



THE UNIVERSITY
of ADELAIDE

FAME strategy

Healthy societies

A healthier and more equitable society
underpinned by world-leading research



Vision

A healthier and more equitable society underpinned by research that makes a difference to improving individual and population health

Fame



The University of Adelaide prioritises its research at scale within FAME (Foci and Magnets for Excellence) Strategies. Our FAME Strategies provide a platform that enables us to attract the best researchers and partners, and deliver positive impacts for our State and Nation through research excellence and its translation.

Mission



To strengthen South Australia's reputation as a research leader driving a healthy and more equitable society through research excellence, strategic partnerships, and delivering valuable outcomes to our partners and communities.

Building our healthier future

The future health and wellbeing of our society will be underpinned by innovative research that informs practice and policy, promotes a world-class healthcare system, and integrates the latest technologies.



The University of Adelaide is poised to continue to build on its commitment to research excellence. For decades, we have been delivering a better world through research impact and innovations that have influenced and protected human health and the communities in which we live, and we are committed to continuing this impact.

Unprecedented disruption to every aspect of our lives has highlighted the critical importance of science and its translation to underpin the prevention and management of disease, and to drive social, political, and economic change to improve health and equity.

We envision a time where no one is deprived of a healthy future. A future with vibrant communities, in which people are connected, active and participative, have access to necessary resources and infrastructure, and feel fulfilled.

Underpinning this future are a range of non-medical factors that the *World Health Organization* have defined as the social determinants of health. These are factors in the environments where people are born, live, learn, work, play and worship that affect a wide range of health, functioning, and quality of life outcomes. Addressing the social determinants of health appropriately is fundamental for improving the health of our society.

Faced with a growing healthcare burden of populations living longer, but not necessarily healthier; the importance of supporting *improved quality of life* is becoming ever clearer.

In this context, *research and its translation to underpin the prevention, diagnosis and treatment of disease* is critical.

The social determinants of health exert an important influence on health inequalities. Tackling these issues, including *greater quality of and equity in access to healthcare, safe and secure housing and social structures, and education*, also involves examining the wider set of systems shaping the conditions of everyday life, including economic, social and development policies, political systems and social norms.

Improved effectiveness and efficiency in health care services is important. There is a need to ensure services are systematically evolving, and can operate sustainably and at scale. Alignment with the changing values and attitudes of

Australians is also important, as is a sustained and quality pipeline of *workforce delivery* that plays a critical role in health care. There is a particular focus on research education to ensure a workforce fit for the future, including clinician researchers who are generating new and innovative discoveries here in South Australia.

In an uncertain world, with new challenges to health and wellbeing emerging, advances in digital technology and leveraging the power of *converging and emerging technologies* will continue to drive breakthroughs in approaches to improving health and wellbeing.

Building a healthier future requires collaborative action by all sectors and government, locally, nationally, and internationally. Unified by a shared vision, industry, government, and the community are primed through strong partnerships to drive translational activities to accelerate innovation, commercialisation and transformation that enables economic development and societal gain.

Guiding principles

- Excellence in Research starts with excellent people, rigorous research culture, and long-term vision and persistence. It is fundamental to the discovery, development, and successful adoption of new approaches to enhance personal and societal health and wellbeing, and to developing the next generation of future researchers, leaders and innovators.
- Equity will be the core ambition underlining Healthy Societies, highlighting our commitment as an institution to generating research outcomes which provide a more equitable society for all.
- Collaboration and partnering with local, national, and international stakeholders will provide new research and translational opportunities and pathways to market, as well as opportunities for the accelerated application of treatment and prevention practices.
- Differentiation will be at the heart of the research we conduct and the impact that research generates. We will ensure our research impacts are fit-for-purpose and end-user focussed.
- Convergence will accelerate access to capabilities, skills, people and knowledge where disciplines intersect, giving rise to cross-sectoral collaboration, advancements, and impact.
- State Priorities, as outlined in the South Australian Health and Medical Industries Plan, will align the Healthy Societies research missions with the needs of healthcare, disease prevention, technology, and equity of access.
- Responsible innovation will ensure we support research translation as efficiently and responsibly as possible in pursuit of our mission, with consideration for the broader social and ethical implications of our research.
- Magnet for Talent will build a reputation that attracts outstanding individuals from across Australia and around the world to join the University of Adelaide.

Aims

The university will:

- Lead and develop innovative, impactful research that supports a healthy and more equitable society through the convergence of research strengths.
- Drive research excellence, with a focus on strengthening social structures and equity health and wellbeing, understanding and managing disease, delivering quality care and efficient healthcare, and converging and emerging technologies.
- Partner with industry, government, and other external stakeholders to strive towards a healthier and more equitable future for South Australians and all Australians.
- Align priorities with those of our strategic partners to support South Australia to maximise the opportunities and outputs of our research in the pursuit of a healthy and more equitable society.
- Educate the next generation of researchers, clinicians, and practitioners, and including through industry-linked higher-degrees and training programs.
- Promote relevant and emerging R&D funds to support research leadership, research excellence and downstream translation and commercialisation activities as a value-add to the South Australian economy.

Research missions for transformation

As the World Health Organization Constitution recognised more than 70 years ago, health implies more than absence of disease, or extension of lifespan. It entails the physical, social, spiritual, and mental wellbeing that contributes to overall quality of life.

The University of Adelaide has a deep commitment to supporting the health and wellbeing of Australians. Through aligning our research and our research strategies with State and National priorities, and working with industry and government partners, we seek to maximise the impact of our research. Our research will help transform a better, healthier, future for all.

The FAME Strategy: Healthy Societies will help support the future of our communities through five Research Missions (RM). The missions demonstrate the impactful research that is and can be delivered through multiple disciplines working together at scale. The missions are convergent by nature, but each mission identifies an area where our unique capabilities make a powerful social and health difference.

- RM1: Strengthening Social Structures and Equity will explore the role of socio-cultural and environmental factors that impact on health equity and quality of life outcomes at a population level.
- RM2: Health and Wellbeing explores the complex factors that influence healthy life trajectories of individuals and approaches to effective prevention and health promotion.
- RM3: Understanding and Managing Disease will investigate the physiological mechanisms of disease and enable new approaches to disease diagnosis and treatment.
- RM4: Delivering Quality care and Efficient Healthcare focuses on undertaking and translating research into outcomes that improve the quality and efficiency of health care.
- RM5: Converging and Emerging Technologies will explore new methods, developing technologies and novel applications to solve complex health needs and generate positive impact at scale.



Transforming research into real societal benefits

A strong commitment to research excellence has defined the University of Adelaide's history, and will continue to drive change and prosperity.

The University of Adelaide is home to impactful health and medical research that has supported our population and strengthened our communities. Our innovative and novel scientific discoveries have led to ground-breaking advancements for human and societal health.

We are a global leader in fields that are critical to our global future and translate to meaningful socio-economic benefits. Consistently ranked in the top 1% of universities internationally, our research translates across all stages of life and can impact every single human life.

To maximise the impact of our research, we have formal research partnerships with government and industry across South Australia, Australia, and the world. Our ties with leading hospitals, government departments, businesses and non-government organisations will allow ideas to transform into commercial and social outcomes.

Our world-renowned researchers conduct cutting edge, transformative research that generates real, impactful benefits and drives societal and economic change.



University of Adelaide FAME strategy – Healthy societies

The Healthy Societies Research Missions ecosystem highlights the multi-disciplinary and evolving nature of our research. Underpinned by innovation and influenced by technological advancements, our research missions are guided by core principles and aims.

Strengthening social structures and equity

Strengthening Social Structures and Equity refers to investigating the socio-cultural, political, and economic systems that generate inequities which impact health and quality of life. RM1 explores how social patterns impact communities and can strengthen or undermine equity in all areas of care and outcomes create a healthier and more equitable society for all.

Health and wellbeing

Understanding the complex drivers of both good and poor health is key to maximising the health and wellbeing of our individuals within our community. Prevention is a key pillar to ensuring good health through understanding and intervening on risk factors for poorer outcomes. RM2 will explore the role that these complex factors play in influencing the healthy life trajectories across the lifespan. This new knowledge will help build the tools to sculpt a healthier future. We will partner with consumers and health care systems to embed appropriate and effective prevention efforts in all aspects of delivering care.

Converging and emerging technologies

The converging and emerging technologies research mission explores opportunities to use data and new technologies for the convergence of existing technologies to drive innovations and define alternative futures states. RM5 is founded in providing new and novel technological applications to solve complex medical needs to drive positive impact of scale.

Understanding and managing disease

The pathogenesis of most disease is complex and influenced by multiple intrinsic and extrinsic factors. RM3 will elucidate the molecular, cellular, physiological, and environmental basis of disease. This will enable the development of new diagnostic and therapeutic approaches for disease management.

Delivering quality and efficient health care

Translating research into outcomes that improve the health of individuals and communities requires an intensive and ongoing commitment to improving the healthcare system itself. RM4 will utilise our burgeoning program of clinical trials, implementation science and evidence-based medicine to improve the quality, efficiency and sustainability of health care.

Research mission 1

Strengthening social structures and equity

Strengthening Social Structures and Equity refers to investigating the socio-cultural, political, and economic systems that generate inequities which impact health and quality of life. RM1 explores how social patterns impact communities and can strengthen or undermine equity in all areas of care and outcomes create a healthier and more equitable society for all.

Health and quality of life are anchored in the social structures into which people are born and live, with research showing that the lower an individual's socio-economic position, the worse their health will be. With so many of these factors determined by chance and not choice, improving and strengthening the social structures that address health inequity is critical to ensuring that everyone has the chance to be as healthy as possible. Essential to our understanding of how society can work together to reduce the disparities in social inequities is our ability as a University to contribute to research that will deliver health equity for Australians.

RM1 will support our investigation of the wider set of systems and structures that shape the conditions of daily life and how they differentially impact people based on culture and language, disability, age, education status and socio-economic standing. The University will continue to contribute to global research outcomes across a variety of disciplines, including Business, Economics, Education, Humanities, Law, Music and Social Sciences, that help define the mechanisms within society that dictate our life course.

We know, for example, that secure and affordable housing is fundamental to the wellbeing of Australians and with renters outpacing homeowners for the first time in generations, our current and future research into health issues

and housing interventions in Australia is critical to understanding the impact of housing stress and quality of housing on health and wellbeing. Our researchers are prioritising initiatives in social housing that will continue to have an impact globally, including the Australian Centre for Housing Research (ACHR), the first and only centre internationally to span healthy housing for Indigenous Australians, people in need and the growing population of rental housing tenants.

The Australian Government has been placing increasing investment into housing, with the National Housing and Homelessness Agreement setting aside AUD \$129 million for homelessness services in 2021, with states and territories matching the funding. This has come due to individuals increasingly experiencing housing stress due to inflation and other economic changes increasing the difference between low income and high income households.

The introduction of the Australian Centre for Housing Research (ACHR) brings the spotlight on housing and homelessness, particularly as our population continues to grow. ACHR provides the University with the opportunity to improve research in understanding valuable service delivery, in particular, to improve housing safety and security.

Many health and social services are exploring ways to strengthen how we interact as a society to improve our health and wellbeing, including what can be done about the underlying factors that determine the distribution of health and wellbeing outcomes. The University will continue to prioritise research knowledge on why health inequities exist, what can be done about them and how population health overall can be improved. For example, with the number of Australian children entering care or beginning life with social disadvantage continuing to grow, the value of research in the social and economic determinants of health is of great importance, both in enabling policy change in Australia, but also in contributing to research of interventions to reduce inequalities that can in turn improve their long-term outcomes.

As RM1 aims to understand how our interactions as a society impact on health and quality of life, it will be fundamental for the University to continue partnering with external stakeholders on research into the legal, economic and political elements that contribute to longstanding inequities in our society that impact on health. RM1 will have particular focus on recognising more can be done to assist our underrepresented and vulnerable cohorts to access and attain the same economic, social and health supports and outcomes experienced by the majority of Australians.





The South Australian Law Reform Institute (SALRI) use law reform to drive social change, with their work having led to major legislative changes that have a direct impact on improving the lives of South Australians from all backgrounds.

SALRI have proposed major changes to South Australia's surrogacy laws to update and improve the current system. The research has played a significant role in reducing systemic discrimination on the grounds of gender, gender identity or intersex status. This has seen wider recognition of the LGBTIQ community through the promotion of inclusion and diversity within legislation, which gained bipartisan support.

Other critical research has included the development of a regulatory framework for surrogacy arrangements. This framework seeks to see major changes to South Australia's surrogacy laws to update and improve the current system. This research will have a major impact through allowing for clearer access to surrogacy in a highly complex and emotional system.

Over time, Australia has witnessed changing values, beliefs, and attitudes which has led to significant milestones in recognition for underrepresented and disadvantaged cohorts and those who face discrimination. The University of Adelaide is leading a range of research programs designed to continue to support thriving communities across these cohorts. Examples include our crossdisciplinary research into the complex issues faced by Indigenous Australians, as well as our research into using law reform to drive social change for South Australians facing legislative discrimination in the areas of reproductive rights and based on factors such as sexual orientation.

The University has strength in delivering research focused on understanding health equity, driven by the Stretton Institute to understand social and economic determinants to promote health equity and reduce exclusion. Research focuses on understanding why inequities exist, and how overall population health can be improved. Multiple grants through NHMRC have assisted to inform public policy that considers health inequities and social determinants. The Stretton Institute highlights contemporary challenges facing Australia and the world, such as the role of the pandemic in impacting social determinants of health and people lives more broadly.

Further exploration and understanding by the University of the changing values and attitudes of Australians in the face of unprecedented times, economically, environmentally, and politically, will be critical for supporting a growing population into the future. An important consideration of our future population is our migrant and refugee population who represent an increasing percentage of our total population. As Australia becomes more diverse, the traditional structures of our health and social care systems will no longer be adequate to support all members of our society. Processes and systems that reflect a range of different

cultures and considerations of health will need to sit at the heart of care to ensure there is equity in our social structures. The University will play a significant role through its support and delivery of research that enables policy change through the development of policy briefs based in research.

Policy reform and influencing policy change will continue to be a priority for University of Adelaide researchers. We will continue to employ cross-disciplinary and multi-method policy research to address issues important to South Australia, Australian and globally, including primary

health care, the social, economic and commercial determinants of health, informing policy on equitable access to medicines, vaccines, tests, devices and health programs, and assessment of policies in a range of areas including housing, urban planning, trade and social welfare in terms of their health and wellbeing impacts.



Research mission 2

Health and wellbeing

Understanding the complex drivers of both good and poor health is key to maximising the health and wellbeing of the individuals within our community.

Prevention is a key pillar to ensuring good health through understanding and intervening on risk factors for poorer outcomes. RM2 will explore the role that these complex factors play in influencing healthy life trajectories across the lifespan. This new knowledge will help build the tools to sculpt a healthier future. We will partner with consumers and health care systems to embed appropriate and effective prevention efforts in all aspects of delivering care.

Better health is the foundation of better living and empowering individuals to make informed decisions regarding their healthcare is important to improving overall health and wellbeing. Key to this is ensuring health promotion strategies are delivered through governments, communities and individuals working together to address social and environmental challenges and to improve access to information for informed decision making. While health-related research has vastly improved the lives of our community and contributed to the greater wellbeing of our society, the way information is consumed has changed with the advances in effective technologies and accessibility to internet improving access to resources and

enabling people to make decisions based on their own research.

RM2 will prioritise research that is focused on prevention, health promotion, and building resilience, exploring opportunities for partnership and collaboration that will work to prevent and overcome disease and illness, from physical to psychological, and from conception to old age. The University's continued focus on improving public knowledge of the factors and

indicators that define the likelihood of disease and the positive impact of early interventions will lead to increased understanding of how to design effective preventive and public health strategies.

The University has many examples of national engagement with a broad cross-section of health service providers and the community to tackle national health problems.

BetterStart are an interdisciplinary team delivering key health and development research to understand how to give children the best start in life.

The group spans epidemiology, public health, nutrition, criminology, paediatrics, social work, biostatistics, and psychology, as they aim to find holistic ways to improve outcomes for disadvantaged children and families. The group focuses on generating quality evidence to inform policy and practice to improve health, wellbeing and development outcomes from the perinatal period into adulthood.

Key to their research is the Better Evidence, Better Outcomes, Linked Data (BEBOLD) platform, containing data on 500,000 South Australian children and their carers. The data platform underpins a range of research partnerships that inform service provision, intervention evaluations and policy to generate better evidence to improve outcomes.

For example, the University has provided access to state-of-the-art laboratories, equipment and scientific/clinical expertise including statisticians, epidemiologists, cohort coordination and biobanking. This access has directly contributed to the integration of laboratory and clinical resources to deliver benefits, such as the University's research into understanding early life health and lifestyle interactions and the subsequent impact on health outcomes for children.

RM2 will continue to prioritise health and wellbeing outcomes for Indigenous Australians. With Aboriginal and Torres Strait Islander peoples continuing to experience greater disease burden than non-Indigenous Australians, our researchers are investigating ways to overcome the factors impeding the availability and delivery of health care and wellbeing initiatives to ensure good outcomes amongst Indigenous and disadvantaged communities. At the University of Adelaide, we understand that wellbeing is not just the absence of disease, but a complex combination of an individual's physical, social, emotional and spiritual self. The University will continue to co-design exploratory research initiatives with Indigenous community stakeholders to ensure culturally appropriate health and wellbeing services and approaches that align with priorities identified by community and health experts. Further, our cross-disciplinary research approaches will continue to drive impact for Indigenous Australians more broadly. For example, research by linguists at the University of Adelaide has directly fostered the reclamation of Indigenous languages in South Australia, producing significant benefits, including a strengthening of sense of identity, self-esteem, cultural pride, and contributing to positive health and wellbeing.

Begin Better aims to understand the link between maternal and intrauterine factors that affect newborn and childhood obesity in their first 1000 days. The research explores how lifestyle interventions for overweight and obese pregnant women six-months prior to conception will impact pregnancy outcomes and the child's health. It will provide a unique opportunity to explore intervention-based models for preconception in driving better outcomes for children.

This large-scale clinical trial will also assess related bio-bank specimens, to evaluate the impact of dietary and lifestyle change across a variety of settings on in-utero and early life health. This will then assess the longer-term health outcomes and impact of the intervention, particularly how it may contribute to childhood obesity. Recognition of the importance of this research was demonstrated in the South Australian Labor Government's commitment to establish the *Royal Commission into Early Childhood Education and Care*, which will place an emphasis on a child's first 1000 days and how they can be set-up for success from the beginning.





The University's Indigenous Oral Health Unit (IOHU) is taking action to improve the oral health and access to dental care for Indigenous Australians. At present, data around Indigenous health outcomes are limited, and IOHU has established studies to improve data collection to establish patterns in life outcomes for Indigenous children relating to oral health. A key component of their research is assessing the impacts of nutrition, early childhood behaviours involving oral health and parental social determinants to provide evidence of the antecedents of Indigenous child dental disease. This research aims to address Indigenous community needs to address inequalities between Indigenous and non-Indigenous communities, as well as develop outcomes that are translational and relevant for policy implementation across Australia.

As part of RM2, the University will continue to partner with community, consumers and the health care sector to embed appropriate and effective prevention efforts in all aspects of delivering care. Our researchers have developed strong, collaborative engagement with hospitals and other health services, including health practitioners, the general public (patient cohorts, community consumer and disease interest groups), state and federal government agencies, health industry, the aged-care sector, health-focused workforces, and not-for-profit organisations to explore population health overall and how it can be improved. For example, the work of the Critical and Ethical Mental Health (CEMH) research group within the Robinson Research Institute is working with government and health and social care organisations in generating research that promotes safer, more effective, and more ethical research and practice in mental health. By collaborating directly with stakeholders, the CEMH group is developing evidence-driven research which is improving the understanding and response to mental health issues and mental disorders.

Finally, preventable and modifiable risk factors account for approximately 40% of Australia's disease burden. Our cross-disciplinary research into health prevention programs relating to tobacco control, obesity prevention and drug and alcohol will continue to increase end-user awareness of risk factors. As RM2 aims to reduce these factors through positive health promotion and prevention, the University will continue to focus on improving health literacy and community awareness of approaches to prevention and public health issues. Boosting our cross-disciplinary research will allow us to look at how we can encourage healthy behaviours and reduce risky behaviours across all aspects of life for all Australians.

Research mission 3

Understanding and managing disease

The pathogenesis of most disease is complex and influenced by multiple intrinsic and extrinsic factors. RM3 will elucidate the molecular, cellular, physiological, and environmental basis of disease.

This will enable the development of new diagnostic and therapeutic approaches for disease management. Understanding disease is critical to developing methods of treatment, recovery, and cures. With nearly half of Australia's population managing at least one chronic health condition, the impact of the research in RM3 is important to maintaining a healthy society. Cutting edge, transformative research will uncover new insights in human biology and novel scientific discoveries that will be critical to increasing our understanding of the biological and environmental mechanisms which underlie the development of disease, ultimately informing the ways in which we approach disease management.

RM3 will continue to prioritise research objectives in cancer through institutional partnership and strong research collaborations that support the attraction and retention of biomedical and clinical research talent to South Australia. Cancer is one of the leading causes of illness and death in Australia, with an average of 150,000 new cases being diagnosed in 2021 and nearly 50,000 deaths. With one in two Australians facing a cancer diagnosis by the age of 85, the need for

coordinated and collaborative world-class research is more important for a healthy Australian society than ever. We will continue to conduct world class research and clinical trials across different areas of cancer biology and clinical oncology, such as identifying the molecular and cellular basis of cancer, developing pre-clinical models that resemble human cancer, mechanisms of cancer spread, chemotherapy resistance, novel biomarkers for detection of cancer and the development of new treatments. Our research will be underpinned by new cutting-edge technologies in immunotherapies and genomics through the South Australian immunoGENomics Cancer Institute (SAiGENCI), our new independent, cancer-focused medical research institute that was established in 2021 with \$80M million in funding from the Australian Government.



Further, the University's research into cancer detection and treatment will also continue to develop through other initiatives, such as through the introduction of the first proton therapy unit in the Southern Hemisphere at South Australian Health and Medical Research Institute (SAHMRI) 2.

RM3 will also support the University of Adelaide to continue to generate research that grows our understanding of human physiology and related systems, such as reproduction and early life origins of health and disease. With approximately one in six Australian couples of reproductive age experiencing difficulties conceiving a child, RM3 will continue to prioritise research to reduce the incidence of infertility and reproductive conditions and diseases by generating new knowledge of reproductive biology and developing improved advice, interventions and treatments.

In addition, as a society, we are unlocking more knowledge about the cause and development of chronic conditions and disease, such as cardiovascular disease and type 2 diabetes. Risk factors such as genetics, diet, and lifestyle influence our likelihood of these diseases and impact on diagnosis and treatment. RM3 will continue to support research that pursues a better understanding of the interactions of these risk factors, such as through our research on the associations between nutrition quality and metabolic processes with serious illnesses.

Despite being largely preventable, cardiovascular disease is one of Australia's leading health problems, affecting one in six people and accounting for nearly 30% of deaths. As part of RM3, the University will continue to conduct interdisciplinary research to understand how and why coronary heart disease, peripheral arterial disease, and vascular and heart rhythm disorders occur, with future research focused on translating biomedical discoveries to treatment in clinical practice.

The Supportive Oncology Research Group is dedicated to improving the health and wellbeing of people affected by cancer. The multidisciplinary group aims to prevent the long-term physical, emotional and economic disadvantages of cancer and develop innovative care solutions.

The group have a focus on understanding the burden of cancer diagnosis and how to support patients with innovative and supportive solutions tailored to their needs. These solutions include a range of medical and non-medical support.

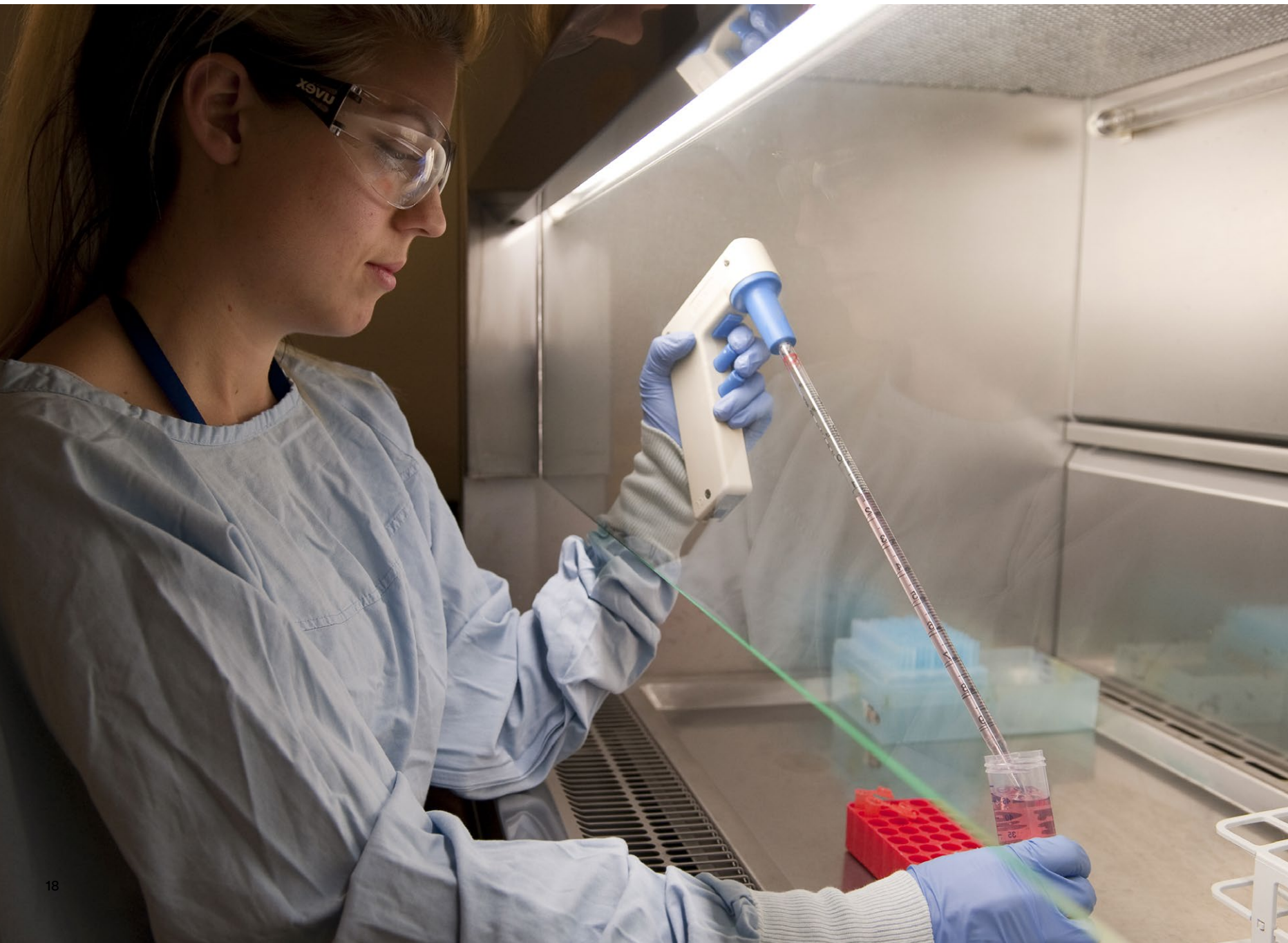
The Supportive Oncology Research Group has received funding from a range of investors, including from the Medical Research Future Fund to investigate the efficacy of medicinal cannabis in controlling the side effects of chemotherapy.

The University is driving research that aims to improve IVF process through non-invasive methods to make it easier and safer for clinicians and patients. New research delivered by the School of Biomedicine and the Robinson Research Institute uses new cutting-edge light-based technologies to generate a non-invasive “molecular photo”, rather than use a cell biopsy. This will allow for a better understanding of the biology underpinning the successful development of the oocyte and early embryo. The research seeks to deliver better health care models, reduce disparities for vulnerable cohorts, increase efficiency and provide value. Additionally, the findings will assist to make valuable progress to deliver the next generation of tools to improve the delivery of fertility care.

Further supporting RM3 is the University’s extensive research into the structure and function of the nervous system and the brain, including diagnosis and treatment of neurological diseases and conditions. For example, our research to improve the translation of novel treatments from laboratory studies into treatment of stroke and traumatic brain injury, as well as our award-winning research on multimodal prediction of transition to the first psychotic episode. Our researchers will continue to generate interdisciplinary research with the aim of developing a stronger understanding of the function of genes in neurodevelopmental disorders, such as epilepsy, as well as the connection between our nervous system and disease management.

Our immune system is at the front line for controlling infection from foreign pathogens, including bacteria and viruses. Understanding immune responses is critical for the identification and development of effective treatment of auto-immune disorders, such as type 1 diabetes, inflammatory bowel disease, multiple sclerosis, psoriasis and rheumatoid arthritis. Via RM3, the University will continue its research into disease causing pathogens, with a focus on understanding how our body’s elaborate, innate and adaptive immune systems can distinguish foreign pathogens from self-tissue to support the development of new diagnostics and treatment for autoimmune disorders.

Through RM3, our core research activities will continue to conduct investigation into a broad range of diseases, both acute chronic, and biomedical research across areas such as immunology and infection, early life, respiratory health, neuroscience, therapeutics, and metabolic and musculoskeletal health. We will prioritise understanding cross-disciplinary applications for research across disease diagnosis, methods for early detection and intervention, and the identification of novel approaches for disease management that will contribute to global research challenges and deliver positive impacts in the area of disease discovery and treatment.



Through delivering multidisciplinary research, the University is exploring the mechanisms, consequences, treatment and prevention of cardiovascular disease, heart irregularity, and heart rhythm disorders. The University’s Centre for Heart Rhythm Disorders provides a forum for translation of research or heart rhythm disorders, in collaboration with the Royal Adelaide Hospital. The Centre’s recent research includes studies examining a home-based education program in reducing hospital use and improving quality of life for patients with atrial fibrillation, compared to typical medical care.

In addition, through our links with global industry and research leaders, we are improving the quality of treatment and outcomes of patients all around the world. Our co-beneficial research partnerships with institutions like the University of Missouri have allowed the University to drive transformational cardiovascular research to generate benefits at the patient care level. For instance, our access to global cardiovascular bioinformatics is allowing our researchers to match the medical outcomes of millions of patients to help identify and determine required cardiovascular treatment for current patients. Our research is improving the quality of patient care and as a result improving outcomes for those with cardiovascular diseases.



Research mission 4

Delivering quality and efficient healthcare

Translating research into outcomes that improve the health of individuals and communities requires an intensive and ongoing commitment to improving the healthcare system itself.

RM4 will utilise our burgeoning program of clinical trials, implementation science and evidence-based medicine to improve the quality, efficiency and sustainability of healthcare.

The delivery of quality care is an essential pillar to improving the quality of life for individuals with disease. Although the Australian healthcare system is recognised as one of the best in the world, increased demand and costs, advancements in treatment and the changing needs of patients require a need for continuous, sustainable and evidence-based improvements to enhance outcomes for patients. Additionally, our healthcare system has been characterised with instances of clinical variations, complications, inefficiencies, and poor use of data. These reduce the opportunities to

drive improvements within the system and strengthen both its quality and efficiency. With strong links to RM3, RM4 will prioritise the exploration of opportunities to improve the quality of treatment and support services for people including in aged care, disability services, and other forms of community care, to advance best practice and deliver improved outcomes.

Continuous improvement is a systematic, sustainable approach to enhancing the quality of care and outcomes for patients. Our researchers are developing new and innovative ways to transfer new knowledge to health service professionals, to change practice, improve skills and influence policy and procedures system wide. Through RM4, University of Adelaide researchers will continue to explore and drive new research projects

The Centre of Research Excellence in Translating Nutritional Science to Good Health is generating world-class clinical research in the area of nutritional physiology that is improving health care services. A research program within the Centre is focusing on gastrointestinal function in diabetes and the impact that it has on the quality of life.

Gastrointestinal symptoms represent an important and often unappreciated cause of morbidity for those with diabetes. Currently, there is no true measure of gastrointestinal damage directly in humans and cardiovascular autonomic reflex tests are often used as a surrogate but are suboptimal in identifying pain. The research conducted at the Centre is driving a better understanding of this.

The research undertaken through these clinical studies is developing new and innovative methods of management of gastrointestinal autonomic neuropathy and improve outcomes for those with diabetes.

The value of specialised technology and data to support health interventions brings together different craft groups to deliver impact. Through the multidisciplinary Adelaide Health Technology Assessment (AHTA) team the University aims to drive evidence-based decision making and policy change through the synthesis and modelling of clinical, social and economic data, as well as methodological research on the evaluation and impact of health technologies on society.

This research assesses the risk and benefits and implementation issues associated with allowing health technology into the health system. This research has seen AHTA support the Medical Services Advisory Committee and the Pharmaceutical Benefits Advisory Committee in their decision-making by recommending medical services and medicines that should be funded by Medicare and the Pharmaceutical Benefits Scheme.

The findings of this research have affected health policy nationally and internationally, seeing improvements to safety, effectiveness and cost-effectiveness in the health care provided to the public. The research has had direct links to improved health outcomes, with observed reductions in morbidity and mortality.

that involve consultation and liaison with patient advocates to refine research objectives and focus on serving patient needs.

For example, our nursing research has involved engagement with consumers and service providers across the acute, primary and community care sectors, with a particular focus on enhancing evidence-based practice and the quality of care.

Frailty is a major personal, public, societal and economic health issue for our community. It is estimated that by 2050, nearly one in four Australians will be aged 65 years and over. With Australia enjoying one of the highest life expectancies in the world, the current and future impact of an ageing population on the aged care system is significant. Under RM4, the University will continue to prioritise collaborative research into ageing, frailty and mobility and the resulting impact on community and health care interventions to develop and deliver effective and efficient models of care. For example, our research into Australia's aged care workforce sought to determine new ways to attract, retain and up-skill

workers to develop a sustainable and skilled workforce to suit the needs of older Australians.

The University has developed a strong, collaborative engagement with hospitals and other health services, including health practitioners, the general public (patient cohorts, community consumer and disease interest groups), state and federal government agencies, health industry including aged care and disability services, and not-for-profit organisations. We will continue to maintain and develop these relationships through our cross-disciplinary research to explore the use of technology and data to improve the quality of care of chronic disease and illness. Advancements in technologies, such as wearable devices, have been key to improving care and treatment within the community and minimising the need for hospital admission, which in turn, reduces burden on the healthcare system and leads to improved patient outcomes.

Further supporting RM4 is our extensive research into health technology assessment, which involves the systematic review and meta-analysis of

evidence on the safety, effectiveness and cost-effectiveness of new technologies in order to create new understandings of the place of these technologies in clinical practice, relative to usual care. Reducing the barriers of access by making such technology affordable and actively available are key to strengthening the use of innovative health technology. The University's health economists within the School of Economics and Public Policy are generating research which is providing greater understanding of these barriers, with a focus on cost and demand research to reduce cost and encourage greater access to technology which will improve quality of life outcomes.

Under RM4, the University will continue to deliver research to support best practices in the evaluations of health interventions, with the aim of directly impacting government policy, clinical pathways, health guideline and government funding of medical technologies and medicines.

Effective translational research will be critical to the continued improvement and sustainability of the Australian health system and will require significant

collaboration and engagement with industry and government. Through RM4, we will continue to explore and prioritise translational health research to enable policy makers to make informed decisions regarding the improvements of healthcare delivery in Australia and worldwide. We will continue to prioritise research in areas that leverage population surveys, longitudinal studies and evidence-based assessment to generate impact on the quality of care and treatment for individuals and communities.

For example, our work in developing evidence-based assessments of novel

surgical techniques and postoperative care to enhance skills and promote knowledge transfer to health service professionals. Our researchers understand that high quality preclinical, clinical and epidemiological research is the foundation of enhanced, best practice health care provision and will continue to focus on expanding our program of implementation research and clinical trials across areas of research that impact upon public health and health care provision.

The 'B Part of It' study was the largest meningococcal B vaccine study conducted. The research aimed to understand more about meningococcal B and its carriage, exploring if immunising a large community group would reduce the spread, with the focus group being teenagers.

The study demonstrated a significant reduction in transmission and providing a herd immunity benefit, as well as highlighting the importance of vaccinations across high-risk age groups to ensure adequate protection.

Further, the study uncovered new and novel insights, that could see protection against other closely-related bacteria responsible for other diseases, including gonorrhoea and meningococcal.

The outcomes of the study have informed global meningococcal B herd immunity research, as well as preventing the disease and its impacts amongst participants.



Research mission 5

Converging and emerging technologies

The converging and emerging technologies research mission explores opportunities to use data and new technologies for the convergence of existing technologies to drive innovations and define alternative future states.

RM5 is founded in providing new and novel technological applications to solve complex medical needs to drive positive impact at scale.

Innovative technologies and novel scientific discoveries have led to new treatments, new ways of thinking and the development of new health policy. In fact, innovation in enabling technologies offers the opportunity to substantially transform healthcare and deliver better patient outcomes in Australia and worldwide through improved models of care and delivery, new and enhanced medical devices, increased accessibility, improved diagnosis and treatment of disease and enabling policy changes. With strong links to each of the other research missions, RM5 plays a significant role in building a healthier future for all Australians.

Increasingly, the convergence revolution will see great advances by leveraging technologies and advances in big data, supercomputing, personalised health-care, precision medicine, genetics-based disease marker development and advanced biomaterial development, which will all contribute to improved treatments for major diseases. Through RM5, our researchers will continue to explore these applications through cross-disciplinary research that leverages the convergence of technologies, such as intelligent robotic imaging systems to enhance invasive procedures and machine learning in developing new diagnostic instruments.

Photonics is a relatively new approach to clinical diagnosis and minimally invasive therapies. The University presents strengths in being able to bring together individuals across sciences to create new technologies within photonics through their Institute for Photonics and Advanced Sensing (IPAS).

The University has demonstrated strengths in the development of medical devices that use photonics to improve precision with risky diagnosis procedures, such as brain needle biopsies, which can decrease the risk of adverse impacts such as disability or death. The University is using its knowledge of 'smart needle' technologies to explore further applications within the biotech space, such as the ability to alleviate Parkinson's symptoms, providing greater precision when removing cancerous tissue and utilising minimally invasive technology to understand fundamental biological processes.

Medical machine learning has become an integral part of healthcare, combining statistics, computer science and medicine to develop new algorithms and models which can then interpret massive medical data sets to develop solutions that help healthcare professionals and patients. The University will continue to focus our research on diagnosis, prognosis, and treatment monitoring for a variety of diseases and conditions, such as chronic myeloid leukemia (CML), for which we are using machine learning to integrate clinical data and biomarkers to optimise the prediction of treatment free remission.

Our researchers are at the forefront of innovation and intellectual property development. Expert intellectual property and technology transfer advice ensures timely translation of innovation into a commercial advantage which has the potential to positively impact health outcomes. RM5 will continue to leverage key enabling technologies, such as biostatistics and data management, 'omics', bioengineering, sensors and imaging, into key health research themes across the University.

Researchers from the Robinson Research Institute and the Australian Institute for Machine Learning (AIML) are collaborating to harness artificial intelligence to facilitate less invasive and quicker diagnosis of endometriosis. People living with endometriosis can see their financial, mental, and social wellbeing impacted due to pain and potential for fertility problems.

The project explores a cost-effective, accessible, and accurate method to non-invasively diagnose endometriosis that is considered the gold-standard for diagnosis. The project has designed a program that reads specialist scans to recognise imaging markers seen in endometriosis. The surgery-free diagnosis method will improve quality of life for the one in nine women with endometriosis through faster diagnosis.



Translating the outcomes of research into products and services is core to RM 5. Our continued successes in commercialisation reflects how our technology could have a rapid impact on medical applications in the public domain. Under RM5, the University will prioritise the investigation of new and novel technologies to strengthen our understanding of their potential applications to further progress advancement in the diagnosis and treatment of disease. Our research

will enable the implementation of safe and effective innovative medical technologies and enhanced methods of disease diagnosis and treatment into the Australian healthcare system.

Collaborations provide opportunities to build complementary skills and resources, and explore applications for infrastructure and enabling technologies. Critically, collaborations and cross-disciplinary research also provide opportunities to expose researchers to new perspectives necessary to explore new solutions for

diseases and conditions that impact a large proportion of our society. The University will continue to establish and maintain meaningful relationships with government, industry, Australian and international Centres of Excellence, and our Institute affiliates to increase opportunity for convergence of knowledge and advancement to deliver impact and improved patient care.

The role of physics in radical treatments is becoming increasingly more prominent, with IPAS researchers driving innovation through radiotherapy treatments to deliver highly focused radio-surgical treatments, particularly for brain tumours.

The delivery of world-class innovation will be front and centre in South Australia through the innovative treatments for paediatric and rare cancers through the introduction of proton beam therapy. The Proton Therapy Unit has received significant support and investment from the Commonwealth, and presents a unique opportunity for the University to collaborate with the Australian Bragg Centre for Proton Therapy and Research to continue to advance cancer research.

This will provide access to a cohort of individuals who can be enrolled in research to develop innovative treatment and recovery methods. Examples include non-invasive cancer treatments for children, which is timely given the new Women's and Children's Hospital being built within the same precinct.

SAiGENCI: bringing together the best research minds

The University of Adelaide is dedicated to supporting world-class, Australian research.

Our South Australian immunogenomics Cancer Institute (SAiGENCI) is bringing together global leaders in cancer research in the pursuit of life-changing treatments and outcomes for cancer patients.

Set in the heart of Adelaide's BioMed City precinct, the South Australian immunogenomics Cancer Institute (SAiGENCI) is South Australia's world-class cancer research institute. The Institute is providing new, more effective approaches to diagnosing and treating cancer through the use of cutting-edge technologies with talented researchers and physician-scientists under one roof.

The addition of SAiGENCI into the University's network of health and medical research centres and institutes highlights our commitment to foster and strengthen our ecosystem of research excellence in South Australia. Alongside the South Australian Health and Medical Research Institute (SAHMRI) and the addition of Australia's first proton therapy centre - the Bragg Centre for Proton Therapy and Research, we are supporting the development of world-class health and medical research infrastructure in Adelaide.

SAiGENCI acts as a home for world-class cancer researchers in Australia, both attracting and retaining brilliant biomedical and clinical researchers for Australia's benefit. The Institute is also collaborating externally, with likeminded



centres of excellence across the globe in the development of life-changing treatments.

Jointly funded by the Federal Department of Health, Central Adelaide Local Health Network (CAHLN) and the University of Adelaide, SAiGENCI will become home to some of Australia's leading and transformative medical research. This collaborative investment will ultimately generate more private and public investment opportunities, create new jobs in the public and private healthcare sector while at the same time improving the health of South Australians and Australians at large.



Research excellence with global impact

A strong commitment to research has defined the University of Adelaide's history.

Our research has supported societal, economic, and health advancements with an institutional focus on generating research excellence with impact.

As South Australia's sole member of the Group of Eight, the University of Adelaide is driving innovation and prosperity through the translation of research and new knowledge. We have been central to the creation and dissemination of knowledge locally, nationally, and internationally for the socio-economic advancement of South Australia and Australia.

Our FAME Strategies are a critical element of our strategic aspirations that highlight how our world-class research is driving impactful, positive outcomes across the world. As a core element of the Research that Shapes the Future pillar of our strategic plan, **Future Making**, we are strengthening our multidisciplinary research collaboration and funding opportunities through our Industry Engagement Priorities (IEPs) and identifying key areas of research and industry focus through strategic research documents.

Future Making aligns the University's global connectivity, research, and innovation with the social, intellectual, and economic needs of young people, South Australia, and the nation.

For more information on the University's internationally recognised research and innovation go to adelaide.edu.au/research





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Kaurna acknowledgement

We acknowledge and pay our respects to the Kaurna people, the original custodians of the Adelaide Plains and the land on which the University of Adelaide's campuses at North Terrace, Waite, and Roseworthy are built. We acknowledge the deep feelings of attachment and relationship of the Kaurna people to country and we respect and value their past, present and ongoing connection to the land and cultural beliefs. The University continues to develop respectful and reciprocal relationships with all Indigenous peoples in Australia, and with other Indigenous peoples throughout the world.