: Smith B, Clifton V

Z Kopsaftis BMedRadSc(NucMed) BHlthSc(Hons)
A multimodal evidence based clinical guideline for multi-disciplinary use in the management of patients with COPD
Supervisors: Smith B, Phillips P

T Ha MBBS
The effects of Chitosan gel on wound healing following Endoscopic Sinus Surgery and Modified Endoscopic Lothrop Procedure
Supervisor: Wormald PJ

J Ou MBBS
Innate lymphoid cells and cytokines in chronic rhinosinusitis
Supervisors: Wormald: PJ, Vreugde S, Psaltis A

D Miljkovic Bsc
Characterization of the immune compartment in Chronic Rhinosinusitis
Supervisors: Wormald: PJ, Vreugde S, Psaltis A

K Richter Msc Pharmacy
Staphylococcus aureus biofilm molecular ultrastructure and its breakdown upon challenge with antibacterial compounds
Supervisors: Wormald PJ, Vreugde S, Prestidge C

C Chan MBBS
Bacterial interference as a novel treatment against Staphylococcus aureus in chronic rhinosinusitis
Supervisors: PJ Wormald, A Psaltis, S Vreugde

J Murphy MBBS
The mucosal barrier in chronic rhinosinusitis
Supervisors: Wormald PJ, Vreugde S, Psaltis A

M L Ooi MBBS
The use of chitodex gel as slow-release drug delivery system to improve wound healing after sinus surgery in chronic rhinosinusitis
Supervisors: Wormald PJ, Psaltis A, Vreugde S

R Black MBBS, Associate Rheumatologist
The epidemiology of glucocorticoid prescribing and ophthalmological side effects in patients with rheumatoid arthritis
Supervisors: Hill C, Dixon WG, Cleland L

H Lau MSc
The role of DNA-responsive inflammasomes in auto-immunity
Supervisors: Vreudge S, Lester S, Rischmueller M

J Gummow BSc(Hons)
A novel DNA vaccine for hepatitis C virus
Supervisors: EJ Gowans, B Grubor-Bauk

K Tomusange BSc(Hons) MSc
Systemic and mucosal immunity to HIV
Supervisors: Gowans EJ, Grubor-Bauk B, Wijesundara D

M Masavuli BSc(Hons)
DNA vaccines to induce neutralising antibody to HCV
Supervisors: Gowans EJ, Grubor-Bauk B, Wijesundara D

Z Mekonnen BSc(Hons)
A novel large animal challenge for HCV
Supervisors: Gowans EJ, Grubor-Bauk B, Wijesundara D

V Panagopoulos BSc (Hons)
A novel role for peroxidases in breast cancer development progression and metastasis
Supervisors: Evdokiou A, De Nichilo M

V Liapis BSc (Hons)
Targeting cancer in bone with hypoxia activating pro-drugs
Supervisors: Evdokiou A, De Nichilo M, Zinonos I

A Zysk BSc (Hons)
Targeting bone metastases using adoptive therapy of gamma delta T-cells
Supervisors: Evdokiou A, De Nichilo M

C DeFelice BSc (Hons)
Fibrosis, cancer and the pre-metastatic niche: implications for peroxidases
Supervisors: Evdokiou A, De Nichilo M, Zinonos I

A Shoubridge BSc (Hons)
The role of peroxidase enzymes during bone repair and regeneration
Supervisors: Evdokiou A, De Nichilo M, Anderson P

HM Palethorpe BMedPharmSci(Hons) BLabMed DipBiomedSci
The regulation of tumour cell behaviour by cancer associated fibroblasts
Supervisors: Drew P, Smith E

M Archer
Immune modulation of breast density and cancer risk
Supervisors: Ingman W, Evdokiou A, Dasari P

V Atashgaran
Hormonal regulation of immune microenvironment in the breast: implications for breast cancer susceptibility
Supervisors: Ingman W, Dasari P, Barry S

M Wee
Pathways and treatment in liver ischaemia-reperfusion injury
Supervisors: Maddern G, Smith E, Drew P

S Costello MBBS
The role of faecal transplantation in the treatment of ulcerative colitis
Supervisors: Roberts-Thomson I, Hughes P, Conlon M, Andrews J

J Smith PhD
Surgery, ethics and climate change
Supervisors: Maddern G, Hewett P

M Pastore BPharm MPharm
Penetration and distribution of fluorescent model compounds in normal and diseased skin
Supervisors: Roberts MS, Mackenzie L

A Macedo BPharm
The development and characterisation of novel nanosystems for transdermal delivery of actives
Supervisors: Roberts MS, Mackenzie L, Holmes A

M Sinnollareddy BPharm
Improving Antifungal Use in the Critically Ill: A Pharmacokinetic/Pharmacodynamic Approach
Supervisors: Roberts MS, Roberts JA

Current Postgraduate Students - Masters

R Teh BPharm (Hon) MBBS
A Health Information Tool to Prevent Falls
Supervisors: Visvanathan R, Wilson A, Mahajan N

M Thompson
The influence of frailty on four years mortality, disability and quality of life in community dwelling older South Australians
Supervisors: Visvanathan R, Yu S

M Chapman BSc
Pathogenesis of valvular and aortic degenerative changes in association with bicuspid aortic valve
Supervisors: Horowitz JD, Nguyen TH

H Jagdale BSc
Production and characterisation of recombinant porcine adenoviruses
Supervisors: Gowans EJ, Grubor-Bauk B, Wijesundara D

K Royals RN
Outreach respiratory nursing in the management of Chronic Obstructive Pulmonary Disease (COPD)
Supervisors: Smith B, Veale A

K Lawton BAN
Management of Bronchiectasis: A Tertiary Healthcare Perspective
Supervisor: Smith B, Veale A

J Pollok BEd Grad DipPsych BHlthSc(Hons)
Evaluation of existing evidence for the treatment of depression in vulnerable populations
Supervisors: Smith B, Licinio G

S Oue MBBS
Neo-osteogenesis in chronic rhinosinusitis
Supervisors: PJ Wormald, A Psaltis, S Vreugde

K Kuan MBBS

Ex-vivo normothermic pancreas perfusion

Supervisors: Maddern G, Trochsler M, Chung W

J Oh MBBS

Effect and biocompatibility of human recombinant Lubricin on the formation of adhesions in rats

Supervisors: Maddern G, Tiong L

H Gostlow MBBS

Development of a simulated laparoscopic short course that can be delivered in a Mobile Simulation Unit to both rural and metropolitan surgical trainees

Supervisors: Maddern G, Babidge W

Honours Students

A Rayan

The effect of Chitosan-Dextran gel with Budesonide and Ropivacaine on pain and wound healing following endoscopic sinus surgery

Supervisors: Wormald PJ, Vreugde S, Psaltis A
University of Adelaide

C Labrosciano BSc

Is there a difference between ankle brachial index and health status in patients with peripheral artery disease? A pilot study

Supervisors: Beltrame JF, Cowled P, Fitridge R
University of Adelaide, 1st Class Honours conferred December 2015

J Li

Grip strength and incident diabetes

Supervisors: Adams RJ, Wittert G
University of Adelaide

D Mbewe BHSc

Establishing better determination of liver function prior to resection surgery for various disease states

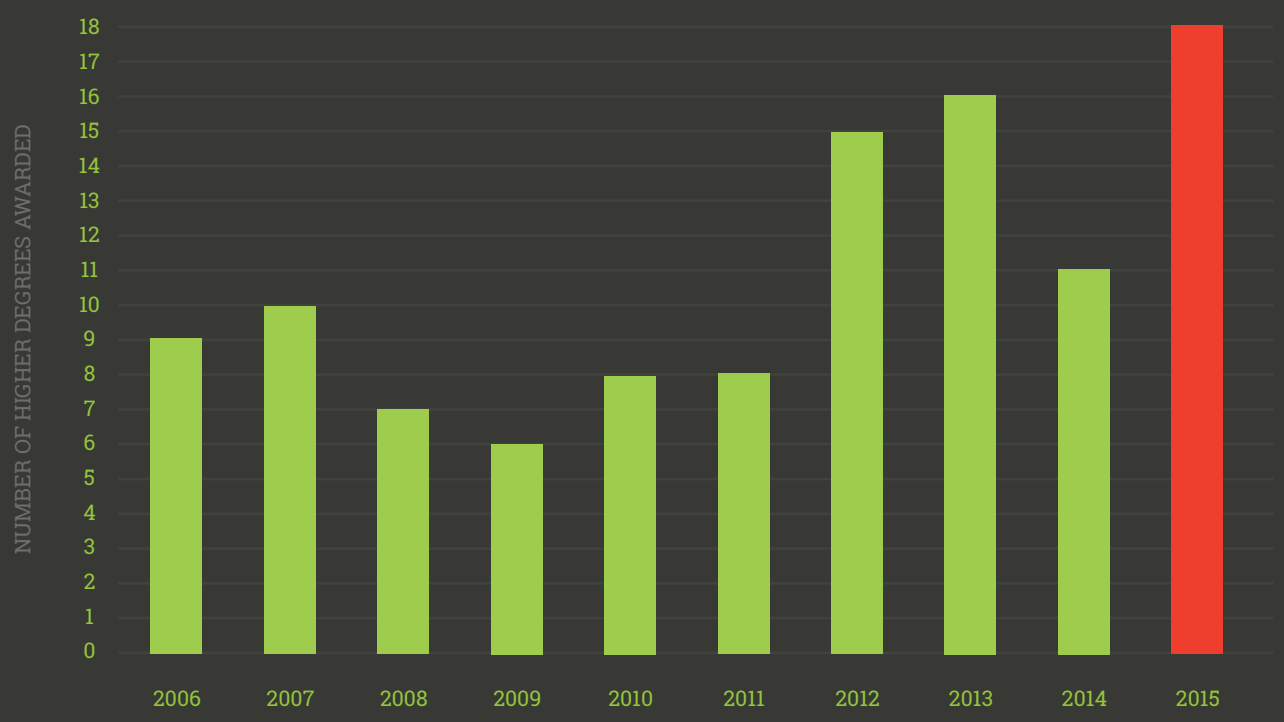
Supervisors: Roberts M, Mackenzie L
University of South Australia

H Dimitroff BSc

The effect of Perhexiline on the efficacy and toxicity of Doxorubicin

Supervisors: Sallustio BC, Evdokiou A
University of Adelaide

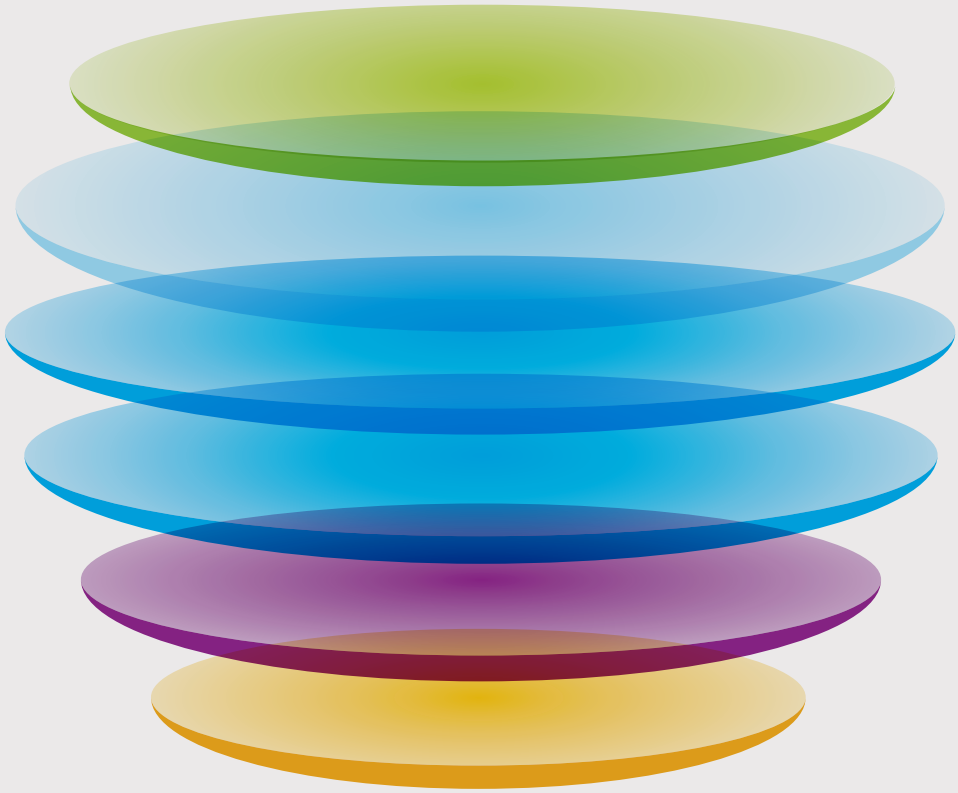
Higher Degrees Awarded 2006-2015



Grants

BHI Research Funding 2015

$14,990,085



$2,250,578
Other peer reviewed grants (ARC, Cancer Australia, SAHMRI, NBCF, Garnett Passe and Rodney Williams Foundation, SA Heart Foundation

$8,337,730
NHMRC

$2,211,000
The Hospital Research Foundation

$1,799,777
Non-peer reviewed externally funded grants

NHMRC Funding $8,337,730

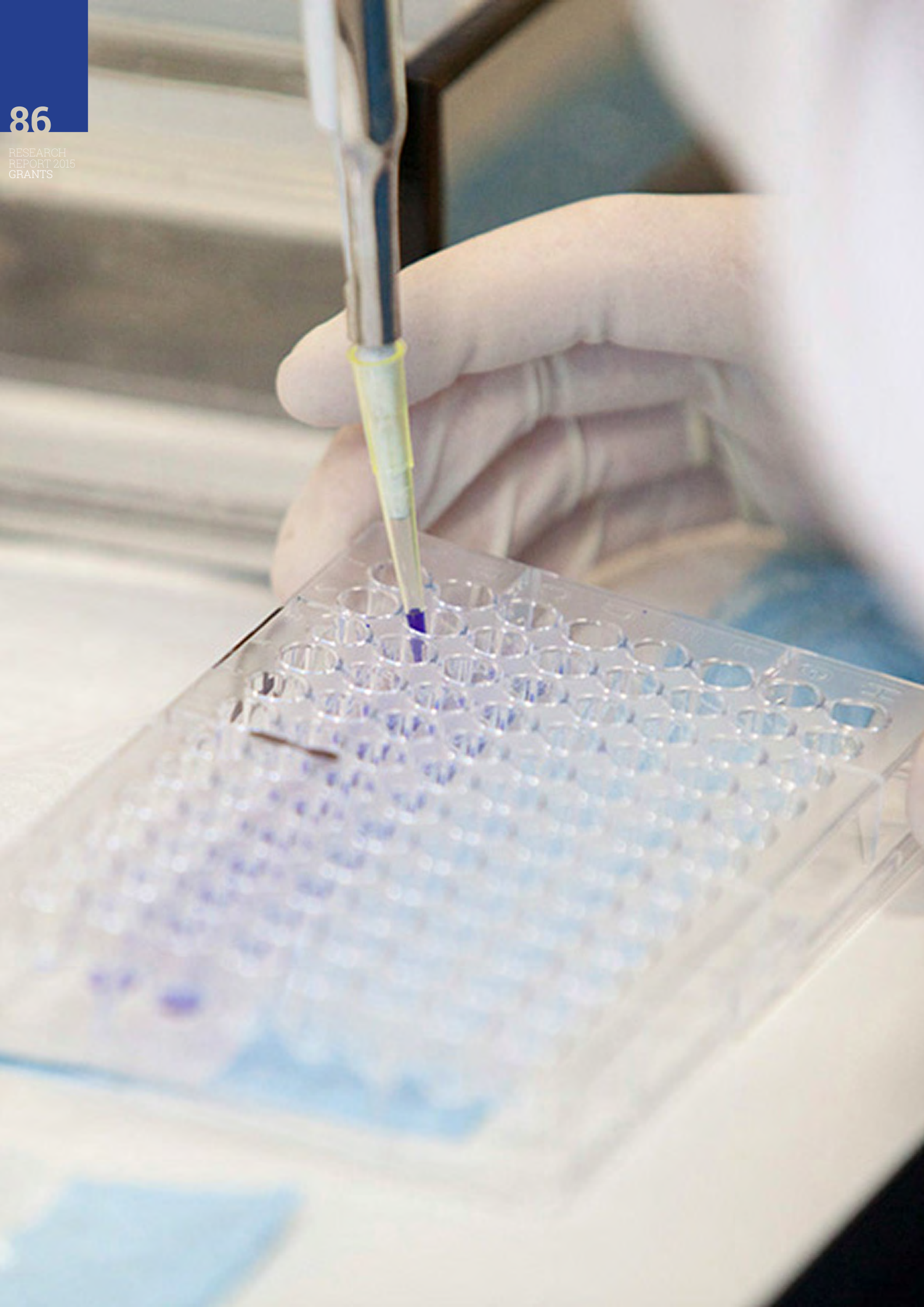
BHI investigators [bolded]	Sponsor / Funding Period / Project Title	Revenue 2015 / Type of Grant
Walters J, Waters H, Holland A, Yang I, Gibson P, **Smith BJ**	**NHMRC (2013-2016)** Australasian satellite of the Cochrane Airways group	**$69,000** Centre of Research Excellence
Golledge J, Kingwell B, Norman P, Tonkin A, **Fitridge R**, Reid C, Walker P, Hankey G, Fletcher J, Nelson M	**NHMRC (2010-2015)** National Centre of Research Excellence to improve management of peripheral arterial disease	**$499,850** Centres of Research Excellence
Jenkins M, Pirotta M, Emery J, Winshi, I, Macrae F, Hopper J, **Young J**, Bousioutas A, Giles G, Bishop J	**NHMRC 1042021 (2012-2016)** Centre for Research Excellence for reducing the burden of colorectal cancer by optimising screening: evidence to clinical practice	**$496,753** Centre for Research Excellence
Horowitz M, Wittert G, Clifton P, Blackshaw LA, Rayner C, Chapman I, Feinle-Bisset C, Jones K, Noakes M, Chapman M. Als Beckett E, Deane A, Heilbronn L, Kitson A, Little T, Luscombe-Marsh N, Nguyen N, Page A, Shi Z, Turnbull D, **Visvanathan R**, Young R	**NHMRC 1041687 (2012-2017)** Centre For Research Excellence in Translating Nutritional Science to Good Health	**$500,000** Centre for Research Excellence
Buckley N, Isbister G, Dawson A, **Roberts M**	**NHMRC 1055176 (2014-2018)** An integrated research program in human toxicology to ensure rapid translation of results into practice and regulation	**$136,936** Program
Beltrame JF, Zeitz CJ, Tavella R, Worthley MI	**NHMRC 1062331 (2013-2017)** The ACCESS Project - Assessment of Coronary Artery disease using Ct Effectively for Stable Symptoms	**$312,833** Partnership
Carson KV	**NHMRC 1092680 (2015-2016)** Translating Research into Practice Fellowship	**$86,455** TRIP Fellowship
Golledge J, Norman P, Walker P Ahimastos A, Dalman R, **Fitridge R**	**NHMRC (2012-2016)** TELmisartan in the management of abDominal aortic aneurYsm (TEDY)	**$221,178** Project
D'Andrea RJ, Lane S, Ross D, **Bardy P**	**NHMRC 1063443 (2014-2016)** Targeting the EGFR and C-MET Tyrosine Kinase Receptors in Myeloproliferative Neoplasms	**$195,854** Project
Ranasinghe I	**NHMRC (2013-2016)** Neil Hamilton Fairley Clinical Overseas Fellowship	**$167,545** Overseas Fellowship
Wang Y, Cicuttini F, Tonkin A, **Hill C**, Ding C	**NHMRC 1048581 (2013-2015)** Does statin use have a disease modifying effect in symptomatic knee osteoarthritis? A multicentre randomised double blind, placebocontrolled trial	**$323,670** Project
Roberts M, Kendall M	**NHMRC 1049906 (2013-2015)** Specific targeting of nanosystems by cutaneous delivery	**$323,567** Project
Roberts M, Crawford D, Maddern G	**NHMRC 1049979 (2013-2015)** Advanced imaging to define hepatic and intestinal drug disposition in aging and liver diseases	**$70,260** Project
Ridding MC, Rothwell JC, **Koblar S**, Ward N, McDonnell M	**NHMRC 1058639 (2014-2017)** Characterising post-stroke cortical plasticity in humans - identifying a critical window for rehabilitation.	**$183,915** Project

NHMRC FUNDING 2015 CONTINUED

BHI investigators [bolded]	Sponsor / Funding Period / Project Title	Revenue 2015 / Type of Grant
Holliday E, Attia J, Thijs V, **Koblar S**, Sturm J, Maguire J, Lincz L.	**NHMRC 1085550 (2015-2018)** Helping stroke physicians choose who to thrombolyse – the "Targeting Optimal Thrombolysis Outcomes" (TOTO) study.	**$257,918** Project
Roberts M, Crawford D, **Maddern G**	**NHMRC 1049906 (2013-2015)** Advanced imaging to define hepatic and intestinal drug disposition in aging and liver diseases.	**$70,260** Project
Roberts M	**NHMRC 1002611 (2011-2015)** Continuing Research Fellowship	**$156,161** Project
Buckley N, Senanayake N, Ibister G, Dawson A, Karalliedde L, de Silva J AI: **Roberts M**	**NHMRC 1030069 (2012-2015)** Neuromuscular junction toxicity after anticholinesterase pesticide poisoning and envenomation	**$180,000** Project
Wittert G, Yeap B, Grossman M Conway A, Allan C, Daniel M AI: **Jesudason D**	**NHMRC 1030123 (2012-2016)** Testosterone intervention for the prevention of diabetes in high risk men: a randomised trial	**$910,581** Project
Sverdlov A	**NHMRC 1037603 (2012-2016)** Lipotoxicity, mitochondrial sysfunction and the pathogenesis of heart failure	**$91,221** CJ Martin Biomedical Fellowship
Roberts J, Lipman J, **Roberts M**, Paul S, **Peake S**, Turnidge J	**NHMRC 1044941 (2013-2015)** Robust antibiotic dosing for critically ill patients receiveing renal replacement therapy	**$379,929** Project
Jones G, Cicuttinin F, March L, **Hill C**, Dore D	**NHMRC 1045415 (2013-2015)** A randomised trial of zolendronic acid for osteoarthritis of the knee	**$318,199** Project
Wormald PJ, Prestidge C, Thierry B, **Vreugde S**	**NHMRC 1047576 (2013-2015)** A novel nitric oxide-based treatment for recalcitrant Staphylococcus aureus-associated chronic rhinosinusitis	**$174,319** Project
Stewart S, **Horowitz JD**, Carrington M, Suffham P, Wong C, Newton P, Rischbieth A	**NHMRC 1049133 (2013-2015)** Which heart failure Intervention is most Cost-effective in reducing Hospital care: (WHICH? II) Trial: A multicentre, randomised trial of standard versus intensified management of metropolitan and regional-dwelling patients with heart failure.	**$609,275** Project
Evdokiou A, Atkins GJ	**NHMRC 1050694 (2013-2015)** Vitamin E biphosphonate coordinates: A new therapeutic approach targeting bone loss associated with osteoporosis and bone related malignancies	**$152,000** Project
Wormald PJ, Maddern G, Moriatti S, Robinson B, Robinson S	**NHMRC 1050883 (2013-2015)** In vivo evaluation of the safety and efficacy of a novel chitosan gel in the reduction of adhesions following abdominal surgery in both animal and human models	**$171,658** Project
Torresi J, **Gowans EJ**	**NHMRC 1060436 (2014-2016)** A quadrivalent vaccine for hepatitis C	**$150,000** Project
Hewitt A, **Hill C**, Evans D, Merriman T, Morgan A, Smith K, McKelvie P, Martin J	**NHMRC 1068023 (2014-2016)** Dissecting the great ophthalmic masquerade: The Global Giant Cell Arteritis Genomics Consortium.	**$189,176** Project
Chapman M, **Peake SL**, Dean A, O'Connor	**NHMRC 1078026 (2015-2019)** The Augmented versus Routine approach to Giving Energy Trial (TARGET)	**$297,027** Project
Stevenson A, Solomon M, **Hewett P**, Lumley J, Fleshman J, Clouston A, Hague W	**NHMRC 1078113 (2015-2019)** A La CaRT: Australasian Laparoscopic Cancer of the Rectum Trial. A phase III prospective randomised trial comparing laparoscopic-assisted resection versus open resection for rectal cancer	**$105,755** Project
Visvanathan R, Hill K, Ranasinghe D, Lange K, Wilson A	**NHMRC 1082197 (2015-2017)** "Effectiveness of an Ambient Intelligence Geriatric Management system to prevent falls in older people in hospitals: a clinical trial.	**$536,435** Project

The Hospital Research Foundation Funding $2,211,000

Grant recipients	Granting body / Project Title	Revenue 2015 / Type of Grant
Maddern G, Price T, Young J, Hewett P, Hardingham J, Worthley D, White D, Mulligan D	**SAHMRI/Beat Cancer/The Hospital Research Foundation (2014-2017)** Individualised Risk Assessment and Therapeutic Intervention for Colorectal Cancer in the South Australian Population.	**$150,000** Project
Beltrame J, Elliot A, Rajopadyaya K, Fitridge R	**The Hospital Research Foundation (2014-2015)** Exercise therapy for the management of the CSFP	**$150,000** Project
Dasari P	**The Hospital Research Foundation (2015)** Interactions between the endogenous hormonal cycle and T lymphocytes underpin breast cancer risk	**$40,000** Early Career Fellowship
Evdokiou A	**The Hospital Research Foundation (2011-2016)** Michell McGrath Breast Cancer Research Fellowship	**$250,000** Fellowship
Evdokiou A, Ingman W	**The Hospital Research Foundation (2015)** Uncovering a new role for peroxidase enzymes as drivers in mammographic density, breast cancer development and metastasis	**$110,000** Project
Gowans EJ, Roberts-Thomson I	**The Hospital Research Foundation (2014-15)** DNA vaccine therapy for hepatitis C	**$150,000** Project
Gowans E	**The Hospital Research Foundation (2015)** Adelaide Research and Innovation Cellular Vaccine and Data Signal	**$54,500** Patent Support
Ingman W	**The Hospital Research Foundation (2011-2016)** THRF Breast Cancer Research Fellowship	**$200,000** Associate Professor in Breast Cancer Research Fellowship
Ngo D	**The Hospital Research Foundation (2015-2017)** Modulation of the anti-angiogenic VEGF-A165b in adipose tissue: novel approach to combat obesity	**$120,000** Mid Career Fellowship
Wijesundara D	**The Hospital Research Foundation (2015-2016)** Early career Research position: Exploiting cytolytic adjuvants and novel recombinant viral cvaccines as a way forward for HIV-1 and HCV vaccine design	**$120,000** Early Career Researcher
Wormald PJ	**The Hospital Research Foundation (2014-2015)** Bacteriophage: a novel treatment of chronic rhinosinusitis	**$150,000** Project
Various	**The Hospital Research Foundation (2015)** Various Higher degree projects	**$92,668** Postgraduate Research Scholarships
Tomasunghe K	**The Hospital Research Foundation (2013 - 2016)** Higher degree project	**$28,000** International Postgraduate Research Scholarship
Various	**The Hospital Research Foundation (2015)** Various Honours projects	**$7,332** Honours Research Scholarships
BHI	**The Hospital Research Foundation (2015)** Infrastructure support	**$250,000** Strategic Research Directions
BHI	**The Hospital Research Foundation (2015)** Equipment support	**$283,000** Strategic Research Directions
Various PhD supervisors	**The Hospital Research Foundation (2015)** BHI Scholarship Supervisor reward funding	**$110,000** Strategic Research Directions



Peer Reviewed Grants Commencing 2016 $10,158,826

Chief Investigators	Granting body / Project Title	Total Grant Funding / Type of Grant
Beltrame J, **Zeitz C**, Worthley M, Arstall M, **Tavella R**	**Astra Zeneca: ESR-14-10465** Ticagrelor In Coronary microvascular dysfunction (TIC) Program: Anti-anginal Efficacy in Primary Coronary Microvascular Disorders	**$300,000** Project
Yool A, Heng S, **Hardingham J**	**Australian Research Council DP160104641** Properties enabling rapid cell migration by Aquaporin-1 channel expression	**$350,000** Discovery Project
Townsend A, **Hardingham J**, Gordon L, Lee CK, **Price T**	**Cancer Council SA** Genome-wide association study of single nucleotide polymorphisms as predictive biomarkers for sensitivity to anti-EGFR antibody therapy for metastatic colorectal cancer with wild-type RAS.	**$75,000** Project
Sallustio B, **Evdokiou A**, **Horowitz J**	**Cancer Council SA APP1109158)** Prevention of Heart Damage During Anthracycline Cancer Chemotherapy	**$75,000** Project
Ngo D	**Diabetes Australia Research Program** Regulators of the novel anti-angiogenic isoform: VEGFA165b in obesity-induced insulin resistance	**$60,000** Project
Carson K, Bedson D, **Van Agteren J**, **Williamson L**, **Smith B**	**Fay Fuller Foundation** Investigation into the causative factors contributing to the high incidence of asthma hospitalisation and mortality in South Australia, compared to other states and territories	**$276,872** Partnership
Foreman A, **Evdokiou A**	**Garnett Passe and Rodney Williams Foundation** Tumour-associated microbiotia and its role in oral cavity cancer carcinogenesis	**$375,000** Conjoint grant
Mackay M, **Adams R**, Bean N	**Government SA** The Promulgation of Operational Research, Systems Thinking and Design Thinking within the Australian Health Care Sector	**$400,000** Premier's International Research Fund
Ranasinghe I	**HCF Research Foundation** Reducing Unwarranted Variation in Early Complications After Cardiac Pacemaker and Defibrillator Implantation among Australian Hospitals	**$250,000** Project
Ransinghe I	**Heart Foundation** Tom Simpson Trust	**$8,000** Equipment
Sverdlov A	**NHF** A glass of beetroot juice a day beats the exercise blues?	**$75,000** Vanguard grant
Hodge S, **Zalewski P**, Roscioli E	**NHMRC 1099040** Exploiting increased autophagy in bronchial epithelial cells: a new therapeutic approach for chronic obstructive pulmonary disease (COPD)	**$724,161** Project
Roberts JA, Lipman J, **Peake S**, Turnidge J, Slavin M, Hopkins P, Bulitta J, Paul S, De Waele J, Joynt G	**NHMRC 1099452** Centre for REdefining antibiotic use to reDUce resistanCE and prolong the lives of antibiotics (REDUCE)	**$2,158,296** Centres of Research Excellence - Clinical
Visvanathan R, Karnon J, Kitson A, Beilby J, Cameron I, Chehade M, Bell S, Feist H	**NHMRC 1102208** Frailty Trans-Disciplinary Research To Achieve Healthy Ageing	**$2,301,169** Centres of Research Excellence - Health Services
Jones G, Wluka A, **Hill CL**, March L, Keen H, Laslett L.	**NHMRC 1102732** A randomised trial of krill oil for osteoarthritis of the knee	**$751,491** Project
Roberts M	**NHMRC 1107356** Research Fellowship	**$851,980** Research Fellowship

PEER REVIEWED GRANTS COMMENCING 2016 CONTINUED

Chief Investigators	Granting body / Project Title	Total Grant Funding / Type of Grant
Smith B, **Carson KV**	**NHMRC 1108309** Training health professionals in tobacco cessation and evidence translation for Aboriginal Australians	**$823,732** Standard Project Grant
Dreyer R	**NHMRC 1111039** Sex Differences in Long-Term Outcomes of Young Patients with Acute Myocardial Infarction	**$333,900** Sidney Sax Public Health Early Career Fellowship (Overseas)
Sverdlov A	**RACP** Early detection of chemotherapy-induced cardiomyopathy	**$50,000** Servier Staff "Barry Young" Research Establishment Fellowship for 2016
Koblar S, **Jannes J**, Kleinig T, Zacest A, **Hamilton-Bruce MA**, Kremer K, Kaidonis X, Nagpal A, **Milton AG**	**RAH** TOOTH Clinical Stroke Trial – Autologous Stem cell Therapy for Post-Stroke Disability: Pilot study	**$54,225** Clinical Project Grant
Adams R, McEvoy D, Wittert G, Vakulin A, Kim J-W, **Appleton S**	**ResMed Foundation** Obstructive Sleep Apnea-related autonomic disturbance and relationships with health outcomes	**$65,000** Project
Adams R, Taylor A, McEvoy D, Antic N, **Gill T**	**Sleep Health Foundation** A survey of sleep health in Australia	**$20,000** Project
Koblar S, **Hamilton-Bruce MA**, Kremer K, Kaidonis X, **Milton AG**	**Stroke SA Inc** Stem Cell Therapy for Stroke	**$50,000** Project

BHI students presented their work at TQEH Research Day 2015.

Dijana Miljkovic, ENT Surgery.

Dr Peter Zalewski (far left) together with PhD graduates from the University of Adelaide Saifei Liu, Nathan Procter, Amenah Jaghoori and Mariea Bosco.

2015 Publications

1. Abbott S, Hewett P, Cooper J, Ruszkiewicz A. Idiopathic myointimal hyperplasia of the mesenteric veins: a rare differential to be considered in idiopathic colitis. *ANZ Journal of Surgery*. 2015;DOI:10.1111/ans. 13210.

2. Air T, Weightman MJ, Baune BT. Symptom severity of depressive symptoms impacts on social cognition performance in current but not remitted major depressive disorder. *Frontiers in Psychology*. 2015,6:1118.

3. Ait Ouakrim D, Dashti SG, Chau R, Buchanan DD, Clendenning M, Rosty C, Winship IM, Young JP, Giles GG, Leggett B, Macrae FA, Ahnen DJ, Casey G, Gallinger S, Haile RW, Le Marchand L, Thibodeau SN, Lindor NM, Newcomb PA, Potter JD, Baron JA, Hopper JL, Jenkins MA, Win AK. Aspirin, Ibuprofen, and the Risk of Colorectal Cancer in Lynch Syndrome. *Journal of the National Cancer Insitute*. 2015 Jun 24;107(9).

4. Ali MJ, Murphy J, James CL, Wormald PJ. Perineural squamous cell carcinoma infiltration of infraorbital nerve treated with endoscopic nerve resection up to foramen rotundum. *Clinical & Experimental Ophthalmology*. 2015 Apr;43(3):288-90.

5. Ali MJ, Murphy J, Wormald PJ, Psaltis AJ. Bony nasolacrimal duct dehiscence in functional endoscopic sinus surgery: radiological study and discussion of surgical implications. *The Journal of Laryngology and Otology*. 2015 Jul;129 Suppl 3:S35-40.

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7. Ali MJ, Psaltis AJ, Murphy J, Wormald PJ. Endoscopic dacryocystorhinostomy and obstructive sleep apnoea: the effects and outcomes of continuous positive airway pressure therapy. *Clinical & Experimental Ophthalmology*. 2015 Jul;43(5):405-408.

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9. Ali MJ, Psaltis AJ, Wormald PJ. The Frequency of Concomitant Adjunctive Nasal Procedures in Powered Endoscopic Dacryocystorhinostomy. *Orbit*. 2015 Jun;34(3):142-145.

10. Ali MJ, Wormald PJ, Psaltis AJ. The Dacryocystorhinostomy Ostium Granulomas: Classification, Indications for Treatment, Management Modalities and Outcomes. *Orbit*. 2015 Jun;34(3):146-51.

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13. Antill Y, Dowty J, Win A, Thompson T, Walsh M, Cummings M, Gallinger S, Lindor N, Le Marchand L, Hopper J, Newcomb P, Haile R, Church J, Tucker K, Buchanan D, Young J, Winship I, Jenkins M. Lynch syndrome and cervical cancer. *International Journal of Cancer.* 2015 Dec;137(11):2757-2761.

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16. Appleton SL, A Vakulin, RD McEvoy, GA Wittert, SA Martin, JF Grant, NA Antic, AW Taylor, PG Catcheside, Adams RJ. Nocturnal hypoxemia and severe OSA are associated with recent development of Type 2 diabetes in a population cohort of men. *Journal of Clinical Sleep Medicine*. 2015;11:609-614.

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24. Bassiouni A, Cleland EJ, Psaltis AJ, Vreugde S, Wormald PJ. Sinonasal microbiome sampling: a comparison of techniques. *PLOS ONE*. 2015;10(4):e0123216.

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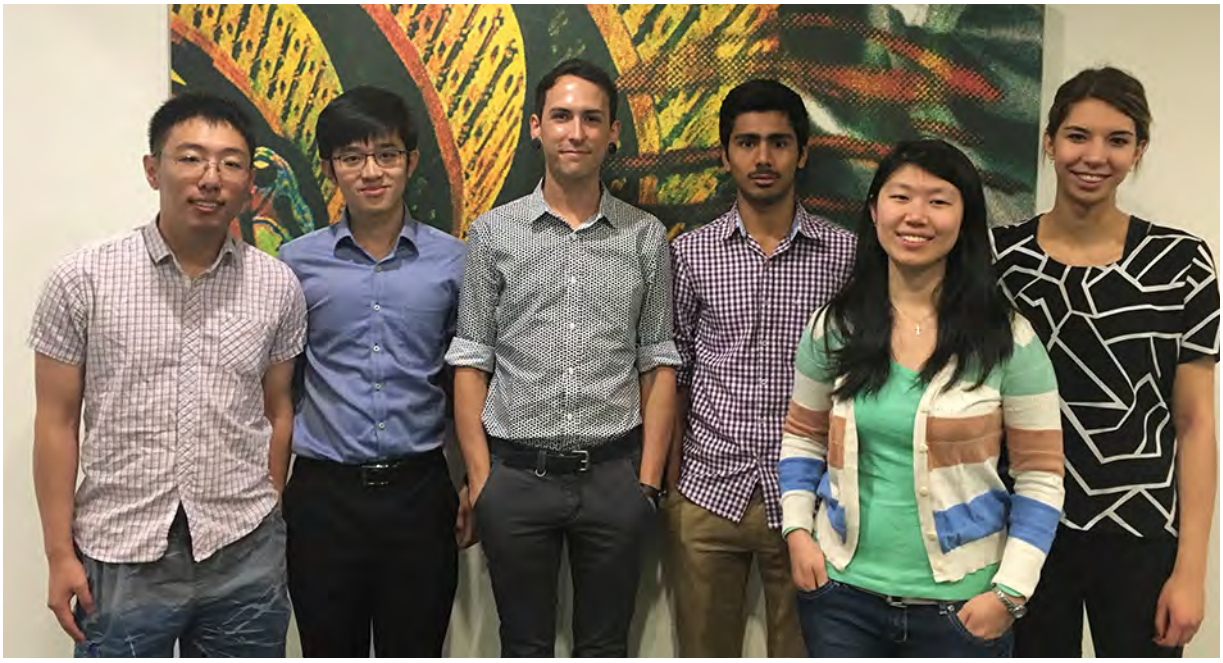
These undergraduate students were among those who were awarded scholarships to undertake placements over the 2015-2016 summer vacation (L-R) Joe Lu, Yu Han Koh, Luke Halliday, Prem Jyoti Poudel, Su Jen Chua and Roberta Potamianos.



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Commercialisation

PATENTS

An assay for determining neuroplasticity effect of stem cells PCT/AU02/01759. Applicant: ARI, University of Adelaide & Medvet Science Pty Ltd, SA, Australia. 2007. Inventors: Koblar SA, Gronthos S, Arthur A (ACTIVE)

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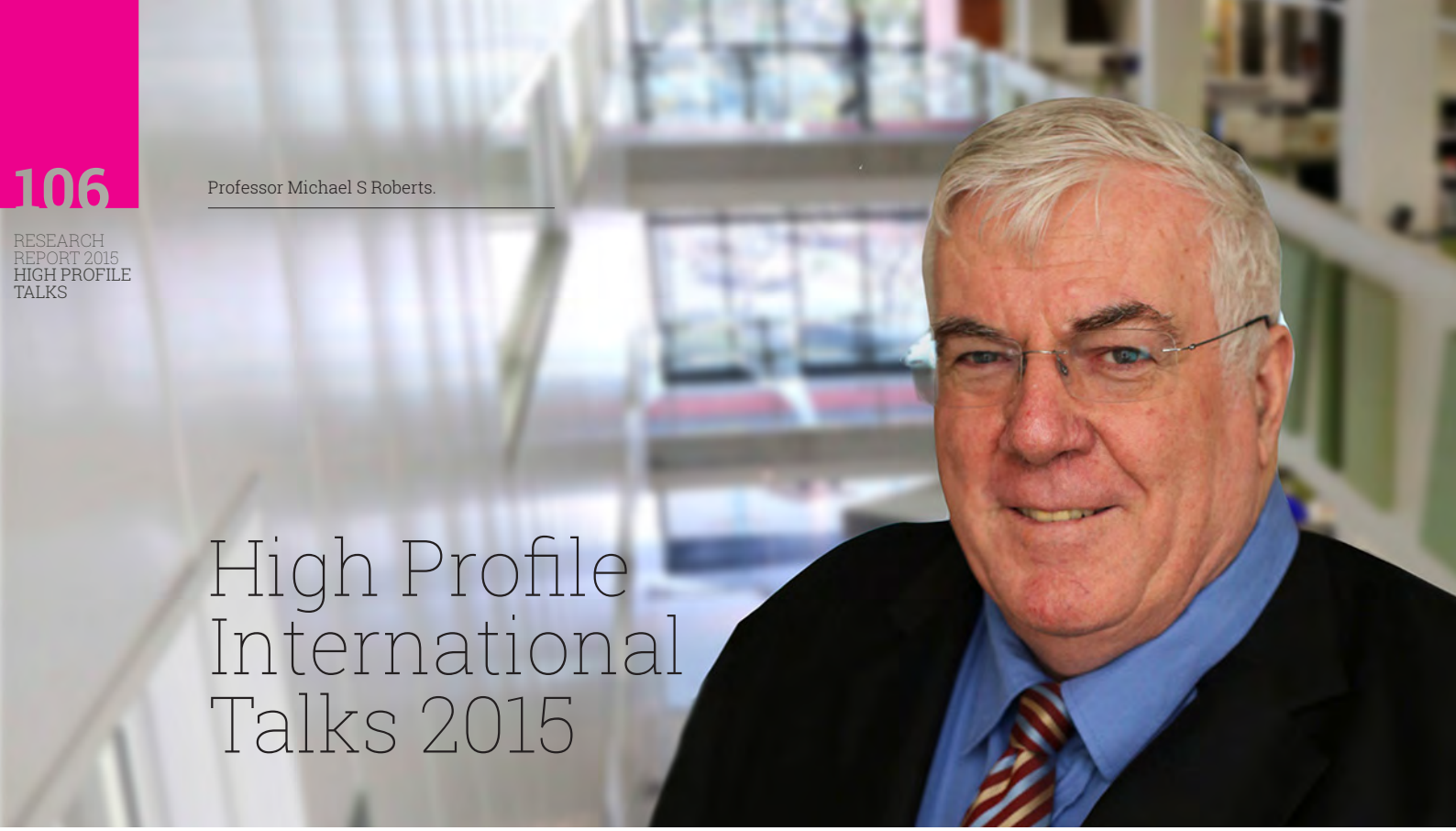
Cellular vaccine and method of inducing an immune response in a subject. PCT/AU2013/000509. Applicant: Adelaide Research and Innovation. Gowans E. This patent is now in National Phase in the following jurisdictions: Australia, USA, Europe, India, Japan, China.



Professor Michael S Roberts.

High Profile International Talks 2015

Conference/meeting	Title of presentation	Significance
John Horowitz		
Acute Cardiac Care, 9th International Conference, Tel Aviv. Israel **2 January**	Takotsubo cardiomyopathy: What's new in 2015?	Invited Lecture - only invited speaker from Australia
Peter-John Wormald		
35th Workshop on Sinuses 'n'Beyond, MAA ENT Hospitals, Speech & Hearing Centre, Hyderabad, India **5-9 February**	Endoscopic Sinus Surgery	Invited Speaker
13th Asian-Oceania ORL-HNS Congress, Taipei, Taiwan **19-22 March**	Endoscopic anterior fossa tumour resection Frontal Sinus Masterclass	Key note speaker
The 8th Wessex Advanced Sinus Surgery Course **3-5 May**	Frontal Sinus Anatomy & Surgical Approaches	Invited Speaker
Modern Functional Nasal & Sinus Surgery Course, Moscow Russia **20-23 May**	The anatomy and endoscopic approaches to anterior skullbase, sella and parasellar region	Invited Speaker in International Masterclass
86th Annual Meeting of the German ENT Society, Berlin **16-17 May**	Honorary "Wullstein" lecture – 'Art and science in modern endonasal sinus surgery'	Honorary Guest Speaker
Sandra Peake		
SG-ANZIC Intensive Care Forum, Singapore **24 - 26 April**	Optimisation of antimicrobial dosing in the ICU Caloric supplementation in the ICU Early goal-directed therapy: what now.	Invited speaker Invited speaker Invited speaker
Betty Sallustio		
International Congress of Therapeutic Drug Monitoring and Clinical Toxicology, Rotterdam, The Netherlands **11-14 October**	Measuring intra-renal tacrolimus concentrations	Invited symposium speaker
Alkis Psaltis		
Australian and New Zealand Rhinologic Society, Queenstown New Zealand **6 April**	An Update on the bacteriology of Chronic Rhinosinusitis	Invited Lecture

Conference/meeting	Title of presentation	Significance
Michael S Roberts		
European Centre for Ecotoxicology and Toxicology of Chemicals Workshop on Salt Lake City, Utah, USA **29-30 October**	The Use of Thermodynamic Chemical Activity in Environmental Risk Assessment	Invited attendee
Beckman Laser Institute, University of California, Irvine, California USA **26-27 October**	Defining the fate of drugs and nanosystems in the body by seeing below the surface	Invited Lecture
Barrier Function of Mammalian Skin, Waterville Valley Resort, NH, USA **16-21 August**	New Technology for Investigating the Barrier	Session Chair
5th International Symposium Topical Problems of Biophotonics, Konstantin Korotkov, Russia **20-24 July**	In vivo and ex vivo multiphoton imaging of nanoparticle and drug interactions with living systems	Inited speaker
USA Food and Drug Administration Workshop on Bioequivalence Testing of Topical Drug Products, FDA White Oak Campus, Silver Spring Maryland **14-15 July**	Topical semisolid drug product critical quality attributes (Q3 characterisation) with relevance to topical bioequivalence.	Invited speaker
10th Workshop and Conference on Advanced Multiphoton and Fluorescence Lifetime Imaging Techniques FLIM2015, Saarland University, Saarbrucken, Germany, **17-19 June**	Non-invasive intravital multiphoton imaging of the transport of solutes and nanoparticles.	Invited speaker
Asian NANO Forum Conference, Kish Island, Iran **8-11 March**	Nanoscience – status, potential opportunities & threats.	Plenary Lecture
Asian Nano Forum Congress (ANFC), Kish Island, Iran **8-11 March**	Topical nanosystems: their absorption, disposition, problems and opportunities	Invited speaker
Shiraz University of Medical Sciences – Iran **7 March**	Nanotoxicology – observations and misconceptions!	Invited speaker
Isfahan University of Medical Sciences, Isfahan, Iran **5 March**	Insights into drug and nanotechnology disposition through imaging.	Invited speaker
Nano School Program, Kashan, Iran **4 March**	A personal journey in understanding the physicochemical & biological determinants of pharmacokinetics	Invited speaker
International School of Nano, Shahid Beheshti University of Medical Sciences, Tehran, Iran **1-3 March**	Seeking to make a difference through a journey in medical research. Pharmaceutical science as a cornerstone in medical research. Imaging is seeing – exploring the fate and safety of medicines and nanotechnologies	Invited speaker Invited speaker Invited speaker
4th Galenus Workshop, Saarland University and Helmholtz Institute for Pharmaceutical Research Saarland (HIPS), Saarbrucken, Germany **25-27 February**	Drug delivery to the human skin – state-of-the-art and future perspective	Plenary Lecture
12th Advanced Imaging Methods Workshop, University of California Berkeley, San Francisco, USA **4-8 February**	Using ex vivo and in vivo Multiphoton Imaging and FLIM to Define the Disposition of Drugs, Metabolites and Nanoparticles as Well as Their Effects on Cells	Invited speaker
Rob Fitridge		
Joint Scientific Meeting of the ANZ Society for Vascular Surgery and the Western Vascular Society (USA), Hawaii **21-24 September**	Predicting outcomes in aneurysm surgery: can one model be used for open & endovascular surgery?	Invited speaker

BHI researcher Joe Wrin, Colorectal Cancer Research Group, hosts the Grange Ladies Probis Club on a tour of the BHI.

Community Engagement 2015

Presenter's name	Delivered to	Topic/Title	Media format
Virology Laboratory			
Eric Gowans	SA Nurses Dinner meeting **18 February**	HCV vaccine	Public talk
	Mitcham Rotary Club **6 May**	How to design vaccines for HIV and HCV	Public talk
	University of Third Age **4 June**	Vaccines for HIV and HCV	Public talk
	University of Third Age **25 November**	Vaccines for HIV and HCV	Public talk
Dan Wijesundara	Science in the pub **13 November**	The science behind vaccines: avoiding misconceptions and harnessing the immune system to develop the elusive HIV vaccine	Public talk
	Coast FM 88.7 FM **June**	Vaccine research	Radio talk
Breast Cancer Research Unit			
Mark DeNichilo	Sandra Kanellos Fundraiser **25 August**	Advances in Breast Cancer Research	Public Talk
	Greenock Charter **4 May**	Breast Cancer Research at BHI	THRF Community Awareness Presentation
	Mixed group **22 October**	Breast Cancer Research at BHI	THRF Community Awareness Presentation
Aneta Zysk	Rosewater Football Club **11 April**	Breast Cancer Research at the BHI	THRF Community Awareness Presentation
	m! 2015 Attendees **9 August**	Research at the BHI	Community engagement
	Basil Hetzel Society Members **5 November**	Research at the BHI	THRF Community engagement

Joep van Agteren, Respiratory Medicine and Clinical Practice Unit, visited a primary school.

PhD students Vahid Atashgaran and Maddison Archer with Tommy Kaye from Coast FM.

Presenter's name	Delivered to	Topic/Title	Media format
Breast Cancer Research Unit			
Irene Zinonos	Coast FM **21 May**	The Longest Table	Radio Interview
	Basil Hetzel Institute Staff and Family Members **20 June**	The Longest Table	Host Fundraising Dinner
Vasilios Liapis	Coast FM with David Hern **17 June**	"Targeting Cancer in the bone"	coast FM radio interview
	Australian Breast Cancer Research Newsletter Research Update **2015 Edition 2**	New Hope for breast Cancers spread to bone	Brief interview about my research
Colorectal Cancer Research Group			
Tim Price	ABC Melbourne 774 Breakfast **April**	GI Cancer Awareness Week	Radio interview
	5 aa Michael Keelan Breakfast Show **June**	Colorectal Cancer Research	Radio interview
	National Indigenous Radio Services **November**	Processed Meats and Moderation	Radio interview
	Gawler Engage Program **October**	GI Cancers Diagnosis and Treatment	Public Talk
Joanne Young	Coast FM **March**	Early Onset Colorectal Cancer	Radio interview
	Flinders U3A **September**	Young Adults with Colorectal Cancer	Public Talk
Stroke Research Programme			
Karlea Kremer	National Council of Women, South Australian **11 June**	Stem cells from the teeth to repair a brain after a stroke	Public Talk
Austin Milton	The Hospital Research Foundation organised BHI Talk and tour **30 April**	Stroke & the Stroke Research Programme	THRF Public Talk
Simon Koblar	Peter Couche Foundation fund-raising talk **2 December**	Regenerative medicine and stem cell therapy	Public Talk
Anne Hamilton-Bruce	The Friends of TQEH **3 December**	Older people, pets and health/wellbeing – a Research Update	Public Talk

Presenter's name	Delivered to	Topic/Title	Media format
ENT Surgery			
Katharina Richter	The Hospital Research Foundation	Katharina Richter – research to treat Chronic Rhinosinusitis	Article, printed and published online
	The Hospital Research Foundation **1 April**	Researcher in Focus article	Newsletter
Amanda Drilling	The Hospital Research Foundation **7 May**	Emerging therapies for Chronic Rhinosinusitis	Community Awareness Program, public talk for U3A Flinders
Katharina Richter	Coast FM (community radio) **21-23 August**	Researcher in Focus: Katharina Richter – research to treat Chronic Rhinosinusitis	Live radio interview
Aden Ho Yin Lau	The Hospital Research Foundation **10 August**	Research to Treat Chronic Rhinosinusitis	Newsletter article, printed and published online
Katharina Richter	Science Alive! National Science Week **21-23 August**	Research at the Basil Hetzel Institute	Representative of the BHI, engaging with the public
	The University of Adelaide **1 December**	Promising New Treatment Joins War on Superbugs	Latest News Article published online
	Channel 9 **1 December**	Superbugs Breakthrough	National wide TV footage on Channel 9 news
	The Australian **2 December**	Kill bacteria without antibiotics by starving them first	National wide newspaper article, printed and published online
	Drug Discovery & Development Magazine **4 December**	Promising New Treatment Joins War on Superbugs	Article published online
Therapeutics Research Centre			
Michael S Roberts	UniSA **27 May**	Rocking your Rejoinder	Panel session
	National Library of Australia (AVPMA) **15 August**	Dermal Absorption	Science Feature Session
Respiratory Medicine and Clinical Practice Unit			
Kristin Carson	Adelaide Convention Centre - corporate Panel Discussion hosted by Brand South Australia with ABC radio personality Ian Henschke as the MC with Gill Hicks (Australian of the Year for SA), John Swan (Senior Australian of the Year for SA) and Vince Coulthard (SA Local Hero) **17 February**	Each person spoke about their journey to becoming SA Australian of the Year representatives, what they do now and what they plan on doing next	Talk
Kristin Carson, Joep Van Agteren and Harshani Jayasinghe	Aboriginal Lands Parliament Standing Committee at South Australia Parliament House, invited guests **18 November**	Research by the Respiratory Medicine Unit and the implications for policy and practice	Talk
Kristin Carson	Federal Minister for Health, Hon. Susan Ley **24 November**	Research by the Respiratory Medicine Unit for clinical practice improvement and health service optimisation	Talk

For a complete listing of Kristin Carson's Community Engagement activities in 2015 please visit ***www.basilhetzelinstitute.com.au***

Science Alive!

The Basil Hetzel Institute for Translational Health Research participated in the 10th Science Alive! at the Adelaide Showgrounds from 7-9th August. Over 25,000 people are estimated to have enjoyed the large range of displays and hands-on activities from over 60 organisations that related to all aspects of science and technology. The BHI booth provided two very different hands-on activities:

- The Royal Australasian College of Surgeons loaned two "Fundamentals of laparoscopic Surgery box trainers" for people to test their surgical skills on. Using the "peg transfer" activity, most people were able to move 3 blocks in one direction in the same time that a training surgeon would move 6 blocks in both directions.
- The Respiratory Medicine and Clinical Practice Unit collected actual data on "forced expiration lung volume" (FEV1s) from over 350 individuals (aged 3-65yrs).

The following people volunteered their time during Science Alive! 2015: Kristin Carson, Joseph van Agteren, Zoe Kopsaftis, Justyna Pollock, Vanessa Coe, Pamela Kidd, Nathan Agar (all from the Respiratory Medicine and Clinical Practice Unit), Pallave Dasari, Prue Cowled, Vahid Atashgaran, Aneta Zysk and Chandra Kirana (from Surgery), Hilary Dorward (Haematology & Medical Oncology), Ana Macedo (Therapeutics Research Centre, UniSA), Ha Nguyen (Cardiology) with the event being coordinated by Kathryn Hudson and Rebecca Anderson (BHI Facilities Manager and Communications Officer).

Additional support from The Hospital Research Foundation

In addition to providing financial support for project grants, fellowships, scholarships and research equipment as outlined elsewhere in this report, The Hospital Research Foundation also generously sponsored a range of events that BHI postgraduate students and early career researchers attended during 2015. These included:

- **Tri-University Distinguished Guest Speaker Evening** 10 postgraduate students attended this dinner at which Noble Prize Winner Professor Robin J Warren AC spoke.
- **EMCR Forum** 4 early and mid-career researchers attended the 2-day Australian Early and Mid-Career Researcher Forum on "Effective Science Communication for EMCRs". The EMCR Forum advises the Australian Academy of Science on issues relevant to EMCRs.
- **ASMR PD Workshop** 6 final year PhD students/ recent graduates attended a half-day professional development workshop which included advice and tips on "Creating a winning CV" and how to "Nail that job interview".

As well as being the major sponsor of TQEH Research Day, The Hospital Research Foundation has also provided lunches after the quarterly "BHI Talking Heads" seminars.

THRF also sponsored a range of social events at the Basil Hetzel Institute during the year including:

- Welcome Games
- Bake Off
- End of year "Amazing Race"

BHI researchers are encouraged to support The Hospital Research Foundation by assisting with their community engagement programs, participating in their many fundraising events, being available for interviews for stories and media opportunities. Professional guidance and support for researchers, especially those new to media and community activities, continues to be provided by Fiona Smithson, Director of Communications and Strategic Relations, and her team at THRF.

The Institute

the hospital research foundation

TQEH RESEARCH DAY

TQEH Research Day 2015 was again held in our research building, with our combined seminar rooms, atrium and common spaces comfortably accommodating the sizeable event. Research Day has been held for 24 years now and continues to be recognized as a significant annual event in the research calendar at TQEH.

The long-established purpose of the Day is to provide an opportunity for students and those "in training" to practice and develop presentation skills under conditions that are typical of most professional society congresses. With this experience, it is expected that research quality from TQEH will benefit as researchers deliver their work to national or international congresses. Prizes are awarded in a number of categories for the best presentation and competition is fierce!

Sponsorship for the Day was obtained from many sources, both University and corporate. However our major sponsor for Research Day has for many years been The Hospital Research Foundation and we are very grateful for this long term support. This year the Foundation sponsored two of the seven oral presentation prizes, as well as prizes for best lay descriptions and we look forward to the Foundation's continued support. The Day was very successful, and our winners are identified in the Award section of this report.

Above: Dr Prue Cowled, Professor Steve Webb (Plenary Speaker) and Professor Guy Maddern.

Below: TQEH Research Day Award Winners with Director of Research, Professor Guy Maddern. (L-R: Aneta Zysk, Aashray Gupta, Katharina Richter, Tharshy Pasupathy, Ben Thurston, Zoe Kopsaftis, Kristin Carson and Bill Liapis).

Dr Prue Cowled,
Chair, Research Day Organising Committee, 2015

Six PhD students from the BHI won awards at the Florey Postgraduate Research Conference, University of Adelaide (L-R): Victor Lamin, Bill Panagopoulos, Alex Shoubridge, Bill Liapis, Makutiro Masavuli and Jason Gummow.

Awards

TQEH Research Day 2015 Award Winners

Best Oral Presentation:	Prize & Sponsor(s)	Winner and title	Research Theme/Group
Best Oral Presentation: Honours Students	**$1,000** The Hospital Research Foundation	**Aashray Gupta** Complication rates for Percutaneous coronary intervention in South Australia	**Cardiovascular Disease Theme**/ Translational Vascular Function Research Collaborative
Best Oral Presentation: Junior Laboratory PhD students	**$1,000** Co-sponsored by Southern Cross Science and Lonza	**Bill Liapis** Anticancer Efficacy of the Hypoxia Activated Pro-drug Evofosfamide (TH-302) in osteolytic breast cancer murine models	**Cancer Theme**/Surgery - Breast Cancer Research Unit
Best Oral Presentation: Senior Laboratory PhD Students	**$1,000** Co-sponsored by LabGear and The Hospital Research Foundation	**Aneta Zysk** Targeting osteosarcoma with adoptive transfer of *ex vivo* expanded cytotoxic gamma delta T-cells in combination with zoledronic acid	**Cancer Theme**/Surgery - Breast Cancer Research Unit
Best Oral Presentation: Junior Clinical Researcher	**$1,000** University of Adelaide	**Zoe Kopsaftis** Short-acting bronchodilators for the management of inpatients with acute exacerbations of chronic obstructive pulmonary disease: Systematic review and meta-analysis	**Clinical Sciences, Health Services and Population Health Theme**/Respiratory Medicine and Clinical Practice Unit
Best Oral Presentation: Senior Clinical Researcher	**$1,000** University of South Australia	**Kristin Carson** Superiority of a course of varenicline tartrate plus counselling over counselling alone for smoking cessation: a 12 month randomised controlled trial for inpatients	**Clinical Sciences, Health Services and Population Health Theme**/Respiratory Medicine and Clinical Practice Unit
Poster Prize	**$500** Beckman Coulter	**Ben Thurston** Calcification in iliac arteries: quantification and correlation with outcomes following endovascular aortic aneurysm repair	**Cardiovascular Disease Theme**/Surgery – Vascular Surgery Research Group
Best Lay Description	**$300** Qiagen	**Katharina Richter** To sneeze or not to sneeze- a novel approach to combat sinonasal biofilms	**Clinical Sciences, Health Services and Population Health Theme**/Surgery - ENT Research Group

Other Awards

Katharina Richter, PhD student

February 2015
The Hospital Research Foundation Travel Award, $2,500 for a research visit to The Costerton Biofilm Centre, Copenhagen, Denmark

May 2015
Bertha Sudholz Research Scholarship ($5,000, one-year PhD top up scholarship) for ENT research by the Florey Medical Research Foundation

October 2015
DR Stranks Travelling Fellowship ($2,500) by The University of Adelaide for a research visit in 2016 at Carl Zeiss Microscopy, Germany

Zacki Malik MBBS, Honours student (2013)

October 2015
Second Prize for best scientific presentation, American Rhinologic Society, Dallas, Texas, USA

Vikram Padhye MBBS, PhD student

November 2015
RP Jepson award, Royal Australasian College of Surgeons

Hilary Dorward, Research Assistant

November 2015
Scheme A award of $250 to present at ASMR meeting; Pharmacological blockade of aquaporin-1 water channel activity by the inhibitors AqB013 and AqB050 restricts migration and invasiveness of colon cancer cells.

Dainik Patel

December 2015
Medical Oncology Group of Australia Travel Award to European Society for Medical Oncology Asia, Singapore, $2,000

Robert Adams, Professor in Medicine

October 2015
Best presentation, Clinical Medicine, Australasian Sleep Association Sleep DownUnder, Melbourne

Joule Li, Honours student

June 2015
Podium Presentation Prize, South Australian Men's Health Research Symposium, Adelaide

PhD Students Kristin Carson and Bill Liapis won awards at the SA ASMR Scientific Meeting in 2015.

Victor Lamin, PhD student

September 2015
Florey Medical Research Foundation Prize, Florey Postgraduate Research Conference, National Wine Centre, Adelaide

Donna Keatley, Pulmonary Function Laboratory Supervisor

April 2015
Australian and New Zealand Society of Respiratory Science Ascencia Education Grant, $5,000

Harshani Jayasinghe, Medical Research Scientist

April 2015
Travel grant to attend the Thoracic Society of Australia and New Zealand conference, $388

March 2015
Premiers Channel 9 Young Achiever of the Year category finalist for career kickstart

Malcolm Brinn, Medical Research Officer

April 2015
Travel grant to attend the Thoracic Society of Australia and New Zealand conference, $388

Mark Jurisevic, Chief Medical Scientist

April 2015
Australian and New Zealand Society of Respiratory Science (ANZSRS) Robert Jensen Award; Title: Pulmonary function interlaboratory quality control: A twenty year retrospective $2,000

Natalie Harrop, Thoracic Intervention Suite Clinical Nurse

April 2015

Best oral presentation for the Nursing special interest group for the Thoracic Society of Australia and New Zealand; Diagnostic sensitivity for visible endobronchial tumours on bronchoscopy: A quality assurance study $500

Kimberley Ting, advanced trainee

May 2015

Helen Moran Gift Award at the Australian Rheumatology Meeting, Adelaide

Vanessa Tee, Advanced Medical Trainee

April 2015

Best oral presentation for the COPD special interest group for the Thoracic Society of Australia and New Zealand; Non-invasive positive pressure ventilation for treatment of respiratory failure due to exacerbations of COPD: A Cochrane systematic analysis $500

July 2015

Jack Alpers Postgraduate Prize in Clinical Respiratory Medicine for best presentation by an Advanced Medical Trainee at the South Australian and Northern Territory Thoracic Society of Australia and New Zealand Annual General Meeting; Non-invasive positive pressure ventilation for treatment of respiratory failure due to exacerbations of COPD: A Cochrane systematic analysis $1,000

Leanne Nguyen, MBBS student

October 2015

Philip Alpers Award for the best scientific presentation at the South Australian Rheumatology Meeting, Adelaide

Leanne Nguyen, research elective student in the Rheumatology Research Group, receiving the Philip Alpers Award from Dr Simon Burnet.

Fong Chan Choy, PhD student

June 2015

Australian Neurology Research (ANR) Travel Award to assist travel to present work on microRNA regulation of the brain-specific transcription factor Npas4, at the 2015 International Forum on Agriculture, Biology and Life Science (IFABL); Sapporo, Hokkaido, Japan, $500

September to December 2015

Australian Neurology Research Project Award, $10,000

Danushka Wijesundara, Early Career Research Fellow

December, 2015

Robert Dixon award, Annual Meeting of the Australian Centre for HIV and Hepatitis Virology, Sydney, $500

Khamis Tomusange, PhD student

December, 2015

Kirby Institute educational grant (HIV) Annual Meeting of the Australian Centre for HIV and Hepatitis Virology, Sydney, $500

Jason Gummow PhD student

September 2015

Florey Postgraduate Research Conference award; John Barker prize for outstanding poster presentation, $700

December, 2015

Australian Centre for Hepatitis Virology travel award Annual Meeting of the Australian Centre for HIV and Hepatitis Virology, Sydney, $2,500

Makutiro Masavuli, PhD student

September 2015

School of Medicine Prize for outstanding poster presentation, Florey Postgraduate Research Conference, Adelaide, $200

Ben Thurston, Masters student

2015

Best thesis submitted for MSc in Surgical Science, University of Edinburgh, British Journal of Surgery prize for best paper submitted as an adaptation of a Master's thesis

Kean Kuan, PhD student

2015

Roneal Naidu Memorial Prize, Faculty of Health Sciences, University of Adelaide (awarded in recognition of research of demonstrable impact in a surgical discipline), $1,700

Alexandra Shoubridge, PhD student

September 2015
Florey Medical Research Foundation Poster Presentation Prize Peroxidases and their role in promoting bone repair and regeneration $300

September 2015
Adelaide Research and Innovation Prize Peroxidases and their role in promoting bone repair and regeneration $500

Bill Liapis, PhD student

June 2015
Australian Society of Medical Research (ASMR) - Poster Prize Wednesday; Anticancer efficacy of the hypoxia activated prodrug TH-302 in osteolytic breast cancer murine models. $300

September 2015
Florey Postgraduate Research Conference – John Barker Prize; Anticancer efficacy of the hypoxia activated prodrug TH-302 in osteolytic breast cancer murine models $300

Bill Panagopoulos, PhD student

September 2015
Florey Postgraduate Research Conference – Florey Medical Research Foundation Prize A new role for inflammatory peroxidases in breast cancer development and metastasis $700

Michael Roberts, Professor, Therapeutics Research Centre

2015
Elected as a Fellow of the Australian Academy of Health Sciences

Kristin Carson, Senior Medical Research Scientist

January 2015
National Finalist for Young Australian of the Year 2015

January 2015
Young Citizen of the Year for Holdfast Bay

February 2015
International Travel Grant Healthy Development Adelaide; $1,000

March 2015
Honorary Member of the Golden Key International Honour Society for the University of South Australia Chapter;

April 2015
Best oral presentation for the Evidence Based Medicine special interest group for the Thoracic Society of Australia and New Zealand, Can nicotine replacement therapy delivered via continuous patch cause auto-induction (up-regulation) of receptors? A pilot study $500

April 2015
Best oral presentation for the Tobacco and Addictive Substances special interest group for the Thoracic Society of Australia and New Zealand; Title: Culturally-tailored interventions for smoking cessation in Indigenous populations: A Cochrane systematic review and meta-analysis $500

April 2015
Travel grant to attend the Thoracic Society of Australia and New Zealand conference; $388

June 2015
Recipient of the Australian Society for Medical Research Ross Wishart Memorial Award for best oral presentation at the South Australia conference; Title: Superiority of a course of varenicline tartrate plus counselling over counselling alone for smoking cessation: a 12 month randomised controlled trial for inpatients $1,000

July 2015
South Australian Tall Poppy Science award from the Australian Institute of Policy and Science

September 2015
CMU-A Scholarship from Carnegie Mellon University Australia for the Masters in Public Policy and Management (MSPPM) $37,212

September 2015
Recipient of the Australian Financial Review and Westpac 100 Women of Influence; One of the winners in the Young Leader category

Support Structures

Above: Management Committee members, 2015.

The Basil Hetzel Institute (BHI) Policy Committee provides strategic advice for the running of the BHI and optimises the available support for research programs across The Queen Elizabeth Hospital (TQEH).

The Committee is comprised of senior representatives from:

- the two universities with whom the hospital is affiliated, the University of Adelaide and the University of South Australia
- University of Adelaide academic heads of departments at TQEH (Medicine and Surgery)
- Chair, Strategic Research Directions Working Group
- BHI Facility Manager and
- the scientific community

THE INSTITUTE (BHI) POLICY COMMITTEE

Current members December 2015

Prof Guy Maddern

Prof John Beltrame

Prof Alastair Burt
(proxy Prof Andrew Zannettino)

Prof Michael Roberts
(proxy Dr Lorraine Mackenzie)

Dr Prue Cowled

Dr Peter Zalewski

Dr Jenny Hardingham

Prof Andreas Evdokiou

Dr Ehud Hauben

Mr Paul Flynn

Prof Eric Gowans

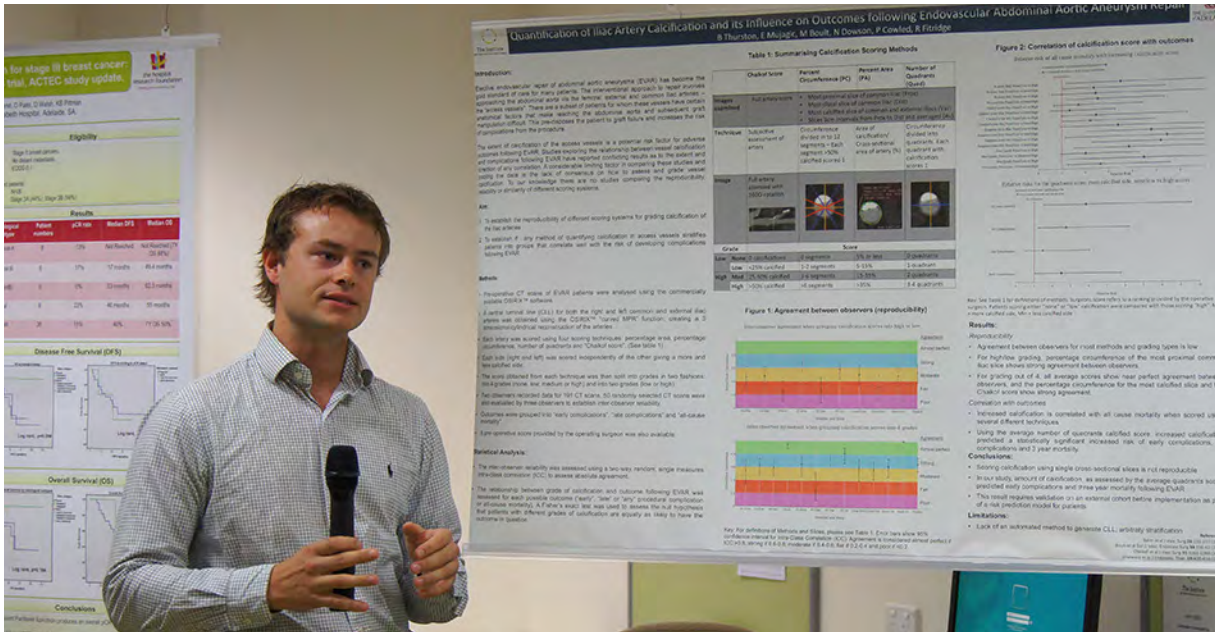
Ms Kathryn Hudson

A/Prof Wendy Ingman

Dr Rebecca Anderson

Executive Support

Ms Gwenda Graves



Ben Thurston, Vascular Surgery Research Group, Poster Prize winner at TQEH Research Day 2015.

Professor Guy Maddern was reappointed to the position of Director of Research in April 2015 for a five-year term. This leadership position has been critical to furthering the aims of research excellence and enhancing the research reputation of TQEH.

Several sub–committees assist the BHI Policy Committee as required, notably the:

- **Research Day Organising Committee**, chaired by Dr Prue Cowled, University of Adelaide Discipline of Surgery, in the planning and running of the annual Research Day event.
- **Scholarship Selection Committee**, chaired by Professor Maddern, in awarding a range of scholarships funded by TQEH Research Foundation.
- **BHI Management Committee**, chaired in 2015 by Dr Lorraine Mackenzie, in managing the Basil Hetzel Institute.

The Basil Hetzel Institute **Strategic Research Directions Group** provides a forum for BHI Researchers to interact and discuss Institute issues and initiatives as well as focus on academic issues such as teaching and postgraduate student recruitment and completions. It reports to The Institute (BHI) Policy Committee, and in 2015 provided recommendations to The Hospital Research Foundation on the 2016 funding framework.

All TQEH researchers at Associate Professor level, Postgraduate coordinators, Heads of departments, and Chief Investigators on Category 1 are eligible to attend each forum, as well as a postdoctoral representative. Professor Eric Gowans has chaired the group since 2012, with Executive Support provided.

TQEH Research Secretariat undertakes a range of activities to assist the Director of Research in supporting, fostering and administering quality research activity across TQEH. Rebecca Anderson joined the team in January 2015 as Communications Officer.

Management Committee

The Institute Level	Representative
Ground Level	Dr Sarah Appleton
Level 1	Dr Sarah Vreugde Dr Chandra Kirana
Level 2	Dr Lorraine Mackenzie (Deputy Chair) Dr Kanchani Rajopadhyaya Ms Irene Stafford
Surgical Suite	Mr Matthew Smith
External representative	Dr Tony Cambareri
Postgraduate Representatives	Ms Agathe Daria Jadczak (Ground floor); Mr Bill Panagopoulos (Level 1); Ms Ana Macedo (Level 2)
Chair	A/Prof Wendy Ingman (maternity leave in 2015; Dr Lorraine Mackenzie chaired)
BHI Facility Manager	Ms Kathryn Hudson

Seminars

A number of regular seminar programs were held in 2015, including:

- **Postgraduate Research seminars** which provide all BHI based higher degree students an opportunity annually to brief staff and students on the progress of their research. Dr Prue Cowled coordinates this program;
- **Invited external speaker research seminars**, held weekly between March and November 2015. The Research Secretariat coordinates this program;
- **The 'Talking Heads' program**, also coordinated by the Research Secretariat, provided a number of clinical and scientific heads an opportunity to brief BHI staff and students about their research programs

In 2015 Staff member seminars were introduced, coordinated by Dr Mark De Nichilo, postdoctoral researcher representative on the Strategic research Directions Group. This valuable seminar program is an initiative of the Strategic Research Directions group supported by The Institute (BHI) Policy Committee and was very well supported by staff and students.

Research Training

The BHI Policy Committee aims to support the research capacity within basic and clinical areas through its strategy of providing a number of scholarships at postgraduate, Honours and vacation levels.

Promotion

In 2015 research training opportunities and Scholarship support were actively promoted through the BHI internet site with links to key university research training sites.

Vacation Research Scholarships

Over the 2015-2016 summer vacation a significant number of undergraduate placements provided scholars with the opportunity to gain valuable research experience in a clinical/laboratory environment. These placements were funded by individual departments.

Honours Research Scholarships

Honours Scholarships continued to be offered at TQEH in 2015 and will continue to be supported through The Hospital Research Foundation.

Higher Degree Scholarships

In 2015 over seventy scholars undertook research towards Higher Degrees at TQEH, with five students supported with The Hospital Research Foundation (THRF)

Scholarships. Responsibility for the selection and award of THRF Honours and Postgraduate scholarships lies with the BHI Scholarship Selection Committee. The Committee draws representatives from clinical academic and scientist streams, with both the University of Adelaide and University of South Australia represented. Scholarships provide stipends that match the Australian Postgraduate Award (APA) rate. The Foundation also provides Scholarship support for two international students.

Other higher degree students at TQEH have scholarship support from a range of funding bodies, including NHMRC, the University of Adelaide and University of South Australia (International scholarships, APA, and University of Adelaide Faculty 'Divisional' scholarships).

Statistical Support Service, TQEH

The Statistical Support Service, jointly funded by BHI and the Faculty of Health Sciences at the University of Adelaide, provides 12 hours per week of statistical assistance to staff and students at the BHI and TQEH more generally.

In 2015 the Statistical Service was provided by Dr Stuart Howell of the Statistics Division of the Data Management & Analysis Centre, School of Population Health and Clinical Practice at The University of Adelaide.

The range of services has included:

- Advice to research staff and postgraduate students about
  - Design of health-related research
  - Statistical aspects of research programs
  - Preparing data for analysis
  - Data analysis
  - Manuscript preparation
- Analysis of data from research programs based at BHI and TQEH.

Human Research Ethics Committee Report

In reporting on the Human Ethics Research Committee (HREC) activities in 2015 I acknowledge the significant work done in the past by Professor Tim Mathew and Melissa Kluge in setting up processes which served the The Queen Elizabeth Hospital/Lyell McEwen Hospital/Modbury Hospital Human Research Ethics Committee very well and continue to do so. As most are aware 2014/2015 was a time of great change in the functioning of the HREC and ultimately has resulted in coordination between the activities of the Royal Adelaide Hospital HREC and TQEH/LMH/MH HREC.

The work in making sure that processes are similar and working to interdigitate meetings, and progressing towards sharing some meetings is continuing. During this time Melissa Kluge, Christy Crilly, Heather O'Dea and Lisa Barrie have been influential in enabling the change process to occur. There are a range of very positive activities which will hopefully make things easier for researchers including a designated low and negligible risk program which is now being run at the BHI site for our HREC by Lisa Barrie and Jan-Louise Durand, and a move to on line submissions. There is also an onsite governance presence at the BHI intermittently.

The transition has not been without difficulties as there have been new processes that have been introduced and a change in roles. I do acknowledge the work that Heather O'Dea has done in taking on the role of Executive Officer working across both sites.

The overall intent of the changes is to provide an improved service to researchers and also to facilitate the governance process.

As a principle the HREC would like to improve its performance by having more interaction about projects prior to Committee meetings, either by email or by face-to-face meetings. We are keen to continue to shorten approval times and the pre-meeting discussions can make a big difference rather than trying to sort things out by email subsequently.

The State Government through the Department of Health has now agreed that as of December 2015 the National Mutual Acceptance scheme will apply across all studies and not just clinical trials. This may make some difference for the workload of the HREC. The principle of picking up the phone to speak to either the Executive officer or the Chair directly can minimise time that can be wasted in emails and tracking emails.

The HREC functions only because of the clinicians, researchers, lay people, pastoral care people and lawyers who are willing to give up their time and apply their skills in comments which enables the HREC to function. At the BHI the Scientific Review Subcommittee looks at studies which involve comparative studies in humans. The full HREC examines all studies that involve clinical trials, comparison treatments, "high risk "projects, a request for a waiver of consent or an opt out consent, and projects involving ATSI participants. There is an expedited review process for "low risk" research (the Chair and the governance/research officer Jan-Louise Durand) with decisions endorsed by the full HREC. A similar review of possible audit/QA projects is undertaken – these designated projects do not require ethical review.

Recent HREC workloads:

2013: Full HREC 57; Low & Negligible Risk (LNR) 70

2014: Full HREC 39; LNR 73

2015: Full HREC 35; LNR 56; Audit/Quality Assurance 18; Amendments 187

Retired Scientific Review Subcommittee (SRS) member: Prof C Hill

New SRS members: Dr Thanh Ha, A/Prof M Rischmueller

Retired HREC members: Prof J McNeill, Dr C Drummond, J Kuyper, Dr C Lai

New HREC Members: Dr S Rice

I thank each of the retiring members for providing the Committees with excellent work and input with common sense views, appropriate questions and 'word smithing'.

In conclusion, the HREC is constituted of a group of lay and professional people who are incredibly supportive of research activities and provide excellent feedback on the information that participants should get. The HREC will also need clinicians to be involved and I remind possible clinician members that HREC meetings are a Clinical Professional Development (CPD) activity and can facilitate learning about aspects of research that sometimes are not well covered in other forums. The HREC is endeavouring to link with an external provider so that formal training that meets the NHMRC requirements for HREC's is fulfilled. 2016 will bring new technology as well as new challenges.

Professor Richard Ruffin
HREC Chairman 2015

the hospital research foundation

The Hospital Research Foundation

Chair's Report

It is my great pleasure as Chair of The Hospital Research Foundation to present the Annual Report for 2015.

It has been a remarkable year for the Foundation with the formation of new allegiances and partnerships, internal and external expansions and further diversification of our core operations.

It has also been a year to momentarily reflect on the Foundation's success as it celebrates 50 years – a magnificent milestone in the support of medical research and patient care in South Australia.

The year has not been without its challenges as the wider Australian community struggles with economic uncertainty, rising unemployment and fluctuations in political leadership and focus.

Locally the impact of the new Transforming Health model, while necessary for the longer-term viability of the states' health service, has also provided unique opportunities in tandem with some navigational challenges.

Despite these external complexities, the Foundation has continued to lead the sector, recognising opportunities when they arise, building support, establishing new relationships and delivering fresh ideas to an increasingly wide and diverse audience.

"It has been a remarkable year for the Foundation with the formation of new allegiances and partnerships..."

New Horizons

In 2015 the Foundation has continued to embrace change and venture into the development and support of new affiliate brands in key areas of need – taking research into the hearts and homes of a growing number of supporters across the nation.

The amalgamation of The Repat Foundation – The Road Home perhaps serves as a fitting example of the organisation's ability to adapt and expand in new directions.

The integration of services and staff has been completed with great consideration. I would like to acknowledge the Repat staff who have transitioned into the expanded team as part of this exciting new chapter.

This successful transition has also been greatly assisted by the dedicated Board of Governors who steadfastly provided direction and support to all parties during this period. We acknowledge the retiring members of The Repat Foundation – The Road Home Board of Governors; Associate Professor Susan Neuhaus CSC (Ret'd), Mr Jim Whalley, Dr Joe Verco and Mr Glen Keys for their outstanding service. We welcome Air Vice-Marshal Brent Espeland AM (Ret'd) and Brigadier Alison Creagh CSC (Ret'd) as Chair and Deputy Chair respectively of the Board of Governors. We also welcome them both as Non-Executive members of The Hospital Research Foundation board.

Together the organisations will be able to forge greater understanding, awareness and support for the health and wellbeing of our nation's veterans, emergency first responders and families across Australia.

The Foundation has continued to work with the Central Adelaide Local Health Network (CALHN) in a mutually beneficial way. The arrangement between the Foundation and CALHN to provide advisory services to the Royal Adelaide Hospital Research Fund is another first.

As the completion and commissioning of the new Royal Adelaide Hospital (nRAH) looms the Foundation is well regarded, situated and ready to assist with key projects as they arise.

Brand Affiliates

The Foundation's fourth disease specific affiliate – Kidney, Transplant and Diabetes Research Australia (KTDRA), a partnership with clinical researchers within CALHN, was officially launched earlier this year at an event marking 50 years since Australia's first successful living donor kidney transplant was performed at The Queen Elizabeth Hospital (TQEH).

The event attended by more than 500 kidney transplant recipients and their families was fitting testimony to the dedication, ingenuity and innovation of our clinical and scientific research leaders who continue to achieve and push medical boundaries.

The Hospital Research Foundation's long-term support has played a significant role in the continued success of the renal transplant team. In the second half of the year the team completed Australia's first auto islet transplant in a seven-year-old boy with contractible pancreatitis. He is recovering well and producing insulin made by his own transplanted islet cells that are now located in his liver.

A responsive framework has been built to accommodate this growing pipeline of brand affiliates. Over the next six months the team will launch Allied Health Research SA to assist in building capacity and support for research in ten vital non-medical disciplines across CALHN. This affiliate, like KTDRA, will seek to grow organically via the various clinical settings across the network.

The Foundation will also help launch the Centre for Creative Health (CCH) at the Royal Adelaide Hospital (RAH) in 2016. This 'arts in health' affiliate heralds a new direction for the Foundation but one that will undoubtedly have a positive impact on the health and wellbeing of inpatients, families and staff once the new hospital opens for business.

Advanced planning is also underway for the 2016 roll out of brand affiliates Cure for Stroke Australia and National Bowel Cancer Research.

The Foundation has evolved into an agile and well-respected partner through the local health network and beyond. The future expansion of affiliate brands is often now being driven by clinicians and researchers, who seek the Foundation's counsel regarding possible partnerships. This is an enviable position to be in and one the Foundation values highly.

Research Grants

2015 started with the announcement of two $25,000 grants offered to researchers across CALHN to mark the Foundation's 50th Anniversary. The process to determine the final winners from more than 30 applicants showcased the Foundation's flair for creativity and superior use of technology and social media to drive participation and votes via an integrated online platform. Winners, Dr Rajdeep Das working in the area of prostate cancer research and Mr Joseph van Agteren working on the development of a mobile app to help quit smoking were announced at the Foundation's celebratory dinner in September 2015.

The Foundation has continued its support of medical and health research into key areas of disease affecting the broader population. Guided by recommendations of Strategic Research Committees within the hospital network, funds are allocated to research that has the greatest potential to translate into the clinical setting and provide patients with better treatments, therapeutics and improved care.

Current funding is directed to major projects in the areas of Ear, Nose and Throat, Cardiology and Virology (HIV/ HEP C). We have also committed funds to core areas of research including breast cancer prevention and metastatic disease as well as prostate cancer and kidney, transplant and diabetes research. We have made a forward commitment in the area of Frailty and Healthy ageing as part of a successful NHMRC Centre of Excellence grant to Professor Renuka Visvanathan and her team based at TQEH.

With NHMRC funding at a record low the need for philanthropic support has never been greater. The Foundation is proud to consistently achieve a 'funds to research as a percentage of gross profit' ratio in excess of 70 per cent which puts us in the top echelons of efficiency for a not for profit charity. In the 2014-15 financial year we have achieved an outstanding 89 per cent funds to research ratio.

To ensure a consistent income stream to support research and patient care into the future we have slowly built our endowment fund. While it is a long-term project, over the last five years we have made significant inroads with the current research reserve already over $9 Million.

We thank our Independent Review Committee members Professors Colin Johnson, Dick Fox and Judy Whitworth who lend their skill and knowledge to ensure we support the highest quality translational research projects and outstanding personnel.

Fundraising Activities

The 2015 year has been one of the busiest on record with a large number of fundraising and friend raising events taking place including several new events on behalf of The Repat Foundation – The Road Home.

The ability to engage with key stakeholder groups across the affiliate brands is unique. It represents the greatest potential to communicate, build relationships, loyalty and trust amongst these groups. It also enables greater efficiencies across our core fundraising and commercial income activities, which in turn helps deliver more than 100 per cent of donated funds to the cause.

The annual Longest Table event held in June 2015 achieved a record total of over $150,000 to support cancer research. The team is to be congratulated for their seamless execution of this signature event, which is fast developing a cult following with high re-engagement rates, social media participants and favorable feedback. It will be back in June 2016 with a new website and a strategy to engage more broadly across Australia.

Our major partnership with Mercer SuperCycle continues to flourish and grow. The 2015 event which saw over 50 cyclists take to the road to complete the ride through regional South Australia was again an outstanding triumph. More than $350,000 was raised by this intrepid team to help complete the Foundation's first Under Our Roof project. The Foundation's internal management of this event is critical to its success.

Together with SuperCycle Inc, we must thank a legion of local companies and generous individuals who have lent their support to complete the Under Our Roof Homes for country cancer patients at Woodville West. The two three-bedroom houses built by Scott Salisbury Homes offer a home away from home for country patients and their families while they receive cancer treatment at TQEH or RAH. With more than 60 SuperCyclists registered for the 2016 ride plans are already underway for a second site closer to the new RAH for the next Under Our Roof project

The Foundation has continued to hone its core fundraising activities. The strategy to integrate campaigns across all available communication channels has taken the Foundation's capabilities to a new level. The national lottery campaign has similarly been fine-tuned to adapt to external fluctuations and the changing needs of ticket buyers.

The Foundation continues to keep abreast of new technologies and developments across the various social media platforms. Social media channels including Facebook, Twitter and YouTube are now mandatory for public engagement and real time news delivery and gathering. This area will continue to be a key area of growth, experimentation and ongoing measurement to ensure strategic objectives are met including the potential for income generation.

Third party giving platforms such as Everyday Hero, Donate Planet and Just Giving have also become invaluable fundraising partners for the Foundation and its brand affiliates. The sites contribute not only monetarily but give a vital connection and interaction with new donors on a local and national level.

Our longest standing and most significant income generator is the Hospital Research Home Lottery Despite the state's economic challenges the sell out success of both 2015 campaigns has boosted confidence leading into 2016. We thank our partners S O Asher (Aust) Pty Ltd, Deloitte Private and Scott Salisbury Homes for continuing to raise the bar to ensure we are positioned as a market leader in the provision of mega lotteries in Australia.

Thank you

It is with some sadness that we say goodbye to our long-standing Board Director Mr John Hender as he retires from a Board he has served for over 15 years. His invaluable contributions and passion for health and medical research has helped shape the organisation's success. We wish him well and know that he will continue to watch the Foundation's future development with great interest.

For an organisation to reflect on its annual performance and see a continued upward trajectory is remarkable. None of this would be possible without good governance and a Board who provide unwavering support for innovative thinking and endeavor.

It is a privilege to be Chair of such a dynamic and exciting organisation. It is also a great honour to work with my esteemed Board Directors whose wise counsel, support and trust has served the organisation well as operations to support medical research and improved patient care have expanded.

On behalf of the Board I would like to acknowledge and thank Chief Executive Paul Flynn and his incredible team for another outstanding year. It is both a fitting end to a milestone year and the perfect segue to launch the next chapter.

Melinda OLeary
Chair, December 2015

the hospital research foundation

THRF Board Members

Melinda OLeary (Chair)

Melinda OLeary is a co-founder and consultant with Nova Systems, an Engineering and Project Management company, which employs more than 300 staff around Australia, Singapore and the United Kingdom. Prior to joining Nova, Melinda held senior positions in several recruitment firms including State Operations Manager for Select Staff and State Manager for both Manpower Services and Kelly Services. She joined THRF in 2009 as a board member and has used her extensive experience in business and HR both at a board level and as Chair of the HR committee. She joined the Board of the Lifetime Support Authority in October 2013 and is a former board member with "Time for Kids". Melinda has been a Time for Kids volunteer carer since 2006.

John MacPhail (Deputy Chair)

John MacPhail is a practising lawyer specialising in corporate and commercial law, particularly intellectual property, media and technology. John has more than 30 years' experience working in law firms in London, Sydney and Melbourne. Most recently he started his own boutique law firm based in Adelaide. John is a past President of the Copyright Society of Australia, and taught part-time as a postgraduate university law lecturer and professional examiner on intellectual property subjects. He advises clients in a wide range of industries, particularly medical and healthcare, biotechnology, the not for profit sector, wine, retail, sports and leisure, marketing and sponsorship, and IT/telecommunications. John became a THRF board member in 2006.

Paul Flynn (Chief Executive Officer)

Paul Flynn is an innovative and entrepreneurial Executive who has earned a stellar reputation for achievement during a multi-faceted career in both the finance and not for profit sectors. He has been acknowledged for his contribution by being awarded the 2005 Ernst & Young Social Entrepreneur of the Year in SA/NT and was also awarded the 2006 Equity Trustees Australian CEO Award for Innovation. Paul is passionate about the opportunity to help medical and scientific researchers in their important voyage of discovery which will benefit all Australians. Paul brings advanced skills to THRF in the areas of Leadership, Sales Management, Property Development and Management, Change Management, Financial Risk Management, Employee and Organisation Development and Employee Relations. He is delighted to be working with the team at THRF and The Institute, contributing to the health and well-being of all Australians.

Professor John Beltrame

Leading cardiologist Professor John Beltrame brings a medical perspective to the board. He has degrees in both science and medicine, and is a Fellow of the Royal Australasian College of Physicians, the European Society of Cardiology, the American College of Cardiology, the American Heart Association and the Cardiac Society of Australia and New Zealand. He is the Michell Professor of Medicine at the University of Adelaide and the Cardiology Academic Lead for the Central Adelaide Local Health Network (CALHN). Professor Beltrame's research group is based at The Institute. John became a THRF board member in 2007.

Dr Stephen Rodda

Dr Stephen Rodda is Chief Executive of UniSA Ventures Pty the technology commercialisation arm (TTO) of the University of South Australia. He was educated at The University of Adelaide gaining a first class honours degree, a PhD in Biochemistry and was awarded the University Medal. Subsequently he was awarded the prestigious NHMRC CJ Martin and Arthritis Foundation fellowships for post-doctoral training at Harvard University. Dr Rodda has a combined 15 years of experience in the areas of scientific research, research management, technology commercialisation, investment management and corporate governance. He holds an MBA and is a Graduate of the Australian Institute of Company Directors. Stephen joined the Board of THRF in 2013.

Luciana Larkin

Luciana Larkin is the lead partner of Tregloans, an established and respected Chartered Accountancy practice. As a sharp and strategic thinker, she applies her expertise in financial, complex tax & business transactions to deliver effective outcomes. Luciana brings this professional expertise and strong focus on accountability & governance to the Board together with experience as a trusted advisor to numerous other corporate boards and not for profit bodies. Luciana joined the Board of THRF in 2010.

Ken Milne

Ken Milne is the Director of Milne Architects Pty Ltd and adds a different aspect to the board. He received a Diploma of Architecture at the University of South Australia and is a Fellow of the Royal Australian Institute of Architects. He is a Past President and former Chapter Councillor of the Royal Australian Institute of Architects (RAIA), and was National Chair of RAIA Public Affairs Committee & Awards Director. He was also a board member & deputy chair of Rostrevor College for 10 years overseeing the formulation & introduction of the College Master Plan. Ken has been a board member of THRF since 2007.

MaryLou Bishop

For the last 23 years MaryLou Bishop has run a surgical devices company selling highly technical operating room equipment to our largest hospitals across SA, WA and NT. MaryLou has a strong understanding of the medical world and the health industry. In 2014 MaryLou was elected a councillor to the Town of Walkerville. She joined the Board of THRF in 2014.

Valerie Timms

Valerie Timms has more than 14 years' experience in Adelaide's competitive real estate industry. After only two years Valerie was the number one sales person for a large franchise group and went on to run her own award winning office for nine years. Four years ago she created her own independent real estate company – Timms Real Estate. Valerie is a skilled coach and mentor within the property sector and is dedicated to serving the community and helping others achieve business success. Valerie joined the Board of THRF in 2014.

John Hender
(Board Member 2001 – November 2015)

John Hender is Senior Manager for Native Title trusts and Investments for Perpetual Ltd. He has worked extensively in the financial services industry for over 30 years in sales, marketing and management roles. He has tertiary qualifications in marketing, finance and trusteeship and is currently studying towards a postgraduate Masters degree in Aboriginal Studies at the University of South Australia. John has a long history of community service and has been a board member of THRF for 15 years.

John Woodward

John Woodward has more than 25 years' experience in technology related change programs, projects and consulting services across industries including the health, water, energy, and entertainment sectors. John is Non-Executive Director at Statewide Super, an Elected Member (Councillor) with West Torrens City Council, and lectures at the University of Adelaide (Masters of Project Management). John holds an MBA specialising in technology management, is a graduate of the Australian Institute of Company Directors and a certified Project Management Professional through the Project Management Institute. John joined the Board of THRF in 2013.

Professor Peter Hewett

Professor Peter Hewett is a Clinical Professor of Surgery in the Discipline of Surgery at the University of Adelaide and is Head of Colorectal Surgery at The Queen Elizabeth Hospital (TQEH). He has published more than 100 articles in peer reviewed journals and has held three NHMRC grants. Professor Hewett is also currently chairman of the Calvary North Adelaide Hospital Clinical Review Committee and teaches at the University of Adelaide Masters Course in Minimally Invasive Surgery. Peter joined the THRF board in 2013.

Hospital Home Lottery Gilberton house

the hospital research foundation

George and Alexandra were thrilled to present the $10,000 cheque to staff from TQEH Palliative Care Unit.

the hospital research foundation

THRF Corporate and Community Support

A Young Star with a big heart

Jennifer Tran Nyugen is not your typical nine-year-old. Using her extraordinary singing talent, Jennifer hosted her own fundraising event in 2015 to raise money for TQEH through THRF.

Hosting 'Angel of Love' on Saturday September 5th, Jennifer wowed the crowd with a mixture of English and traditional Vietnamese songs, raising an incredible $5,450.

The choice to donate to TQEH was important to Jennifer after her mother went through a long, difficult time with an illness and was given tremendous support by medical staff at the hospital.

With her mother now fit and healthy, Jennifer and her family were beyond grateful to TQEH staff for their skill and support and chose this reason to give back with the help of THRF.

Aspiring to become a neurosurgeon, multi-talented Jennifer also celebrated her academic feats at the event – as the youngest person to complete year 12 Maths and English.

Boost from Drakes Supermarket

THRF received more than $21,000 to support health and medical research thanks to the South Australian community and the ongoing generosity of Drakes Supermarkets and their suppliers.

For 16 years, Drakes Supermarkets has teamed up with a number of suppliers to produce the Drakes Supermarkets Charity Showbag, which goes on sale in South Australian stores throughout the Royal Adelaide Show week.

THRF was one of four charities who received an equal share of a total of $86,620 raised during the 2014 Show Bag campaign. The recent cheque handover occurred at a Morning Tea held at the picturesque Kooyonga Golf Club.

"The Foundation is once again incredibly grateful to CEO Roger Drake, his wife Wendy, their suppliers and stores for their wonderful community spirit and generosity," said THRF CEO Paul Flynn.

Left: A very talented performer, Jennifer's fundraiser was a huge success and will fund vital medical research right here in SA.

Right: John Paul Drake, Paul Flynn (THRF) and Wendy Drake.

Annual Cancer Support Dinner Dance raises over $28,000

On Saturday 14th March 2015, Maria and Chris Giannoudis along with their friend, Jim Makris hosted the 14th annual Cancer Support Dinner Dance, raising over $28,000 for vital research into cancer and heart diseases through THRF.

After being diagnosed with ovarian cancer, Maria was inspired to host something 'Greek' to make herself and others feel better. Sadly, she already had lost her father and a close cousin to cancer.

"The Cancer Support Dinner Dance has grown out of our own personal experiences with cancer and we have a real passion to reduce the burden of these conditions in our community," Maria said.

"These diseases are some of the most devastating and affect our community in many ways."

Held at the Krystal Function Centre in Port Adelaide, the Dinner Dance provided live entertainment, a raffle, an auction, a lucky door prize and delicious Greek cuisine.

Professor Andreas Evdokiou, Head of the Breast Cancer Research Unit at the BHI spoke on the night about his team's research into the development, progression and metastatic spread of breast cancer.

The money raised on the night has gone towards supporting Professor Evodkiou's research team and the purchase of two important pieces of equipment for use at the BHI.

"We're so grateful for all who attended and supported this event – be assured your support is greatly appreciated and will change the lives of people affected by breast cancer in our community," Professor Evdokiou said.

Top: The 14th Annual Cancer Support Dinner Dance raised over $28,000 for THRF, which will go towards lifesaving medical research.

Above: Sandra and breast cancer researcher, Dr Mark DeNichilo from BHI who spoke on the day.

Café De Cure comes to life

Two years on from her breast cancer diagnosis, a still larger than life Sandra Kanellos hosted a Café De Cure fundraiser morning tea at Nazareth Catholic College.

The $3,731 raised has gone towards TQEH Oncology Department which will help fund the Under Our Roof homes as well as towards medical research into secondary breast cancer through Professor Andreas Evdokiou and Professor Peter Hewett's gastric cancer research.

Sandra explained, "When I heard about Under Our Roof I knew it was the perfect cause – having chemo I met a couple of women from the country who would drive up for chemo, and I was thinking to myself there should be somewhere for them to stay."

THRF would like to extend a very warm thank you to Sandra for making this kind donation to support various areas of lifesaving medical research and tangible patient care projects.

The Greek community spirit

Research at the BHI has once again been boosted by the generous contributions of the Olympic Spirit Greek Friends (OSGF).

Led by the dedicated and passionate Alexandra (Alex) Vakitsidis, the members of OSGF raised $23,300 through a range of activities – from cake stalls featuring gourmet Greek cakes and sweets to traditional Christmas carolling for local communities.

The OSGF are united in their quest to provide on-going funds that assist medical research and patient care in South Australia.

The majority of the funds raised have gone towards a new -80°C freezer for the Ear, Nose and Throat (ENT) research group, which will be used to store essential tissue samples.

The remaining funds raised will go towards Associate Professor Peter Bardy, Head of Haematology at TQEH.

At the recent cheque handover held at the BHI, Dr Alkis Psaltis, Research and Head of Unit, Department of Otolaryngology Head and Neck Surgery, who works with the ENT Research group at the BHI, thanked the OSGF for their extraordinary dedication and commitment to raising much needed funds.

The attendees at the morning tea also heard from Alex, Paul Flynn, CEO from THRF and Father Stavros Psaromatis from the Greek Orthodox Norwood Church. Andreas-Konstantinos Gouras, Consul-General of Greece in Adelaide also attended the morning tea which was catered with delicious treats made by the Greek ladies from OSFG.

Proud Dad leaves lasting gift to medical research

THRF were honoured to receive a $500 cheque from the family of Basile Frangos who was kind enough to leave a legacy to medical research after passing in September last year. Basile, who had supported the Foundation since 1995 passed away in September 2014 at the age of 92.

Arriving in Australia in 1959, and armed with a passion for learning, Basile left Greece with his young family to give his children greater educational opportunities.

Always a hospitable man, Basile's home was constantly filled with visitors who were delighted to indulge in his vegetable garden.

THRF would like to extend a warm thank you to Basile's children Sofia Zissopoulous, Eva Petropoulos and Evan Frangos who describe him as a generous man dedicated to his family.

"Dad loved his family and was immensely proud of his three children. He is forever in our hearts," said Sofia.

Alex Vakitsidis, front, centre, with Dr Alkis Psaltis (far left) and researchers from the ENT group at the BHI.

Giving back to TQEH in memory of a much loved Papou

After losing their beloved 'Papou', Georgios, to prostate cancer at the age of 86, the Panagiotidis grandchildren are very passionate about their family donation of $10,000 to TQEH Palliative Care Unit.

George, 14 and Alexandra (Lexi), 12, from West Beach have fond memories of growing up with Georgios, who was able to fix anything they broke, build anything they needed, encourage them to seize opportunities and provide support in all areas of their lives.

As a way of giving back to the professional caring environment at TQEH, where Georgios spent his last days before passing away in March 2015, the family made this generous donation in recognition of the care he received, to thank the staff involved and to contribute to patient care in the future.

In a cheque handover, the Palliative Care team announced that the donation will allow for the creation of a Family Room where loved ones will be able to spend time together.

"Papou was a nice, active healthy man – he was just beautiful. I miss him a lot," Lexi said while sharing memories with her brother.

"He built us cricket stumps, a high jump set, basketball hoops, swings and he was able to fix pretty much anything."

"He always used to say – 'Don't put off until tomorrow what you can do today,' and that's how we'll live our lives," George said.

Left: George and Lexi with a photo of their beloved Papou, Georgios, in his younger years.

Right: THRF were honoured to receive this legacy from Basile and his loving children Sofia, Eva (pictured) and Evan.

While building and fixing were regular occurrences for Georgios, he also strongly encouraged the kids to 'stay in school' and make the most of the education available to them. In return, both George and Lexi have agreed to live their lives to the fullest in memory of him.

"My favourite memory of his last few weeks was when I promised him I would win a gold medal at athletics, even though I had never won before – and I did! I took it into TQEH to show him and that is something that will always be very special to me," George said

"It sometimes doesn't feel real. We go around to see our Yia Yia and you still expect him to be sitting at his chair in the kitchen. We will always miss him."

After being diagnosed with prostate cancer 10 years ago, Georgios was given the all clear after successful treatment. Sadly, in 2013 he was re-diagnosed and the cancer had spread to other parts of his body.

Born in 1928 in a small Greek village named Tsotilion Kozanis, Georgios migrated to Australia in the 1950's making Adelaide's western suburbs a permanent home. According to the family, Georgios was also very grateful for the community feel of the hospital and appreciative of the continuous care he received.

George, Lexi, Georgios's wife Marianthi and his two children Maria and Alex, will be very happy to see the donation of $10,000 used to support patient care at the TQEH Palliative Care Unit in a hope to make a difference to families in the future who will experience the loss of a loved one.

Alex and her team from Olympic Spirit Greek Friends raised an incredible amount for vital medical research.

BBQ for a Cause

Less than a week back from a three-month holiday to Greece, THRF Ambassador Alex Vakitsidis was back in full force and cooking up a storm for a THRF fundraising barbeque at Woodville Bunnings.

Backed by her community group, Olympic Spirit Greek Friends (OSGF), the barbeque raised an amazing $2,160 to go toward lifesaving medical research undertaken in Adelaide.

Always passionate about helping local patients, particularly at TQEH, Alex and friends are the type of supporters that allow THRF to always be at the heart of the community.

Thank you Alex and OSGF!

Disease Specific Affiliate Community & Corporate Supporters

THRF is proud to have the support of various individuals and community groups through our disease specific affiliate brands: Australian Breast Cancer Research, Australian Prostate Cancer, Australian Heart Research and Kidney Transplant and Diabetes Research Australia.

We are very grateful to these generous individuals and groups who have each contributed a significant amount through fundraisers in 2015.

- Intimo Lingerie
- Grumpy Old Men
- Rotary Club of Coromandel
- Riverland Sign Writer, Mark Lewis
- Adrian Yeak
- Jay Claringbold
- Madeline Gardner

THRF Research Equipment

THRF is proud to support researchers at the BHI by funding the most advanced equipment needed to investigate health conditions including arthritis and chronic sinusitis as well as various cancers and cardiovascular diseases.

This research will ultimately lead to improved treatments and patient care at TQEH and beyond.

In 2014/15, THRF contributed over $221,690 to the purchase of the following items:

- Shimadzu LCMS Triple Quadrapole mass spectrometer
- X30R Allegra centrifuge
- X15R Allegra centrifuge
- 5720R Eppendorf centrifuge
- 19AIC CO2 tissue culture incubator
- Bead bath
- BioRad chemiDoc imaging system
- -80°C freezer
- -80°C freezer
- Electric screwdriver
- IVC air handling unit

Main image: BHI researcher Hilary Dorward using the new BioRad Chemi Doc Imaging System.

Above: BHI researcher Tamila Heresztyn with the mass spectrometer, purchased thanks to generous support from THRF, TQEH and the Universities of Adelaide and South Australia.

the hospital research foundation

THRF Fundraising Events

1000km in 7 Days for Country Cancer Patients

Going Dry in July

American Chamber of Commerce in Australia

An Unexpected Sea Change

The Longest Table Comes To Life

Community Tours , Radio segments and Speaking Engagements

A Thank You Lunch – Basil Hetzel Society

100KM IN 7 DAYS
FOR COUNTRY CANCER PATIENTS

Riding to support South Australian country cancer patients, two pelotons of inspiring cyclists and a convoy of dedicated volunteers completed a 1000km journey across regional South Australia in March for Mercer SuperCycle 2015.

The annual seven-day Mercer SuperCycle ride saw a total of 52 riders, 15 volunteers and seven support vehicles travel to various regional centres including Clare, Wallaroo, Port Pirie, Burra, Tanunda and Murray Bridge, with a total of 32 riders completing the full seven days of the challenge.

Their inspiration? Raising vital funds for THRF's first Under Our Roof project.

"Since we began SuperCycle in 2012 we have raised more than $1 million to support country cancer patients and their families in South Australia, which is an exciting and rewarding achievement," said SuperCycle Chair Mr Mark Day.

The SuperCycle convoy stopped in 35 local communities where the group spread their inspiring message to community groups, support groups and a number of local primary schools.

"Engaging with the local communities is a big part of Mercer SuperCycle and something that we as riders get a lot of satisfaction from – they are part of our inspiration for pushing ourselves to our physical, emotional and mental limits," explained Mr Day.

Top:: The riders were reunited with their families after cycling 1000km in 7 days to decrease the burden on country cancer patients in SA.

Above: The amazing cyclists out on the road during the annual seven day event.

"I'd like to congratulate all the riders and support crew on a safe and successful 2015 ride. The riders trained for months and put in a huge fundraising effort, but we know that nothing we experienced is as hard as what people with cancer and their families suffer – it makes it all worth it."

GOING DRY IN JULY

More than 200 South Australians took a month off drinking to support THRF for Dry July in 2016 raising over $32, 254.

Thank you to everyone who took part – these much needed funds have supported THRF's Under Our Roof Project providing accommodation for country cancer patients and their families who are travelling to hospitals in Adelaide for treatment.

Thanks to those involved in Dry July, these two family sized homes in Woodville West have been built for country cancer patients to stay while having treatment in Adelaide.

AMERICAN CHAMBER OF COMMERCE IN AUSTRALIA

In 2015 THRF was again a proud charity partner of the American Chamber of Commerce in Australia (AMCHAM) business lunches held throughout the year. Through hosting auctions and raffles THRF raised an incredible $5,290 for life changing medical research. These lunches also gave THRF the opportunity to engage with the South Australian corporate community and provide insights on the medical research undertaken at the BHI.

AN UNEXPECTED SEA CHANGE

With a million reasons to smile, winner of the first Hospital Research Home Lottery for 2015 Kathryn and her husband Joe have chosen to take a sea change over a cash windfall.

Kathryn and her husband are ecstatic about their new beachside home and so happy they could help support something that benefits the community.

The win came as a complete shock to the mother of four who purchased her five lottery tickets online.

"I was really shocked, surprised and overall happy. It took a while for it to sink in – especially having to make such a big decision between the cash and the house," Kathryn said.

"But we've made a wonderful choice to live mortgage free and embrace an exciting new lifestyle near the beach."

The couple has now moved in to their stunning new two-storey property at Somerton Park designed and built by Scott Salisbury Homes.

"I grew up only a few kilometres away from the Whyte Street house and spent lots of time on Glenelg beach and shopping along Jetty Road with my mother, so there is a lovely familiarity about returning.

"We are so grateful – this is something people really only dream about. I will never forget how lucky we are."

Kathryn knows only too well how important the lottery is to the health and wellbeing of her fellow South Australians.

"I've always been happy to support the Hospital Research Home Lottery because I know the proceeds go to something good that benefits people whether you win or not."

THE LONGEST TABLE COMES TO LIFE

Fun. Simple. Lifesaving.

The Longest Table (TLT) came alive across the state on Saturday June 20, 2015 – the official date to #forkcancer by raising money for lifesaving medical research.

Thanks to our TLT family, the Longest Table raised a magnificent total of $150,000 to fight cancer – high fives all round to those that hosted a dinner and all the friends and colleagues that donated both time and money.

The evening of June 20 was met with enthusiasm, creativity and excitement by all dinner hosts with themes ranging from Japanese Fusion, Murder before Midnight, a Remembrance Table and a lively Mexican Fiesta!

Two TLT Paparazzi teams hit the road visiting a number of dinners to see how everyone rallied together for the cause.

TLT Ambassadors Bree May and Dougal McFuzzlebutt hosted their 'Dude Food' dinner showcasing SA produce, wine and beer on the night at The Big Shed Brewing Co.

Renowned Adelaide Food Blogger Foodie Ling said she and her partner had a fantastic time at Bree and Dougal's dinner and absolutely loved the food and the atmosphere. A lot of people also agreed they had the best espresso martinis from one of the local businesses supporting the night – Steve the Bartender!

Back at TLT Headquarters, a team was busy running the online auction and giving out party prizes to lucky winners throughout the night.

The #forkcancer theme on social media was a huge success with a large number of hosts and guests sharing their dinners with the rapidly growing TLT community.

Researchers from the BHI celebrated a Longest Table Lunch on June 18th following a "Talking Heads" seminar presentation by Professor Rob Fitridge. Approximately 50 people attended with each person bringing along a plate of food to share and helping to raise a total of $1,765. TLT Ambassador and BHI cancer researcher Dr Irene Zinonos also hosted a dinner for colleagues, friends and family on the evening of June 20.

"Thanks to everyone who supported TLT in 2015. Without support from fundraising events like this, our research would not be possible. People think that without medical research, we would not have the anticancer treatments we do. I believe that without the kind and generous donations from people we would not have the research or the treatments," Irene said.

We can't wait to #forkcancer with you in 2016, register your interest at **www.thelongesttable.com.au**

Top to bottom:

BHI researchers including TLT Ambassador Dr Irene Zinonos held a Longest Table lunch in their atrium.

TLT came alive across the state as everybody joined together to #forkcancer and raise money for lifesaving medical research.

TLT Ambassadors Bree May and Dougal McFuzzlebutt hosted their own dinner for the cause.

COMMUNITY TOURS, RADIO SEGMENTS AND **SPEAKING ENGAGEMENTS**

2015 was another successful year for THRF's Community Awareness Program which continues to raise community awareness on the vital medical and health research being undertaken at the BHI.

As part of this program, in 2015 THRF held four public tours of the BHI giving community members the opportunity to hear from researchers in different areas and have guided tours of the labs. Each tour was dedicated to a different area of research ranging from cardiology and stroke to breast and colorectal cancer.

In 2015 THRF's monthly segment on community radio station Coast FM has seen a variety of researchers have the opportunity to share their research projects with presenter David Hearn.

Community groups throughout the state were also given the exciting opportunity to hear from researchers based at the BHI. In 2015, researchers attended 17 speaking arrangements visiting groups such as Rotary clubs, University of The Third Age, Weight Watchers and community groups in Largs Bay and Aldinga.

If you are interested in a tour of the BHI or a community group presentation, please visit our website for more information **www.hospitalresearch.com.au**

Above: BHI researcher Dr Mark DeNichilo (far back), Breast Cancer Research Unit, hosts a public tour of the BHI.

Below: PhD student Bill Panagopoulos, Breast Cancer Research Unit, with David Hearn of Coast FM.

A THANK YOU LUNCH - **BASIL HETZEL SOCIETY**

On Thursday November 5 2015, a group of THRF's highly valued supporters came together for the annual Basil Hetzel Society Luncheon.

Held at the Kooyonga Golf Club, the luncheon is a way of thanking these supporters for their vital contribution to lifesaving medical research that is having a direct impact on our community.

To provide an update on some of the exciting new developments in local Adelaide research, guests were treated to a very informative panel discussion. The panel included Emeritus Professor of Medicine Richard Ruffin AM, Professor of Otorhinolaryngology, Head and Neck Surgery and Head of Department at The Queen Elizabeth Hospital, Professor Peter John Wormald and PhD Candidate Aneta Zysk who is undertaking her research in the Breast Cancer Research Unit at the Basil Hetzel Institute for Translational Health Research.

THRF would like to thank all of the speakers for donating their valuable time to be involved in what was a very well received panel discussion!

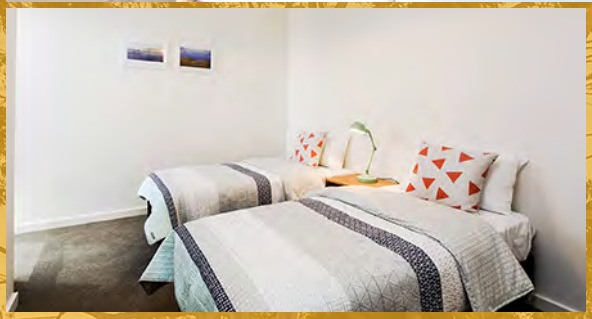
Main image: (L to R)Professor Richard Ruffin AM, PhD Student Aneta Zysk and Professor Peter John Wormald provided guests with an entertaining and valuable panel discussion, led by THRF CEO Paul Flynn.

Above: THRF staff member Sam Zammit (centre) with four members of the Basil Hetzel Society.

For all the supporters who attended, THRF would also like to congratulate them for their lasting contribution to the health and wellbeing of our local community through lifesaving medical research and advancements in patient care.

THRF Major Project

Under Our Roof



UNDER OUR ROOF

LAUNCHES FOR COUNTRY CANCER PATIENTS

More than 80 people celebrated the much-anticipated launch of THRF's first Under Our Roof project on the 3rd of September 2015, marking a major milestone for THRF and everyone who has supported this wonderful project.

Two family-style homes on Nicholls Terrace, Woodville West have been built to provide a 'home away from home' for country cancer patients who need to travel to Adelaide for cancer treatment.

The homes, named 'Mercer House' and 'Bendigo Bank House', were built by long-time partner of THRF and multi-award winning builder Scott Salisbury Homes. The two, three bedroom houses have been designed specifically to cater for families and cancer patients who may be feeling unwell.

Without the generosity of the South Australian community, contributions from major fundraising partner Mercer SuperCycle and proceeds from Dry July, the completion of these homes would never have been possible.

The Mercer SuperCycle team has partnered with THRF over the last three years and has raised more than $800,000 through their annual 1000km, seven day ride around country South Australia to make these homes a reality.

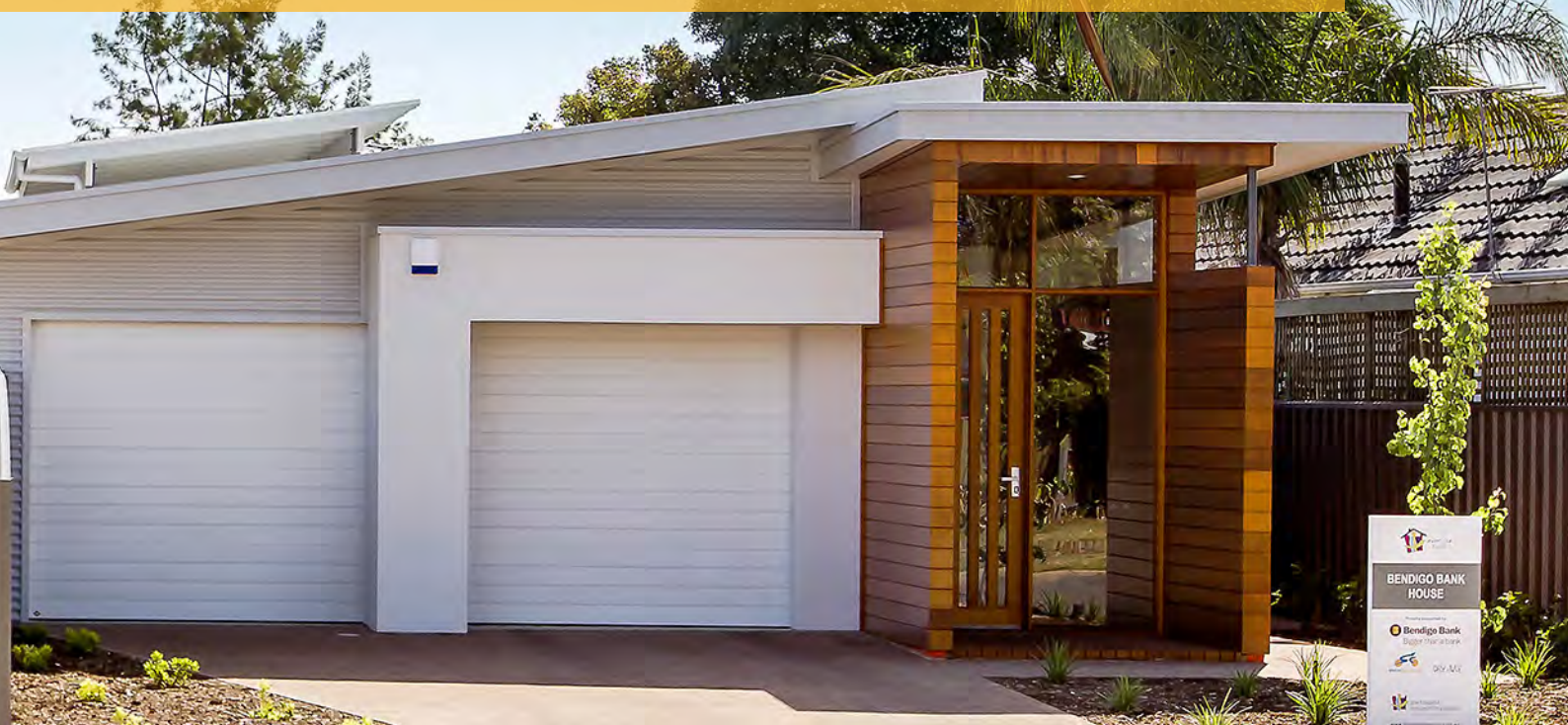
"Supporting country cancer patients in South Australia is a really exciting and rewarding achievement and we're so pleased to be part of launching these two stunning homes named after our two major and very generous ride sponsors, Mercer and Bendigo Bank," said Mercer SuperCycle Chairman Mr Mark Day.

THRF CEO Paul Flynn also extended thanks to the generous individuals, communities and companies who have donated goods and services to ensure this project can provide all the comforts of home for country patients and their families.

Local businesses including Austral Bricks, Beaumont Tiles, Kewco, Statesman Windows, Kitchens by Farquar, Routleys, TDR Elecrical, Floors Plus Carpet Court, The Good Guys Marion, Wallspan Wardrobes and BlueSky Air-conditioning are just some of the generous suppliers to this project.

"We're very excited to be able to welcome our first families in September where we hope they will feel safe and comfortable in these beautiful new homes. When you're Under Our Roof – we want our house to be your home," said Paul.

"If we can help reduce the impact and stress a cancer diagnosis has on country families who may be separated from loved ones at a vulnerable stage of their lives, then this initiative has been a success and one that we will work to replicate in the coming years."



The Institute

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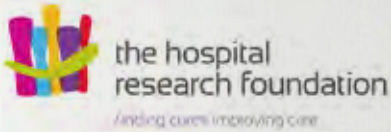

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