



**Murdoch**  
UNIVERSITY

# Research and Innovation Plan

2018-2023



# Research and Innovation Plan 2018–2023



Harry Butler Institute: (l to r) Scientist Simon O'Connor, Deputy Vice Chancellor David Morrison, Vice Chancellor Eeva Leinonen, Harry Butler Institute Director Simon McKirdy, and Chevron-Harry Butler Chair in Biosecurity and Environmental Science, Marnie Campbell on Barrow Island.

## Contents

Foreword	1
Murdoch University Purpose	2
Research and Innovation Purpose	3
Our Areas of Focus	4
Goal One: Research Income and Quality	8
Goal Two: Multi-discipline Murdoch Research Institutes and Centres	12
Goal Three: Health Research and Innovation Agenda	14
Goal Four: Australian Phenome Centre	18
Goal Five: Collaboration and Pathways to Impact	21
Key deliverables and KPIs	24

# Foreword by Professor David Morrison, DVC R&I

**Since its inception in 1975, Murdoch University has established itself as a research led tertiary education institution. Today the University is internationally networked and a collaborator of choice in key areas of research from bench top science to community engagement.**

In the years ahead, it is critical that we not only maintain this position but strive to build upon it, in a context where there is fierce global competition.

Our Murdoch University Strategic Plan and Future Horizon 2017-2027 states our purpose: “To be a creative force for current and future generations” with the delivery of Research & Innovation at its core.

This five-year Research and Innovation Plan 2018-2023 is a selective approach to building on our current research strengths and immediate opportunities.

Research activities at Murdoch University must be shaped towards consolidation and critical mass in key areas to make a contribution at the local, national and global level.

The broad narrative for our research is that it is translational in nature and substance, with inspiration coming from our local community and industry-based partnerships, as well as from national and international collaborators with whom we tackle some of the major challenges of our time.

Into the short and medium terms, Murdoch University will consolidate its translational research focus, with the aim of delivering practical, impactful and sustainable solutions to the challenges of the modern world.

A thorough analysis of our University’s research outputs over the past four years, the following key areas of focus have emerged as strengths:

- (i) primary food production (e.g. grains, meat, fish including agricultural biotechnologies) and protection;
- (ii) climate variation and adaption; and environmental and natural resources (e.g. land and marine ecosystems science, environmental engineering, land and water management including dry land agriculture);
- (iii) human and animal health and welfare (e.g. including infectious diseases, rare diseases, genetics and bioinformatics);
- (iv) a broad contribution is made by colleagues in Arts, Humanities and Social Sciences who add significantly to the research effort of the University through careful analysis and critique, especially in history, culture and media studies. Especially important are translational disciplines notably: Public Policy, Governance, Political Science, Culture and Communication.

Since the last strategic review 2012-2017 we also have a number of emerging areas. In particular those relating to digital technologies and the analytics of large quantities of data are beginning to have an impact on our profile. While important in their own right, they also add to, and build on our “traditional” key areas of strength.

From these fundamental disciplines three broad themes emerged, which outline the key thematically linked areas in which our research will focus for the next five years and beyond:

1. Health Futures
2. Food Futures, and
3. Business and Environment.

Focusing our investment around these themes will ensure that Murdoch University continues to build on its reputation for achieving significant, meaningful research outcomes, sustained by strong funding streams and partnerships.

Critical mass and excellence bring with them research reputation and profile. Each is vital because they have an important influence on student choice and impact greatly on our ability to attract and retain high-calibre staff and students locally as well as globally.

The University’s evolving Knowledge and Health Precinct, will show case three interdisciplinary Research Institutes and associated Research Centres. These will align with our three key themes. The combination of expertise in depth and leading-edge technology will generate a range of innovative and collaborative research and training opportunities. This will include advancements in the investigation of the nexus between human, animal and environmental health. To be healthy we need nutritious food, to produce nutritious food we must look after our environment and the ecosystems therein as it and they change over time. The generation of new knowledge and its translation through community uptake are dual foci. This means core disciplines will be reinforced with new organisational structures and multidisciplinary approaches to research and its translation encouraged through University Centres and Institutes.

Building long-term relationships with business and industry and collaborative research partnerships on a local, national and international level are vital to underpin and direct research efforts to address the complex and unique global challenges. It must be easy to find our front door and we must be engaged to be relevant. Together, Universities and communities can work for profit and long-term survival.

The sustainability of the world seems to hang in the balance as we contemplate population growth, land fertility, food and water security, as well as pandemic infectious diseases, those diseases afflicting the aged and the myriad diseases and health conditions that blight so many lives.

At Murdoch we already excel in finding solutions to many of these problems and are firmly positioned to tackle these 21st century challenges. In so doing, we will consolidate our reputation as an internationally-recognised, research collaborator of choice, in fields of study that have global significance.

**Professor David Morrison**

Deputy Vice Chancellor  
Research and Innovation

# Murdoch University Purpose:

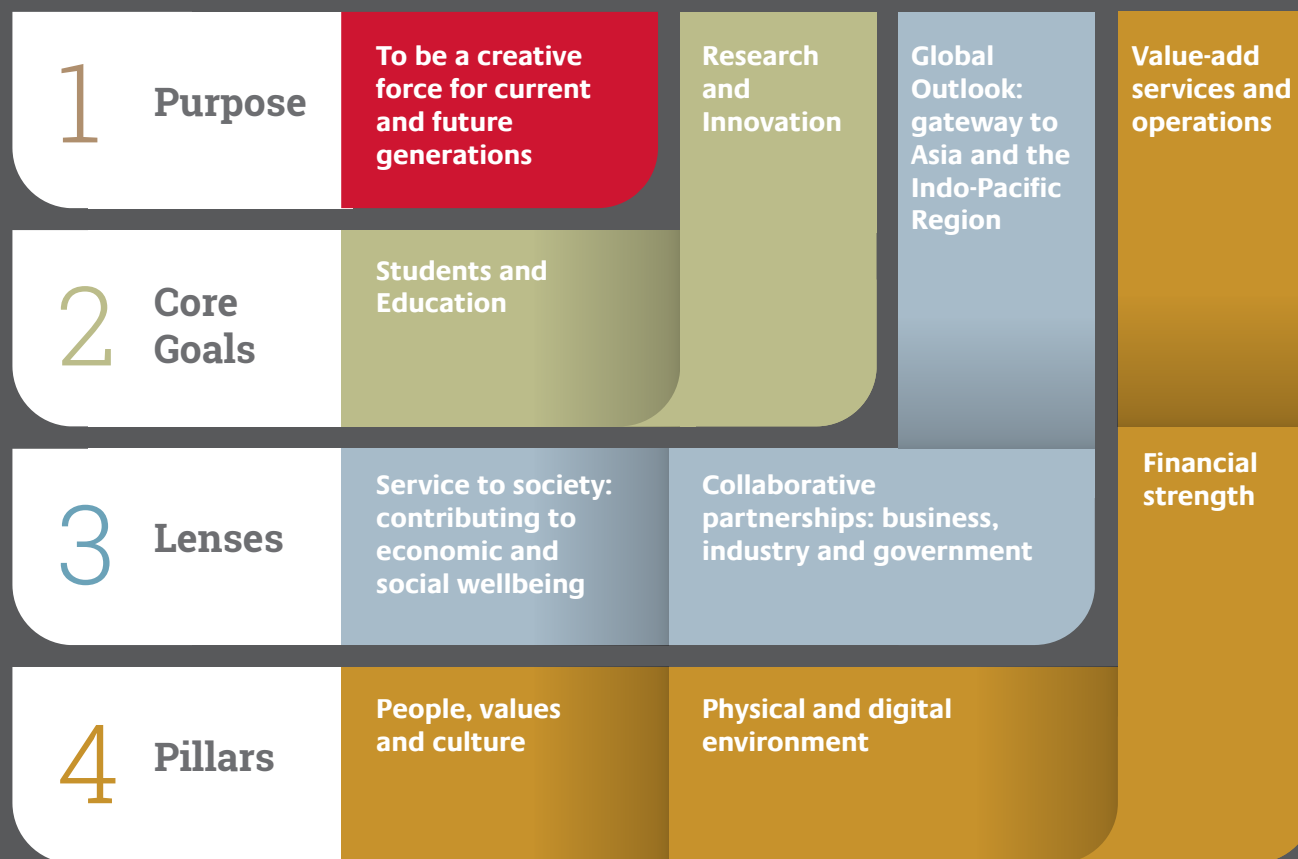
To be a creative force for current and future generations

Universities have for generations shaped the world we live in through the creative force of education and research.

Across Murdoch University there is a shared belief that the academic endeavours we engage in are undertaken to bring benefit to current generations and for those in years ahead. Recognising that we are only temporary custodians of the world we inhabit the many discipline areas and professional teams at Murdoch work to create positive futures for Western Australian, national and international communities.

Our purpose is to be of service to our communities and apply our creativity, knowledge and determination to making a sustainable difference for current and future generations.

## Strategic Plan at a glance 2017–2027



# Research and Innovation Purpose:

To provide life changing solutions to complex world challenges.

## Our Core Goal: **Research and Innovation**

As the global population grows towards 10 billion citizens over the next 30 years, we intend to apply our world-class translational research and our capacity to innovate, to some of the world's greatest challenges. Our five-year plan is a selective approach to building on our current strengths and immediate opportunities. In particular, we will strengthen our interdisciplinary capacity and prepare for a longer term 10-year horizon, in order to position Murdoch University as an internationally-recognised, and well-connected research collaborator of choice in selected areas of global significance. Everything we do must deliver a positive outcome.

Our Goal is:	To provide life changing solutions to complex world challenges			
We will achieve this through:	<b>Murdoch Research Institutes:</b> Launch three interdisciplinary research institutes	<b>Australian National Phenome Centre:</b> Establishment at Murdoch of the Australian National Phenome Centre	<b>Innovative and collaborative ecosystem:</b> Our distinguished collaborator program, development of joint research appointments with industry and industry linked PhD students	
Our progress will be measured by:	Total HERDC income <sup>1</sup>	Engagement Income <sup>1</sup>	HDR student completions <sup>1</sup>	Percentage of research publications in the top 10% <sup>1</sup>

<sup>1</sup>These are Key Performance Indicators (KPIs) used with the Murdoch University Senate.



**Dr Kirsty Bayliss:**  
tackling food waste by  
extending fruit shelf life



## Our Areas of Focus

**Over its 45-year history, Murdoch University has established itself as a comprehensive university. A wide range of disciplines have been supported and have produced excellent outputs and have significantly supported student careers and the community. Societal interests shift, however, and this can affect support for certain areas of research such that they may become regarded as ‘niche’ as opposed to ‘relevant’.**

In the first instance, we will focus our efforts on our major research themes by volume of output, excellence and impact but we will always allow the opportunity for new emergent fields of study to flourish. Animal health and well-being; primary food production, terrestrial and aquatic ecosystems - underpinned by the core disciplines of the natural sciences - have been constants in our history, in addition to the social and cultural analyses and critiques offered by the fundamentals of humanities and the social sciences. In more recent times - engineering, commerce and a small number of health professions have been added to the portfolio. Also, in the digital world where everything is measured either directly or inferred by proxy, there has been an emerging need for analytics. Water, energy and power are also global challenges that we will weave into our research agenda. We must, however, respond to the changes in national and international funding as well as societal expectations of higher education providers, if we are to retain our social

license to operate and continue to improve our global position. Our research activities should be shaped towards making a contribution to the international challenges that are triggered by population growth and longevity, including climate variability; and the ongoing debate over political, philosophical and economic ideologies as they are translated into policy and regulation. Historically, our University has had strengths in research on Asia, but as the world ‘shrinks’ we must expand our horizons to include the broader Indo-Pacific region, and incorporate the challenges of interconnectivity; disproportionate population growth; and climate change. At Murdoch University we can make a unique contribution to the reality of “One Health” which encompasses the interface between human health, animal health and the environment.

The Murdoch University Mandala neatly captures our major themes, and our five and 10-year research horizon will be focused on developing the themes contained within its broad scope. We will be tightly focused at first, broadening out as success grows. We will be prepared to encourage emerging areas of excellence and to shift direction where decline is evident.

What is not evident within the Mandala - is the importance of the supporting platforms and resources that will enable our research - as well as our teaching - to be leading-edge. We need to be selective in the fields in which we invest, and to seek to gain maximum benefit wherever possible. In the pursuit of excellence and efficiency - we need to forge partnerships and joint ventures, both locally and internationally. We must also develop our human and physical resources. In short - our research and educational system must represent a value proposition for those with whom we interact. This is our strategy for building our University’s reputation and for developing long-term, valuable relationships.

## Murdoch University research institutes

Consistent with the major themes outlined within the mandala - three interdisciplinary research institutes will be launched to align with our major research strengths and the University’s local, national and global priorities.

## The Australian National Phenome Centre

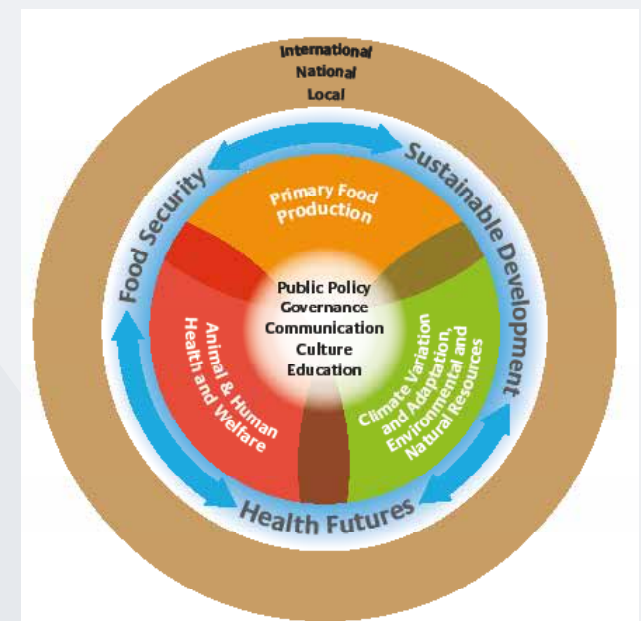
Metabolic phenotyping characterises the interaction between the genome and the environment to give a precise analysis of current functional status. Murdoch University will invest in a major research centre which will utilise the unique metabolic signatures of individuals to guide bespoke and personalised treatments. Murdoch University will be instrumental in establishing the first Phenome centre in Australia (the southern hemisphere), which will support a world-wide network of research collaboration.

Precise descriptions of metabolic status during treatment will also be used to enhance therapeutic outcomes. The application of the methodologies developed in ANPC will also be extended to define nutrition regimes for plants and animals. The possibility of identifying therapeutically active ingredients embedded within our biodiverse environment is also possible.

## Innovative and collaborative ecosystem

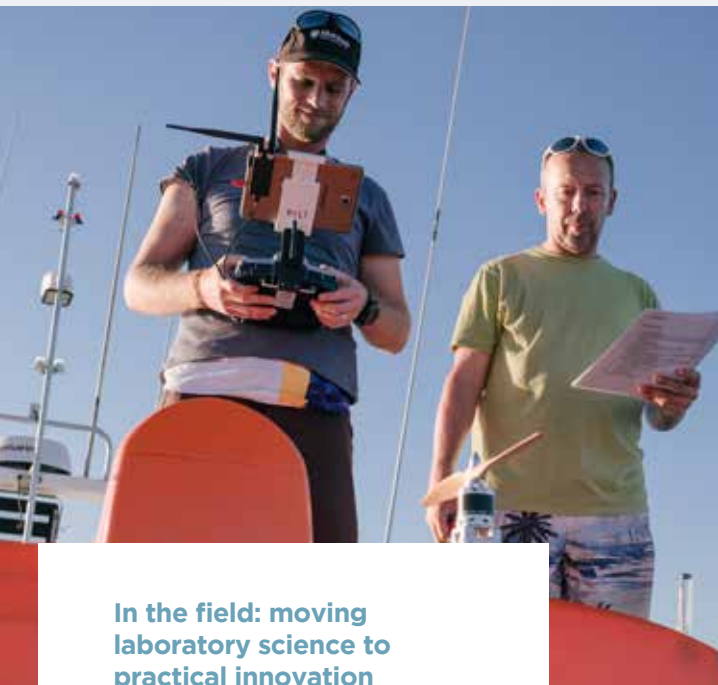
As a translational research University, Murdoch has more often focused on finding solutions to real world challenges, than on curiosity-driven conundrums. We place high value on long-term external partnerships with the communities from which we derive our inspiration. This does not, however, diminish the value of research for research’s sake or “basic research”. Indeed, we aim to nurture inventiveness where we see the possibility for impact and disruption. Our Knowledge and

Health precinct will provide a fertile intellectual ecosystem that will bring together researchers, health professionals, business, industry, investors and entrepreneurs. Joint industry and Murdoch University-funded research appointments - across many of our discipline areas - are a key feature of our research agenda. We will invest in postgraduate students, early career researchers and future innovators. We will also invest in world-renowned researchers, rising stars and distinguished international collaborators to help us achieve our strategic goals. Working with our existing staff groupings and providing research leadership and resources for our ECRs and research teams is also critical.



**The Murdoch Mandala**

## Our Areas of Focus (cont.)



**In the field: moving laboratory science to practical innovation**

### Murdoch University five-year research and innovation goals:

1

**Deliver an annual increase in research quality and income.**

2

**Establish three interdisciplinary research institutes.**

3

**Complete Phase 1 of the Knowledge and Health Precinct.**

4

**Strengthen the enabling technology platform for our research focus areas.**

5

**Increase the impact, range and significance of our collaborations with external partners.**



# Research & Innovation Priorities for Murdoch University

**This strategy articulates the research-focused objectives that are driven by the portfolio of the Deputy Vice Chancellor for Research and Innovation (DVC R&I) for the years 2018-2023. Under this strategy, Murdoch University will:**

1. Grow the total **research income** (HERDC) but in particular income derived from industry engagement.
2. Provide greater **higher degree research** study opportunities and increase successful completions by diverse **student** groups.
3. Improve the visibility and impact of our research and this will be evidenced by field-weighted **citation impact** that arises from our research publications.
4. Improve the quality of our research outputs by increasing the proportion of publications journals that are ranked in the top 10 per cent of cited journals
5. Grow our international collaborations and thus increase the percentage of our publications that involve **international collaboration**.

In the 2012-2017 Murdoch University Research Strategy the need to focus our research on a small number of key areas was identified as a priority and was in response to the changing nation and international funding landscape for research. By 2015, in the updated Murdoch University Research Strategy 2015-2020 - the key areas were identified and represented by the Murdoch University Research Mandala. This strategy reflects a further update to that plan in that it is focused on a more distant horizon. It also provides more detail about operationalisation in the early years.

In the 2012-2017 plan it was stated that: "We will encourage new areas of excellence as they emerge and where necessary, restore some that may have stalled where they are deemed to be of strategic importance." As anticipated, new areas of opportunity and strength have emerged and new data is constantly being added to sectoral and national debates about the value of universities and the research undertaken by them. The triennial analysis of Research Excellence in Australia (ERA) and other ranking systems enable us to be precise in meeting the requirements of a top 300 global university.

The three institutes indicated in the Major Mandala themes will be supplemented by a number of research centres embedded within each. A new budget model for 2019 will be developed to reinforce key activities and evaluate their progress. Similarly, workload models and transparent reward systems will be embedded within a framework to support and grow research over the 10 year horizon, as articulated within the overarching strategy for Murdoch University.

This latest edition of Murdoch University Research Strategy 2018-2023 articulates the research-focused objectives that are within the portfolio of the DVC (R&I) for the years 2018-2023. This is an overarching plan which is activated by the detailed operational plans associated with all the DVC (R&I) portfolio areas, including the schools, research centres and institutes.

# GOAL ONE

## Research Income and Quality



**New horizons: Professor Rob Trengove and Vice Chancellor Eeva Leinonen at the Australian National Phenome Centre**

**In 2015, income from grants was \$19m. By 2016 this had grown to \$23m, and by 2017 this increased yet again to \$30m+ reflecting a 75 per cent increase. This has been accompanied by a doubling of research outputs over the past five years.**

The goal is to grow the University's research income to \$40m by 2021; with a target of \$70m by 2027 and to increase the focus on research quality rather than quantity. To ensure the quality of our research we will support internationally and industrially linked research outputs and provide adequate mentoring for researcher development. Delivery of these outcomes will place Murdoch University in the top third of universities nationally and in the top 300 globally, which is our ultimate goal. Strategic investment and hiring, internal staff development and external collaboration will be essential to achieving this outcome.

We will need to focus investment on those areas that are likely to be sustainable and yield the greatest returns, in terms of both direct and indirect benefits. For the next five years, we will divide research areas into three focus groups:

- The first group (Group 1) includes selected areas of engineering (environment and resources), biomedical and life sciences, information technology and data science (informatics, artificial intelligence and decision support). As these areas are highlighted in the Mandala via the broad themes of: Health, Food and the Environment, they will initially attract the largest share of central

assistance, either because they have the potential to leverage increased income; maintain or improve world ranking; or add to the impact of translational activities and international collaborations.

- The second group (Group 2) - including education, social sciences and humanities (regional studies and public policy), creative industries (media), are smaller, although they have high reputational value through national and international university rankings. They also provide a link between the select areas above and the broader translational issues of public policy, economics and governance. This group also requires less resource investment in physical infrastructure to achieve outcomes. Where more resources are needed, working with colleagues in the first group will be encouraged and reinforced through the transparent budget flow model to be developed for 2019.

The third group (Group 3) which largely includes the professions currently have research profiles that are still emerging and, by their nature are less likely in the short-term to achieve significantly-improved performance. This group does, however have a strong role to play in community engagement and translation. Support for research of this nature should arise through their involvement in centres and institutes receiving priority funding. The vital role of the professions in maintaining and building links at the interface of research and community, as ambassadors and engagement brokers, will be recognised and facilitated through various means such as internships, joint appointments, and through supervision of research students.

STRATEGIES We will:	ACTIONS	MEASURES OF SUCCESS (With reference to relevant key performance indicators and other performance indicators)
Identify <b>research opportunities</b> that are well-aligned with our capabilities.	Focus on supporting Group 1 and 2 disciplines, with timely notice of upcoming research grant opportunities. Commit to a target of 'within 48 hours' for responses to requests for assistance by academics within Group 1 disciplines.	Increase in HERDC research income. Target:\$40M by 2021
		Increase in engagement income (categories 2-4). Target:\$25M by 2021
		Increase success rate of grant applications lodged for Group 1 disciplines.
Provide support for our researchers throughout the <b>grant lifecycle</b> .	Pre-award support in applying for grants (where appropriate). Contract delivery Deliver post award management services.	Timely submission of grant applications.
		Timely contract delivery.
		Positive feedback on grant award management.
Form better connections with <b>Industry Growth Centres (IGC)</b> .	<b>Step up engagement</b> with targeted Industry Growth Centres (IGC) to be competitive in Category 3 and 4 Industry funding. Focus on IGCs such as FIAL, MTP Connect and METs	Demonstrable increase in engagement with targeted IGC Successful CRC applications
Increase the <b>depth</b> of research quality.	<b>Actively support</b> the career development of <b>individual academics</b> to foster top-quality research Review current 'researcher development programs' and make enhancements to the program Targeted research academic appointments and promotions	At least 85 per cent of assessed areas of research, at the 4 digit Field of Research (FOR) code level and increase to 70 per cent at the 2 digit FOR code at world standard or above in ERA 2018 and beyond ----- 'Researcher development program' review complete and recommendations implemented



## GOAL ONE

# Research Income and Quality (cont.)

STRATEGIES We will:	ACTIONS	MEASURES OF SUCCESS (with ref. to relevant KPIs & other PIs)
Enhance our practices around ERA reporting.	Prepare submissions for ERA 2018 and beyond Select Field of Research 4 digit codes for optimisation Consult inclusively with the academy Select Field of Research 2 digit codes for preparation of Impact and Engagement case studies	Murdoch University impact studies highlighted nationally Timely ERA submission, including engagement and impact reports 85% of 4 digit submissions at or above world standard
Intellectual Property (IP) improvements	Implement Intellectual Property management software Deliver an education program for researcher obligations, rights and responsibilities regarding IP	Software programs operational Number of academic staff completing the IP education program
Distinguished collaborators program	Re-invigorate the 'distinguished collaborator scheme', with 15 collaborators visiting Murdoch University each year	Quality of distinguished collaborators Percentage of papers with ?? authors Number of joint PhD appointments with distinguished collaborators as supervisors
International research collaborations	Joint centres operating with significant international partners such as prominent universities or leading research centres and academies	Increase in publications with overseas institutions Funding through international agencies

Anti-microbial research:  
predicting where new  
infectious diseases will emerge



# GOAL TWO

## Multi-Disciplinary Murdoch Research Institutes and Centres

### **Bring the three research institutes into full operation with diversified income streams and international collaborators.**

Historically, Murdoch University has been a translational research university and it remains so today. We seek to make a contribution to both local and global problems by being a part of a translational research pipeline. Frequently, knowledge generated in the laboratory is passed through this pipeline in ways that traverse traditional discipline boundaries. While this is a self evident requirement for the broader community, traditional university organisational structures —while promoting disciplinary excellence — have often worked against collaboration, cross fertilisation and the transition from innovation to application.

Among the drivers of organisational transformation are access to information and interaction. Proximity, co-location, shared spaces and time to engage, are catalysts of information-sharing. The three Institutes that Murdoch University will each have a Director who will be selected for their vision; ability to communicate; and their demonstrable achievements in bringing diverse interests together in a cohesive fashion. It will be the role of the Directors to be both internally and externally-focused in order to bring relevant parties together on a project-by-project basis.

Their responsibilities will be to lead in innovative ways in order to create new collaborations that will increase income

and enhance the University's global reach and reputation. Research Centres will maintain a focus on our historic and current strengths, as well as on our emerging research areas, and will be required to be agile and coordinated so they can be successful in addressing the complex challenges of a rapidly-changing world.

Funding of this initiative will come from research grants. We will, however, use government (e.g., block grant) and sources of support derived from University investments as well as other sources of income to support key areas through Institute Directors and Centre leaders that continue to meet our objectives. We will create 'seed funding' to support new and emerging areas from the aforementioned funds.

There will be regular performance reviews and oversight and where Institutes or Centres do not meet performance criteria and objectives, we will replace them with funds for areas that have the potential to create better returns on investment. Individual researchers will benefit from this new approach, as the invested funds will not only be allocated to the facilities, but also towards providing personal support for teaching and or research activities. In essence, by 2019, we will have created a funding system that is contingent on performance, and rewards strategic areas and behaviours that support the Murdoch University strategy. Translation through cross-disciplinary engagement will be among the core activities for support.

**Knowledge and Health Precinct: concept rendering of the Murdoch of the future**





STRATEGIES We will:	ACTIONS	MEASURES OF SUCCESS (with ref. to relevant KPIs & other PIs)
Recruit leaders for the institutes	Advertising and competitive recruitment for Institute Directors and Research Centre leaders	Staff competitively recruited and in place
Support academic staff to align their work and build areas of expertise with institutes and centres	Provide grant writing and project development support Create Industry Engagement Officer positions Support a Research Centre Expression of Interest (EOI) process by: <ul style="list-style-type: none"> <li>identifying academics with the appropriate expertise</li> <li>assist in the development of successful EOIs</li> <li>for EOIs that are not mature, provide incubator funding to allow team-building over a longer period of time</li> </ul>	Quality of research Increase the percentage of grant applications with staff from more than one discipline cluster Academics from small schools added to larger teams A successful pipeline of EOIs submitted over a three to five-year time period
Budget reconfiguration	Murdoch University budget model adjusted to provide performance-based research funding	Implementation of a new University-wide, performance-contingent budget model
Increase PhD enrolments and completions	Advertise opportunities Improve candidature management Build co-tutelle relationships	Percentage of students completing within 4 years 150 completions per year by 2021
Build industry-linked PhD scholarships	Grow industry-linked PhD student enrolments aligned with the Institutes and Centres and supported by University/Industry exchange programs	Up to 50 industry-linked PhD enrolments 20 adjunct appointments added to Murdoch University team Staff seconded from Murdoch University into industry positions
Build PhD internships and training	Leverage existing relationships and grow new relationships with the goal of offering our PhD students opportunities with partner organisations	A 10 per cent annual increase in the number of students accepted and placed year-on-year

# GOAL THREE

## Health Research and Innovation Agenda

**Murdoch University is located next to one of the most technologically-advanced private and publicly-funded hospital precincts in the southern hemisphere. Perth is located in the most densely-occupied time zone on the planet, with rapidly ageing populations.**

Our oceanic coastline is shared with countries that present significant challenges in human and animal biosecurity. In the past 30 years, 75 per cent of the emerging global diseases

have come from viruses, parasites and bacteria jumping the species boundary.

While human longevity has increased, lifestyle diseases are a significant burden on our economy, and cause significant human distress.

In the past 10 years, Murdoch University has developed a footprint in human and animal health research, and we are uniquely placed to make a contribution to global health-related problems and to capitalise on proximally-located opportunities.

In the next 10 years, we will focus on a select number of health-related research areas and pursue those in partnership

with local health care providers, community groups and international collaborators.

These areas of focus will include:

- (i) public health and infectious disease (e.g. One Health)
- (ii) precision medicine and personalised therapeutics, including genetic disorders and inherited disease
- (iii) community delivery of health services, especially in aged care and Aboriginal Health
- (iv) telemedicine, digital health and health analytics
- (v) health economics and policy

STRATEGIES We will:	ACTIONS	MEASURES OF SUCCESS (with ref. to relevant KPIs & other PIs)
Establish the Health Institute	Recruit the Director of the Health Institute	Director recruited and leading the Health Institute
	Recruit the Chief Operating Officer (COO) for the Health Institute Recruit the Clinical Trials Coordinator for the Health Institute Establish a policy framework to guide Health Institute operations	COO recruited Clinical Trial Coordinator recruited Implemented policies and procedures for operating the Institute, including the three main teams
	Implement a governance framework for the operation of the Institute	Establishment of the Institute approved by the University Senate, Resources Committee, and Academic Council Governance Committee in place with approved Terms of Reference and Membership
	Migrate existing Murdoch University research teams and academic staff into the Health Institute	Number of staff in each research team. Compliance with Health Institute policies.
	Establish three Research Centres: Precision Medicine; Zoonotic Disease; Community Health	Centres operational



**Professor Sue Fletcher:**  
pioneering the discovery  
of new drugs to treat rare  
inherited diseases



Mind Body Lab: a place to  
understand and enhance  
human performance



# GOAL THREE

## Health Research and Innovation Agenda (cont.)

The next section describes the operation of the Health Institute and divides goals into those with a commercial focus and those with research focus.

STRATEGIES We will:	ACTIONS	MEASURES OF SUCCESS (with ref. to relevant KPIs & other PIs)
Undertake the commercially-focused activities of the Health Institute	Develop the business model to support the Health Institute operations.	Health Institute operating under the business model in a self-sustainable manner
	Implement affiliation agreements between the Murdoch University Health Institute and key partners such as: Telethon Kids, Fiona Stanley Hospital, and St John of God Hospital	Affiliation agreements in operation
	Initiate clinical trials programs and health clinics on a for-profit basis, in order to contribute to ongoing research activities. Identify a professional clinical trials partner to manage programs	Clinical trials partner appointed Trials program agreed with Fiona Stanley Hospital and WA Department of Health
Undertake the research-focused activities of the Health Institute	Offer continuing professional development activities at Murdoch University. These will include weekly seminar programs to help build connections with local clinicians.	Number of clinicians attending the weekly seminars Number of joint research projects with clinicians
	Establish an annual researcher and clinician colloquium at Perkins Centre.	Number of attendees
	Evaluate the contribution of Murdoch University academics to the Health Institute research endeavour	Health related HERDC income Health related engagement income Field Weighted Citation Impact for outputs in income

# GOAL FOUR

## Australian National Phenome Centre

### Build the Australian National Phenome Centre to ensure its sustainable operation and valuable contribution to the International Phenome Centre network.

Throughout the past decade, Murdoch University has been producing well above world-class research in the broad area that is often referred to as 'omics' that includes metabolomics and genomics. In 2015, Murdoch University began developing

expertise in metabolic phenotyping (phenomics) through growing collaborations with Imperial College in the UK, and ever closer interactions with leading technology companies. In 2016, the WA Health Translation Network was created and identified metabolic phenotyping as a key platform. Later that year, a WA consortium led by Murdoch University was awarded significant funds from the Australian Research Council to create the Australian National Phenome Centre (ANPC). WAHTN was formally accredited in 2017 and earmarked for targeted funding in the Medical Research Future Fund (MRFF). Murdoch

University has committed to developing the ANPC not only as a key platform for WAHTN, but as a national facility that is linked in to an international network. The Phenome Centre has the potential to contribute across all of Murdoch University's priority areas: health, food and the environment; and hence its creation is a major strategic initiative for the University. The creation of the ANPC has commenced, though the purchase of equipment. Now, as it is set to grow, the implementation of a formal structure and governance plan is in hand to ensure its accountability as well as success.

STRATEGIES We will:	ACTIONS	MEASURES OF SUCCESS (with ref. to relevant KPIs & other PIs)
Establish a <b>steering committee</b> for the Phenome Centre	Governance committee to include DVC (R&I), Phenome Centre Director, Chief Finance Officer (or nominee), health sector representative, agricultural sector representative, and an animal sector representative	Terms of reference established and steering committee operational
Open a <b>pilot centre</b>	Pilot site for operation of the Phenome Centre is on the Murdoch University South St Campus and at UWA Actions to activate it include: <ul style="list-style-type: none"> <li>• upgrade of physical infrastructure</li> <li>• purchase and commissioning of 4 mass spectrometers</li> <li>• purchasing and commissioning of one NMR</li> <li>• processing first batches of samples.</li> </ul>	Mass spectrometers operational NMR operational Building upgrades completed 1st batch of samples processed
Move the Phenome Centre to the Harry Perkins Building	<ul style="list-style-type: none"> <li>• lease agreed with Department of Health</li> <li>• refurbishment of third floor completed</li> <li>• relocation of Health Platform to the Harry Perkins Building</li> </ul>	Centre relocated successfully within budget and by the expected date
Pursue facility accreditation	Purchase of SoPs from Imperial College. Implementation and training by Bruker, Waters and Imperial College Accreditation by the Royal Society of Chemistry	Accreditation certificates awarded



STRATEGIES We will:	ACTIONS	MEASURES OF SUCCESS (with ref. to relevant KPIs & other PIs)
Commence <b>operating</b> the centre ( <b>research aspects</b> )	Progressively increase the number of large scale clinical studies in which the centre is involved	Yr 1: Involved in one international research study ----- Yr 2: Involved in four international research studies ----- Yr 3: Involved in six international research studies
Grow international phenome partners	<p>Collaboration agreements for funding and PhD student supervision in place for Murdoch University and:</p> <ul style="list-style-type: none"> <li>• Birmingham</li> <li>• London</li> <li>• Singapore</li> <li>• Tokyo</li> <li>• Fudan University</li> <li>• Queens University</li> <li>• CAIO</li> <li>• CAAS</li> </ul> <p>Involvement in multi-site clinical studies in, for example, diabetes, antimicrobial resistance and autism</p>	<p>Amount of research funding</p> <p>Number of PhD completions</p> <p>Growth in samples processed from 2,000 to 40,000</p>
Commence <b>operating</b> the centre ( <b>commercial aspects</b> )	<p><b>In 2018:</b></p> <ul style="list-style-type: none"> <li>• establishing funding structure with MTP Connect</li> <li>• Identification of two or three pharmaceutical trials with the pharma industry</li> </ul> <p><b>In 2019:</b></p> <ul style="list-style-type: none"> <li>• Collaboration with International Phenome Centre Network</li> <li>• three to five trials with the pharma industry</li> </ul> <p><b>Beyond 2019</b></p> <ul style="list-style-type: none"> <li>• multiple collaborations with IPCN</li> <li>• more than five trials with the pharma industry</li> </ul>	<p>2000 samples to be processed for commercial payment in 2018</p> <p>-----</p> <p>15 per cent of capacity to be processed for commercial payment in 2020</p> <p>-----</p> <p>25% of capacity to be processed for commercial gain/ payment in 2022</p>



**Bayer Pilot Plant:**  
fabricating engineering  
tools and solutions

# GOAL FIVE

## Collaboration and Pathways to Impact

Enhancing our collaboration activities aligns with Lens 2 in the Murdoch University Strategic Plan 2017-2027, will work with distinguished collaborators and industry partners within Australia and the Asia and Indo-Pacific regions to further enhance Murdoch's innovative research environment. We will make Murdoch an attractive environment to host industry collaborators and incubate new businesses by providing access to cutting edge technologies through a new enabling technologies centre. Finally, we will ensure that research is translated into new products, services and community benefits through agile research incubators and accelerators supported by expert teams and state-of-art digital platforms.

STRATEGIES We will:	ACTIONS	MEASURES OF SUCCESS (with ref. to relevant KPIs & other PIs)
Grow the <b>distinguished collaborators program</b>	Invest in established, world-renowned, and leading researchers by <b>bringing them to Murdoch University</b> to engage in our priority research areas and collaborate with our researchers Support our researchers to work with distinguished Australian and international collaborators	<b>Increase</b> in the number of participants in Murdoch University <b>distinguished collaborators program</b> , year-on-year, with a maximum of 15 per annum Increase in publications with international collaboration
Pursue strategic <b>domestic partnerships</b> with key business, industry, government and non-government organisation in WA and Australia	<b>Plan</b> which domestic organisations should be targeted for relationship development Agree a <b>coordinated engagement approach</b> with research and innovation, and advancement staff, and the school's academics	<b>Increase</b> in philanthropic donations. <b>Increase</b> in the number of domestic <b>partnerships</b> which focus on strategic areas of interest for Murdoch University <b>Decrease</b> in the number of domestic <b>partnerships</b> which focus on areas that are <b>no longer strategic priorities</b> for Murdoch University Five per cent <b>increase</b> in engagement income (Categories 2-4) per annum
Pursue strategic <b>international partnerships</b> with business, industry, government and non-government organisations, and other universities	Plan which international organisations should be targeted for relationship development. Agree a <b>coordinated engagement approach</b> with the research and innovation; advancement; and academic teams Focus on <b>Singapore</b> utilising SCRIPT connections Explore (Middle East and North Africa) <b>MENA</b> options particularly around Innovation cluster and Dry Land Agriculture Institute Connect with <b>WA Trade Commission</b> and <b>Austrade</b> to build strategic partnerships in Vietnam, Myanmar and Bangladesh, leveraging ACIAR and Department of Foreign Affairs and Trade funding	Five per cent increase in engagement income (Categories 2-4) per annum <b>Increase</b> in the number of <b>international partnerships</b> which focus on strategic areas of interest for Murdoch University <b>Increase</b> partnership funding through AusTrade, DFAT and ACIAR



## GOAL FIVE

# Collaboration and Pathways to Impact (cont.)

STRATEGIES We will:	ACTIONS	MEASURES OF SUCCESS (with ref. to relevant KPIs & other PIs)
Enhance the <b>Western Barley Alliance</b>	Renew the existing agreement and expand to include lupin and legume pre-breeding and possibly wheat Consolidate and expand the <b>Western Barley Alliance</b> with WADA	Increase in income particularly in GRDC Increase in CRC collaborations
Build <b>internal collaboration</b>	Improve engagement within the Academy to build the research agenda and <b>culture</b>	Number of WADA staff on site extended to the lupin pre-breeding team
Consolidate our research equipment infrastructure	Establish an Enabling Technology Centre	Governance established
Maximise technology use	Recruit Director of the Enabling Technology Centre	Director appointed
	Develop an enabling technology access policy and contract arrangements, to maximise use of the investment made in the platform	Policy framework in place
Centralise our research services	Develop service level agreements between research institutes, centres and the centralised research service team	Service level agreements in place
	Appoint and/or transfer staff to the central research services group to ensure maximum use of the enabling technology platform, including: <ul style="list-style-type: none"> <li>• statisticians</li> <li>• data scientists</li> <li>• computer programmers</li> </ul>	Staff in place and ready to work

STRATEGIES We will:	ACTIONS	MEASURES OF SUCCESS (with ref. to relevant KPIs & other PIs)
Increase visibility and accessibility of Murdoch University research staff to the <b>broader community</b>	<p>Raise the profile of the innovation and commercialisation team in the community</p> <p>Establish a '<b>clear front door</b>' for the research and innovation team, via web based services, to assist people outside Murdoch University to connect with research staff</p> <p>Update all academic staff profiles to enhance the presentation of their research expertise</p> <p>Update the public profile of the School of Research and Innovation, via the use of social media</p>	<p>Demonstrable increase in the number of visitors to Murdoch University's research-focused web pages, including academic staff profile pages</p> <hr/> <p>'Front door' open</p> <p>Web portal/ resources updated</p> <p>Capability brochures printed and published on the research and innovation web page</p>
Improve <b>internal communications</b> with Murdoch University academic staff	<b>Quarterly presentations</b> of the Office of Research and Innovation portfolio to the entire Murdoch community, alerting them to upcoming opportunities and the progress of current initiatives	At least 80 per cent of academic staff attending presentations by 2019
<b>Knowledge transfer team</b> capacity building	<p>Develop a repository of articles, videos, photographs, podcasts, quotations and other resources, which can be shared with industry as well as students</p> <p>Apply to AusIndustry for an additional sponsored employee with a focused on agricultural-biotechnology</p>	<p>Increase in inventions disclosures to &gt;20 per year</p> <p>Increase in patents filed to &gt;10 per year</p> <p>Increase in patents optioned to &gt;50 per cent of patents filed</p> <p>Establish research accelerator</p>

# Key Deliverables and KPIs

## Key Deliverables in 2018 include:

1	Health Institute Director recruited
2	Phenome Centre operational
3	Five Murdoch University Research Centres launched
4	Three Institutes established and moving toward full operation
5	Progress on plans for improved university rankings
6	Third Murdoch University Commission underway
7	Research and Innovation team aligned with the Murdoch University Strategic Plan
8	Chinese and African HDR Agreements in place
9	Research Infrastructure Plan complete

## DVC(R&I) KPIs

	2021 Target
Total HERDC income (\$000) received	\$40,000,000
Engagement income (Categories 2-4)	\$25,000,000
HDR Student Completions	150
Field-Weighted Citation Impact	2
Percentage of Research Publications in the top 10 per cent of journals	>30 per cent
Percentage of Publications with International Collaboration	55 per cent (of sector average)





**Investigating: Professor Una Ryan's team is researching the link between tick bites and a mysterious Lyme-like disease**

**The Vector and Waterborne Pathogens Team**



**Professor  
Una Ryan**



**Professor  
Peter Irwin**



**Doctor  
Charlotte  
Oskam**



**Murdoch**  
UNIVERSITY



### **Contact**

Murdoch University  
90 South Street, Murdoch Western Australia 6150  
Telephone: +61 9360 6000

[www.murdoch.edu.au](http://www.murdoch.edu.au)