ST VINCENT'S
CENTRE FOR APPLIED
MEDICAL RESEARCH

A DIVISION OF ST VINCENT'S HOSPITAL SYDNEY

RESEARCH REVIEW 2020/2021


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MESSAGE FROM THE CEO

I think I am on safe ground in stating that the past couple of years have been like no other we have experienced. Certainly for our St Vincent's Precinct, the relevance of our Founding Sisters' Mission of responding to community need has never been as relevant. And indeed respond is what we did. Few precincts in the country found themselves in the middle of the pandemic the way our Darlinghurst Precinct did.

St Vincent's played a pivotal role in relation to treating many patients and screening a large proportion of the community. The central components of this rapid response rested on two fundamental characteristics: agility and partnership. Our health service was able to scale up and repurpose many of our services, and we swiftly collaborated with our clinical, research and teaching partners in a unique way that belies our reputation for Precinct integration.

It is no coincidence that our St Vincent's pathology service has played a pivotal response in the screening process, having processed close to a million tests in the past two years. Similarly, we were the first precinct to introduce rapid point-of-care COVID swab testing, which has been vital in guiding our care in critical situations, and St Vincent's was announced as the first Australian site to trial Remdesivir, the experimental antiviral treatment for critically ill patients with COVID-19 under a special access program.

Perhaps not since our role in responding to HIV in the 1980s has the St Vincent's Precinct's focus on integrated research been so resolutely illustrated. Currently there are 17 separate COVID trials being undertaken by St Vincent's in conjunction with our research partners, the Victor Chang, Garvan, Kirby, and Nursing Research institutes, and our clinical partners, St Vincent's Private and St Vincent's Clinic. This collaboration has seen the Precinct leverage the unique skillsets of our individual parts to deliver collective gains – in doing so, attracting important research grants, particularly in relation to exploring the impact of long COVID.

Beyond COVID, the strength and collaboration of our research across St Vincent's has continued to flourish, particularly as we galvanise our status as one of Australia's leading precision healthcare facilities.

Over at the Centre for Applied Medical Research (AMR), we witnessed the multidisciplinary team of researchers from St Vincent's Hospital Sydney and Macquarie University identify a way to modulate an important biochemical pathway involved in inflammation – the kynurenine pathway (KP) – and prevent brain inflammation and degeneration.

The capacity to modulate the KP has significant ramifications, particularly for preventing the progression of multiple sclerosis (MS) from an inflammatory condition to degeneration.

Late last year we opened our Haematology BMT Unit, signalling the opportunity to expand our Centre of Excellence in clinical and research cell-based therapies. Not surprisingly, our cellular therapy clinical trials are flourishing across the Precinct, as are our medical oncology clinical trials, which number the highest in New South Wales.

In a year that marked the 35th anniversary of the establishment of 17 South, the St Vincent's HIV ward, we appointed Dr Pei Dai as our first David Cooper Fellowship recipient. The fellowship, which acknowledges Scientia Professor David Cooper's legacy of promoting Precinct collaboration, focuses on precision medicine genomics in rare immunodeficiencies and other diseases of the immune system. Dr Dai is now well on the way to completing his PhD.

Still on the subject of precision medicine and collaboration, a groundbreaking genomic research project led by Dr Kathy Wu and the St Vincent's Clinical Genomics Unit exploring pharmagenomics recently secured $2.95 million as part of the Commonwealth Government's $20 million additional funding for mental health.

The St Vincent's project, which is Australia's first multicentred double-blinded randomised controlled trial, will trial genotype-guided versus standard psychotropic therapy in moderately to severely depressed patients. The $2.95 million in funding will come from the Medical Research Future Fund's Emerging Priorities and Consumer Driven Research initiative.

The trial aims to recruit 550 adult patients newly diagnosed with moderate to severe major depressive disorder, combining new pharmacogenomics and emerging neuroimaging biomarker technology with large-scale data in a novel Deep Learning application, aiming to refine existing tests and enhance precision of psychotropic therapy in depression treatment.

The project represents the absolute embodiment of two of our key-strategic priorities on the St Vincent's Precinct: the extraordinary potential of genomics and precision healthcare as well as supporting this often vulnerable patient population.

We recently welcomed Professor Jason Kovacic as the new Executive Director. The ability of the Chang to recruit someone of Jason's calibre to lead the institute is indicative of their international status as a genuine leader in cardiac research.

Still on the subject of conjoint clinical research leaders, we were proud to see St Vincent's cardiologist and Victor Chang researcher Dr Nicole Bart named as a 2020 Fulbright Future Scholar. Nikki will be spending 10 months at the Brigham and Women's Hospital, Harvard Medical School, collaborating with experts in the field of cardiac genetics.

In writing this foreword, I have highlighted a range of milestones over the past year that illustrate the strength of our partnerships that distinguish our Precinct. Our foundation of membership of the Sydney Partnership for Health, Education Research and Enterprise (SPHERE) is continuing to reap terrific rewards for the St Vincent's Precinct, particularly SPHERE's translational fellowships where our clinicians are undertaking invaluable collaborative projects in a wide array of fields.

While our research activities are thriving on the Precinct, it is important that we continue to ensure that we have the right infrastructure to support these endeavours. During our Precinct master planning, we identified West Street as a priority building development to be progressed to create a new hub of innovation and learning, bringing together researchers, industry partners, educators, students and support staff together on the research precinct.

The West Street development would include new purpose-built research and education facilities, with improved technological capability, physical infrastructure and greater efficiencies; increasing potential for collaboration between existing research and education groups, research support, clinical trials staff and industry partners; and increasing capacity to grow research and clinical trial programs. Securing Federal, State and philanthropic funding for West Street remains a key Precinct priority.

While the COVID-19 pandemic has reaped extraordinary destruction throughout the globe, and there are few, if any, positives to take away from our experience so far this year, I am proud that our Precinct has stepped up to play such an extraordinary role. I have little doubt that this role has been enabled by two fundamental characteristics of the St Vincent's Precinct: the commitment to our mission and the strength of our collaborative clinical research.

Associate Professor Anthony Schembri AM
CEO, St Vincent's Hospital Network Sydney

MESSAGE FROM THE DIRECTOR OF RESEARCH

This was always going to be the year of clinical trials because of the coming of a compulsory national accreditation process for public and private hospitals wanting to carry out trials in Australia. And then along came COVID-19!

St Vincent's Precinct has responded wonderfully to the COVID-19 crisis in terms of looking after our patients, our community and our staff, and this is just as true in the research arena. We have identified a cohort of subjects who have recovered or are recovering from infection and these are being intensely studied by our Infectious Diseases and Respiratory teams and others, to learn what we can about the development of antibodies and similar observations. They are particularly interested in discovering novel biomarkers which might predict the development of long COVID. This work has attracted significant media attention, as many of you will have seen. The old Centre for Immunology building, now rebadged as the Translational Research Centre, is humming with this activity, added to all its other functions. This has brought into urgent focus the pressing need to develop the West Street site as soon as possible to allow us to enhance our clinical trials capacity.

COVID delayed the introduction of the new Clinical Trials Accreditation program, auspiced by the Australian Centre for Quality and Safety in Health Care, but the pilot proceeded in December 2020 and St Vincent's, one of the pilot sites, passed with flying colours. In preparation for accreditation, we made several new appointments, including the new positions of Clinical Trials Quality Manager and Clinical Trials Senior Pharmacist. We also established a new Clinical Trials Steering Committee, which has met regularly online for over a year now. A feature of this committee is the presence of two high-profile community representatives.

The Research Governance Office under Pamela Blaikie has been extremely busy, both because of the various COVID-related studies being implemented and because the majority of the staff have been working from home since the early days of the pandemic. This has proven very successful.

At a national, SVHA level, the Research enterprise is being reorganised under Professor Erwin Loh's direction, with a refresh of the SVHA Board Research and Education Committee, which includes the Directors of our affiliated research institutes as members, and a new SVHA Research Council, of which both Philip Cunningham and I are members.

Professor Terry Campbell AM
Director of Research,
St Vincent's Health Network Sydney

AMR ANNUAL SUMMARY

St Vincent's Research Precinct continues to grow. The progressive development of the Darlinghurst Research Precinct to co-locate and shared scientific infrastructure of the Garvan Institute of Medical Research, Victor Chang Cardiac Research Institute, our numerous academic partners and health services has established our place as an internationally recognised research precinct.

Our primary flagship research enterprise, the Centre for Applied Medical Research, brings together our scientific researchers with our clinician researchers – many of them involved with conducting clinical trials of investigational new drugs, devices and procedures together under one umbrella. As a result of this centralised coordination of research and clinical trials, we were well placed for the new Australian Commission on Safety and Quality in Health Care, National Clinical Trials Governance Framework rolled out in 2020.

A major achievement for me personally and for the St Vincent's Centre for Applied Medical Research has been becoming an Academic Member of Franklin Women, recognising the gender balance in the St Vincent's research community in early career and senior leadership.

As employees of St Vincent's Health Australia we adhere to equal opportunity and non-discriminatory practices, work cooperatively, support and learn from each other, and accept and respect the differences in our opinions and our personal styles of interaction. We each have a responsibility to contribute to a work environment that is fair, transparent in its operations, and impartial, and to ensure individuals are treated with dignity, courtesy and respect.

Gender equality is not just about respecting the fact that that balance and acceptance of gender differences brings a richness of perspectives, experiences and skills. It's also about ensuring we provide a safe environment free from barriers to attracting, retaining and promoting on merit, and free from conscious or unconscious bias.

Transforming health care is what St Vincent's is all about, and we believe that this fundamental step of bringing our bench scientists together with clinician researchers will mean we're well placed to take a leadership role in clinical research to accelerate the translation of new knowledge into leading edge practices, devices and tests, techniques and treatments. We hope our vision for the West Street Translational Research and Education building will become a reality and crystalise our vision to create a home for our clinical research enterprise.

As the St Vincent's research agenda continues to evolve, AMR will continue to be agile and responsive to the changing needs of the hospital precinct and to produce high-quality work. Our many and diverse staff, students, visiting scholars and collaborators will continue to work closely together to contribute to the success of the vision. I would like to thank every member of our organisation for their contribution, particularly those who ensure our environment runs safely and smoothly and is great place to work.

Associate Professor Philip Cunningham OAM
Deputy Director Research &
Chief Operating Officer

RESEARCHERS REMAINED REFORM **REPORT** RELEASE REPRESENTED RESOURCES REQUIRED RELATIVELY REVOLVED

RESEARCH-INFORMED HEALTH CARE

This annual report provides evidence we are delivering on our key objectives outlined in the St Vincent's Darlinghurst Research Strategic Plan, *Informing health care (2019–2024)*. Our research vision has found its way into the many other strategies developed for the St Vincent's Health Network in Sydney, including the Clinical Services Plan, Cancer Plan and Inclusive Health Strategic Plan. The strategy is a living document and evolving with the future directions of this Precinct. We have remained agile and have adapted to the challenges faced with rapidly changing fields of biotechnology and health care.

WE WILL ACHIEVE THESE OBJECTIVES BY STRATEGIC INITIATIVES:

Research-informed health care

- Make St Vincent's campus a National centre for Precision medicine.
- Implement campus clinical trials reform to promote, support and enhance clinician, patient and public involvement in quality dinical research.
- Expand our e-research footprint through strengthening virtual and telehealth pathways.
- Continue to strengthen the interdisciplinary research effort into health issues facing poor and vulnerable populations.
- Strengthen collaborative partnerships.

Remarkable people

- Identify, engage and nurture talented research-active staff within our clinical service lines.
- Attract, recruit and retain early and mid-career clinician researchers in our service lines.
- Expand schemes for formal release of clinicians to engage in research projects.
- Leverage both internal and external Translational Research Fellowship and Internship programs aimed at clinician engagement in healthcare research
- Invest in building workforce capability through training programs in research skills
- Ensure research-active clinicians are represented on campus advisory groups to promote a culture of research.

Sustainability and growth

- Identify and develop selected international centres of excellence in teaching, research and clinical care.
- Seize the opportunity of a new building on West Street to establish world-class support facilities for research on campus.
- Increase research funding through targeted fundraising and philanthropic campaigns.
- Optimise our return on commercially viable intellectual property in services and products.
- Diversify research income sources, leveraging collaborative opportunities arising through SPI-ERE, OHMR, NHMAC, MRFF and other funding agencies.
- Reduce administrative burdens on clinician researchers by using the resources of AMR.

Innovation

- Collaborate with industry bodies to map and optimise our research and technology capabilities.
- Support and encourage entrepreneurial and innovative health care researchers along the journey of commercialisation.
- Stimulate interdisciplinary research to enhance innovation and discovery through new models of integrated care.

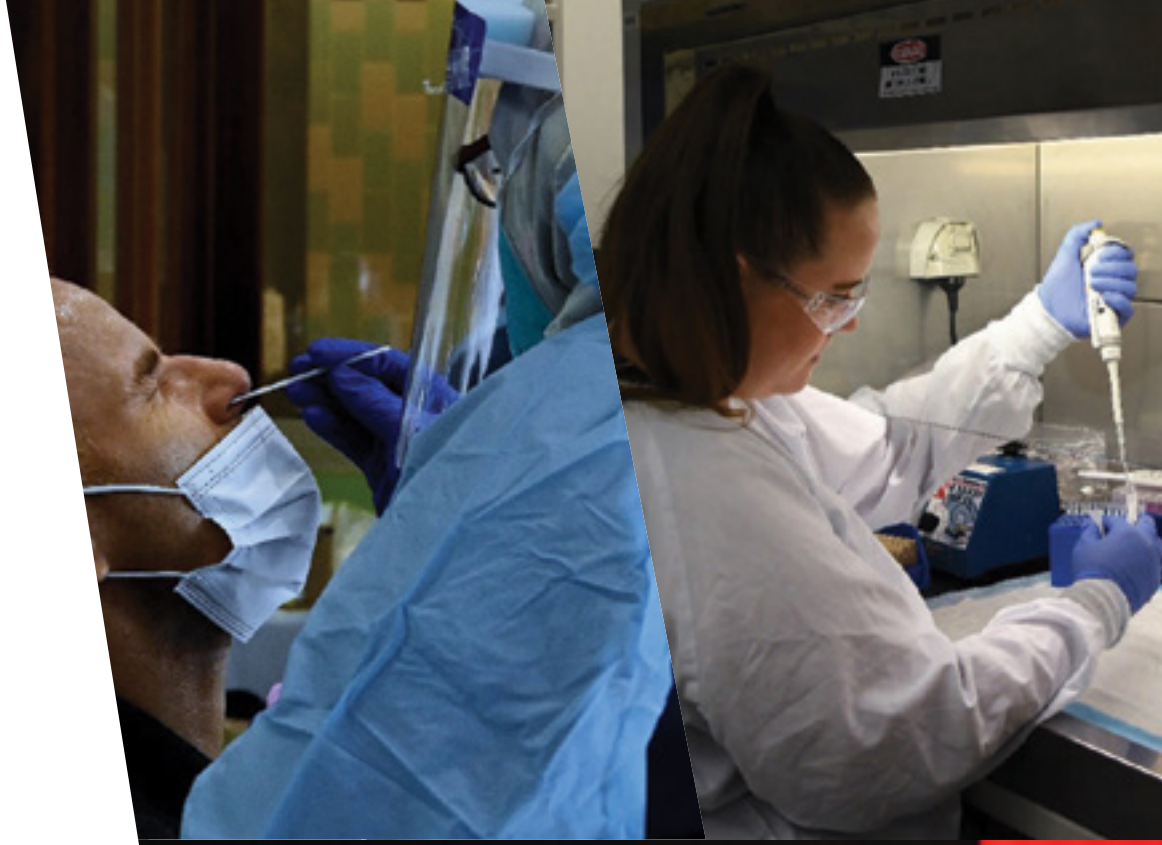
CLINICAL TRIALS AT ST VINCENT'S – COVID

COVID-RELATED RESEARCH AT ST VINCENT'S HOSPITAL

The speed with which the COVID pandemic developed in the months of March and April 2020 required a rapid response in terms of research-related activities. These studies can be roughly separated into therapeutic, observational cohort and lab-based projects. Therapeutic studies involved the addition of extra arms to the already established REMP-CAP ICU study plus a number of potential new studies, including the national ASCOT study and a Remdesivir expanded access program. Prophylactic studies included SHIELD (HCQ) and BRACE (BCQ) in healthcare workers. Due to the relatively small number of COVID inpatients as at July 2020, none of these studies have needed to enrol patients but are established to do so if necessary moving forwards.

The majority of the research activity at St Vincent's Hospital has revolved around the establishment of COVID-related cohorts and, in particular, the ADAPT study. ADAPT is enrolling patients diagnosed with COVID-19 in a long term follow-up cohort aimed at evaluating a variety of clinical outcomes, including lung function, neurocognitive change and quality of life measures. Additionally it collects plasma, sera and PBMCs to study immunological biomarkers. ADAPT is the parent study for a number of other laboratory substudies to be carried out, including WGS, NGS and hyperimmune globulin. ADAPT had enrolled 99 patients by July 2020. Alongside ADAPT is a second community cohort, ADAPT-C, which is enrolling people with non-COVID coronaviruses to act as a control cohort to ADAPT. ADAPT continues to enrol newly diagnosed COVID-positive patients prospectively.

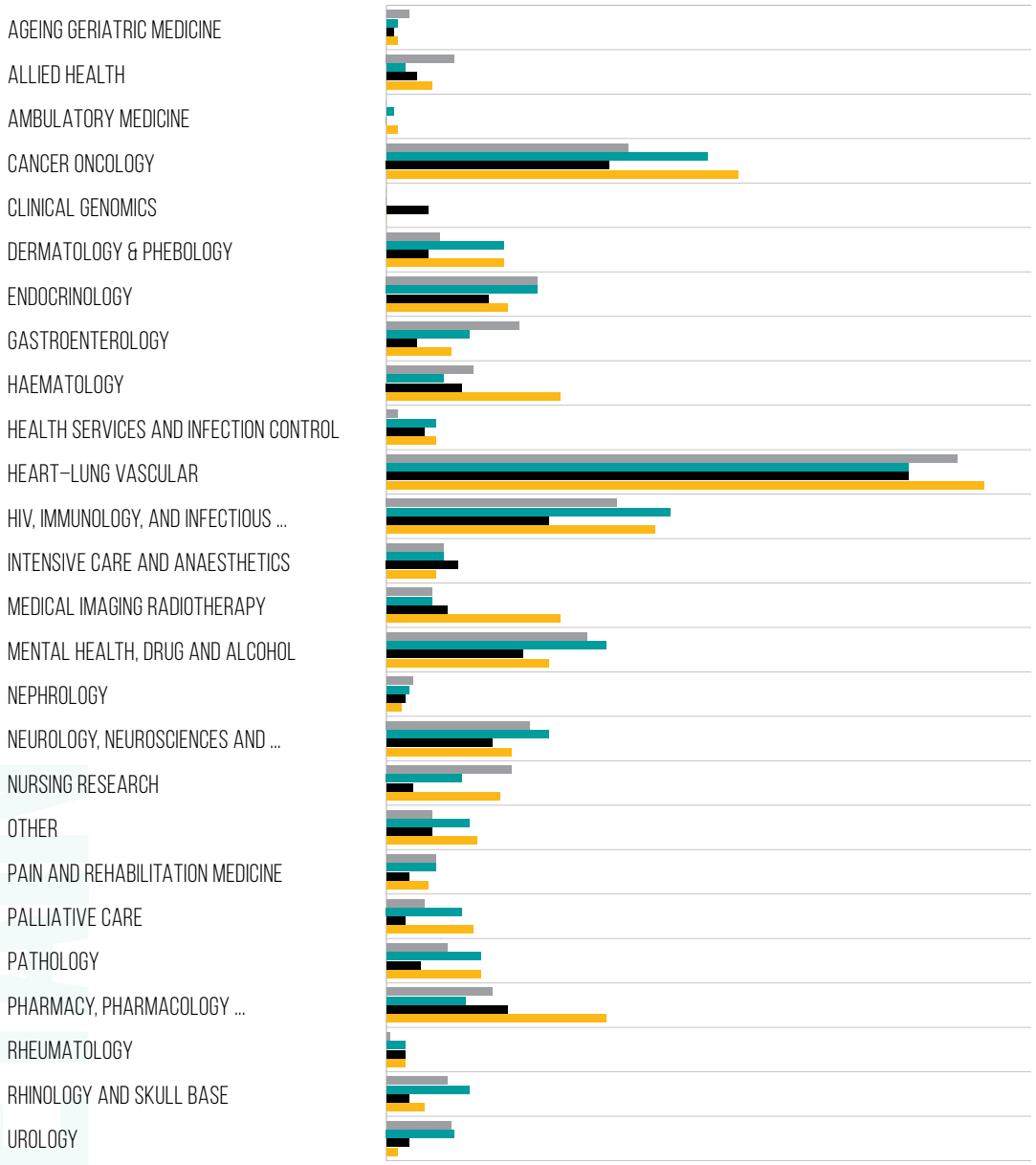
Professor Gail Matthews – COVID



CENTRES FOR EXCELLENCE

Peer-reviewed publications are a surrogate indicator of research active clinical disciplines across the St Vincent's Health Network. While there is much collaborative overlap with research projects undertaken within the hospitals, medical research institutes and university facilities, each of these publications has been counted because a St Vincent's staff member was involved with the study conceptualisation, design, analysis and preparation of the manuscript for publication.

RESEARCH PUBLICATIONS BY DISCIPLINE **2018** **2019** **2020** **2021**




REMARKABLE
RENOWNED
REGULATOR
RECENT
RESISTANCE
REGION
RECOVERY
RECORD
REGENERATION
REVOLUTIONARY

REMARKABLE PEOPLE

RESEARCH FELLOW REPORTS

DR PEI DAI

Inaugural David Cooper Fellowship – Immunology and Infectious Diseases

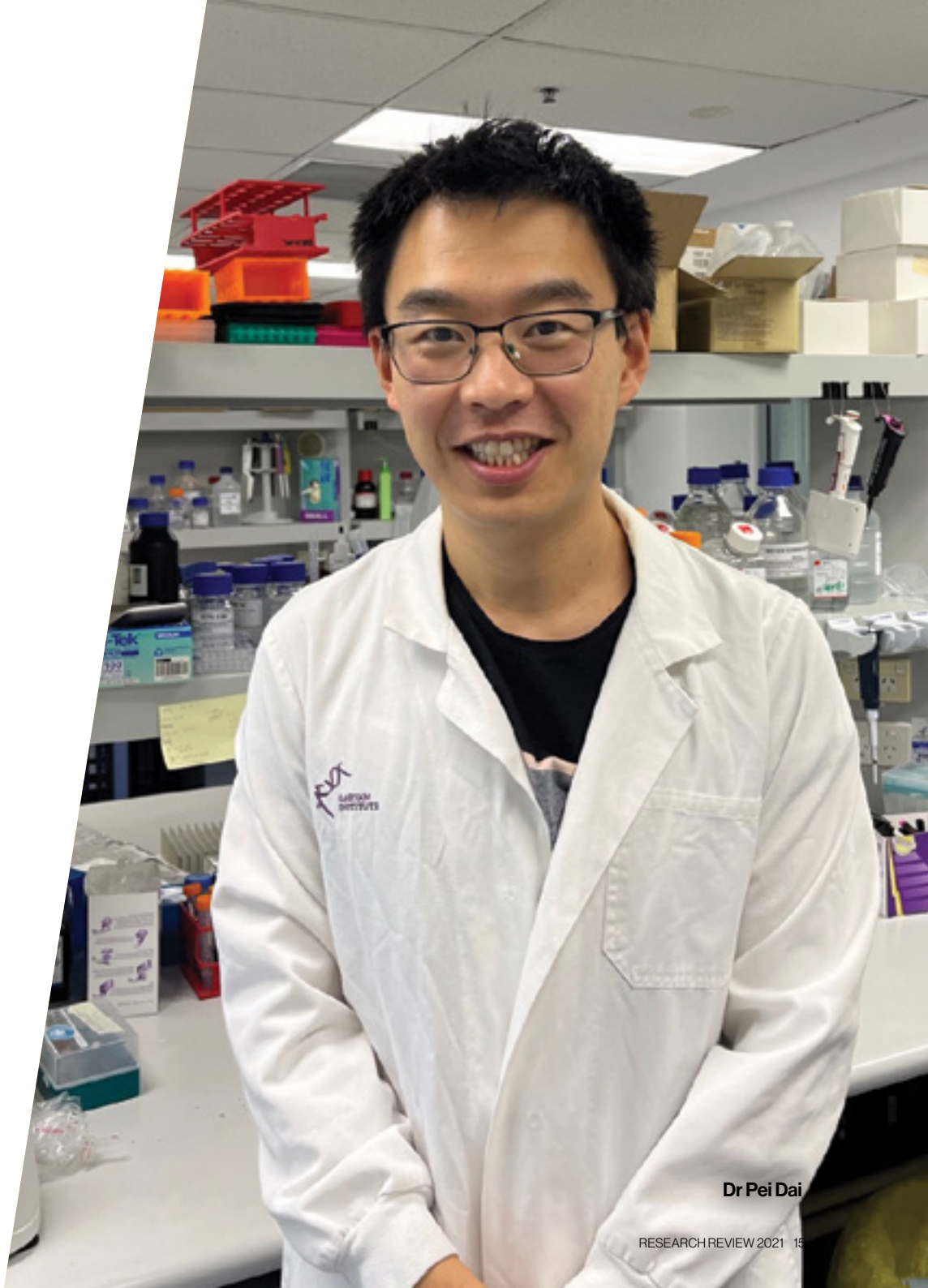
I am the inaugural recipient of the David Cooper Fellowship, named in honour of Professor David Cooper AO (19 April 1949 – 18 March 2018). Professor Cooper was an immunologist at St Vincent's Hospital renowned internationally for his seminal research in HIV/AIDS treatment and care.

Novel Gene Discovery in Primary Immunodeficiency Diseases

My project involves the analysis of whole genome sequencing data of patients with undiagnosed primary immunodeficiency diseases with the goal of discovering novel mutations and validation of their pathogenicity with functional genomics wet lab work. By understanding these diseases at a molecular level, patient management can be potentially transformed by introduction of mechanism-based precision medicine.

Research progress to date

The first few months of the project involved training in genetic pathology, variant curation and elementary bioinformatics under the supervision of Professor Leslie Burnett at the Kinghorn Centre for Clinical Genomics (KCCG). Together with bioinformaticians at KCCG, I have also implemented novel splice variant detection tools (Spliceogen and SpliceAI) into the analysis pipeline. I have now started the formal analysis process and am currently involved in planning wet lab validation of a number of candidate variants.



Dr Pei Dai

Professor Samuel Breit

DR JACQUELINE LOPRETE – IMMUNOLOGY/ ALLERGY FELLOW

My Clinical Research Fellowship in Allergy allows for a multi-faceted approach to advances in allergy management, with a particular focus on improving outcomes for adults with allergy.

'Combining Peanut Oral Immunotherapy and Omalizumab in Adults with Peanut Allergy' – an Australian-first trial – aims to bring therapies that have proven effectiveness in paediatrics to adult suffers of peanut allergy, a group who previously had limited options. The project will also look at biomarkers in peanut allergy, assessing their role in predicting patient outcomes and response to treatment. We have received a Seed Grant from the SPHERE Triple I Clinical Academic Group, and philanthropic funding from the Balnaves and St Vincent's Curran Foundations. Recruitment begins in Q4 2020.

Phase 2 of 'De-labelling patients with antibiotic allergy in Sydney adult and paediatric hospital allergy services', a multi-centre study aiming towards standardising the approach to beta-lactam allergies and improving patient outcomes, commenced in Q3 2019 and will be completed Q4 2020. Phase 1 data was presented this year at national and international conferences.

In collaboration with the Emergency Department at St Vincent's Hospital, 'Anaphylaxis deaths and near-misses', an audit of adults presenting with anaphylaxis from 2009 to 2018, commenced Q4 2019. It aims to identify gaps in management of adults with anaphylaxis, identify modifiable risk factors and address issues specific to the adult population. The audit is ongoing.

DISCOVERY RESEARCH LABORATORY PROGRAM REPORTS

PROFESSOR SAMUEL BREIT

Inflammation and Cytokine Biology Program report

The major focus of the Inflammation and Cytokine Biology Research Program, headed by Professor Samuel Breit, is the study of GDF15, previously called MIC-1.

This lab first identified and characterised this cytokine over 20 years ago and have remained international leaders in its study. This protein circulates in the blood of all individuals at levels that rise in many disease processes. Professor Breit's lab has discovered its capacity to predict outcomes like cardiovascular risk, cancer and all-cause-mortality and have licensed these applications to Roche Diagnostics, whose clinical assay is now available in Europe and will over time also be available in Australia.

GDF15's major role as a cause of anorexia/cachexia syndromes and appetite regulator has led to recognition of its role as an important metabolic regulator. Inhibiting GDF15 in anorexia/cachexia syndromes such as those associated with cancer have been licensed to Aveo Pharmaceutical, and phase I studies of their therapeutic antibody are anticipated to commence soon.

More recent studies from Professor Breit's program, headed by Dr Vicky Tsai, have shown that GDF15 is important in obesity resistance and when administered to obese mice, it acts on a small region of the brain to normalise not only their body weight and adiposity but also to correct the metabolic abnormalities of obesity such as insulin resistance, steatotic hepatitis and excess inflammation. Application of the technology from the

Inflammation and Cytokine Biology Program, licensed to Novo Nordisk, is currently in phase I trial for treatment of obesity.

This capacity of GDF15 to correct inflammation may also be why it hastens recovery after spinal cord injury, a discovery recently made in a project headed by Professor David Brown, from the Inflammation and Cytokine Biology Program. This and other studies suggest that GDF15 may also have applications in the treatment of spinal injury and some types of chronic inflammatory diseases.

ASSOCIATE PROFESSOR MARK DANTA, DR SIMON GHALY & DR SANTOSH SANAGAPALLI

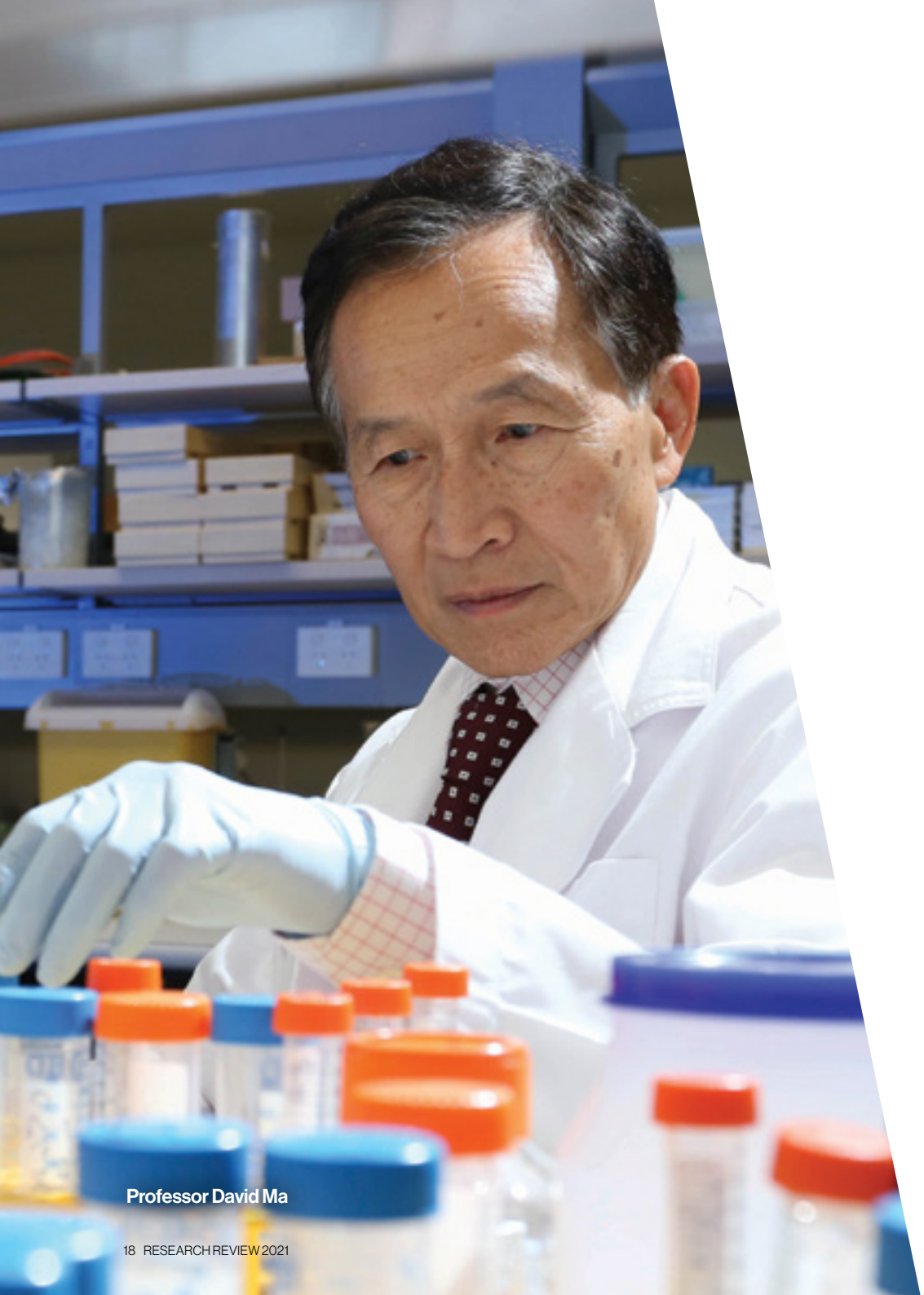
GIT, Liver and Microbiome Research Program

The GIT, Liver and Microbiome Research Program forms the collaborative research arm of the Gastroenterology and Hepatology Department. This translational program is currently exploring four areas: the role of the microbiome in liver and gastrointestinal disease; the complications of cirrhosis, including hepatocellular carcinoma, led by Associate Professor Mark Danta; inflammatory bowel disease, specifically, the roles of the microbiome, faecal microbiome transfer and associated bone disease, led by Dr Simon Ghaly; and oesophageal disorders, led by Dr Santosh Sanagapalli. The group currently supervises a number of PhD, MSc and honours students through University of New South Wales (UNSW). The program has a number of ongoing collaborations with the Garvan Institute, UTS, Sydney University and UNSW. This work is funded by NHMRC, Cancer NSW, the St Vincent's Curran Foundation, Gastroenterology Society of Australia and St Vincent's Clinic Foundation.


A/Professor Mark Danta


Dr Simon Ghaly


Dr Santosh Sanagapalli



Professor David Ma

PROFESSOR DAVID MA

Blood, Stem Cell and Cancer Research Program

This research program is headed by Professor David Ma, a clinician scientist. His group has a proven track record of discovery and translation to clinical practice in haematopoietic stem cell transplantation, management of haematological malignancies and haemostasis (thrombosis and bleeding disorders). Using state of the art technologies, the program engages in three key research themes: Stem Cell Biology, Stem Cell Transplantation and Haemostasis. The Stem Cell Biology team investigates the key genetic changes leading to cytopenia, myelodysplasia and development of haematological cancers. The Stem Cell Transplantation team focuses on the effects of immune system changes that occur with blood stem cell transplantation, especially in autoimmune disease patients. The Haemostasis team investigates inherited platelet bleeding disorders and thromboses associated with artificial heart–lung devices. Professor Ma's group engages widely with national and international multidisciplinary teams in their research endeavours. The goal of their collaborative research is to fast track laboratory findings to improve outcomes for patients in the clinic. Dr Joseph and her collaborators in Sydney have recently set up the first multidisciplinary clinical service for inherited platelet disorders in New South Wales. Based on one of their recent discoveries, Dr Molloy and Professor Ma aim to bring a new diagnostic test and a novel drug treatment for acute leukaemia into the clinic. Associate Professor Moore is driving the process of establishing a Centre of Excellence in haematopoietic stem cell transplant and cellular therapies. These are prime examples of our expanding translational research portfolio directly affecting the health of current and future generations.

Dr Joanne Joseph, Professor David Ma, Dr Sam Milliken

PROFESSOR BRUCE BREW

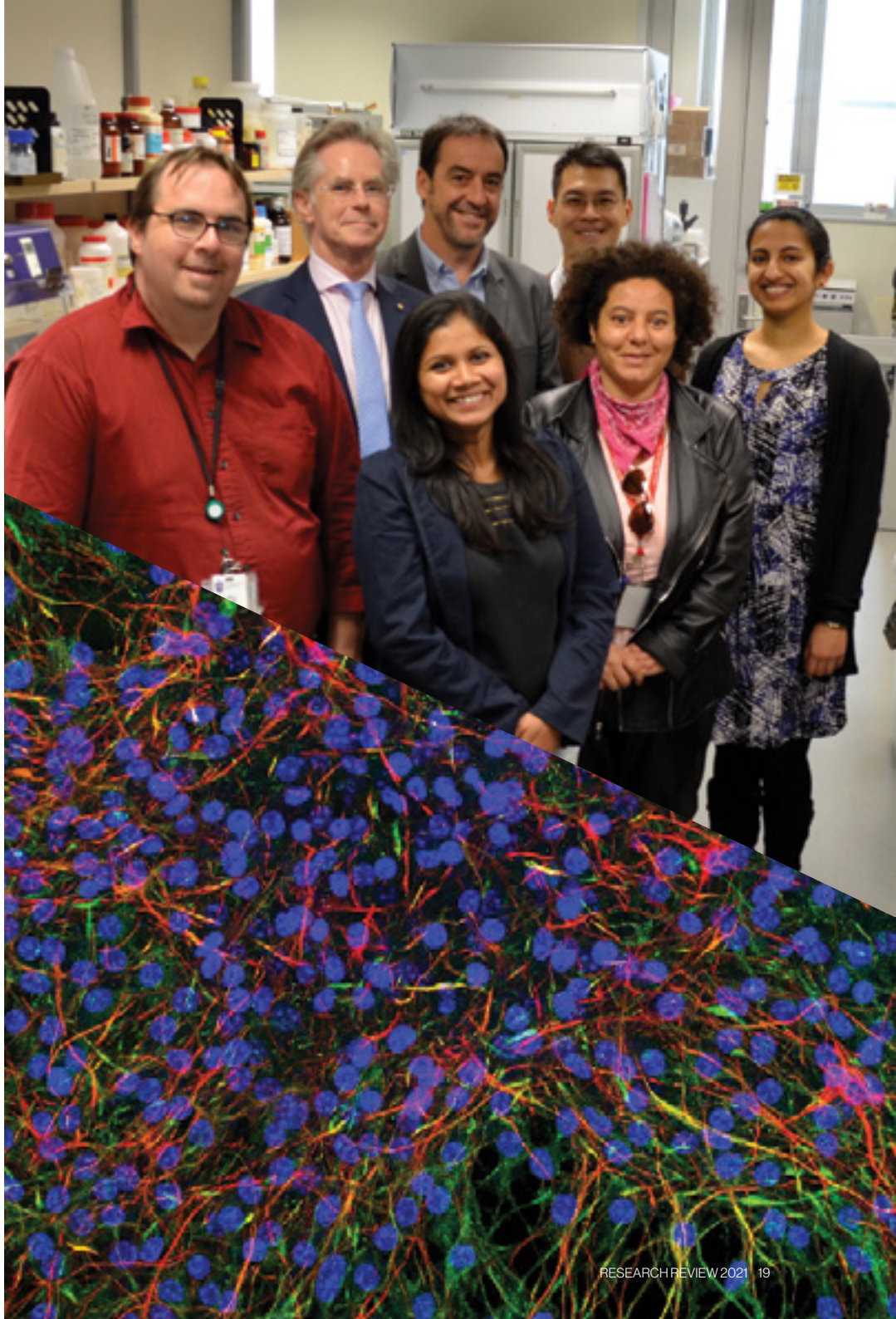
Neurosciences

The Peter Duncan Neurosciences Research Unit headed by Professor Bruce Brew has both basic/translational science and clinical components. It is primarily concerned with research into regeneration of brain tissue in a variety of disorders, including MS, and various forms of dementia, including HIV and Alzheimer's. The unit combines laboratory-based basic science, neurology and neurosurgery focused on the therapeutic use of adult stem cells, with modulation of biochemical pathways (especially the Kynurenine pathway – KP) to

promote stem cell growth and differentiation to enable transplantation. The clinical component focuses on testing biomarkers (derived from our basic science research) and clinical trials for dementia (30 thus far).

In the past year, the unit has achieved some significant milestones including:

- Publication of a pivotal manuscript (Journal of Neuroinflammation) showing the mechanism of degeneration in multiple sclerosis (with relevance to other brain diseases, including dementia) and validating a new class of drugs.
- Award of the 2019 Association for Research in Vision and Ophthalmology
- (ARVO, USA) Scientific Image Contest prize to senior scientist Dr Michael Lovelace and collaborator Professor Tailoi Chan-Ling, University of Sydney, for their image of developing and differentiating brain cells.
- Award of two highly competitive infrastructure grants from Perpetual (funder: Baxter Charitable Foundation) and a second Ian Potter Foundation grant, enabling upgrade of an existing Incucyte system (live-cell imaging) and purchase of a revolutionary new microscope (significantly improving resolution).
- Development of novel KP gene knock out mice to model inflammatory and degenerative diseases of the brain.
- Establishment of new collaborations: University of Wollongong (induced pluripotential stem cell (iPS) derived 3D brain organoid model), UNSW (novel dementia drug), University of Western Sydney and James Cook University (brain macrophage regulation), McGill University Canada (oligodendrocyte regulation), AMR HIV Latency Program (novel HIV biomarker); partnerships with: Tempo Biosciences – a USA-based company for production of iPS cells, French pharmaceutical company Abivax (novel HIV drug for dementia), Weill Cornell Medical Centre New York (Alzheimer Prevention).



(Left) The adult brain contains stem cell niches such as the sub-ventricular zone which can produce replacement neurons and other brain cell types, and is therefore an attractive target to harness for disease therapies. This striking image shows layers of adult mouse stem and precursor cells in cultures isolated from the SVZ (image captured by Varda Sardesai, Peter Duncan Neurosciences Research Unit).

Associate Professor Kurosh Parsi

Professor Richard Harvey

ASSOCIATE PROFESSOR KUROSH PARSI

Dermatology, Phlebology and Fluid Mechanics

Associate Professor Kurosh Parsi is a dermatologist, phlebologist and vascular anomalies specialist and the Head of Department of Dermatology at St Vincent's Hospital, Sydney. The **Dermatology, Phlebology** and **Fluid Mechanics research** laboratory based at St Vincent's AMR is a translational program focusing on three areas: vascular dermatology, chronic venous disease and vascular malformations and fluid mechanics of sclero-embolic agents. The group has ongoing international and inter-university collaborations and is currently focusing on the physico-chemical and biologic interactions of liquid sclero-embolic agents and in particular n-BCA glues used in interventional radiology and endovascular surgery.

PROFESSOR RICHARD HARVEY

Rhinology and Skull Base Research Program

Professor Richard Harvey heads the Rhinology and Skull Base Research program. As one of two surgeon-led research programs, Professor Harvey brings together a collective group of clinicians and researchers working on inflammatory and neoplastic diseases of the upper airways. The group has three main themes of research. Primarily, Professor Harvey's team develops clinically meaningful interventions and therapies for the treatment of inflammatory airway disease. These interventions include the spectrum from surgical techniques to topical therapies and the effects of biologic agents. Professor Harvey's team also works to advance our management of skull base and pituitary tumours, from surgical techniques that are less morbid and afford rapid recovery to genetic features that allow prognostication and personalised treatment decisions. The research team works alongside St Vincent's clinical team that currently provides services to more than two thirds of all patients with pituitary tumours in New South Wales. Finally, the program works to develop diagnostic tools to better define nasal obstruction and conditions that contribute to the sense of nasal congestion or blockage. Such diagnostics look at not just the mechanics of airflow but also the sensory feedback involved. In a constant effort to ensure translation of research, the team assesses novel surgical interventions of the airway that are performed to improve airflow. His team were named as the clinical research leaders in otolaryngology via an investigation by *The Australian*. *The Australian*'s Research magazine uses unique methodology to reveal the best research, drawing on public sources to find the researchers and the research institutions that lead on both volume and quality of their work.

PROFESSOR RIC DAY

Pharmacology Toxicology Research Laboratory joins AMR

Clinical Pharmacology and Toxicology (CPT) is delighted to have transferred our laboratory to the AMR. Our focus is on optimising efficacy and safety outcomes from the use of medicines. We are exploring and testing new ways to individualise drug therapy better and faster in areas of greatest need – infectious disease, transplantation, rheumatology, endocrinology and renal medicine. Our team uses drug concentrations, pharmacogenomics and sophisticated dose-forecasting software to help provide prescribers with the best dosing options for each patient.
Examples of current projects include:

Metformin: an overlooked medication to treat heart failure?

Our work has shown that metformin can be used safely in severe chronic kidney disease (CKD) and liver impairment contrary to established guidelines. Now, in collaboration with Cardiology, our PhD student, Ms Gina Chowdhury, is working to describe the safety and pharmacokinetics of this drug in patients with heart failure, previously a contraindication.

SGLT2 inhibitors: broadening indications?

Our PhD student, Dr Tamie Milder, is undertaking pharmacokinetic (PK) and pharmacodynamic (PD) studies focused on the potential cardiovascular benefits of SGLT2 inhibitor medicines in non-diabetic patients with chronic kidney failure in collaboration with Endocrinology/Garvan and the George Institute.

Lowering serum urate to slow decline of kidney function in CKD?

Allopurinol, a medicine for gout, did not slow CKD progression in the landmark CKD-FIX study that CPT was part of. Now patients with type 1 diabetes from the parallel Joslin Diabetes Centre, Harvard, PERL study, both published in the *New England Journal of Medicine*, have been added to the CKD-FIX patients for a more detailed combined PK/PD analysis in our laboratory.

Dosing of antivirals for COVID-19

Blood samples from SVH patients with COVID-19 are being collected for antiviral drug PK analysis. Important insights on optimal use of these emerging medicines in people with COVID-19 are anticipated.

AMR has given us the opportunity to extend our work on personalising medicines dosage regimens for optimal results utilising AMR's world class facilities and equipment. New assays established in collaboration with the Clinical Pharmacology Laboratory of Sydpath and Infectious Disease added to our expertise in PK modelling, therapeutic drug monitoring (TDM) and implementation science provide a 'translation pathway' to take our work rapidly into practice.

Dr Sophie Stocker PhD
Dr Jane Carland PhD
Department of Pharmacology

NCCRED

National Centre for Clinical Research on Emerging Drugs

NCCRED
A BRIEF UPDATE

St Vincent's Hospital Sydney was instrumental in setting up the National Centre for Clinical Research on Emerging Drugs (NCCRED), a national clinical academic partnership made up of a consortium of St Vincent's Health Australia, UNSW, Curtin University and Flinders University. NCCRED was established in 2018 to address health harms related to methamphetamine and other drugs of emerging concern, with Dr Nadine Ezard, Conjoint Professor NDARC, UNSW Medicine and Clinical Director of St Vincent's Alcohol & Drug Service as its first Director.

NCCRED draws on the expertise of both the AMR-CRP and the Alcohol & Drug Service at St Vincent's to conduct leading clinical research in this area, such as the recently completed LIMA study. This large NHMRC-funded multisite trial examined the lisdexamfetamine as a candidate treatment for methamphetamine use disorder. NCCRED also oversees a national clinical research program involving a broad spectrum of novel pharmaceutical and psychotherapeutic approaches. Examples include trials of cannabinol and oxytocin, cognitive remediation groups and family support interventions.

Building clinical research capacity is a major goal for NCCRED, providing scholarships to clinicians to undertake their own research. Dr Elizabeth Knock, clinical psychologist at St Vincent's Alcohol & Drug Service, is one such scholar, undertaking world-first research with Dr Jonathan Brett into the use of psilocybin as a treatment for methamphetamine dependence.

The early detection of drugs of emerging concern is a key component of NCCRED's work, such as the work on sentinel surveillance for illicit fentanyl led by St Vincent's Dr Craig Rodgers. NCCRED has also begun work on a national Prompt Response Network, translating the findings of such research for use by clinicians and community across Australia. Recognising the growing importance of telehealth, NCCRED is researching the training needs of telephone support staff who provide assistance to people with alcohol and other drug issues nationally.

NCCRED is committed to inclusive health research and works closely with consumers. It also has an Aboriginal and Torres Strait Islander working group to oversee a focused granting and capacity building program, which awarded its first scholarship this year.


REPLACEMENT
NGC
RED
REVEAL
RESEARCH
RELATED
RECENTLY
REMEDIATION
RECOGNISING
RESEARCHING


RESPONSIVE
REALITY
RESOLUTION
REGULATION
REFERRAL
REGIONAL
REVEALED
RESULTS
RELATION
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CLINICAL TRIALS VISION AND STRATEGY UPDATE

At St Vincent's we have made clinical trials part of the standard of care. In addition to their role in furthering knowledge, trials provide a pathway enabling patients access to new therapies and medical devices long before mainstream availability.

Over the past four years we have developed our current vision for clinical trials: 'Striving for something greater for clinical trials – making St Vincent's a world class centre for clinical trials'. A key part of St Vincent's Research Strategy is to align clinical trials closely with established clinical service lines in the public hospital clinical service lines. Our Clinical Services Plan for the next five years identifies at least six clinical flagships, and we aspire to embed a strong research-driven clinical trials culture in all of these: HIV viral hepatitis, cancer, cellular therapies, neurosciences, gastroenterology and cardiovascular.

Looking ahead we aspire to overlay the clinical trials infrastructure and opportunities across our state-wide clinical referral services to expand participation in clinical trials beyond greater Sydney into regional centres. We have rigorous governance of, and support for, clinical trials. Our clinical trials reform agenda has implemented the following:

- Establishment of a Clinical Trials Steering Committee (CTSC) with local and external researchers, clinicians, quality management, trial coordinators, pharmacists, community representatives and Executive members.
- Enhanced use of information technology platforms and innovative approaches for improving recruitment and accruals especially through the introduction of a Clinical Trials Management System (CTMS) enabling e-consent, e-source data, e-governance and Tele-Trials.
- Developed metrics to manage under-performing clinical trials (e.g. slow recruiting).

In 2018,the St Vincent's Oncology Clinical Trials Unit won the NSW Premier's Award for the best Cancer Clinical Trials Unit. As a result of this work, clinical trials activity on the Precinct has rapidly increased in recent years – between 2013 and 2020 there was a 140% increase in the number of clinical trials approved on the Precinct. Around 20% of patients being treated in the Kinghorn Cancer Centre are on a clinical trial. There is ample opportunity, and we fully intend to continue this trajectory going forward.

In our Research Strategic Plan 2019–2023 – Transforming health care – St Vincent's has declared that clinical trials will become part of standard care. Clinical trials provide a pathway enabling access to new therapies and medical devices long before mainstream availability. We recognise that a thriving clinical trials environment is essential for a robust healthcare system. Clinical trials provide early access to innovative treatments and interventions for patients and improve the overall standard of medical care provided in St Vincent's Hospital facilities through the uptake of evidence into practice.

A key part of our Research Strategy is to align clinical trials more closely with clinical service priorities. Improving the governance and support for clinical trials will enable the delivery of many of the elements of our Clinical Services Strategy, particularly Precision Medicine, Virtual Care and Telehealth (including 'Tele-Trials'), as well as innovating models of care. St Vincent's AMR embarked on a substantial review of clinical trials in 2017 and since commenced a journey to reform the conduct of clinical trials across the Darlinghurst Precinct, recognising the rapidly changing global healthcare and regulatory landscape: in particular, the provision of innovative and personalised care through minimally invasive, targeted interventions, leveraging genomics, advanced imaging and metabolomics – otherwise known as 'precision or personalised medicine'.

At the same time, to support the delivery of high-quality clinical trial services the Australian Commission on Safety and Quality in Health Care (the Commission) has developed the National Clinical Trials Governance Framework on behalf of all jurisdictions in collaboration with the Australian Government Department of Health. The National Clinical Trials Governance Framework is a key initiative of the Council of Australian Governments Health Council's revitalised clinical trials agenda.

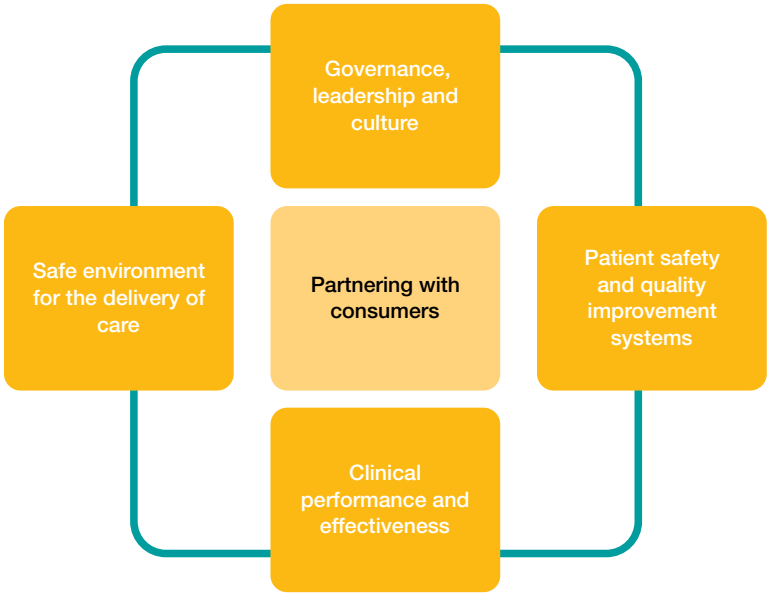
The National Clinical Trials Governance Framework is based on the NSQHS Standards – in particular, the Clinical Governance Standard and the Partnering with Consumers Standard.

The five components of the Clinical Trials Governance Standard are as follows:

- Governance, leadership and culture – integrated corporate and clinical trials governance systems are established and used to improve the safety and quality of clinical trial service provision for patients, their carers, and consumers.
- Patient safety and quality improvement systems – safety and quality systems are established and used to manage and improve the provision of clinical trial services.
- Clinical performance and effectiveness – the workforce has the right qualifications, skills and supervision to provide safe, high-quality clinical trial services to patients.
- Safe environment for the delivery of care – the environment in which clinical trials are conducted is safe and promotes high-quality clinical trials to patients.
- Partnering with consumers – systems are designed and used to support patients, carers, families and consumers to be partners in planning, design, measurement and evaluation of clinical trial services. Consumers may also work with health service organisations and others acting as trial sponsors, in the design and evaluation of clinical trials. Elements of this component include clinical governance and quality improvement systems to support partnering with consumers:
  - Partnering with patients in their own care, and in trial participation
  - Health literacy
  - Partnering with consumers in organisational design and governance of clinical trial services

REMAINS REAPED RECOGNISE REPORTED

COMPONENTS OF THE NATIONAL CLINICAL TRIALS GOVERNANCE FRAMEWORK

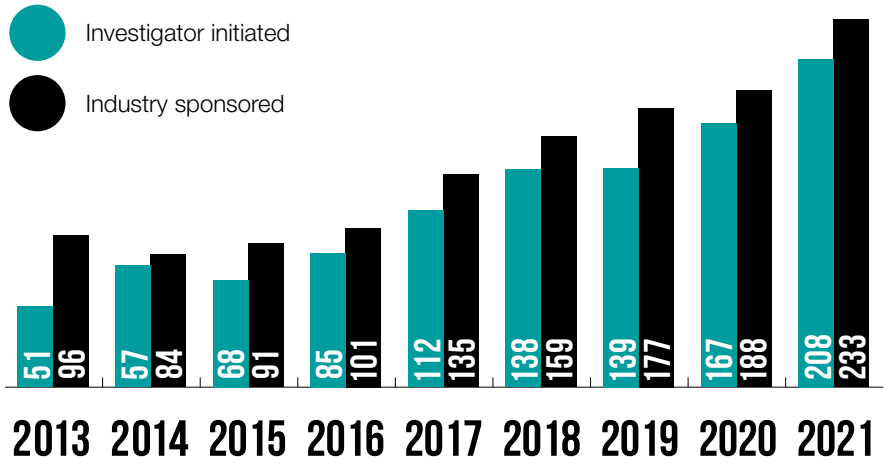


St Vincent's was fortunate to have been selected as one of the 15 luminary 'pilot' sites to be mentored on the implementation of the Framework and undergo accreditation in 2020. St Vincent's Hospital Melbourne was also selected to participate in the pilot phase, bringing a 'network or multisite' perspective to the Commission's program of implementation. In preparation for accreditation, we have already made or are in the process of making several new appointments, including the new positions of Clinical Trials Quality Manager and Clinical Trials Senior Pharmacist. We have also established a new Clinical Trials Steering Committee and this has held its first meeting online. A feature of this committee is the presence of two high-profile community representatives.

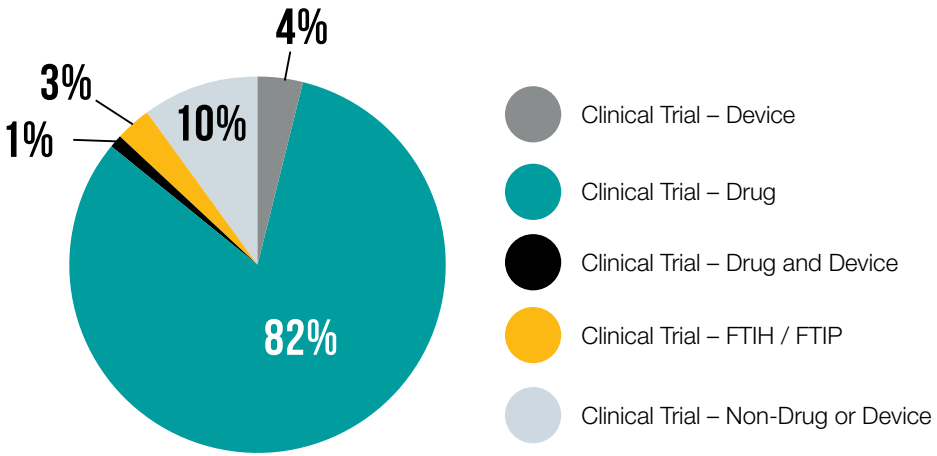
SVHA assessment against the National Clinical Trials Governance Framework was undertaken in December 2020. The assessment outcome reported compliance with 31 of 33 action items for Standard 1 (Governance, leadership and culture) and 14 of 14 action items for Standard 2 (Clinical governance and quality improvement systems to support partnering with consumers). These impressive scores indicated our clinical trials enterprise at St Vincent's was operating to a very high standard. The new Clinical Trials Governance Framework would be rolled into the general Hospital Accreditation cycle in two years time.

The following figures highlight our clinical trials activity over the past 8 years and indicate a steady increase in the number and scope of studies being conducted on the Darlinghurst campus. There is a clear increase in the number of across all disciplines and clinical service lines but particularly in cancer clinical trials, highlighting our strategic growth early phase clinical trials and precision medicine.

SVHS CLINICAL TRIALS BY YEAR



CLINICAL TRIALS BY INVESTIGATIONAL PRODUCT



REWARDING
REVIEWED
RECIPIENTS
RETAINING
REDUCED
REFLECT
RECOMMEND
RECOVERING
RESPECTING

FOSTERING LEADERSHIP

CLINICIAN BUY-BACK – PROTECTED TIME GRANTS FOR RESEARCH

PROFESSOR LOUISE EMMETT

I was lucky enough to be the recipient of a Clinician Buyback Grant in 2020 – which enabled my clinical role to be backfilled in 2021 for a day a week. As a clinician who is passionate about clinical research, how it improves our practice and drives change, it can be practically impossible to fit it into a standard clinical week with no allocated research time. It fills our evenings, weekends and family time. The double responsibility leads to a constant feeling of failure, and reduced trial productivity.

This dedicated research time from the Buyback Grant has been so productive. In that time, we have been able to finish, analyse and publish our prospective PET MRI trial in the diagnosis of prostate cancer, and have just opened the follow-on trial – a randomised multisite prospective phase III trial being run across Australia. It has enabled me to be more hands on with our PhD candidate who has been a powerhouse in publishing the findings from our LuPIN Lu-PSMA therapy trial. We have progressed the translational arm of our large randomised ENZAp therapy trial and made better international research connections. It sounds like a lot from one day – but it is incredible the difference a day brings.

DR MAYOORAN NAMASIVAYAM

The St Vincent's Applied Medical Research Clinician Buyout Grant has been a great support to my activities as a clinician and researcher. As a busy staff specialist cardiologist at St Vincent's Hospital, this grant support allows me to dedicate time towards clinical research. My work focuses on better understanding mechanisms of disease and clinical risk in the important heart valve disease, aortic stenosis. Using advanced imaging analyses and machine learning approaches, my team and I study disease progression, risk prediction and optimal timing of therapy in this increasingly burdensome disease.

Some highlights of research achievements that this grant has assisted with in 2021 include the launch of the Heart Valve Disease and Artificial Intelligence Laboratory at Victor Chang Cardiac Research Institute, which I head up and lead a team of PhD students and research assistants. I have also been successful in building on AMR's support by securing additional funding from the NSW Health Early–Mid Career Researcher Grant, the Ramaciotti Foundation Grant and NVIDIA Academic Hardware Grant. Our lab has made great progress in building a large image database spanning the St. Vincent's Campus (public and private) and has forged links with colleagues in computer science and big data from UNSW. In 2021, I have published 15 peer-reviewed papers (five first author) and three book chapters (all first author).

Having the time to dedicate to research, as afforded by the AMR Clinician Buyout Grant, has facilitated these opportunities. I am grateful to the St Vincent's Clinic Foundation and the St Vincent's Applied Medical Research Institute for their support of clinical research and encouragement of clinicians who actively engage in research. I am hopeful that our work will lead to better outcomes for patients with heart valve disease and strengthen our campus capabilities in advanced cardiac imaging and artificial intelligence.

Franklin Women

SHINING A LIGHT ON IT

ACCELERATING GENDER EQUALITY IN RESEARCH

Gender equality is not just about respecting the fact that balance and acceptance of gender differences brings a richness of perspectives, experiences and skills. It's also about ensuring we provide a safe environment free from barriers to attracting, retaining and promoting on merit and free from conscious or unconscious bias.

In 2020, St Vincent's Centre for Applied Medical Research became an Academic Member of Franklin Women, recognising the gender balance in the St Vincent's healthcare research community in early career and senior leadership.

Franklin Women is an independent and peer-driven professional organisation that is dedicated to empowering women to pursue rewarding careers across the health and medical research sector. They do this by providing training in important professional development skills outside of the technical sciences; opportunities for networking across organisations, disciplines and career level; and initiatives that address specific barriers women face in their careers. Franklin Women have engaged Serendis, which is an Australian leadership consultancy developing agile, visionary, inclusive and adaptive leadership for success.

By partnering with Franklin Women, St Vincent's AMR will be supporting the career progression of staff and students, as well as investing in a cultural change towards a diverse and inclusive health and medical research sector.

A flagship professional development program of Franklin Women is the annual Mentoring Program. The Mentoring Program is a structured program that connects mid-career women with leaders working across the health and medical research sector. The program supports and promotes women working in the sector who are aspiring to leadership roles. It also provides an opportunity for senior leaders (of any gender) to develop inclusive leadership capabilities to benefit their own teams, organisation and broader sector. In 2021, St Vincent's AMR sponsored two mentor/mentee pairs to participate. The feedback of both mentors and mentees has been overwhelmingly positive, with one mentor from SVH being selected to participate in the Annual Panel Discussion to share insights and experiences about their careers.

(MENTEE) DR CHRISTINE SHINER (PHD, BMED SCI HONS I) SENIOR RESEARCH OFFICER

In 2021 I had the opportunity to participate in the Franklin Women Mentoring Program, as a sponsored mentee representing St Vincent's Centre for Applied Medical Research. I joined a cohort of 32 female mentees working across the health and medical research sector in New South Wales, to participate in a structured six-month program focused on mentorship and the development of inclusive leadership skills.

The program was a rare and valuable opportunity to connect with a senior academic mentor from outside my immediate network who was generous with their time, offered new perspectives and supported me to work towards professional goals. Mentoring

sessions helped me gain new insight, build professional confidence, and identify my strengths, and challenged me to think ‘big’ and strive to make meaningful change in the medical research sector.

Unique to this program was the addition of formal training sessions for both mentees and mentors, focused on leadership skill development. I particularly valued this part of the program, which drew on the combined experience of all mentors, mentees, and the wider Franklin Women community. Here I gained skills, practical tools and frameworks that I have been able to bring back and apply within my own role at St Vincent’s, as an emerging research leader, supervisor and mentor.

I thoroughly enjoyed being a part of the Franklin Women Mentoring Program in 2021, where I gained skills that I will carry with me throughout my career. I look forward to strengthening connections I made during the program and continuing my research career with renewed commitment to creating a more diverse and inclusive medical research sector, where all can thrive.

(MENTEE) DR LAUREN CHRISTIE PHD, BAPPSC (OCCUPATIONAL THERAPY) SENIOR IMPLEMENTATION SCIENCE RESEARCH FELLOW – ALLIED HEALTH

I am very grateful for the opportunity to have been a mentee in the Centre for Applied Medical Research's inaugural year as a partner organisation with Franklin Women in their Mentoring Program. The structured program provided a fantastic opportunity to meet and develop networks with other women working in diverse roles across the medical research sector. The mentee group are an incredible group of talented, supportive women and having the opportunity to share our range of experiences and to learn from them was very beneficial. The mentee group has supported each other throughout the year and celebrated each other's achievements.

At a personal level, the structured education sessions on inclusive leadership have helped me to reflect on my values and what I love about my role leading the Allied Health Research Unit at St Vincent's Sydney, as well as my leadership strengths and areas where I can continue to develop. The sessions also helped me to learn skills that I can use to support our frontline allied health clinicians in their growth as leading researchers in their fields.

I was fortunate to be partnered with a wonderful mentor through the program, Professor Mark Parsons. Through the program. Mark has provided me with strategic career advice, championed and helped raise my research profile and supported me to develop my research networks at both a national and international level. He has also helped me to develop new cross sector research collaborations as well as refining my career roadmap of where I would like to be in the next five years.

The Franklin Women Mentoring Program has been invaluable in supporting my development as an emerging research leader at St Vincent's. I look forward to continuing to support the Mentoring Program at St Vincent's Health Network Sydney and to seeing the ongoing impacts of Franklin Women both on our campus and more broadly, in creating a research sector where women thrive.

ASSOCIATE PROFESSOR PHILIP CUNNINGHAM OAM (MENTOR) DEPUTY DIRECTOR, RESEARCH, SVHNS

I was cautious at first because I was unsure what to expect and whether like many of senior leaders on campus, whether I would have the time. Having sponsored the Franklin Women partnership I decided I wanted to commit first-hand by immersing myself in this program to learn how I might drive some change and raise awareness about inclusion. I was paired with my mentee who was a senior staff specialist and head of department at a major tertiary teaching hospital in Sydney. I did think I may end up being the 'mentee' by the end of the programn… We met weekly (online due to the pandemic) and shared ideas, frustrations, what drives us, and talked about challenges and different ways approaching problems. The program opened my eyes about myself and the importance of inclusive leadership skills and how to apply in my own teams, organisation and broader sector. This was certainly a highlight for me over the past few years and I would recommend to my colleagues to get involved.


Professor Greg Dore (Mentor)
Scientia Professor and Head,
Viral Hepatitis Clinical Research
Program at Kirby Institute
Dr Lauren Christie (Mentee)
Senior Implementation
Science Research Fellow
Alfred Health
St Vincent's Health Network
Fearless Women


REPERFUSION
RESISTANT
REVOLUTIONARY
RECORDING
REDCAP
RESILIENT
REGULATORY
REQUIREMENTS
REASONS
REVENUE

HIGH-IMPACT PUBLISHED HIGHLIGHTS

CIRCULATION

VOLUME 144, ISSUE 12, 21 SEPTEMBER 2021; PAGES 947–960

Therapeutic inhibition of acid-sensing ion channel 1a recovers heart function after ischemia–reperfusion injury

An international collaboration including a team of researchers headed by Professor Peter Macdonald at St Vincent's Hospital and Victor Chang Cardiac Research Institute published results in the high-impact journal *Circulation*. The work demonstrates for the first time that acid-sensing ion channel 1a (ASIC1a) mediates cardiac ischemia-reperfusion injury (IRI) and identifies ASIC1a inhibition as a novel pharmacological strategy significantly impacting cardiac function.

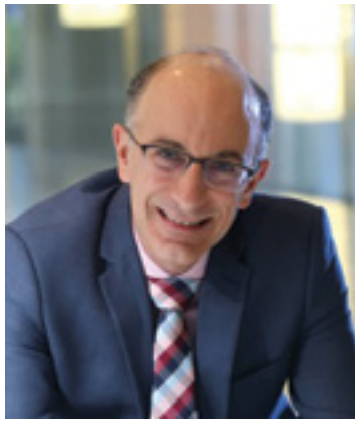
THE LANCET

THE LANCET

VOLUME 397, NUMBER 10276, 27 FEBRUARY 2021; PAGES 797–804

Lu-PSMA-617 versus cabazitaxel in patients with metastatic castration-resistant prostate cancer (TheraP): a randomised, open-label, phase 2 trial

In February 2021 Professors Louise Emmett and Anthony Joshua from St Vincent's Public Hospital published important work in the world's leading medical journal, *The Lancet*. The publication presents work from a clinical trial known as TheraP and provides compelling evidence that the therapeutic radiolabelled small molecule PSMA-617- (Lutetium-177) has activity and safety in patients greater than the standard of care chemotherapy in men with advanced treatment resistant metastatic prostate cancer.



This revolutionary mode of treatment known as theranostics involves the combination of using one radioactive drug to identify (diagnose) and a second radioactive drug to deliver therapy to treat the main tumour and any metastatic tumours. Theranostics and radiopharmaceuticals are classic examples of precision medicine and destined to radically change the way we manage men with prostate cancer.

Professor Anthony M Joshua

ST VINCENT'S PRECINCT RESEARCH WEEK 2020/21

2020 ST VINCENT'S CAMPUS RESEARCH SYMPOSIUM & ST VINCENT'S RESEARCHER DEVELOPMENT PROGRAM

14TH – 15TH OCTOBER, SYDNEY AUSTRALIA

The St Vincent's Research Symposium has been held annually for over 25 years and brings together the brightest minds across the campus to share their research with peers. It involves a great coming together of prominent healthcare researchers from across the St Vincent's Research Campus Sydney, one of the largest medical research precincts in Australia and brings together the Garvan Institute, The Kinghorn Cancer Centre, Victor Chang Cardiac Research Institute, Nursing Research Institute, our own Centre for Applied Medical Research, Kirby Institute and our many prestigious academic partners.

With the support of Professor Terry Campbell (Director of Research) and Associate Professor Philip Cunningham (COO AMR), the **2020 and 2021 St Vincent's Campus Research Symposium & St Vincent's Researcher Development Program** was held as a virtual event


GET AN INSIGHT
INTO OUR
GREATEST MIN
GET AN INSIGHT
INTO OUR
GREATEST MIN
GET AN INSIGHT

ST VINCENT'S PRECINCT RESEARCH WEEK 2021

2021 ST VINCENT'S CAMPUS RESEARCH SYMPOSIUM & ST VINCENT'S RESEARCHER DEVELOPMENT PROGRAM

30TH SEPTEMBER – 15TH OCTOBER, SYDNEY AUSTRALIA

The St Vincent's Research Symposium has been held annually for over 25 years and brings together the brightest minds across the Campus to share their research with peers. It involves a great coming together of prominent healthcare researchers from across the St Vincent's Research Campus Sydney, one of the largest medical research precincts in Australia and brings together the Garvan Institute, The Kinghorn Cancer Centre, Victor Chang Cardiac Research Institute, Nursing Research Institute, our own Centre for Applied Medical Research, Kirby Institute and our many prestigious academic partners.

With the support of Professor Terry Campbell (Director of Research) and Associate Professor Philip Cunningham (COO AMR), **the 2021 St Vincent's Campus Research Symposium & St Vincent's Researcher Development Program** was held as a virtual event from 30 September to 15 October 2021.

GET AN INSIGHT INTO OUR GREATEST MINDS

'RESEARCH INNOVATIONS – DISCOVERING WHAT'S POSSIBLE

The COVID-19 pandemic significantly impacted St Vincent's Campus research, with many researchers having to adapt, stop or change their 'normal' way of research and trials in labs and the hospital. The result of these challenges? Stronger, braver, resilient, and more creative researchers!

This is the 29th year of the annual St Vincent's Campus Research Symposium, bringing together the brightest minds across our NSW Campus to share their research with peers. **This year's symposia themes included Big Data and Deep Learning, Cutting-edge Technology, and AI and Bioengineering, with 12 leading researchers as invited speakers.**

The virtual meeting program included:

- **29th Annual St Vincent's Campus Research Sym**
  - **Keynote presentations**
  - **Short oral presentations** from abstract submission
  - **Fast talk presentations** from abstract submission
  - Inaugural **Twitter presentations** from abstract submission
  - Research Symposium Awards and Prizes
  - Networking opportunities
- **Medical Grand Rounds *Research Leading Innovation Series: 'COVID–19 in 2021'***
  - Dr David Darley – 'ADAPT study, long COVID from a clinical patient outcome perspective'
  - Prof Tony Kelleher – 'Insights into the pathophysiology of long COVID'
  - Dr John Zaunders – 'Long and short-term immunity to COVID'
- **Researcher Development seminars and workshops**
- **ICH–GCP training and certification.**

We were excited about this program, which had a large input from senior clinicians as well as basic science researchers on this campus as they work towards 'Research Innovations– Discovering what's possible'!

This virtual event allowed students and researchers to continue to present their research and discuss quality medicine, health, science, allied health, multidisciplinary and translational research. The event involved sessions with questions from the audience and virtual meeting rooms so that participants can engage and network with their colleagues. This was an outstanding opportunity for campus staff and visitors to celebrate some of the country's finest medical research and healthcare innovation.

The organising committee fostered gender equity in health and medical research principles, alongside working to support the EMCR community and to keep researchers connected throughout COVID-19.

RESEARCH SYMPOSIUM PROGRAM HIGHLIGHTS

The full agenda and abstract books with all talk titles are now available to download.

Agenda: SVCRS 2021 agenda.pdf

Thursday 14th October Abstract book: SVRS Abstract book 2021_THURSDAY.pdf

Friday 15th October Abstract book: SVCRS Abstract book 2021_FRIDAY.pdf

OPENING AND KEYNOTE

Opening address by **Professor Terry Campbell** and **keynote by Professor Daniel MacArthur**: 'Using large-scale genomic data sets to improve the interpretation of human genetic variation'.

BIG DATA AND DEEP LEARNING

Prof Louisa Jorm – 'Using big data and machine learning to inform cardiovascular care'

Dr Tansel Ersavas – 'Artificial intelligence in life sciences: applications, opportunities and pitfalls'

A/Prof Clair Sullivan – 'The algorithm will see you now'

Professor Gemma Figtree – 'Using big data in the fight against heart disease'

WOMEN IN MEDICAL RESEARCH

Dr Melina Georgousakis (Founder of Franklin Women) – 'Gender equity in health and medical research: good for you, your science and the community'

TECHNOLOGY ACROSS PRECINCT

Prof Jeffrey McArthur (VCCRI) – 'Making use of high-throughput electrophysiology in your research to tackle drug screening and cell phenotyping'

Dr Ira Deveson (Garvan) – 'At least three reasons to get excited about nanopore sequencing'

Dr XiaoSuo Wang (VCCRI) – 'Innovative ion mobility mass spectrometry based metabolomics'

Dr Venessa Chin (Garvan) – 'Using single cell genomics to personalise treatment for virally- associated oropharyngeal cancer'

Dr Michael Lovelace (AMR) – 'AMR Live Imaging Facility (LIF): towards a complementary core facility for research across the precinct'

AI AND BIOENGINEERING

A/Prof Helen Frazer – 'Transforming breast cancer screening with artificial intelligence - BRAIx program'

Dr Sze-Yuan Ooi – 'TeleClinical care: an integrated approach to cardiovascular disease management'

Dr Fatemeh Vafaee – 'Big data and AI – driving personalised medicine of the future'

Prof Mark Cook – 'Epilepsy monitoring'

RESEARCHER DEVELOPMENT PROGRAM HIGHLIGHTS

Dr Ken Dutton-Regester, Jennyfer Nhuyen, Dr Valentin Romanov – 'How to use Twitter for academic domination + Using TweetDeck + Pre-recording on Zoom'

Emma-Louise Hunsley – 'From researcher to inventor'

RESEARCH SKILLS WORKSHOP AND FORUM

Research data management, Privacy and Confidentiality

- **Prof Jo-Anne Brien** – 'The National Statement: research data collection and management'
- **Dr Christine Shiner** – 'Protocol design: data collection and storage considerations'
- **Amy Regan** – 'Privacy Act, privacy principles and obligations'
- **Madison Macdonald** – 'Data storage regulatory requirements'
- **Christopher Rofe** – 'RedCap at St Vincent's Hospital'
- **Dr Kate Patterson** – 'Animating research: design decisions and authentic scientific data'
- **Dr Zhixin Liu** – R Studio – 'Practical session of R Learning'
- **Dr Zhixin Liu** – 'Statistics in clinical trials, involving trial design, monitoring, data analysis'

AWARDS AND PRIZES

Congratulation to all our award winners:

Best oral (sponsored by Medtronic) - Sharissa Latham
'Subcellular specific targeting of JNK as a novel anti-metastatic therapy in triple negative breast cancer'

Best student oral (sponsored by BD) - Cecilia Chambers
'Inhibition of the NPY signalling axis as a novel therapeutic option in pancreatic cancer'

Best flash talk (sponsored by Illumina) - Kathryn Wolhuter
'Unravelling PHACTR1: How does the most important gene in vascular disease signal?'

Best student flash talk (sponsored by Illumina) - Rohan Joshua Krishnaswamy
'Inspiratory-breath-hold related flow-waveform responses in continuous-flow left ventricular assist device patients'

Best Twitter presentation (sponsored by BD) - Alison McLean
'A model of care for clinical implementation of pharmacogenomics: Stage 1 of the ENACT study'

Best student Twitter presentation (sponsored by Medtronic) - Michelle Xu
'Diverse genetic background of individuals contribute to variable response to proarrhythmic drugs'

SVCRS – Engagement prizes

Top score on Whova Leader board – **Sarrvesa Hari Vijay Singh**
Most liked SVCRS photo on Whova – **Tida Danwilai**
Best photo caption on Whova – **Kate Merlin**
Exhibition Passport winner – **Fiona Zhou**
Most tweets – **Celine Santiago**
Most liked tweet – **Vikneswary Batumalai**
Most retweeted tweet – **Anna Liza Kretzchmar**

SPONSORS

We would also like to thank all our sponsors! Without your support, we could not have put on such a great event.

DONOR

GOLD SPONSORSHIP

SILVER SPONSORSHIP

BRONZE SPONSORSHIP

29TH ANNUAL ST VINCENT'S RESEARCH SYMPOSIUM ORGANISING COMMITTEE

Kathryn Wolhuter (VCCRI, Co–Chair)
Melissa Mangala (VCCRI, Co–Chiar)
Melinda Tursky (AMR, Treasurer)
Ksenia Skvortsova (Garvan)
Amanda Khoury (Garvan)
Valentin Romanov (VCCRI)
Emma–Louise Hunsley (AMR)
Lachlan Gray (Garvan)
Kylie James (Garvan)
Etienne Masle–Farquhar (Garvan)
Kathryn Laloli (AMR)
Mitchell Starr (AMR)
Madhavi Pandya (Garvan)
Ranita Kirubakaran (UNSW)
Braydon Meyer (Garvan)
Marcel Schulz (UNSW)
Oliver Skinner (Garvan)
Kuet S Li (AMR)

29TH ANNUAL ST VINCENT'S RESEARCH SYMPOSIUM ADVISORY BOARD

Thuy Huynh (UNSW)
Alex Viardot (Garvan)
Terry Campbell (AMR)
Philip Cunningham (AMR)

ST VINCENT'S RESEARCHER DEVELOPMENT COMMITTEE

Thuy Huynh (Chair)
Christine Shiner
Christopher Hastings
Pamela Blaikie
Christopher Rofe
Philip Cunningham
Deborah Burnett
Terry Campbell
Emma–Louise Hunsley
Lauren Christie
Hayley Shephard
Lowenna Holt
Kuet Li
Emma Collyer

RESEARCH AT A GLANCE

2017 2018 2019 2020 2021

DIVERSIFY RESEARCH INCOME

RESEARCH GRANTS

Category 1 grants (NHMRC/ARC)

Non-cat 1 grants (non-peer reviewed)

St Vincent's Clinic Grants awarded

AMR Translational research grants awarded

OTHER REVENUE

Research office gross revenue

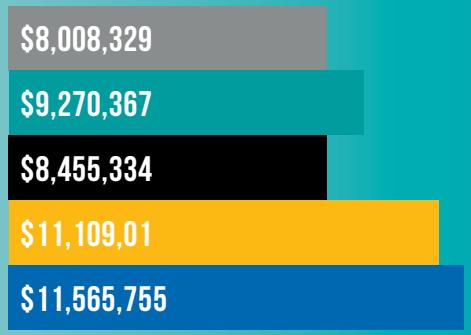
Proceeds from commercialisation

Contract research

St Vincent's Curran Foundation philanthropy for research (FY)

2017 2018 2019 2020 2021

TOTAL RESEARCH GRANT INCOME



TOTAL OTHER REVENUE

RESEARCH PRODUCTIVITY METRICS

	2017	2018	2019	2020	2021
JOURNAL PUBLICATIONS	786	810	729	518	818
BOOK CHAPTERS PUBLISHED	19	18	17	20	12
PRIZES/AWARDS	18	26	22	18	27
UNDERGRADS (MEDICINE)	323	453	349	330	302
PHD STUDENTS	127	91	105	115	112
HIGHER DEGREE STUDENTS	39	15	6	35	6

RESEARCH OFFICE METRICS

HREC FULL SUBMISSIONS	104	96	64	113	107
HREC LOW/NEGLIGIBLE RISK SUBMISSIONS	83	89	96	119	90
SITE SPECIFIC ASSESSMENT – FULL SUBMISSIONS	171	146	64	112	148
SITE SPECIFIC ASSESSMENT FOR LOW/ NEGLIGIBLE RISK	76	52	46	95	73
CLINICAL TRIALS – OPEN	297	316	315	355	441

COMMERCIALISATION AND IP METRICS

NEW INVENTION DISCLOSURES	6	1	3	1	0
PROVISIONAL PATENT APPLICATIONS FILED	1	1	2	2	1
ACTIVE PATENT FAMILIES	18	18	21	17	12
LICENCE AGREEMENTS EXECUTED	1	1	1	1	0
ACTIVE PATENT FAMILIES MANAGED BY SVH TO LICENSED COMMERCIAL PARTIES	10	10	13	13	8


RECEPTORS
REHABILITATION
REDISTRIBUTE
RELATIONSHIPS
REJECTION
REPLACING
RESPIRATORY
RECURRENT
REGRESSION
RETURNING

CAMPUS RESEARCH GRANTS

AWARDED 2020 (COMMENCING 2021)

	TITLE	FIRST NAME	LAST NAME	PROJECT TITLE	GRANT AWARDED	AMOUNT OF GRANT
1	Dr	Simon	Ghaly	Lyophilised orally administered faecal microbiota transplantation in the management of ulcerative colitis (lotus) study – a double blind randomised controlled trial	The SVPHS Ladies' Committee Sr Mary Bernice Research Grant	$120,000
2	Prof	Jerry	Greenfield	INTIMET - Insulin resistance in type 1 diabetes managed with Metformin	Tancred Research Grant	$50,000
3	Dr	Elysse	Filipe	Drug Carrying Nanoparticles (nanoP3) as the future of metastatic breast cancer treatment	K&A Collins Cancer Grant	$50,000
4	Dr	Max	Nobis	Imaging CDK4/6 and CDK1 inhibition live in vivo to overcome Palbociclib resistance in breast cancer	Thelma Greig Cancer Grant	$50,000
5	Prof	Michael	Rogers	New approaches to understand and treat bowel inflammation in a childhood auto inflammatory disease	Kavan Research Grant	$50,000
6	A/Prof	Tri Giang	Phan	Mechanism-based precision medicine of diseases of immune dysregulation	Annual Research Grant 1	$40,000
7	Dr	Matthew	Perry	Development of adult human induced pluripotent stem cell derived atrial cardiomyocyte models for the study of atrial fibrillation	Annual Research Grant 2	$40,000
8	A/Prof	Ann	McCormack	Pituitary tumours and the immune system: Investigating the role of immunotherapy for aggressive pituitary tumours	Annual Research Grant 3	$40,000
9	Dr	Charles	Cox	Understanding the role of a novel mechanosensor in physiological hypertrophy	Annual Research Grant 4	$40,000
10	Prof	Jacqueline	Center	Predicting bone loss in patients with inflammatory bowel diseases	Annual Research Grant 5	$25,000
11	Ms	Rebecca	Black	Oropharyngeal dysphagia and laryngeal dysfunction before and following heart and lung transplantation	Multidisciplinary Research Grant 1	$25,000
12	Prof	Sandy	Middleton	Improving patient safety by reducing hospital-acquired urinary tract infections	Multidisciplinary Research Grant 2	$25,000

	TITLE	FIRST NAME	LAST NAME	PROJECT TITLE	GRANT AWARDED	AMOUNT OF GRANT
13	Dr	Sara	Hungerford	Better understand the impact of structural heart disease interventions on volume and pressure loaded left ventricular states using a variety of existing and novel imaging techniques	Travelling Fellowship	$10,000
TOTAL						$565,000
14	Dr	Alison	Mahoney	2019 Clinical Excellence Award - Emerging	Clinical Excellence Award	$1,500
Additional Grants						
15	Dr Prof	Anthony Louise	Joshua Emmett	3 Year Grant - Prostate cancer research in partnership with Movember and the Commonwealth Government - Year 2 of 3	Movember Research Grant	$134,000
16	Dr	Venessa	Chin	Using the power of single cell sequencing to change the management of lung cancer - Year 2 of 3	De Angeli Research Grant	$100,000
17	Dr	Gail	Matthews	'ADAPT' COVID-19 study: A prospective, observational cohort study at St Vincent's Hospital Sydney	COVID-19 Research Grant	$150,000
GRAND TOTAL						$949,000
18	Dr	Kazuo	Suzuki	Development of new sensitive assay to detect ongoing transcriptional mRNA activity of HTLV-1 and the integrated DNA in peripheral whole blood	AMR Translational Research Grant	$50,000
19	Mr	Anthony	Kelleher	Dissecting the primary immune response within human lymph nodes to a novel HIV immunogen	AMR Translational Research Grant	$50,000
20	Dr	John	Zaunders	Pilot study of flow-seq: feasibility of cost-effective high throughput next generation sequencing of B and T cell receptors in cell sorted, putative neoplastic lymphocytes, identified by clinical flow cytometry	AMR Translational Research Grant	$25,000
21	Prof	David	Ma	Clinical application of gene mutation and variant testing for autologous haematopoietic stem cell transplant (AHSCT) for malignant and non-malignant diseases	AMR Translational Research Grant	$25,000
22	Dr	Christine	Shiner	Examining the use of health care interpreters, and their impact on clinical outcomes for patients with limited English proficiency undertaking inpatient rehabilitation	AMR Translational Research Grant (IHIF)	$30,000

	TITLE	FIRST NAME	LAST NAME	PROJECT TITLE	GRANT AWARDED	AMOUNT OF GRANT
23	A/Prof	Richard	Hillman	Cancer AwaREness in people living with HIV (CARE)	AMR Translational Research Grant (IHIF)	$30,000
24	Dr	Michael	Lovelace	Dedicated automated live-cell imaging facility at St Vincent's AMR	AMR Equipment Grant	$15,000
25	Dr	Darren	Roberts	Buy-Out Clinician Time	AMR Buy-Out a Clinician Grant	$50,000
26	Dr	Jane	Currie	Adaptation and implementation of a homeless health vulnerability index	Multidisciplinary Research Grant 3	$25,000
27	Ms Ms	Nadine Victoria	Ezard Malone (left)	Decreasing discharge against medical advice (DAMA)/Leave against medical advice (LAMA) and increasing patient satisfaction in an alcohol and drug inpatient unit	Multidisciplinary Research Grant 4	$25,000
28	Ms	Alison	Mahoney	Supporting carers of people experiencing anxiety and depression: developing and trialling an online program	Multidisciplinary Research Grant 5	$38,000

AWARDED IN 2021 (COMMENCING 2022)

	TITLE	FIRST NAME	LAST NAME	PROJECT TITLE	GRANT AWARDED	AMOUNT OF GRANT
1	Prof	Jerry	Greenfield	Elucidating the immune and metabolic phenotype of autoantibody negative diabetes in adults	Sr Bernice, Packer Family Foundation Research Grant	$120,000
2	A/Prof	Richard	Hillman	Trial of individually collected anal testing (TICAT)	Kavan Research Grant	$50,000
3	A/Prof	Andrew	Jabbour	Implementing and validating a novel method of non-invasive detection of cardiac rejection for the management of heart transplant recipients using high field strength (3T) MRI imaging	Annual Research Grant 1	$40,000
4	Prof	Reginald	Lord	Evaluating the performance of a three gene hypermethylation PCR assay for the diagnosis of oesophageal adenocarcinoma and high risk Barrett's oesophagus	Annual Research Grant 2	$40,000
5	Dr	David	Herrmann	Pinpointing and targeting novel drivers of pancreatic cancer progression, invasion and metastasis	Annual Research Grant 3	$40,000

	TITLE	FIRST NAME	LAST NAME	PROJECT TITLE	GRANT AWARDED	AMOUNT OF GRANT
6	Fr	Darryl	Mackie	The Impact of Indigenous spirituality in healthcare and healthcare decision making	Multidisciplinary Research Grant 1	$25,000
7	Ms	Lauren	Christie	Recite (remote constraint induced therapy of the upper extremity): An implementation study	Multidisciplinary Research Grant 2	$25,000
8	Dr Prof	Anthony Louise	Joshua Emmett	3 Year Grant - Prostate cancer research in partnership with Movember and the Commonwealth Government - Year 3 of 3	Movember Research Grant	$133,333
9	Dr	Venessa	Chin	Using the power of single cell sequencing to change the management of lung cancer - Year 3 of 3	De Angeli Cancer Research Grant	$100,000
10	Ms	Karin	Obrecht	A retrospective study of psychosis in Aboriginal communities	Community Grant 1	$50,000
11	Fr Adj A/ Prof	Darryl Jeffery	Mackie Cohen	Parish health care	Community Grant 2	$32,000
12	Fr Adj A/ Prof	Darryl Jeffery	Mackie Cohen	Indigenous health SWOT auditing tool	Community Grant 3	$14,000
TOTAL						$669,333
13	Dr	Alisa	Kane	The clinical and immunological benefits of curative allogeneic haematopoietic stem cell transplantation (HSCT) and precision therapeutics in adults with primary immunodeficiency	AMR Translational Research Grant	$50,000
14	Dr	Arjun	Iyer	Improving the preservation of donor heart by the administration of blood thinning agents heparin and tiroflban	AMR Translational Research Grant	$25,000
15	Dr	Megan	Barnet	Investigating the role of innate immunity in abscopal response to radiotherapy	AMR Translational Research Grant	$25,000
16	Dr	Jim	Poulipoulos	Alcoholic cardiomyopathy: Elucidating the structural, function and cardiometabolic sequelae attributing to frequent ventricular ectopy and heart failure using advanced	AMR Translational Research Grant (IHIF)	$30,000
17	Dr Dr	Christine Simon	Shiner Mosalski	Evaluating rehabilitation needs, a access and service provision among people experiencing homelessness who have sustained a traumatic brain injury	AMR Translational Research Grant (IHIF)	$30,000

	TITLE	FIRST NAME	LAST NAME	PROJECT TITLE	GRANT AWARDED	AMOUNT OF GRANT
18	Dr	Joga	Chaganti	Neural correlates of methamphetamine use disorder	AMR Translational Research Grant (IHIF)	$30,000
19	Dr	Susan	Hart.	Barriers and facilitators to the delivery of evidence based care for people with eating disorders in an acute care setting	AMR Translational Research Grant (IHIF)	$30,000
20	Dr	Claudia	Woolf	A feasibility randomised controlled trial of a virtual version of club connect: an evidence based healthy brain ageing cognitive program for older adults	AMR Translational Research Grant (IHIF)	$30,000
21	Dr Prof	Michael Bruce	Lovelace Brew	Upgrades for Leica Thunder live-cell imaging microscope	AMR Equipment Grant	$30,000
22	Dr	Mayooran	Namasivayam	Buy-Out Clinician Time	AMR Buy-Out a Clinician Time Grant	$50,000
23	A/Prof	Louise	Emmett	Buy-Out Clinician Time	AMR Buy-Out a Clinician Time Grant	$50,000

COMMERCIALISATION AND INTELLECTUAL PROPERTY MANAGEMENT

COMMERCIALISATION AT SVHS

MIC-1 SUMMARY

MIC-1 is a human protein belonging to a biologically important family of cytokines known as the TGF-ß superfamily. Through the inventorship of Professor Samuel Breit and his team, SVHS owns ten patent families related to MIC-1's use for a number of disease states. MIC-1 has been successfully licensed to three pharmaceutical companies for development and sale. Two of the MIC-1 licensees are multinational large pharmaceutical organisations and have licences for treatment and diagnosis use of MIC-1 in specific disease states, and for agonising MIC-1 for a range of diseases including obesity. A smaller, scale-up, US based pharmaceutical company has a licence to antagonise MIC-1 for cancer cachexia.

These licences were entered into between 2009 and 2012, and the relationships between SVHS and the organisations remains strong. To date one product is on the market as a result of these agreements, a diagnostic test for acute coronary syndrome, chronic heart failure and the prediction of atrial fibrillation. Thus far SVHS has received over AU$5 million as a result of the commercialisation of MIC-1 and this figure is set to increase as additional products enter the market and complete their milestones.

VAD IMPROVEMENTS

SVHS researcher and clinician Professor Christopher Hayward invented two patent families around the development of improvements to existing commercial Ventricular Assistance Devices (VADs). Both patent families have been assigned to one of the two major players in the VAD market in 2017, for further development and implementation into their marketed product.

OX40 ASSAY

The OX40 assay is a flow cytometry assay, capable of detecting CD4+ T cells, specific for a wide range of antigens. The OX40 assay has been validated in infectious disease, vaccines, autoimmune disease and viral diseases and remains highly cited in the literature. In 2015 SVHS entered into a licence agreement for the assay in 2015 with a European biotechnology company, for its commercialisation. This partnership has resulted in a commercial product available for sale, and royalty income to SVHS.

IN PROGRESS

HIV DETECTION ASSAY

Associate Professor Kazuo Suzuki developed an HIV assay capable of determining whether HIV patient medications are effective for the individual. The assay is currently in term sheet negotiations with a large international biotechnology company, for further development and productisation. It is likely a licence agreement will be entered into in 2022.

THIS WAY UP

Professor Gavin Andrews catalysed the development of This Way Up, an online cognitive behavioural therapy (CBT) platform, which has been shown to have equal clinical validity in head-to-head studies with in-person CBT. This Way Up includes courses for many mental health disease states including depression, general anxiety, mixed anxiety and depression, and obsessive compulsive disorder to name a few. This Way Up is currently in term sheet negotiations with a digital health company based in the US for the licence of some of the CBT courses, and is likely to be licensed in 2022.

ABOUT COMMERCIALISATION AT SVHS

SVHS commercialisation is managed by our Intellectual Property and Commercialisation Officer (IPCO), Emma-Louise Hunsley, and our Intellectual Property Committee (IPC) comprised of members from across SVHS.

IPC Membership:

- **Professor Terry Campbell,** Chair – Director of Research
- **Associate Professor Philip Cunningham,** Chief Operating Officer, AMR
- **Dr Pamela Blaikie,** Research Office Manager
- **Ruth Hood,** Executive Director Legal & Risk
- **John Slaven,** Director of Finance
- **Jim Dwyer,** Independent Member
- **Emma-Louise Hunsley,** IPCO – Secretariat.

Emma-Louise Hunsley

2019 – 2020 METRICS

	FY 19–20	FY 20–21
NUMBER OF NEW INVENTION DISCLOSURES	3	0
NUMBER OF PROVISIONAL PATENT APPLICATIONS FILED	2	2
NUMBER OF PATENT FAMILIES UNDER MANAGEMENT	21	16
NUMBER OF PATENT FAMILIES LICENSED TO A COMMERCIAL ENTITY	13	10
NUMBER OF MATERIAL TRANSFER AGREEMENTS EXECUTED	0	2
NUMBER OF CONFIDENTIALITY AGREEMENTS EXECUTED	1	2
NUMBER OF IP ASSIGNMENTS EXECUTED	2	3
NUMBER OF TERM SHEETS UNDER NEGOTIATION	1	2
NUMBER OF LICENCE AGREEMENTS EXECUTED	1	1
NUMBER OF EVALUATION AND OPTION AGREEMENTS EXECUTED	1	0
INTER-INSTITUTIONAL AGREEMENTS	0	0
LETTERS OF UNDERSTANDING	1	0
VARIATION LETTERS	1	1

GOING GREEN – ENVIRONMENTAL STEWARDSHIP ON THE ST VINCENT'S RESEARCH PRECINCT

St Vincent's Centre for Applied Medical Research and Victor Chang Cardiac Research Institute's outstanding efforts to reduce our carbon footprint have been recognised in the annual CitySwitch National Awards.

By working closely with the Victor Chang Cardiac Research Institute, the Centre for Applied Medical Research collectively cut its footprint in the Lowy Packer Building by a remarkable 407.5 tonnes.

This outstanding effort was led by Mr Colin McRobbie, Facilities Engineering Manager, with support of the Lowy Packer Building Management Committee, who put in place a highly effective energy reduction technology. These included replacing older style electric light globes with LED options and adding computerised timers to the natural gas steam boilers that provide hot water and process wastes from the research laboratories.

An impressive $92,000 was also saved by cutting back on electricity and gas usage, earning the team the Highly Commended prize for the National Partnership of the Year.

'We achieved the equivalent of taking 80 cars off the road per year, or saving the running of 42 average domestic homes,' says Mr McRobbie.

Professor Jason Kovacic, Executive Director of the Victor Chang Cardiac Research Institute, said, 'These results are impressive but are also just the beginning of our commitment to reduce energy use and emissions, and to do everything we can to tackle climate change.'

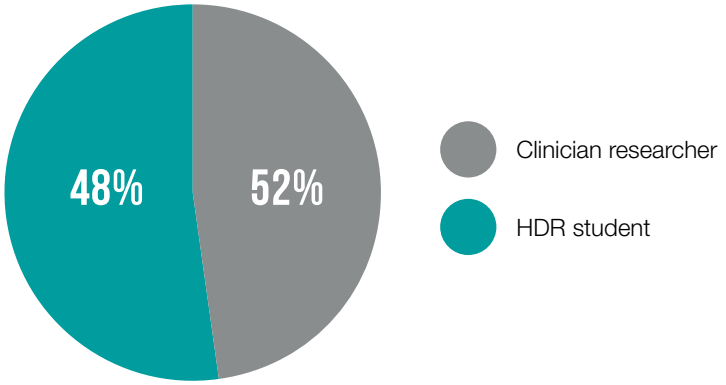
AMR BIOSTATISTICS CLINIC

The AMR Biostatistics (Biostats) Clinic provides biostatistics advice, support and training for clinicians and biomedical researchers to enhance the research capacity and quality at St Vincent's AMR.

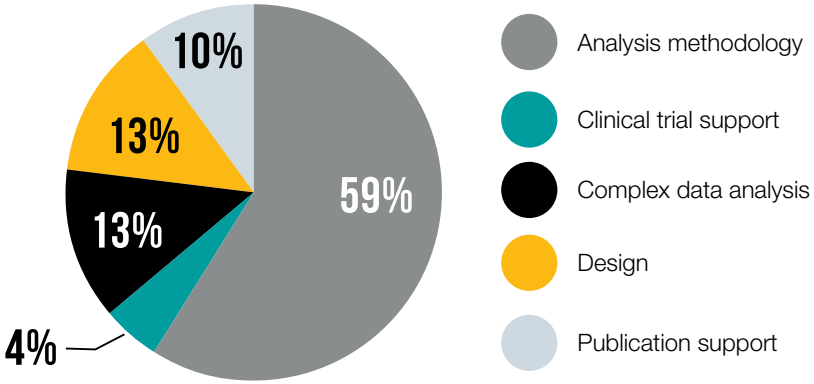
There are continuing statistical guidance and assistance to ILP students, higher degree research (HDR) students, advanced trainees, allied health network researchers at all stages of their research activities, from study feasibility assessment, hypothesis generation, design, data processing, statistical analysis and result interpretation.

The clinic also supports significant research projects and collaborates with clinical and biomedical investigators and research groups across multiple disciplines, including genetics research, respiratory, cariology, haematology, drug and alcohol, ICU, endocrinology, neurosciences, clinical pharmacology, anaesthesia etc. The Biostats Clinic plays a key role in applying rigorous study design and contemporary statistical methods to the evaluation of health programs and intervention effect, the investigation of the prognostic factors and the prediction of disease progress etc, so as to be competitive in research grants, and publishing high-quality papers. Success in major grants (e.g. TGRS, MMRF) and seed grants, publications in impactful journals are seen through the support and collaboration.

BIOSTATISTICS CONSULTATIONS



TYPE OF SUPPORT PROVIDED



Investigator-initiated clinical trials are supported through the clinic, covering design, protocol development, randomisation, interim/final analysis etc, under the role of trial statistician. The clinic also serves related roles as steering committee member and data safety monitoring board member to advise and oversee the trial conduct and safety.

Aligned with Stats Central, the Biostats Clinic provides tailored biostatistics training including workshops and serial seminars to uplift the analytical skills and statistical thinking for SVH AMR researchers.

SHORT COURSE NAME	2021
SAMPLE SIZE AND POWER CALCULATIONS	February
INTRODUCTION TO R	May, August
INTRODUCTORY STATISTICS FOR RESEARCHERS USING R	May, August
INTRODUCTORY STATISTICS FOR RESEARCHERS USING SPSS	May
INTRODUCTION TO REGRESSION MODELLING IN R	August

COURSE WEB PAGE

Online Short Courses

https://www.analytical.unsw.edu.au/facilities/stats-central/online-short-courses

STATS CENTRAL

Dr Zhixin Liu is a statistical consultant at UNSW Stats Central with experience in statistical design and modelling in clinical trials, epidemiology/public health, behavioural sciences, and evaluation studies. Advanced survival analysis, recurrent event modelling, multi-level modelling, interrupted time series.

Dr Zhinxin Liu

ST VINCENT'S BIO (TISSUE) BANK

The St Vincent's Centre for Applied Medical Research Biorepository continues to be a pivotal component of the research infrastructure for the St Vincent's Hospital Research Precinct. There is ongoing development and maintenance of both technical expertise and facilities to support participation in biomedical research and clinical trials with the aim of providing the best possible outcome for patients.

The facility is home to more than 220 separate human tissue collections. Primary biospecimen collections involve the following disciplines: Immunology, Neurology, Gastroenterology, Haematology, Oncology, Clinical Pharmacology, ICU, Cardiology, Diabetes, Appetite and Metabolism; and a number of research programs at the Kirby Institute, including Immunovirology Pathogenesis program, Therapeutic and Vaccine Research Program, HIV Epidemiology & Prevention Program, Viral Hepatitis Clinical Research Program, BIOS.

Our track record of working safely with biospecimens known to contain pathogens meant that we were in a strong position to provide processing and cryopreservation services for recent SARS-CoV-2 clinical research studies offered at St Vincent's. The largest body of work has been the biospecimen processing, storage and data capture for the ADAPT study, which has currently recruited almost 200 participants with multiple time points, resulting in 18,000 individual specimens stored so far (over 4,000 biospecimens have already been removed and sent to collaborators locally, interstate and overseas for research purposes).

Another exciting initiative has been helping establish robust biospecimen storage for the newly created St Vincent's Cardiac tissue bank, the objective of which is to provide researchers with heart tissue for clinical and fundamental investigations into the molecular and cellular mechanisms underlying heart disease and failure.

Planned interaction with the new CTMS to be adopted by the Clinical Research team will aim to further streamline accounting for biospecimen storage for clinical trials on the campus.

REDUCING
REDUCE
RECENTLY
RELEVANC
REVEAL

Left to right: Kate Merlin, Sridevi Meka, Shannen Butterly, Bertha Fsadni

ST VINCENT'S AMR LIVE-CELL IMAGING FACILITY

The AMR Live Imaging Facility expands with a Leica Thunder widefield live-cell imaging microscope, hypoxia suite and high-impact publication.

St. Vincent's AMR Live Imaging Facility was formally established in late 2019, following the award of a $100,000 Ian Potter Foundation Medical Research Grant in the previous year. The facility addresses critical unmet needs in the area of automated (Incucyte Zoom) and manual live-cell microscopy imaging (Thunder microscope), and also includes an electronic cell counter, flow cytometer and Cellasic microfluidic microscope upgrade. Much of the equipment is housed in a cell culture facility, while an adjacent microscopy room has been thoroughly upgraded with gases needed for live-cell imaging, and additional air conditioning needed for maintaining temperature during prolonged live-cell imaging. Total gross value of equipment in the facility is now over $750,000.

In 2020, a second $100,000 Ian Potter Foundation Medical Research Grant was awarded to AMR, which together with significant support from St Vincent's Curran Foundation enabled further expansion of the facility by purchasing a Leica Thunder live imaging microscope. The grant was led by St Vincent's Hospital clinical neurologist Professor Bruce Brew (Head, SVHA Department of Neurology and Peter Duncan Neurosciences Research Unit) and his senior scientist, Dr Michael Lovelace, and was supported by other laboratories at AMR, Precinct and external collaborators.

This revolutionary microscope was the first to be installed in Sydney and enables fast live-cell imaging combined with software removal of out-of-focus 'blur' (caused by light scattering). 'Blur' has traditionally been an impediment to obtaining biologically insightful images on a widefield fluorescence microscope, particularly with thick sections. 3D cell cultures are increasingly being recognised as being more biologically insightful than 2D monolayers. With the Thunder microscope, researchers are equipped to image both fixed and live samples, from simple monolayer cultures to challenging 3D spheroid and organoid cultures several millimetres thick. The microscope has already assisted researchers from the Victor Chang Cardiac Institute to complete a study published in the prestigious journal *Cell Stem Cell*, and more publications are likely to follow. Two AMR equipment grants in 2020/–21 have funded upgrades, including a colour camera for documenting immunohistochemically-stained tissues.

In 2021, a hypoxia cell culture incubator was purchased, which now houses the Incucyte. Hypoxia functionality allows researchers to conduct experiments on cultures under low oxygen conditions which mimic those of several diseases. Complementing this is the Whitley Hypoxystation (a donation from Victor Chang Cardiac Institute), which is used for manipulating cell cultures under hypoxic conditions, before returning them to the incubator.

Overall, the Live Imaging Facility is delivering important new equipment to ensure that Precinct researchers can progress their research.

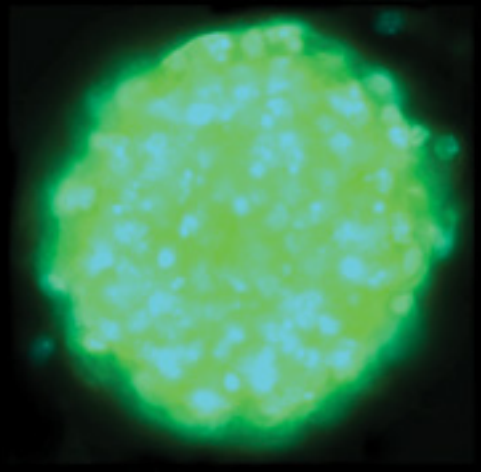
Incucyte Zoom installed in Hypoxia cell culture incubator.

Leica Thunder widefield live cell imaging microscope. A temperature-controlled cabinet surrounds the microscope, to allow physiological conditions to be maintained.

Hypoxia workstation.

WITHOUT THUNDER

WITH THUNDER



Example of Thunder microscope post-image capture processing, to reveal neurons on the outside of neurospheres that are invisible in the raw image due to out-of-focus blur. (Image captured by Dr. Michael Lovelace.)

ST VINCENT'S
CENTRE FOR APPLIED
MEDICAL RESEARCH

A DIVISION OF ST VINCENT'S HOSPITAL SYDNEY

REIMAGINED