



Victor Chang
Cardiac Research Institute



Delivering Hope

ANNUAL REPORT 2022



Acknowledgement of Country

The Victor Chang Cardiac Research Institute acknowledges Aboriginal and Torres Strait Islander peoples as the Traditional Custodians of the lands and waters on which we live and work and we pay our respects to their Elders past, present and emerging.

We proudly recognise the ongoing spiritual and cultural custodians of the lands where we make our discoveries – which at the Victor Chang Cardiac Research Institute in Darlinghurst is the Gadigal people of the Eora Nation and at the main Crawley campus of the University of Western Australia the Whadjuk Noongar people.

At the Victor Chang Cardiac Research Institute, we are committed to improving health outcomes for Aboriginal and Torres Strait Islander peoples.

Cover photo: Victoria Macarthur-Stanham. Copyright Justin Hunstdale ABC

Left: A/Prof Emily Wong and Dr Lithin Louis

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About the Institute

The Victor Chang Cardiac Research Institute is renowned for the quality of its scientific discoveries and is dedicated to finding cures for cardiovascular disease through world-class, collaborative, and cutting-edge medical research.

The Institute's scientists are committed to improving the understanding, prevention, diagnosis and treatment of cardiovascular disease that will save lives the world over.

It is focused on delivering a complete cardiovascular investigational pipeline that spans fundamental basic science discovery and translational studies through to pre-clinical and clinical trials.

Founded in 1994 in honour of Dr Victor Chang AC, it now has over 230 scientists, doctors and staff working together across 23 laboratories.

The Institute is Australia's only national cardiovascular research institute with headquarters in Darlinghurst, Sydney, and a growing hub in Western Australia.

Heart disease remains the single biggest killer of all Australians

Every week **3 Australians under the age of 35** lose their lives to sudden cardiac arrest

1 in 3 Australians will die prematurely of cardiovascular disease

1 Australian dies from heart disease every **28 minutes**

Women are **50% more likely than men** to be dead a year after having a heart attack

20,000 Australians suffer a cardiac arrest outside of hospital every year

Chairman's message



Above:
Mr Matthew Grounds AM

2022 was an exciting year for the Victor Chang Cardiac Research Institute after two years of working in the pandemic environment.

It was a prolific year for publications and it was wonderful to see our scientists once again connecting with their colleagues and collaborators interstate and internationally.

We were able to return to hosting important in-person events such as the Sohn Hearts & Minds Investment Leaders Conference and the Women Against Heart Disease lunch.

We launched the Institute's 10-year Strategic Plan that captures Executive Director Professor Jason Kovacic's vision for the future, which is focused on developing a complete translational research pipeline that will see our ground-breaking fundamental discoveries benefitting patients faster.

An inspiring illustration of this is Infensa Bioscience, which has licenced the drug candidate developed from the venom of the Fraser Island Funnel web – one of the world's deadliest spiders. This is a result of collaborative research by the Institute's Professor Peter Macdonald, and colleagues at the University of Queensland.

Under Professor Kovacic's leadership we have consolidated our position as Australia's only national heart research institute. The Institute's strategic partnership with the University of Western Australia and the expansion of the Perth-based cardiovascular research hub has been embraced by the philanthropic community in Western Australia.

A major focus for the Institute is to ensure we are establishing income streams to counter the increasing costs of doing research and the ever-widening funding gap for indirect costs in current grant schemes.

On average for medical research institutes, 60% of indirect costs are not recovered as income through institutional grants.

Independent medical research institutes had a \$387 million funding gap for the indirect costs of research in 2020.

With this in mind, the importance of the funding that the Sohn Hearts & Minds Investment Leaders Conference and HM1 Investments provide to the Institute, and to other medical research institutes, cannot be overstated. Since the commencement of the Sohn Hearts and Minds Conference in 2016 and the establishment of Hearts and Minds Investment Ltd (HM1) in 2018, \$47.6 m of much needed funds has been distributed to medical research due to the generosity of the fund managers involved.

We are enormously proud of the heritage the Institute shares with our precinct partners and it was very pleasing to have the collective capabilities of the founding partners recognised when the St Vincent's Precinct was acknowledged as a Health Innovation Precinct by the NSW Government in 2022.

As always, we must extend our gratitude to the Institute's Board members for their extensive expertise and support of our scientific and strategic vision. In particular, I must express my deep gratitude to David Craig, our Deputy Chairman and Chairman of the Finance and Risk Committee, for his unwavering commitment to the Institute.

We are deeply grateful to our many supporters for your enduring support. We rely on your generosity to find ways to prevent and treat cardiovascular disease.

Matthew Grounds AM
Chairman



Executive Director's message

Our cover patient Victoria Macarthur-Stanham is only here today through the heroic efforts of her husband Tim.

Tim performed CPR for 16 minutes after Victoria suffered a sudden cardiac arrest at home.

It was later discovered she had long QT syndrome – a rare genetic disorder that can cause fatal heart rhythm irregularities.

Left: Executive Director Professor Jason Kovacic

Soon after, her baby daughter Indi and Indi's grandmother were also diagnosed with this condition.

The family had no idea they were at risk until it was almost too late. Thanks to the extraordinary work taking place at the Institute, a new screening test can now better identify people at risk of these deadly arrhythmias.

That's a profound change and one that is allowing families to undergo preventative life-saving treatments and procedures. You can read more about this work, and how Victoria is doing on page 10.

This work is only possible because of the huge advances in the field of genetics. We're also incredibly lucky here at the Institute to be able to utilise our ground-breaking Innovation Centre. What we can do now in hours with our high-throughput machines would have taken months only a handful of years ago.

These giant leaps in technology have also allowed us to identify the top 10 genes that drive heart attack, and to start honing in on a gene called PHACTR1. We've already discovered it's not just linked to coronary heart disease, but also spontaneous coronary artery dissection (SCAD) and fibromuscular dysplasia (FMD).

It's not just our work in genetics that is delivering results and impact. Our proud history of partnering with St Vincent's Hospital in Sydney is once again transforming the field of heart transplantation.

Hearts that have stopped beating are now being used across Australia and around the world thanks to research led by the Institute's Professor Peter Macdonald with the support of St Vincent's Sydney Health Innovation Precinct. A special solution of nutrients, used alongside the game-changing 'Heart in a Box', has seen the number of heart transplants increase by around 25%.

Being part of the St Vincent's Sydney Health Innovation Precinct has also seen our Associate Professor Andrew Jabbour develop a new virtual biopsy using MRI scanning to detect heart transplant rejection.

It is expected this far less invasive technique will also be adopted by clinicians the world over. It's also proving a hit with heart transplant survivors – mums like Marie Domingo who went into end-stage heart failure when she was 31 weeks pregnant. You can read her story on page 22.

It's thrilling to be able to give you this snapshot of what we've achieved at the Institute over the last year. Our goal is not just about furthering our understanding of heart disease, it's also about improving diagnosis and delivering new treatments and innovative medical devices faster than ever before.

For mothers like Victoria and Marie, we need to ensure that their children and future generations don't suffer unnecessary heartbreak.

Our scientists are united in their mission to impact clinical patient care, improve health outcomes, and save lives. And this year their breakthroughs have changed the lives of families not just in Australia but around the world.

We've changed the face of heart transplantation and seen the number of viable donor heart transplants soar. We're helping generations of families with deadly heart arrhythmias through new genetic testing, and we've pinpointed the top 10 genes associated with heart attacks.

What we are achieving is only possible by utilising the brightest minds, by accessing game-changing technology, and most importantly by collaborating with like-minded partners in NSW, throughout Australia, and across the globe.

02 Research breakthroughs

Stronger Together



Professor Peter Macdonald and Dr Yashutosh Joshi



Above: Dr Chai-Ann Ng and Professor Jamie Vandenberg

Screening for sudden cardiac arrest

It will now be easier for families to discover if they are carrying genetic mutations that cause sudden cardiac arrest – a condition which kills nine out of 10 victims outside of hospital.

Researchers at the Institute developed a new electrical test that can screen hundreds of gene mutations to pinpoint the exact mutations that are harmful to the heart for those suffering from inherited heart disorders.

The breakthrough is a giant step forward in the accuracy and precision of genetic testing.

Professor Jamie Vandenberg, who led the research, said: “It’s primarily young people with otherwise healthy hearts that die from these inherited heart disorders and even though that number is small, the consequences are devastating.”

Fellow author Dr Chai-Ann Ng said: “Genetic sequencing has revealed that we all contain a vast array of genetic variants, but we have not always been able to identify if these variants are dangerous or not.

“If you can isolate the mutation and identify those at risk, there are lifestyle changes people can make, as well as taking beta-blockers or even using a defibrillator. Family members can also get tested.”

Professor Vandenberg’s team investigated variants in genes that encode ion channels, which are proteins that control the movement of electrical signals between cells. The majority of genetic disorders that lead to an increased risk of sudden cardiac arrest are caused by these mutations.

The test they have developed can easily be adapted to test other ion channel genes associated with a wide range of diseases spanning neurological, kidney, and muscle disorders.

Professor Vandenberg said: “We hope that within five years, as soon as anyone gets their gene testing done, or their genomes sequenced, they will find out if their variant is dangerous.

“It’s incredible to think we will be able to screen family members not just across Australia but anywhere in the world and give them a diagnosis.”



Left: Victoria Macarthur-Stanham, husband Tim and eldest daughter Clementine

Life-giving genetic testing

When Victoria Macarthur-Stanham started suffering from recurring fainting fits, she put it down to keeping up with the demands of being a new mum and juggling a full workload.

But in March 2021 Victoria had a sudden cardiac arrest at home and was only saved by the heroic efforts of her husband, Tim Prowse, who performed CPR for 16 minutes before paramedics arrived and defibbed her heart.

After a spell in the intensive care unit in Wollongong Hospital, Victoria was transferred to St Vincent's Hospital in Sydney. She was seen by cardiac electrophysiologist Dr Nicholas Kerr, who is undertaking a PhD at the Institute.

He quickly made the diagnosis of Long QT Syndrome - a heart rhythm disorder that can lead to sudden, uncontrollable, and dangerous arrhythmias. After conducting screening on her immediate family, it has since been discovered that both her mother Edwina, and her youngest daughter Indi also had Long QT syndrome.

Subsequently, both Victoria and her mum Edwina were fitted with a combined pacemaker and defibrillator to mitigate their risk of a sudden cardiac arrest in the future. Genetic testing of Edwina and Victoria has also revealed they share a rare genetic mutation.

Their genes are now being studied by Dr Chai-Ann Ng, who is trying to establish if this mutation is the one that is causing their Long QT syndrome. If proven, it will mean that other members of Victoria's family can also undergo genetic testing that currently is unavailable to them.

In the year after her sudden cardiac arrest Victoria got married, fell pregnant and gave birth for a second time. A series of milestones she attributes to Tim and to Dr Kerr and his team.

"The results of the work being carried out by the Institute are not only life-changing, but life-giving in its most pure form. I've been given the gift of time. Now I just want to do something hugely meaningful with it," said Victoria.



Fixing Phi's little heart

Phi wasn't even two years old when she was diagnosed with congenital heart disease. She needed open-heart surgery to live.

When Phi was just a baby, her parents Jackie and Darren noticed she wasn't eating much and was struggling to gain weight. They searched for answers before doctors uncovered a terrifying diagnosis.

Their baby girl had been born with a hole in her heart. A heart defect called Ventricular Septal Defect.

Worse still, doctors said they had to operate on Phi immediately before the hole damaged her heart even more.

Jackie and Darren knew it was the only way little Phi would have the best chance in life. But as the surgery approached, they were understandably worried.

"The day of the surgery stands out as such a clear memory. It was so scary and incredibly upsetting," said Jackie.

Facing every parent's worst nightmare, Darren carried his little girl into the operating theatre where they'd cut open her chest to fix her heart.

"When I dropped her off in the operating room, there were so many doctors and nurses. It suddenly hit me," said Darren.

Phi was crying as they placed the anesthesia mask over her mouth. Darren kissed her forehead, and the doctors ushered him out.

Surgeons had to stop Phi's heart during the operation. It would have only been the size of an egg.

Darren and Jackie were shocked to see their daughter when she came out of surgery, covered in wires and tubes, a huge bandage over her chest.

"We couldn't even cuddle our baby girl. All I could do was stand by her bed and stroke her hair while Jackie held her hand," said Darren.

Thankfully, Phi's surgery was a success. Now she gets to be a kid, run around with her two sisters, go to school, and play games.

Phi is sadly far from alone in what she went through. Research is the only way we can hope to prevent babies like Phi from enduring open-heart surgery.



Preventing birth defects

Four babies die of congenital heart disease every week in Australia. In approximately 80% of these cases, the cause of the congenital problem is unknown.

In 2017 Professor Sally Dunwoodie, Deputy Director of the Victor Chang Cardiac Research Institute, discovered a genetic cause for heart and other defects and crucially, a possible way to prevent some cases.

The genetic mutations cause a deficiency in a molecule, NAD, which is required for a baby to develop normally.



It's very rare to find a mutation, and then to uncover the mechanism that causes the birth defect. It's even rarer to find a possible treatment.

Professor Dunwoodie

"NAD is a vital molecule that is required in every cell in our body. For women who have low levels of NAD we believe this might be an issue in pregnancy because the growing baby also needs NAD to develop."

Clinical studies are underway in collaboration with the Royal Hospital for Women at Randwick to identify women who might have low NAD levels and might benefit from increasing their vitamin B3 intake.

The next stage will be clinical trials to measure the effects of vitamin B3 supplementation to bring NAD to normal levels in the context of pregnancy.



Top left: Baby Phi and her older sister
Bottom left: Phi in hospital
Right: Research Midwife Jennifer Goth and Lily Twigger



Above: Dr Nicole Bryce and Dr Christine Lucas
Right: Professor Jason Kovacic and his team

Critical heart attack genes identified

The most critical genes that cause coronary heart disease and trigger heart attacks have been identified in a major study conducted by the Institute, the Icahn School of Medicine at New York's Mount Sinai, and other sites in Europe and the USA.

The results pave the way for a new field of targeted therapies for those at risk of developing coronary heart disease.

Professor Jason Kovacic said the study achieved three major breakthroughs, all of which are of key importance in the fight against heart disease.

"Firstly, we have more accurately defined the precise genes that are likely to cause coronary heart disease. Secondly, we've identified exactly where in the body the main effect of those genes is – it might be in the heart arteries themselves that directly cause blockages, or perhaps the effect is in the liver to increase cholesterol levels, or in the blood to change inflammation," said Professor Kovacic.

"The third major achievement was to rank those genes – 162 in total – in order of priority for causing coronary heart disease."

Six hundred patients who had coronary heart disease and another 150 without coronary heart disease were included in the study. All underwent open chest surgery for coronary heart artery bypass surgery or other medical procedures. The team used Mount Sinai's supercomputer – called "Minerva" – to crunch the numbers, analyse data and collate information from thousands of genes.



This knowledge will allow us to go after these critical genes that cause heart attacks, to understand exactly how they cause coronary heart disease and if they might be promising drug targets for patients.

Professor Kovacic

"Another important aspect of this study was that one of our previously suspected top genes – PHACTR1 – was validated as being among the top two genes for causing coronary heart disease. Scientists around the world have little idea of how PHACTR1 works and we are determined to fix that."



Accelerating innovation

Collaborations across the St Vincent's campus have always been key to the Institute's success.

The formal recognition by the NSW State Government of The St Vincent's Sydney Health Innovation Precinct in 2022 will make its research partners stronger by boosting the scale of its research and its ability to attract more commercial and philanthropic investment.

Cornerstone partners St Vincent's Sydney Public and Private Hospitals, the Garvan Institute of Medical Research, and the Victor Chang Cardiac Research Institute are all located on one campus in the heart of Sydney and over the years have amassed nationally unique technical capabilities and outstanding expertise in clinical genomics, cancer clinical trials, cardiac care, cell therapies, human immune profiling, cellular genomics and medical device development.

Its globally recognised research teams are committed to fostering entrepreneurship which will dramatically improve care for patients across NSW and the country.

This vision is already paying dividends

Last year saw our scientists deliver new treatments that are transforming care for heart transplant patients the world over and they've established a multi-disciplinary clinic at St Vincent's Hospital to treat what was once a deadly disease.



Providing new hope for patients with amyloidosis

A new multi-disciplinary clinic has been established at St Vincent's Hospital, Sydney by the Institute's Dr Nikki Bart.

Dr Bart, who is clinical faculty at the Institute and a cardiologist at the hospital, said new therapies and better screening are transforming the treatment of amyloidosis, a disease that was considered a death sentence just five years ago.

Dr Bart said: "We estimate there are now more than 20,000 undiagnosed and untreated cases in Australia and around 13-17% of patients with 'at risk' conditions - including heart failure with preserved ejection fraction and degenerative aortic stenosis - have underlying amyloidosis.

"The trouble is that many in the community are unaware of this disease and that we can now treat it. We need a paradigm shift to increase awareness, increase diagnosis, and streamline access to treatment across our medical community and the wider Australian population."

Amyloidosis occurs when abnormal protein deposits — amyloid fibrils — build up in tissue and organs including the heart, kidney, and nervous system. It can cause heart failure.

Treatments that can reduce symptoms, hospitalisations and improve mortality are now available at the clinic. Patients are also being enrolled in several different trials accessing therapies ranging from medications to injections to gene-modifying therapies.

The clinic also helps patients streamline their care which involves seeing multiple specialists to manage a range of different symptoms. The multidisciplinary service provides access to specialist cardiology, neurology, haematology, and genetic counselling.



Left to right: Dr Natasha Gorrie, Dr Antonia Carroll, Dr Georgia McCaughan and Dr Nikki Bart

Saving hearts for three decades

Professor Peter Macdonald has overseen more than 1000 transplants and delivered a breakthrough that's been adopted by surgical teams around the world.

Though this breakthrough is more than enough for one life's work, Professor Macdonald isn't planning on slowing down anytime soon.

It's 1988 and 33-year-old Dr Peter Macdonald is sitting in the back of a police car as it races down Sydney's South Dowling Street.

The three-car convoy speeds through a series of coordinated green lights and in just seven minutes they've made it to their destination: Sydney Airport.

Dr Macdonald boards a Learjet owned by Kerry Packer. He's with the heart transplant retrieval team from St Vincent's Hospital, Sydney on its way to retrieve a donor heart from Adelaide, and as Dr Macdonald will come to learn, every minute counts.

When he recalls his first experience with heart transplants, the now Professor Macdonald's face lights up.

"I think I got bitten by the bug at that stage," Professor Macdonald said.

That first transplant was a success, but as is inevitable with such a complex procedure, an unsuccessful transplant followed soon after. That was when the reality of heart transplantation hit him: to save a patient, you first have to save a heart.

In 1994, Professor Macdonald joined the newly opened Victor Chang Cardiac Research Institute.

Exploring heart transplants from the human side and the research side has given this clinician-scientist a unique perspective.

"You know what the problem is in the patients you deal with in the hospital, which means you have a better sense of how you might approach things in the lab to address that problem," Professor Macdonald said.

"Plus it's very satisfying when we get to see something that we tested in a lab translate and make a meaningful difference in the hospital environment."

One of those satisfying lab-to-patient projects is the ground-breaking 'Heart in a Box' device.

In a world first in 2014, Professor Macdonald and his research team at the Institute's Cardiac Transplantation Laboratory discovered how to transplant donor hearts that had stopped beating after death - also known as Donation After Circulatory Death (DCD) hearts.

This was made possible through the use of a preservation fluid developed in the lab and a machine that allows the heart to beat outside the body known as 'Heart in a Box.'

Before 'Heart in a Box', transplant teams like the one at St Vincent's Hospital relied on donor hearts from brain-dead patients



Left: Professor Peter Macdonald
Above: Dr Yashutosh Joshi transporting the 'Heart in a Box'

whose hearts are still beating. With the development of 'Heart in a Box', DCD hearts were now added to the donor pool - boosting the transportation time from four to 14 hours.

This game-changing technique has since increased the number of heart transplants by 25% and is now being used in countries including the US, Spain, Belgium, Austria, the Netherlands, and the UK.

Research carried out by Professor Macdonald and Dr Yashutosh Joshi last year also revealed survival outcomes were just as successful for those who received DCD hearts as those who received hearts from traditional brain-dead donors.

In an interesting twist of fate, another research project Professor Macdonald is involved in has discovered that venom from the deadly funnel-web spider appears to hold the answer to preventing damage to the heart.

Together with the Institute's Professor Bob Graham and Professor Glenn King and Associate Professor Nathan Palpant from the University of Queensland, Professor Macdonald is working to develop a drug derived from a protein in the spider venom called H1a.

While the new drug - which the team hopes to progress to clinical trials in 2024 - could have benefits for heart attack victims, it may also help bring Professor Macdonald closer to his mission of keeping donor hearts viable for transplant for longer.

"We think that we'll be able to extend the timeframe in which we can retrieve hearts - which could add up to 30% more hearts to the donor pool," he said.

With his busy clinical and research schedule complemented by time spent enjoying his new role of grandfather, it's hard to imagine there's a 'typical day' for Professor Macdonald.

When asked what makes a 'good day', he said: "If we do a transplant and it all goes well, then that's a good day at work.

"Having said that, I'm always very aware that someone has to die for someone else to have a transplant - it's someone else's tragedy that you're dealing with, and you just hope that from something that is otherwise a complete disaster, something positive can come out of it for a donor family."

Saved by a DCD heart

Imagine being told you'd be dead within 12 months unless you have a heart transplant. That was the reality Ross Tripodi was facing just before Christmas 2019.

Ross had been feeling ill for months but had no idea he was suffering from heart failure until he was told by cardiologists at St Vincent's Hospital in Sydney that he'd have to go on the transplant list.

Sadly, Ross's kidney began to fail, and he ended up in ICU and was put to sleep. The next day he woke up with a Left Ventricular Assist Device (LVAD) inserted in his heart. This artificial heart pump would take over the role of his left ventricle until he got a transplant.

Ross said: "It was apparently touch and go. They told my wife Lyn that I might not survive. But when I came to Lyn told me that I was ok, and that I had an artificial heart keeping me alive."

Ross soon began to feel better and got the call that they had a heart for him. In April 2020 he underwent heart transplant surgery at St Vincent's. He later found out he had received a donation after circulatory death (DCD) heart from a brain-dead donor.

He said: "I felt amazing when I woke up. There was no pain and within two days I was up and about walking and just felt better and better."

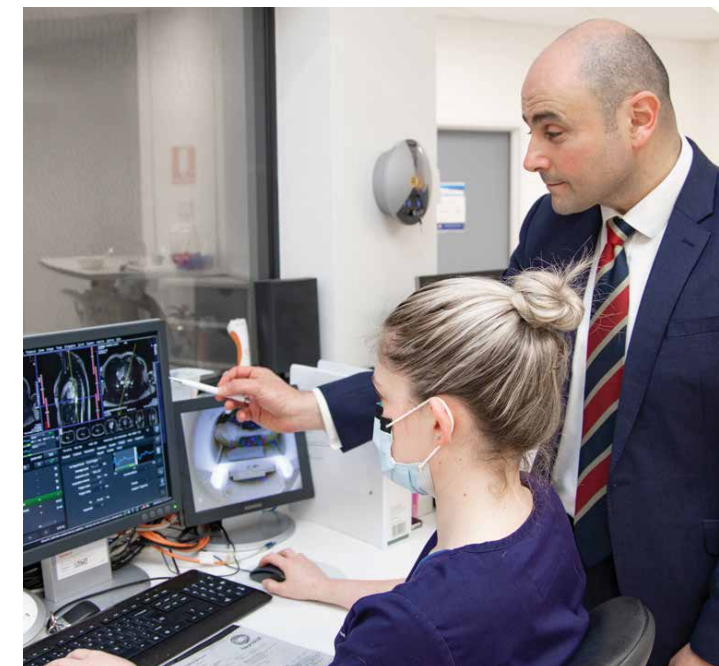
Ross, who is from the Sutherland Shire in NSW, ended up spending around five weeks in hospital after contracting an infection, but he said he now feels near perfect.

The former mechanic said: "I'm 57 and I go to the gym. I've got a few aches and pains but that's just to be expected. I've seen my daughter turn 21, my nephew and niece married and I've even trekked 20km in the Snowy Mountains."

He added: "I never thought I would have this quality of life after a transplant. I've got the highest respect for the team at St Vincent's who do such a fantastic job and have helped so many people like me."



Improving heart transplant care



Heart transplant survivors could avoid invasive biopsies after a study conducted by scientists from the Institute and St Vincent's Hospital showed a new MRI technique to be safe and effective.

The Institute's Associate Professor Andrew Jabbour said the new development will lead to major improvements in care for heart transplant patients worldwide.

"This new virtual biopsy takes less time, is non-invasive, more cost-effective, uses no radiation or contrast agents, and most importantly patients much prefer it," said A/Prof Jabbour.

Approximately 100 Australians receive heart transplants each year and most experience some form of organ rejection. While survival rates are high, a small percentage will die in the first year after surgery.

Most clinicians currently test for rejection by performing a biopsy. This invasive procedure involves a tube being placed in the jugular vein to allow surgeons to insert a biopsy tool into the heart to remove multiple samples of heart tissue. As well as being uncomfortable, it can lead to rare but serious complications if the heart is perforated, or a valve is damaged.

Patients usually undergo a biopsy around 12 times in the first year after transplantation.

The new MRI technique has been proven to be accurate in detecting rejection and works by analysing heart oedema levels, which the team demonstrated are closely associated with inflammation of the heart.

Results from the study of 40 heart transplant patients from St Vincent's revealed the new test was just as effective as a biopsy at detecting rejection. Secondary findings of the study revealed there was a reduction in hospitalisation and infection rates for those who underwent the MRI procedure.

Fellow author and cardiologist Dr Chris Anthony said: "The technique is now frequently used at St Vincent's Hospital in Sydney, and we anticipate that more clinics across the world will adopt this novel technology."

The team is also developing new genetic testing to be used alongside the MRI which it is hoped will detect signs of rejection through identifying genetic signals of donor-specific inflammation in the bloodstream.

Surviving heart failure, a coma, and a heart transplant

Marie Domingo never got to experience the first few weeks of bonding with her newborn daughter. Instead, she was in an induced coma after suddenly developing end-stage heart failure.

The mum of one from NSW was on life-support for weeks and had to undergo a heart transplant just a few weeks after giving birth in October 2018.

Marie started to feel unwell a couple of weeks before giving birth but had no idea she was suffering from peripartum cardiomyopathy, a rare disease that causes the heart's left ventricle to become dangerously enlarged and weakened.

Eventually, she went to the hospital and a few hours later had an emergency c-section. After giving birth to Faith, she was told her organs were shutting down and she needed a heart transplant.

After being transferred to St Vincent's Hospital, Sydney, she crashed soon after arriving in Emergency and was placed in an induced coma for six weeks.

Marie said: "This was the time I should have been bonding with my daughter and instead I was fighting for my life. The doctors did an amazing job of fighting to keep me alive, and I owe them everything. It was really tough and go as to whether I would make it."

She was in and out of hospital until undergoing a heart transplant in April 2019.

Marie has also had to contend with her body rejecting her new heart.

Marie said: "In those first few weeks and months I had to undergo many biopsies to keep an eye on how my heart was doing. It was very scary at first as you are awake, and the needle goes in through your neck. It's also very uncomfortable and has left me with scars."

Marie's incredibly thankful for a new MRI technique developed by the Institute's Associate Professor Andrew Jabbour.

"Having an MRI is so much better. I'd choose that any time of the day over having a biopsy," said Marie.



2022 was another remarkable year for the Institute's hub in Western Australia. It marked the beginning of a new strategic partnership with The University of Western Australia, solidifying our position as Australia's only national cardiovascular research institute.

Perth father Ben Beale was remembered through the naming of Professor Livia Hool's lab in his honour, while epidemiologist Dr Lee Nedkoff was awarded significant funding for her work investigating population burden, trends, and outcomes in people with heart disease. Former CEO and Non-Executive Director and Global Ambassador of Fortescue Metals Group Elizabeth Gaines joined the Institute's Board of Directors, and supporters came together at our State of the Heart Dinner.

None of it could have been achieved without the support of Wesfarmers, Woodside Energy and the Group of Hearts.

03

Western Australia

Professor Jason Kovacic, Professor Tim Colmer, Professor Livia Hool, Dr Lee Nedkoff, Susannah Rooney and Professor Amit Chakma



Australia's only national cardiovascular research institute

The Institute and The University of Western Australia (UWA) signed a new strategic partnership that will significantly boost heart disease research in WA and across the country.

The Institute's affiliation with UWA marks a new chapter for both organisations and the creation of Australia's only national cardiovascular research institute.

Professor Jason Kovacic said the affiliation was the culmination of a long history of working together.

"This partnership marks a major expansion for the Institute that will not only help the 100,000 Western Australians hospitalised by cardiovascular disease each year but will also help save the lives of people around the world," said Professor Kovacic.

Cardiovascular disease is responsible for 29% of deaths in WA.

UWA Vice-Chancellor Professor Amit Chakma said the University was pleased to partner with the Institute to grow much-needed research capacity in Western Australia.

"This affiliation strengthens our commitment to addressing cardiovascular disease and creating a brighter future for Western Australians and the rest of the nation," Professor Chakma said.

"I am incredibly excited and honoured to join the team and bring a new set of skills to the Institute that I hope will shine a light on the true scale of cardiovascular disease in Western Australia."



This will not only help us to save lives in Western Australia but deliver scientific breakthroughs that will benefit people the world over.

Professor Livia Hool

GUILLAUME

State of the Heart Dinner celebrates Institute's achievements

In May, Bistro Guillaume in Perth welcomed 70 supporters of the Institute at our annual State of the Heart Dinner.

MC for the evening, Professor Livia Hool, reflected on the Institute's progress over the past year and our goals for the future as Australia's only national cardiovascular research institute.

Professor Hool said: "We are focused on building the capacity of the Institute in Western Australia – beginning with the continued recruitment of leading scientists, acquiring world-best technology and equipment, and most importantly, boosting the number of life-saving projects underway right here in Perth."

Putting a human face to cardiovascular research, guests heard from Ayden Glover, who spoke movingly about his family's battle with hypertrophic obstructive cardiomyopathy - a condition that causes the heart to enlarge.

"The research coming out of the Institute provides me with hope and excitement," Ayden said.

"It is evident that the research is leading towards a future where children won't have to walk the same paths my brother and I did."

The Institute's supporters - including, Woodside Energy, Wesfarmers, the Simon Lee Foundation, the McCusker Foundation, the Stan Perron Charitable Foundation, and the Group of Hearts - were thanked for their generous contributions.

A thank you was also extended to Guillaume Brahimi and the team at Bistro Guillaume.



Left: Matthew Grounds, Andrea Dawber, Professors Livia Hool and Jason Kovacic, Dr Lee Nedkoff, Ariane Gallop, Rob Byrne, Susannah Rooney

Right: Ayden Glover (right hand side back row) and his family

Opening of the Ben Beale Laboratory for Cardiovascular Research

The family of much-loved Perth businessman Ben Beale and the Institute proudly launched a laboratory named in his honour.

The Ben Beale Laboratory is based at the Institute's hub at the University of Western Australia and will investigate new treatments for cardiovascular disease.



It was made possible through the heroic efforts of Ben's wife Sarah Beale, who launched the Group of Hearts campaign in early 2022. Supported by family, friends, and generous business associates, the fundraising campaign raised more than \$2 million for heart research.

Sarah hopes it will prevent other families from suffering unnecessary heartache.

"Through the generosity and support of the Group of Hearts, we have been able to not only honour Ben but extend his love of life through this research to other families," said Sarah.

"There are no words adequate to thank this amazing group for believing in our family's and the Institute's vision. Ben would be incredibly proud of what we have achieved."

Father of five Ben was just 47 years old when he died from a heart attack in 2017. It was later discovered he had atherosclerosis, which causes the arteries to block and is often known as the silent killer.

Professor Livia Hool, who oversees a team of 11 researchers at the Institute's WA hub, said: "We are proud to partner with the Beale family on such an incredibly personal mission. Far too many Australians lose their lives to heart disease, and we owe it to Ben and the Beale family to do better."

The Institute's researchers have already discovered a critical pathway that drives atherosclerosis, which is hoped will lead to a new preventative treatment.

Dr Lee Nedkoff receives funding boost

The Institute's Dr Lee Nedkoff has been awarded significant funding to support her work investigating population burden, trends, and outcomes in people with cardiovascular disease.

Dr Nedkoff, who joined the Institute's hub at the University of Western Australia in early 2022 and is head of the Cardiology Population Health Laboratory, received grants from the State Government-funded WA Near-miss Awards (WANMA) Ideas Grants and its Research Excellence Awards (REA).

The epidemiologist is using the WANMA award to support her work in chronic coronary disease. The REA grant will be used to investigate a broad range of projects including heart attacks, heart failure, atrial fibrillation, and cardiomyopathy.

It will also support some of Dr Nedkoff's collaborative work with the Cardiovascular Research Group (UWA) on Aboriginal heart health, including rheumatic heart disease, which disproportionately affects Aboriginal and Torres Strait Islander peoples.

Dr Nedkoff said: "This funding will allow me to investigate sex-specific determinants and trends in coronary heart disease which is vitally important.



The more we drill down into uncovering the differences between men and women, the better it is for everyone.

"I am also proud to be part of an incredible research group that is committed to the fight to end rheumatic heart disease in this country and improving health outcomes for First Nations people. This funding will certainly help us achieve this goal."

Dr Nedkoff is now supported by a growing team of eight researchers.



Elizabeth Gaines joins the Institute's Board of Directors

In 2022, the Institute welcomed the appointment of Elizabeth Gaines, former CEO and current Non-Executive Director of Fortescue Metals Group, to its Board of Directors.

Ms Gaines brings a wealth of leadership experience, and her appointment aligns with the expansion of the Institute's footprint into Western Australia.

Ms Gaines said: "The Victor Chang Cardiac Research Institute has an incredible reputation worldwide for the breadth of its discoveries. The work that the Institute is doing here in Perth, will not only benefit the most disadvantaged communities, it will also drive investment and opportunities that will benefit the wider population too.

"As someone whose family has been impacted by the devastation of cardiac disease, I look forward to helping the Institute deliver on its important work."

The Institute's Chairman, Matthew Grounds AM, said Ms Gaines' skills complement the existing Board members.

Mr Grounds said: "Elizabeth is one of the most highly experienced and respected business leaders not only in Australia but on the world stage. It's a privilege to have her join our Board."

Executive Director Professor Jason Kovacic said: "To achieve our bold new vision, we not only need to attract and retain the brightest scientific minds, we also need visionary leaders like Elizabeth who can help deliver new and exciting partnerships with world-leading industries and innovators."

Ms Gaines is a former Chief Executive Officer of Helloworld Limited and Heytesbury Pty Limited and has previously held Non-Executive Director roles with Nine Entertainment Co. Holdings Limited, NEXTDC Limited, Mantra Group Limited and ImpediMed Limited.



The Institute's Innovation Centre is transforming our understanding of heart disease and allowing us to translate our discoveries faster than ever before.

In 2022 it played a central role in the development of a new electrical screening test for sudden cardiac arrest (see page 8) and is helping our scientists unravel the secrets of the PHACTR1 gene (see page 14).

Researchers from institutes across the country are now utilising the Innovation Centre and its highly specialised scientists in increasing numbers, with its mass spectrometers proving essential in a new stroke project that could change the way patients are treated.

04 Innovation Centre

New Era of Innovation

Above: Dr Christine Lucas

Preventing side effects for stroke patients

Around 56,000 Australians suffer a stroke every year, with survivors suffering from a range of devastating disabilities including paralysis, speech difficulties, memory loss and chronic fatigue.

Whilst there have been incredible advances in the field of stroke in the last decade, scientists still don't fully understand the mechanisms that cause these side effects.

Dr Kirsten Coupland from the University of Newcastle is utilising the Institute's Innovation Centre to try and understand how a stroke sets off a chain reaction that leads to cell death, but also how it activates mechanisms to protect the brain.

It's hoped this work, part funded by a NSW CVRN Research Innovation Grant, could eventually limit the damage caused by a stroke – which could be a game changer for the treatment of stroke the world over.

Dr Coupland utilised the Innovation Centre's mass spectrometers to analyse cerebrospinal fluid – powerful biomarkers of central nervous system disease.

Dr Coupland has also had access to the expertise of the Innovation Centre's team. It's been instrumental to her project, which has already generated exciting data.

Dr Coupland has found clear evidence that particular pathways have been altered. It's now about honing in on the top targets to characterise in more detail and see if they do indeed have an impact on stroke outcome.

Dr Coupland hopes it might lead to the design of new drugs or repurposing of existing drugs that could make a huge difference in how people recover from stroke.

The NSW CVRN Research Innovation Grants, which are proudly supported by the NSW Government, provide early to mid-career researchers access to the Institute's Innovation Centre to support short term projects focused on cardiovascular research.

“““

This technology allows us to look at what chemicals make up a substance in a very unbiased way.

It reveals each of the little components at a chemical level and allows analysis far, far quicker than traditional lab bench work. It really picks the sample apart.

Dr Coupland



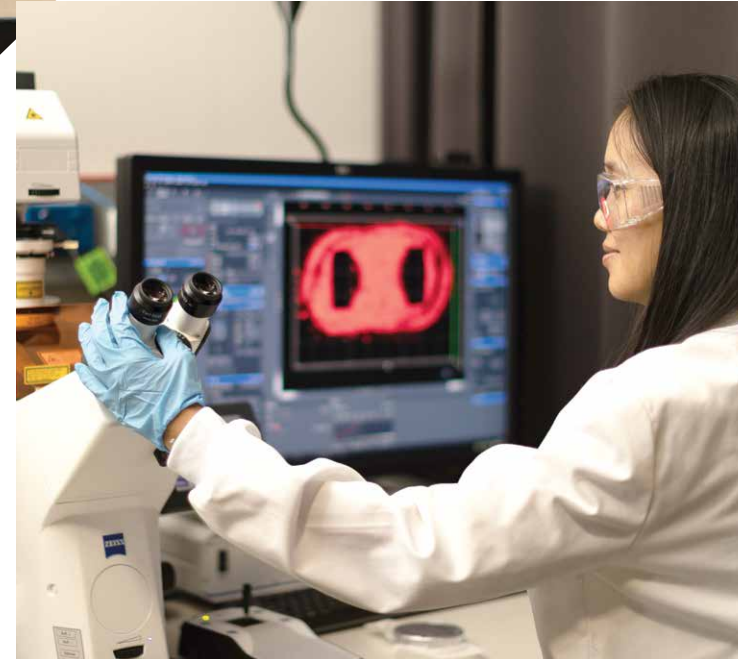
Top: Dr Kirsten Coupland and the Institute's Dr Maz Ali
Bottom left: Mass spectrometer
Bottom right: Dr Coupland. Copyright Hunter Medical Research Institute

Expanding the Innovation Centre's Micro Imaging Facility

2022 saw the arrival of two new cutting edge instruments which are allowing researchers to analyse cells in 3D and to measure minute changes in cardiac muscle cells.



Above: Dr Christine Lucas
Right top: Dr Delfine Cheng
Right bottom: Dr Scott Page



ZEISS LSM900 Laser Scanning Confocal Microscope

Our LSM900 microscope is a 'workhorse' for researchers at the Institute. Confocal microscopes are used routinely in biomedical research to image cells and tissue samples that have been stained with fluorescent probes to identify specific components within those specimens.

The microscope can take pictures of several fluorescent probes at one time but also resolves the locations of those probes in three dimensions. This lets the scientists have a 3D view of the shapes of the cells or tissues and lets them clearly see the distribution of the molecules they are most interested in.



SciMedia-Brainvision High-speed Fluorescence Mesoscope

A mesoscope is an instrument for quickly visualising fine details across areas that are too large for conventional microscopes.

The SciMedia-Brainvision High-speed Fluorescence Mesoscope has multiple lenses and a very sensitive camera that allows researchers to photograph very small changes in light intensity very quickly in samples up to about 40 millimetres in size.

Our scientists will use this system to measure changes in cardiac muscle cells grown in a dish that act as a model for conditions like arrhythmia that occur in patients. They will be aided by a fluorescent chemical dye that indicates the tiny changes that happen so fast that the researchers will use the system to capture high speed movies at up to 1,000 images each second.

2022 started off with a bang, with Associate Professor Emily Wong awarded a game-changing Snow Medical Fellowship.

The following months did not disappoint with our scientists taking home prestigious awards and achieving incredible grant success which will improve drug safety and better diagnose those at risk of sudden cardiac arrest.

The year ended on a high with Professor Bob Graham appointed Vice President of the Australian Academy of Science.

05 Team highlights

Awards & Funding Success



Associate Professor Emily Wong

victorchang.edu.au

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TEAM HIGHLIGHTS

\$8 million from the Snow Medical Research Foundation

The Institute's Associate Professor Emily Wong was awarded an \$8 million Snow Medical Research Foundation Fellowship to investigate the dark genome.

These regions are 'dark' because they are poorly understood compared to regions in the genome that encode proteins but they make up 98% of the human genome.

Associate Professor Wong said the game-changing investment from the Snow Medical Research Foundation will allow her to accelerate her research into the dark genome to understand its impact in causing heart disease.

Associate Professor Wong said: "I feel incredibly honoured to be a Snow Medical Fellow. This level of support is transformative. My research vision would not be possible without this level of sustained funding.

"I'm thrilled to be able to expand this research, which has the potential to alter our understanding of heart disease and shine a light on the dark genome and its disease-causing variations."

Associate Professor Wong will be focusing on regions in the dark genome called 'enhancers' which play critical roles in regulating our genes. She will seek to discover how they function or malfunction to understand their impact on the role they play in heart disease and ageing.

This will not only uncover what variants are causing disease but will also provide a new systems-based understanding of the heart in the context of healthy ageing.

"The Snow Fellowship is designed to back the brightest and best of their generation to take bold risks. We want our researchers to have the guts to fail before they succeed – and we give them eight years to deliver their vision," Snow Medical Chair Tom Snow said.

Professor Jason Kovacic, Executive Director of the Victor Chang Cardiac Research Institute, added: "I want to thank the Snow Family and the entire team at Snow Medical for believing in Associate Professor Wong's work and for providing her with the independence that will allow her to expand her team and to deliver on the potential of her incredibly exciting research."

Snow Fellows and their teams will also have access to training in leadership and management, policy, entrepreneurship, and engagement support.



Above: Associate Professor Emily Wong. Copyright Australian Financial Review
Right top: Ginette and Terry Snow
Right middle 1: Steven Lowy, Associate Professor Owen Siggs, Matthew Grounds, Associate Professor Emily Wong, Derek Van Dyk
Right middle 2: Professor Bob Graham, Tom Snow, Ginette and Terry Snow, Professor Jason Kovacic
Right bottom: Tom Snow and Dr Dave Kennedy

Great wealth comes with great responsibility

It was an honour to bestow the inaugural Chuck Feeney Award for Philanthropy to Terry and Ginette Snow.

The award recognises those who have made extraordinary philanthropic contributions to cardiovascular health and research. It also pays tribute to US businessman Chuck Feeney, who gave away his fortune of \$11 billion and played a critical role in the Institute's history.

"I spent my life investing in projects, causes, and people that give back to the community. We must support leaders with the vision and ambition to tackle the world's biggest problems. I am delighted that Ginette and Terry Snow share my philosophy," said legendary US philanthropist Chuck Feeney, who gave \$20 million towards the building of the Institute's headquarters in Darlinghurst in 2005.

Terry and Ginette said: "Our vision has always been to invest in excellence. We want to support and encourage emerging leaders with big and ambitious goals. Our brightest young minds need the resources and independence to focus on building multidisciplinary research programs and teams capable of changing the face of healthcare in Australia and globally."

Terry and Ginette established the Snow Foundation in 1991, which has provided over \$130 million to more than 400 organisations and 420 individuals.

The Snow family also established the Snow Medical Research Foundation to support Australia's most visionary medical research leaders and their teams. In 2022 the Institute's Associate Professor Emily Wong was awarded a Snow Fellowship that will allow her to accelerate her research into the dark genome.

The Snows added: "Chuck Feeney's incredible generosity and foresight enabled Australian institutes and universities to conduct world-changing research. Through Snow Medical, we also intend to create a legacy that delivers real and lasting impact."

The Institute's Professor Bob Graham, said: "Chuck Feeney continues to inspire us, and we are very proud to have established this award to encourage and recognise others who seek to emulate his generosity.

"Terry and Ginette Snow are incredibly worthy awardees whose support for medical research, particularly their focus on developing the next generation of research leaders, is both visionary and impactful."



Australian Academy of Science appoints new Vice President

Professor Bob Graham, AO, Head of the Institute's Molecular Cardiology Laboratory, was elected Vice President of the Australian Academy of Science and Secretary of Biological Sciences.

The Australian Academy of Science provides independent scientific advice, promotes international engagement, builds public awareness of science, and champions excellence in Australian science.

Professor Graham said: "I am honoured and humbled to have been elected to this role by my peers. I have great respect for the work of the Academy, an organisation of many of Australia's leading scientists that provides important input on scientific issues ranging from climate change to the COVID pandemic.

"I am looking forward to working with my colleagues and the Academy's secretariat to further enhance its reputation and recognition."

The Institute's Professor Jason Kovacic congratulated Professor Graham and praised him as a worthy recipient of such recognition.

"Professor Graham is a highly-regarded clinician and an important figure in cardiovascular research, not just in Australia but globally," Professor Kovacic said.

"He is well deserving of this honour and will no doubt be a dedicated ambassador and champion for the biological sciences."



Above: Professor Bob Graham

Institute's academics recognised for research excellence

The Institute's Professor Jamie Vandenberg and Associate Professor Eleni Giannoulatou were honoured at the 2022 NSW CVRN Showcase and Awards Ceremony.



Hosted by the NSW Cardiovascular Research Network (CVRN) Showcase, Officer for Health and Medical Research, NSW Health, and the Heart Foundation, these awards recognise the state's most eminent health and medical researchers who are making significant contributions to the treatment and prevention of cardiovascular disease.

NSW Health Secretary, Susan Pearce, presented the Ministerial Award for Cardiovascular Research Excellence, and two Ministerial Awards for Rising Stars in Cardiovascular Research.

Professor Vandenberg received the Ministerial Award for Research Excellence for his extensive achievements in understanding heart arrhythmias, including breakthrough discoveries in revealing how ion channels work and how drugs interact with these channels, and facilitating precision treatments of patients with inherited cardiac arrhythmia syndromes.

Professor Vandenberg's award also highlights his passion for supporting the next generation of cardiovascular researchers in NSW.

Associate Professor Giannoulatou was awarded one of two Rising Star Awards for her research into bioinformatics and statistical genetics. Her research focuses on the development and application of computational methods to answer genetic questions using high-throughput genomics data which has resulted in ground-breaking methodologies aiming to increase the current genetic diagnostic rate in cardiovascular disease.

This year, the Showcase also highlighted research into sudden cardiac death by pairing people with lived experience of this devastating disorder with researchers who are trying to target its causes and how to prevent it.

Left: Associate Professor Eleni Giannoulatou and Professor Jamie Vandenberg

Funding highlights



Professors Jason Kovacic and Sally Dunwoodie (shown above) and Dr Johanna Barclay were part of a 50-strong team of Australian-wide researchers awarded a \$5 million MRFF Genomics Health Futures Mission grant to establish a National Indigenous Genomics Network led by Professor Alex Brown.



Dr Charles Cox was awarded an ARC Future Fellowship to explore how healthy heart cells sense and generate forces using molecules on their surface.



Dr Monique Bax, Dr Bob Lee and Dr Celine Santiago were awarded 2022 NSW CVRN Professional Development Awards.



Professor Jamie Vandenberg was awarded close to \$3 million from the Medical Research Future Fund (MRFF) Genomics Health Futures Mission to expand on work that will make it easier for families to discover if they are carrying genetic mutations that cause sudden cardiac arrest.



Professor Kovacic was part of a team led by Monash University awarded an MRFF Cardiovascular Health Mission grant to investigate the link between heart disease and clonal haematopoiesis.



Dr Alastair Stewart and Associate Professor Eleni Giannoulatou received NHMRC Emerging Leadership Investigator Grants totaling around \$1.5 million each. Dr Stewart's grant will enable his team to shed light on how cells transport drug molecules to improve safety (toxicity) of a wide range of drugs. A/Prof Giannoulatou aims to improve the rate of genetic diagnosis of cardiovascular disease and provide better understanding of the disease mechanism.



Professor Diane Fatkin was awarded around \$1 million from the MRFF Cardiovascular Health Mission Fund to investigate the links between alcohol consumption and heart disease.



A/Professor Eleni Giannoulatou was the winner of a CVRN Near Miss Grant to improve the genetic diagnosis of cardiovascular disease.



A/Prof Eleni Giannoulatou and Dr Nikki Bart were awarded Ramaciotti Health Investment Grants. Dr Bart will use her funds to uncover the hidden burden of cardiac amyloid. A/Prof Eleni Giannoulatou will aim to improve the genetic diagnosis of cardiovascular disease.

2022 Award Winners

It's always a pleasure to recognise those who have made an exceptional contribution to the Institute.

At our end of year celebrations, the Institute's Professor Jason Kovacic presented awards to five outstanding individuals and organisations.



Executive Director's Award

Dr Audrey Adji

Post-doctoral Scientist Audrey Adji was recognised for her contributions to research and her commitment to diversity.

Dr Adji is an accomplished scientist and researcher who works in the area of cardiac function in the Institute's Cardiac Mechanics Laboratory.

Dr Adji has won numerous scientific prizes and awards, including the inaugural 2018 International Society of Hypertension Mid-Career Award for Women Researchers and is also the Chair of the Institute's Diversity Committee which has helped the Institute in its evolving approach to issues such as gender, equity, diversity and inclusion.



Ambassador Award

Sarah Beale

Sarah's husband Ben died of a heart attack in 2017. It was later discovered he was suffering from atherosclerosis – the number one driver of coronary heart disease.

Sarah has since been moved to fund research into this disease. Earlier this year Sarah and the Institute's Philanthropy team launched the Group of Hearts and raised more than \$2 million. (read more on page 30)



Impact Award

Hearts & Minds Investments Limited

The Impact Award recognises how the Australian Funds Management community and philanthropy can come together and benefit the wider community with effective altruism.

The award was accepted by Maggie O'Neill from Sohn Hearts & Minds. Collectively HM1 and Sohn Hearts & Minds Investment Leaders Conference have raised more than \$40 million for medical research. (read more about HM1 on page 53)



Executive Director's Award

Kiran Narsey

Chief Financial Officer Kiran Narsey was celebrated for ensuring the ongoing financial strength of the Institute.

Kiran has been with the Institute for over a decade and during that time has ensured the Institute has been able to successfully weather financially challenging times, including during the COVID-19 pandemic.

Kiran was identified by Professor Kovacic as a quiet achiever, who doesn't seek attention or recognition for his great work at the Institute.



Impact Award

Simon Lee Foundation

This award given to the Simon Lee Foundation recognises philanthropic leadership that has an impact on providing significant funding for medical research. It was accepted by the Foundation's Cheryl Lee.

The Foundation has been instrumental to our work in Western Australia and is a long-time supporter of our researchers.

After two long years of the COVID-19 pandemic, it was a huge relief to hold our much-loved events in person. Millions were raised for medical research at this year's Sohn Hearts & Minds Conference in Hobart, and women's heart health was highlighted at the Institute's annual Women Against Heart Disease Fundraising Lunch.

Genomics, diversity, and equity took centre stage at the Sydney Cardiovascular Symposium – a partnership between the Victor Chang Cardiac Research Institute and the Heart Research Institute.

Almost 400 people attended Club Marconi's Heart of the West fundraising extravaganza and over 100 schools from across NSW and Western Australia took part in the Victor Chang School Science Awards.

06 Events & Fundraising

Back on the Road



Professor Jason Kovacic presenting at Sohn Hearts & Minds

Sohn Hearts & Minds 2022 raises millions for medical research

After a two-year hiatus from in-person events, more than 600 financial luminaries from around the world gathered in Hobart for the seventh annual Sohn Hearts & Minds Investment Leaders Conference.

The event, which is dedicated to supporting Australian medical research, began in style with an exclusive dinner at Mona. Guests arrived by ferry and were met by dancers and singers curated by the Mona team. Once inside the attendees were served canapes showcasing Tasmania's finest produce and Sohn Hearts & Minds Investment Leaders Conference Founder Matthew Grounds AM welcomed the guests.

Highly-respected interviewer and comedian Andrew Denton conducted a riveting interview with David Walsh, founder, and owner of Mona.

As in prior years, the conference delivered exclusive content relevant to global economic affairs. Setting a high bar was Jennifer Byrne's interviews with human rights advocate Bill Browder, a UK-based fund manager and the largest foreign investor in Russia until 2005; Luke Harding, the Guardian UK foreign correspondent and a New York Times bestselling author; and futurist Ramez Naam, Managing Partner of US-based PlanetaryVC.

This year, the Institute's Professor Jason Kovacic took to the stage to highlight how every attendee can do more to look after their heart health. He also revealed details of a new study being launched in 2023, which it's hoped will tackle heart disease at a far earlier stage in life.

The TOOTHHeart study will help discover what factors set children on a trajectory that culminates in atherosclerosis and heart attack

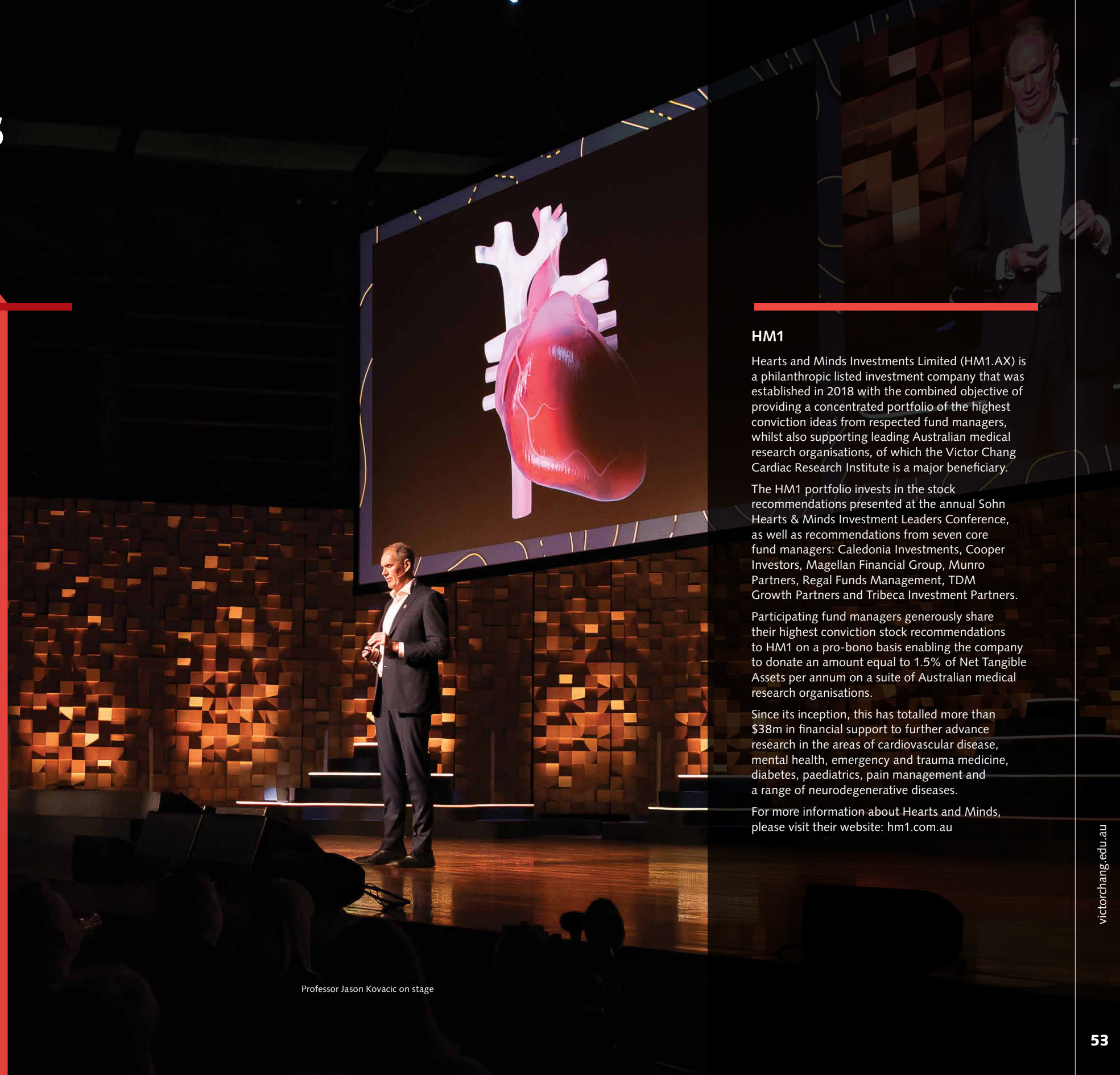
later in life. By analysing baby teeth, the team will tap into a wealth of biological information that will inform about early life behaviour and exposures and help reveal how these factors impact heart health.

The event also saw an astonishing \$2.3 million pledged in just minutes by 10 leading investors and companies, including the Lew Foundation and Regal Partners. The funds raised will benefit a range of Australian medical research organisations, along with the Institute.

As always, the stock picks presented on the day will become part of the investment portfolio, Hearts & Minds Investments Limited (HM1), which supports Australian medical research. This could not happen without the expertise of selected fund managers, including Ricky Sandler of Eminence Capital, Joyce Meng of FACT Capital, Jun Bei Liu of Tribeca Investment Partners, Anthony Aboud of Perpetual, Nick Griffin of Munro Partners and Peter Cooper of Cooper Investors.

Professor Jason Kovacic said: "The incredible generosity demonstrated at this year's event will enable us to develop our bold visions, none more so than our latest study, which we hope will help us prevent heart attacks from early life.

"It was very heartening to see so many investors moved to dig deep into their pockets to fund research that will benefit many generations to come."



Professor Jason Kovacic on stage

HM1

Hearts and Minds Investments Limited (HM1.AX) is a philanthropic listed investment company that was established in 2018 with the combined objective of providing a concentrated portfolio of the highest conviction ideas from respected fund managers, whilst also supporting leading Australian medical research organisations, of which the Victor Chang Cardiac Research Institute is a major beneficiary.

The HM1 portfolio invests in the stock recommendations presented at the annual Sohn Hearts & Minds Investment Leaders Conference, as well as recommendations from seven core fund managers: Caledonia Investments, Cooper Investors, Magellan Financial Group, Munro Partners, Regal Funds Management, TDM Growth Partners and Tribeca Investment Partners.

Participating fund managers generously share their highest conviction stock recommendations to HM1 on a pro-bono basis enabling the company to donate an amount equal to 1.5% of Net Tangible Assets per annum on a suite of Australian medical research organisations.

Since its inception, this has totalled more than \$38m in financial support to further advance research in the areas of cardiovascular disease, mental health, emergency and trauma medicine, diabetes, paediatrics, pain management and a range of neurodegenerative diseases.

For more information about Hearts and Minds, please visit their website: hm1.com.au

Genomics, Diversity & Equity



Delegates from around Australia and the world gathered at the annual Sydney Cardiovascular Symposium – a partnership between the Victor Chang Cardiac Research Institute and the Heart Research Institute.

This year's theme was **'Genomics, Diversity, and Equity: Ensuring Benefit for All.'**

One of the highlights included the Princesses' Lecture, which saw Professor Alex Brown outline the objectives of the new National Indigenous Genomics Network.

The symposium held at The Garvan Institute of Medical Research also provided early and mid-career researchers with an opportunity to showcase their work.

Highly commended EMCR flash talk:
Dr Chai Ng (VCCRI)

Winning student flash talk:
Bailey Walker (VCCRI)

People's choice poster:
Isobel Waugh (VCCRI)

Heart of the West fundraiser

More than \$60,000 was raised for the Institute at Club Marconi's Heart of the West fundraising extravaganza in November.

Professor Jason Kovacic said it was fantastic to finally have the opportunity to meet Club Marconi supporters after the COVID-19 hiatus, with almost 400 guests turning up for the event.



Our partnership with Club Marconi continues to grow and strengthen. As Australia's national heart research institute, it's vital that we ensure we meet the needs of every community in the country.

Professor Kovacic

"Heart disease does not discriminate, and I am so pleased that Club Marconi recognises this and helps us raise much-needed funds to tackle Australia's biggest killer."

Professor Kovacic paid particular thanks to Club Marconi President Morris Licata, Club Marconi Board Director Frank Oliveri and all its board members, and Doltone House's Paul Signorelli for hosting the stunning event.

Over the years Club Marconi has raised a staggering \$560,000 for the Institute.





Heartstrong women

It was fantastic to see and hear from so many incredible women at our annual Women Against Heart Disease Lunch held at Establishment in Sydney in September.

It was a chance to be reminded that whilst heart disease is the number one killer of Australian women, it is too often misdiagnosed, overlooked, or even ignored.

MC for the day was Sky News anchor, Jaynie Seal, who was joined by guest speakers Marie Domingo, Heather Turland and Victoria McGee.

Marie shared how she had dismissed her symptoms before suffering heart failure days after giving birth. Heather spoke about how she had a SCAD heart attack while swimming off Bondi Beach but ignored the warning signs. And Victoria shared her experience of being misdiagnosed for years before needing a heart transplant at the age of 32.

The Institute's Professor Jason Kovacic also spoke about the urgency for more research and funds into women's heart disease.

For the first time in the event's history, raffle tickets sold out – with incredible prizes generously donated by Cockatoo Grove, Park Hyatt Sydney, Carla Zampatti, Hair Angel, Bidinis, Catalina, Gunners Barracks and Belvoir St Theatre.

Along with being an important annual fundraiser for the Institute, the Women Against Heart Disease Lunch is an opportunity to ensure women are aware of what they can do to protect and improve their heart health.

Guests were educated about the symptoms of heart disease and our Victor Chang Heart Health Check team were also in attendance – providing cholesterol, blood pressure and blood sugar testing.

Main image: MC Jaynie Seal, Marie Domingo, Victoria McGee and Heather Turland



COVID-19 impact on heart health

The vital importance of the Victor Chang Heart Health Check service was demonstrated again last year.

Nearly half of Australians undergoing our specialist Heart Health Checks had test results outside of the healthy range.

The Heart Health Check specialist team, which conducts a mobile testing service across Australia, found total cholesterol, blood sugar, and blood pressure levels were all significantly higher since the start of COVID-19.

Since March 2020, the number of people having at least one test result outside the healthy range increased from 33% to 49%.

Victor Chang Cardiac Research Institute Program manager Anastasia Dounas said the results demonstrated the COVID effect was real and a huge concern. "People undergoing our heart health checks told us that COVID had a big effect on their health and lifestyles. They got out of the habit of going to the gym during lockdown and ate and drank more because they were worried and stressed, leading to weight gain," said Ms Dounas.

"Working from home also led to less incidental exercise and the fear of COVID saw more people choosing to drive to work than catching public transport which resulted in people taking fewer steps each day. That all adds up."

Last year 2792 people across Australia had their blood pressure, total cholesterol, and blood sugar levels tested by our specialist team.

We would like to thank our partners including the Walker Corporation, Wesfarmers, April Group, 580 George, the Hills Shire Council and the Heartbeat of Football & IMB Bank Community Foundation.

Their support allowed us to conduct lifesaving tests in NSW, Victoria, Western Australia, Queensland, and South Australia.



Celebrating excellence at the Victor Chang School Science Awards

171 bright young minds were highlighted for their passion for Science, Technology, Engineering, and Mathematics (STEM) at this year's Victor Chang School Science Awards.

More than 100 schools from across NSW – including Sydney, Tweed Heads, Broken Hill, and Albury – and Western Australia took part in the awards.

Award ceremonies were held in Blacktown, Campbelltown, and North Sydney, recognising the achievements of students who took part in the annual event.

The awards aim to foster an interest in science and inspire young Australians to pursue a career in research.

Blacktown City Mayor Tony Bleasdale OAM said: "I am very proud of all the students from schools in our city who work hard in science and are setting the foundations to be part of the next generation of Australian researchers."

““““

Children are naturally curious, and we need to encourage students across the country to embrace science and understand just how important STEM skills can be in critical thinking, problem-solving, and creativity.

Professor Jason Kovacic



Left: Blacktown School Science Awards ceremony

Financials

For the year ended 31 December	2022	2021
	\$	\$
Income		
Research Grants	\$16,278,903	\$15,237,277
Innovation Centre Grant	\$1,677,460	\$1,677,460
Donations and Fundraising	\$12,888,390	\$11,912,419
Investment and Other income	\$1,676,816	\$1,183,838
Total income	\$32,521,569	\$30,010,994
Expenses		
Research expenses	\$20,265,630	\$17,674,435
Administration expenses	\$7,535,286	\$7,119,494
Fundraising expenses	\$2,338,588	\$2,108,279
Total Expenses	\$30,139,504	\$26,902,208
Operating Surplus	\$2,382,065	\$3,108,786
Non Operating income/(expenses)		
(Losses)/Gain on revaluation financial assets	(\$2,162,397)	\$2,644,362
Net Surplus before Government Subsidies	\$219,668	\$5,753,148
Government Subsidies	-	\$36,906
Net Surplus for the year	\$219,668	\$5,790,054

Comparative figures have been adjusted to conform with changes in presentation for the current year.

This data is an extract from the 2022 audited Financial Statements. The extract does not include the information normally included in the financial statement. Accordingly, this extract is to be read in conjunction with the audited Financial Statements for the year ended 31 December 2022.

Our Board of Directors



Mr Matthew Grounds AM
Chairman



Mr Hamish Douglass



Dr Gary Weiss AM



Mr David Craig
Deputy Chairman



Ms Jennifer Doubell OAM



Professor Vlado Perkovic



Professor Jason Kovacic
Executive Director



Ms Eileen Hoggett



Ms Elizabeth Gaines



Mr Peter K Allen



Mr Shangjin (Jin) Lin



Adjunct Professor
Anthony Schembri AM

For more about our organisational structure visit:
victorchang.edu.au/about-us/our-structure

Supporters and Acknowledgements

The Victor Chang Cardiac Research Institute would like to thank every one of its supporters. Our research would not be possible without your incredible generosity.

THE ROBERT M GRAHAM CHAIR IN MEDICINE

- The Douglass Family

The Simon Lee Foundation

The Lowy Family

The Oatley Family

The Ritchie Family

The Johnson Family

The Vidor Family

The Gutman Family

Mr & Mrs Jacob & Enis Mamutil

The Selig Family

Mr Matthew Grounds, AM

Mr David Gyngell

Mr Richard Elmslie & Ms Leslie Tilly

Mr & Mrs Paul & Valerie Ferry

Mr Stephen Johns

Navarra Venues

Mr John Kean, OAM
- Chain Reaction Challenge Foundation

Citigroup

Commonwealth Private Bank

Consolidated Press Holdings Ltd

Crown Resorts Foundation

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Lowy Packer Building, 405 Liverpool Street
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T (+61) 02 9295 8600
E info@victorchang.edu.au
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S @VictorChangInst

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