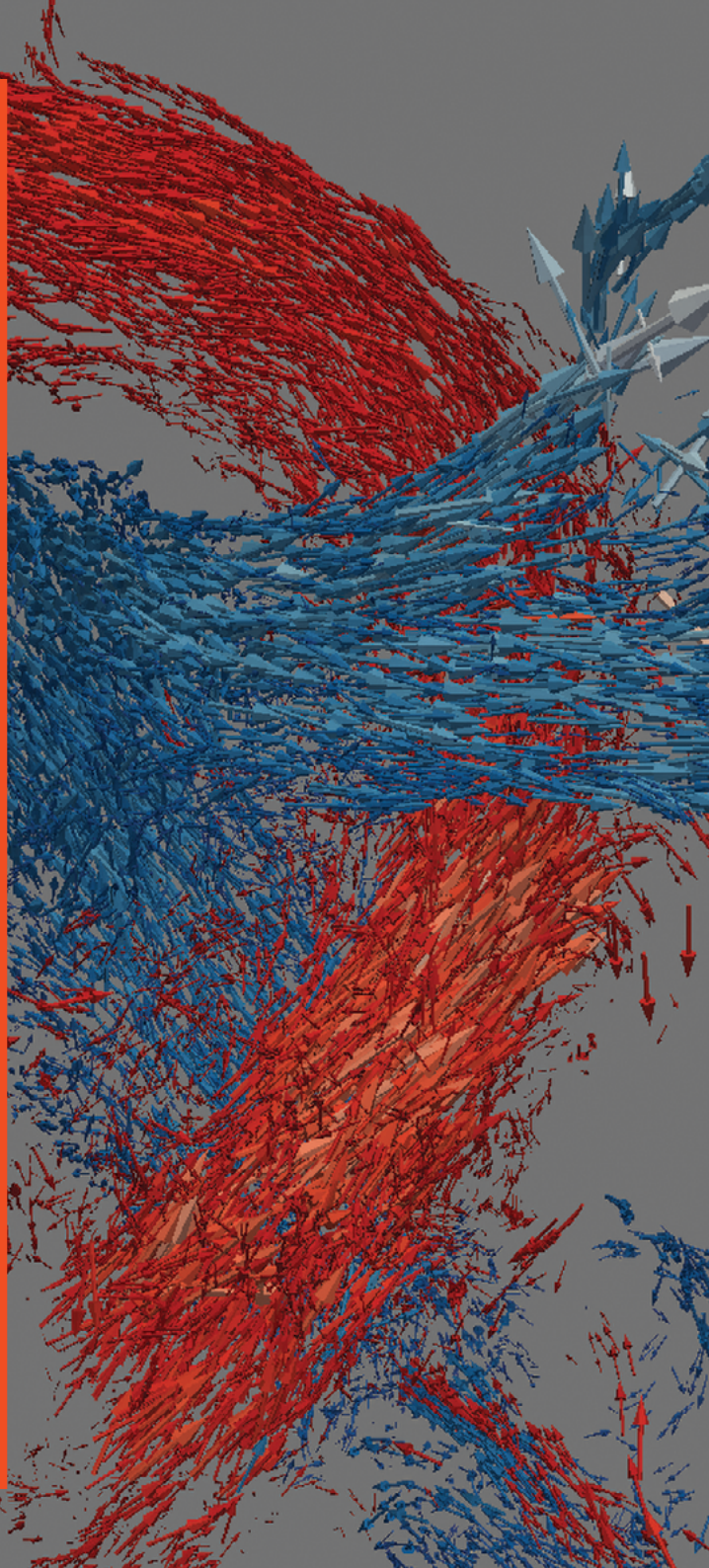


Cardiovascular Initiative Strategic Plan

2018–2020



Cover image: Flow within the aorta (red) and pulmonary arteries (blue) as measured using 4D-flow MRI
Credit: Fraser Callaghan/Stuart Grieve (Sydney Translational Imaging Laboratory, Charles Perkins Centre)

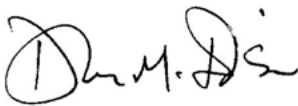
We acknowledge the tradition of custodianship and law of the Country on which the University of Sydney campuses stand. We pay our respects to those who have cared and continue to care for Country.

Foreword

The University of Sydney has a long-standing track record of excellence in cardiovascular research. The University of Sydney Cardiovascular Initiative (CVI) provides a platform to bring together and facilitate outstanding researchers and clinicians, world-class medical research institutes and the clinical services across Sydney Health Partners.

The CVI Strategic Plan outlines the vision, mission, strategic priorities and research pipelines that have been identified to enable the University to further unleash the potential that we have in the CV community across all of our campuses, faculties and medical research institutes, with a particular focus on cross-disciplinary opportunities, and initiatives to overcome common hurdles in the bi-directional translational pipeline.

This plan represents the vision of a large group of stakeholders. I would like to thank all our partners for their efforts during the consultation and drafting stage of the document.



Professor Duncan Ivison
Deputy Vice-Chancellor Research

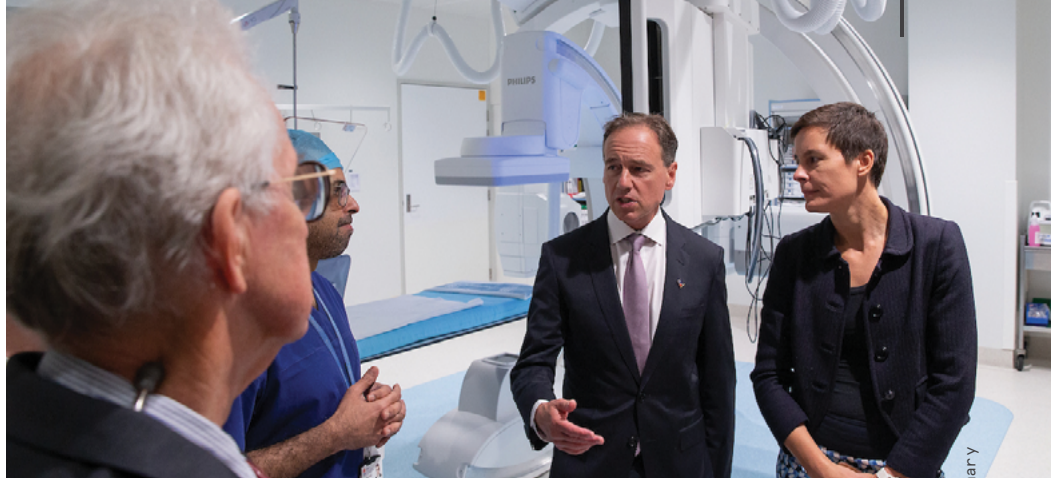


Executive summary

The University of Sydney Cardiovascular Initiative (CVI) 3 year strategy will enable the cardiovascular component of the University's obesity, diabetes and cardiovascular disease strategy.

It recognises and leverages the key interaction between our strong research capability and the health system in improving health outcomes. The CVI aims to facilitate and catalyse collaborations, partnering pre-clinical and clinical research hubs and facilities with the clinical cohorts and power of the three local health districts (LHDs) and affiliated medical research institutes of Sydney Health Partners (SHP).





The Honourable Greg Hunt MP, Federal Minister for Health, with interventional cardiologist, Professor Gemma Figtree, in the Cardiac Catheter Laboratory at Royal North Shore Hospital

This document outlines how the CVI will focus on targeted prioritised pipelines to achieve its three strategic cardiovascular (CV) objectives:

1. Build capacity
2. Accelerate translation
3. Increase global impact

Coordinating efforts along prioritised pipelines will provide a framework for bench to bedside and bedside to bench communication, enabling new collaborations and networks with rapid feedback mechanisms that foster efficient translation pathways. Cross-cutting support will be provided to the pipelines for infrastructure access, data analysis and sharing, biobanks, clinical trials and commercialisation.

As part of this strategy the CVI will facilitate a clinical trials team for investigator-led trials that operates across the three LHDs.

The three proposed CVI targeted research pipelines are:

- CV Drug Discovery
- CV Bioengineering
- CV Precision Medicine

These pipelines are aligned with University priorities and will work closely with the Drug Discovery Initiative, the ARC Training Centre for Innovative Bioengineering, and the Precision Medicine Initiative. The CVI will engage with the Faculties of Medicine and Health Sciences, Engineering, and Science to increase high value CV collaborations. The Charles Perkins Centre (CPC) and SHP will be key partners for translation. The strategy aims to bring the extensive and distributed CV expertise within the University and SHP together, to improve patient outcomes and increase our impact on the global stage.

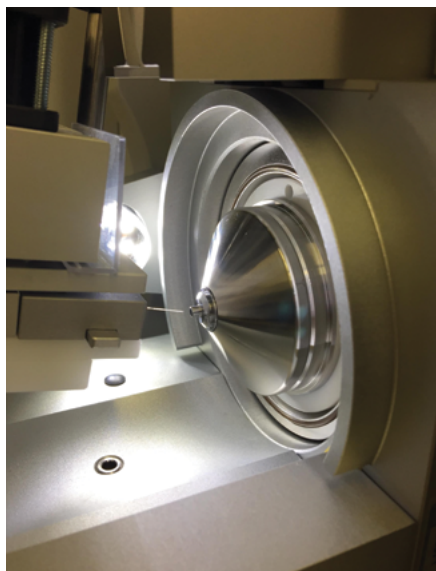
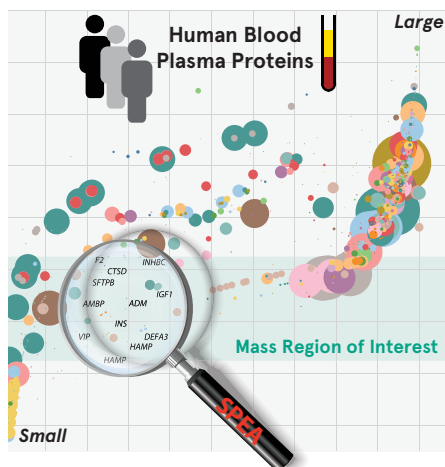
Background and opportunity

The establishment of the multidisciplinary CVI in late 2017, with seed funding and support provided by the Deputy Vice-Chancellor Research (DVCR), Sydney Health Partners, and Charles Perkins Centre, provides a historically unique opportunity for its members to work together with DVCR.

By strategically identifying and overcoming hurdles along the translational pathway from fundamental discovery to clinical trials and implementation, the CVI will enable the University to be a globally recognised translational cardiovascular institution, facilitating the impact of each of its individual researchers.

The CVI aligns with the broad strategy of the University's 2016–2020 Plan which outlines a culture of research excellence through: investing in and driving research excellence across the University; attracting and developing outstanding researchers; and developing partnerships that enable

our research to make a difference, locally and globally. It also aligns with a key part of the University strategy, to increase investment in multi-disciplinary initiatives (MDIs). These provide new opportunity for innovation and translation, bringing together talented researchers across diverse disciplines. The CVI will work with the CPC to develop and promote the University cardiovascular disease (CVD) strategy and leverage the close relationship with SHP and the Heart Research Institute (HRI). Opportunity exists to increase CV research impact through closer relationships with the newly established Drug Discovery Initiative and the CPC priority of Precision Medicine and CPC themes and



Left: Visualisation of Human Proteome

Right: Mass Spectrometer source region for Proteome Analysis

Credit: Mark Larance - CINSW Future Research Leader Fellow. larancelab.com

domains, in particular: Aboriginal and Torres Strait Islander Health; Integrative Systems and Modelling; Biology; Population Health; and Commercialisation, Innovation and Industry Partnerships.

It also places us in an excellent position for recent and emerging changes in state and federal funding opportunities. Historically there has been a vast inequity in both University of Sydney and NSW in the level of cardiovascular research funding in relation to both the burden of disease and the quality and impact of research. This has been addressed by the State Governments announcement in June 2018 that it will commit \$150 million to cardiovascular

research over the next 10 years. The CVI strategic objectives and focussed research pipelines align closely with State Government priorities, including CVD, the NSW Biobank, medical research translation, and increased clinical trials capability, as well as funded initiatives announced in the 2018 Federal Budget for Research and Innovation – specifically, the Medical Research Future Fund (MRFF) expenditure on (i) \$1.3 billion ‘National Health and Medical Industry Growth Plan’ and (ii) \$275 million ‘Investing in Health and Medical Research’. Notably, opportunities for the CVI include increased funding for Advanced Health Research and Translation Centres, translation of heart research, genomics and

precision medicine, transformative research that builds new industry ecosystems, clinical trials, industry collaborations, and biomedical and medical technology programs.

The University of Sydney's Health and Medical Research Strategic Review recommended support for four strategic, collaborative, priority areas:

- obesity, diabetes and cardiovascular disease (ODCD)
- cancer
- brain and mind science
- infectious diseases

The first of these priority areas (ODCD) was the basis for the establishment of the Charles Perkins Centre. The CVI was conceived as a mechanism to develop the cardiovascular component of the CPC strategy for the University, and to meet its mission to extend collaborative research and translation opportunities across the University's disciplines and its health partners, including through Sydney Health Partners.



CVD is a major cause of death in Australia, accounting for almost one-third of adult deaths. It accounts for 11% of hospitalisations and is the largest cost group to the health system, with expenditure projected to rise. Despite major advances there are many areas in which CVD diagnosis and treatment can be improved, including new or repurposed drug development, early identification of at risk individuals, improved precision of diagnosis and treatment, and development of implantable devices. The CVI will support these areas through three prioritised research pipelines:

- Pipeline 1: CV Drug Discovery
- Pipeline 2: CV Bioengineering
- Pipeline 3: CV Precision Medicine

The CVI will provide cross-cutting support to the pipelines for infrastructure access, data analysis and sharing, biobanks, clinical trials and commercialisation. As part of this strategy the CVI will coordinate: a clinical trials team for investigator-led trials that operates across the three LHDs; a multidisciplinary CV bioinformatics

group; and focus groups for Aboriginal and Torres Strait Islander CV health, early and mid-career researcher (EMCR) development, an increase of strategic funding, and attraction and retention of excellence.

The prioritisation of these pipelines will focus efforts, enable networks, and increase the strength and excellence of the University of Sydney multidisciplinary cardiovascular research and development. In the long term this will enable high impact outcomes, increased access to partnerships with industry, government and peak bodies, increased global impact and reputation, and an expanded and diversified funding base. In addition, the improved collaboration and interaction of our elite clinician researchers with fundamental scientists from diverse disciplines will enhance the focus and relevance of discovery efforts to improve human health, providing bed to bench and bench to bed insights.

Our purpose

- Improve cardiovascular health
- Increase global leader recognition
- Increase high impact multidisciplinary collaborations
- Diversify research income
- Increase industry engagement
- Build and enable future leaders



Our vision

Our mission

Our overarching strategic goals for 2018–20 are:

The University of Sydney is a globally recognised leader for delivering cardiovascular health outcomes through high impact multidisciplinary and collaborative research, deep linkage to national and international health systems, strong collaborations with industry, and translation through policy and commercialisation.

The CVI will capitalise on the outstanding science and facilities offered by the unique partnership between the University of Sydney, Sydney Health Partners and affiliated Medical Research Institutes to drive the CV component of the University's strategy for ODCD. This partnership will be used to drive excellence, scale, and impact of cardiovascular research, improving health outcomes for current and future generations. Research pipelines will be prioritised to focus and align CV research and ensure excellence is achieved across the translational pathway.

The CVI is designed to deliver:

- deeper collaboration
- greater efficiency
- increased investment by Federal and State governments, Local Health Districts, the University of Sydney, peak bodies, industry and philanthropy
- heightened global impact and recognition for our CV research.

We will combine cutting edge laboratory with clinical research to enable the best possible outcomes for CV patients.

Goal 1:
Build capacity

Goal 2:
Accelerate translation

Goal 3:
Increase Global impact

Strategic objectives

The CVI has three key Strategic Objectives: Build Capacity, Accelerate Translation and Increase Global Impact. These will be realised by programs to support three prioritised research pipelines (Figure 1) through the bench to bedside pathway and back again. The leadership team, comprising clinician and non-clinician scientists, for each research pipeline will regularly review performance across the translation pathway to ensure innovative strategies are developed and employed for maximum impact from our fundamental and preclinical research.

The CVI focus on impact, translation, and patient outcomes provides strong opportunity to increase and diversify research income from the Medical Research Futures Fund (MRFF), industry, commercialisation, and philanthropy. CVI programs will be structured to increase multidisciplinary collaborations, grow global impact and recognition, attract world class researchers, and educate, mentor and train the next generation of health leaders. Formal mechanisms will be established to work with Deputy Vice-Chancellor Research to recruit targeted international elite researchers.

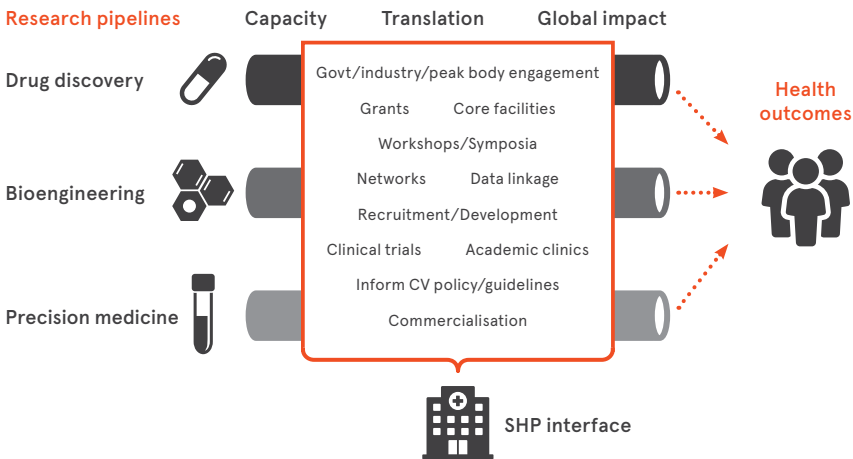


Figure 1: CVI pipelines, strategies and programs to improve CV health outcomes

1. Build capacity

The CVI will facilitate high impact, patient focussed, collaborative and world-leading multidisciplinary CV research capacity within the University of Sydney.

This will be achieved in three key areas by:

- deepening the links between clinician researchers, scientists, engineers, bioinformaticians and mathematicians,
- promoting the many cutting-edge facilities available through the relationship with Charles Perkins Centre and other Sydney Core Facilities, and
- recruiting targeted international elite CV researchers.

These relationships and partnerships will be leveraged to ensure research is cutting edge and aligned with the CVI priority pipelines of: CV drug discovery; CV bioengineering; and CV precision medicine.

The CVI will facilitate regular symposia or workshops for each of the prioritized research pipelines to build networks and innovative approaches to clinical and preclinical research. These pipelines and workshops will be run in partnership with the Drug Discovery Initiative, the Faculty of Engineering and IT, the ARC Training Centre for Innovative Bioengineering, and the Precision Medicine Initiative, to ensure maximum benefit and multidisciplinary collaboration is achieved. Seed grants will be awarded to EMCRs for innovative, cross-disciplinary, collaborative projects with a translational benefit that aligns with CVI priorities and enable them to leverage external competitive funding.



2. Accelerate translation

The CVI will build the networks and relationships required to accelerate CV research translation and impact by establishing high-value engagement and linkages with the health system, government, industry and peak bodies that incorporate complementary capacity, policy alignment, expertise and investment.

The CVI will facilitate the establishment of a CV clinical trials team, to operate across the three LHDs to reduce trial start-up times and simplify investigator-led clinical trials, and CV Academic Clinics, to allow implementation of new evidence based diagnostic and therapeutic strategies stemming from our discoveries, across the SHP, and be the stepping stone for broader translation, influencing guidelines of peak national and international bodies.

To progress research from bench to bedside the translational pathway needs to be navigated. This requires skill sets distinct from those required for cutting edge research. The CVI will enable researchers to navigate this pathway through access to industry partners and mentors, and training programs in business development, regulation and commercialisation.

The research pipelines will focus efforts on prioritised themes providing multi-disciplinary expert collaborations of high value to external partners.

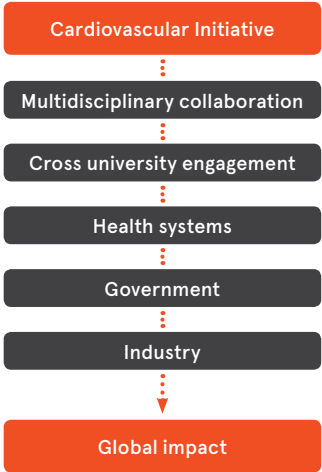


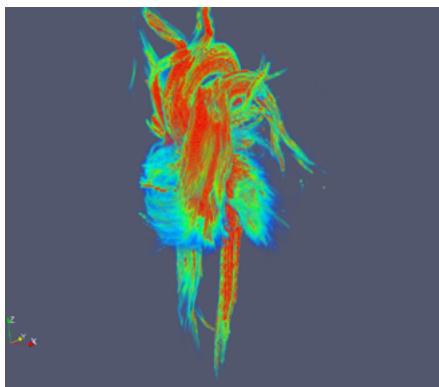
Figure 2: CVI Translation Partners

3. Global impact

Building capacity and accelerating translation will lead to increased global impact and recognition. Global recognition will entice elite national and international CV researchers to the University of Sydney and facilitate the migration of our researchers to prominent and influential positions in external organisations, continually strengthening and deepening the University of Sydney CV brand.

The recognised CV strength will enable partnerships and funding opportunities that further strengthen our reputation and provide expanding opportunities to diversify the funding and investment base.

Left: Whole heart cardiovascular flow captured using 4D flow MRI in a single 10 minute acquisition.
Credit: Fraser Callaghan/Stuart Grieve
(Sydney Translational Imaging Laboratory, Charles Perkins Centre)



Cardiovascular Initiative (CVI)
cardiovascular.initiative@sydney.edu.au

**sydney.edu.au/research/
centres/cardiovascular-initiative**