



Victor Chang
Cardiac Research Institute

THE BEAT

Through heart surgery, Dr Victor Chang was able to save hundreds of lives. But he knew that through research, he could save millions.



Chris on his first tentative return to the water after his heart attack.

"IT HIT ME OUT OF THE BLUE, IN MORE WAYS THAN ONE."

You're helping to tackle Australia's single greatest cause of death

Surfing on the Central Coast of NSW on his 60th birthday, Chris Hewgill was dumped from his board in rough waves and briefly knocked out by his beloved surfboard.

As he felt himself sinking into the churning water, he felt like he'd been hit by a freight train. "My arm felt like concrete," he remembers.

He thought he was dying. And he was. He was having a heart attack. But he was determined that his body would be found.

It took Chris 15 minutes to drag himself to shore, frequently blacking out and getting tumbled around by the heavy surf.

Chris was found to have hardening of the arteries (atherosclerosis), the biggest cause of heart attack, stroke and death in Australia.

It is caused when plaque, the build up of cholesterol on the inside of the arteries,

suddenly breaks off the wall of an artery. This causes a massive blood clot which blocks the flow of blood to the heart itself. Plaque is frequently caused by high blood pressure, high cholesterol and smoking, but also occurs in people who have none of these triggers.

The scary thing is that these blockages can develop without you ever feeling a thing, which is why atherosclerosis is often referred to as the 'silent killer'.

With the help of supporters like you, Professor Roland Stocker and his team of 15 researchers are trying to work out what

goes wrong in the blood vessels, how they become diseased, and how the process of atherosclerosis can be stopped, and, importantly, which plaque is likely to break off and cause a heart attack as opposed to remaining fixed and not causing problems.

They're focusing on developing a test to identify dangerously unstable plaque, so it can be treated before causing heart attack or death.

It's a complex project that has to overcome many hurdles, but its ultimate goal is to prevent and reduce deaths from heart attacks. That's why support for this work is so important.

Atherosclerosis may be happening in anyone. The heart attack that hit Chris occurred completely out of the blue. As he described it, "I was never sick, I was bloody bulletproof, how could this happen to me? Little did I know that the stress of my work, coupled with genetic heart issues meant the surf accident was just the trigger for my heart attack"



Heart attack survivor Chris Hewgill is happy to be alive.



Cardiovascular disease
kills more people
than ANYTHING else
in the world



Cardiovascular disease is
Australia's single
biggest killer



2 OUT OF 3
families are affected by
cardiovascular disease

INNOVATION & DISCOVERY



Could this fish help us
one day regrow our
own damaged organs?

COULD OUR DAMAGED HEARTS REPAIR THEMSELVES?

You (and these zebrafish) are helping to find out



Thank you for supporting
the groundbreaking work
of Dr Kikuchi's team.

Imagine if your body could repair damage to your heart,
spinal cord and even your eyes if they are injured.

With your help, scientists at the Victor Chang Cardiac Research Institute
have found for the first time that a special population of cells in a tiny
tropical fish called zebrafish, can do exactly that.

It's a world first discovery that could eventually show us how this could
be achieved in humans.

Zebrafish have a special type of immune cell known as regulatory T cells.

Until now, it was known that these cells were important to the immune
system, but no one had discovered that they enabled a zebrafish to
regenerate its heart, spinal cord and retinal tissue.

The Victor Chang Institute's lead investigator on this project, Dr Kazu
Kikuchi explained that, "By examining how this type of regulatory T cells are
able to regenerate and work properly in zebrafish, we're now able to work
backwards and see what's happened in evolution that doesn't allow humans
to do this". (Please note: the zebrafish are not harmed in this process.)

"If we can manipulate human T cells to cure heart disease, repair vision loss
and reverse spinal cord damage, the implications are likely to be huge... this
is the exciting part for the future".

"We believe we can learn a lot from zebrafish because if we understand
how their cells transform, we may be able to encourage regeneration in a
human heart." Dr Kazu Kikuchi.



42 babies
are born with a heart
defect every week



13 Australian
men
die every day of a heart attack



11 Australian
women
die every day of a heart attack

RESEARCH UPDATE

Searching for the right pieces – in a 6 million piece puzzle

Together we're tackling lethal congenital heart diseases at the genetic level.

Somewhere in the 6 million pieces of code that make up the human genome lies a mutation that causes babies to be born with Hypoplastic Left Heart Syndrome (HLHS) – a condition where the left side of the heart does not form correctly.

The challenge is to find these mutations.

It's like searching for a needle in a haystack.

Professor Richard Harvey, is working in collaboration with the Victor Chang Institute's Professor Sally Dunwoodie, as well as Professor David Winlaw from the Children's Hospital at Westmead. With the support of wonderful people like you, they have already found one particular gene variant that may

cause disease, and what's called a 'common gene expression signature' for HLHS.

The goal is to prove that a particular gene variant can cause HLHS, and to develop a diagnostic DNA test for serious heart diseases, such as HLHS.

Anxious parents will get better and earlier information, and the findings may also support better results from treatments.



HLHS is fatal without treatment. Of those who receive treatment, around half survive until the age of 18.



Professor Richard Harvey is investigating the genetic mutations that cause specific congenital heart diseases.

NEWS



Important new cause of birth defects found

Cellular stress during embryo formation – a cause of many types of birth defects

In an important breakthrough, our scientists believe they've discovered a cause of multiple types of birth defects triggered by environmental stresses.

Victor Chang Institute scientists have discovered that cellular stress very early in embryo formation could be the key to understanding why many babies are born with defects of the heart, vertebrae and kidney, among others.

It happens when an embryo is no bigger than the head of a pin. Organs like the heart are beginning to form. But if the cells creating the heart are subject to stress, they stop producing proteins. If the proteins aren't available to make the heart at this critical time, then the heart can't develop properly.

"We discovered that low oxygen levels trigger a stress response in the embryonic cells," says Professor Sally Dunwoodie. "But that is not the only cause."

"There are multiple factors which can set it off, such as a viral infections, increased temperature, high blood sugar, poor nutrition, and pollution."

Every parent of a child with a birth defect wonders what could have caused it. Now, we are closer to knowing.

With your help ...

2017

Victor Chang Institute scientists make a double pregnancy breakthrough which has the potential to prevent recurrent miscarriages and various birth defects globally using vitamin B3.

2015

Our scientists discover how to limit the damage to the heart after a heart attack, which could help 55,000 Australians who suffer a heart attack each year.

2014

Using a virtual heart we develop a more reliable way of predicting sudden cardiac death, which kills 25,000 Australians each year.

OPEN UP YOUR HEART

Being a **One Heart** supporter is a powerful way to contribute to ending heart disease.

"I do it for my sister Susan. It's the best way I can help someone else."

Sisters Gillian and Susan were close. They always met for lunch at least once a week. Then one day, Susan went home early after not feeling well, and died alone of a heart attack with no warning. She was only 62.

"I was devastated," says Gillian. "Susan wasn't just my sister – she was my best friend. I still miss her every day."

"I felt the need to do something useful, so I became a One Heart supporter with the Victor Chang Cardiac Research Institute by making a regular gift every month from my credit card."

"It's really easy. It took me only a few minutes to set up and I am reassured knowing I am doing something substantial about ending heart disease."

You can join Gillian as a One Heart supporter online at www.victorchang.edu.au/oneheart or by calling 1300 842 867.

SPOTLIGHT ON

Euan and Ella Kenny did everything they could to save their Dad.



Huge Roosters fans, Ella and Euan loved the chance given to them by the Victor Chang Institute to meet their heroes.

On 24 February 2017, 11 year old Ella Kenny and her 10 year old brother Euan woke up to a silent house to find their Dad still in bed. They couldn't wake him. Even tickling his toes didn't work.

They texted their mother who was out running; "Mum, Dad's not breathing you need to come now".

The clear-thinking children then called 000. Under the guidance of Control Centre Operator Kerrie Petz, the children performed CPR on their Dad.

They needed to get him off the bed and onto a hard surface but they were worried he'd bang his head. But they kept their cool and together they dragged their father off the bed and started chest compressions, continuing until paramedics arrived.

Sadly, in spite of their valiant efforts, Euan and Ella's father, Kieran Kenny, died of a heart attack. He was only 47 years old.

Ella and Euan were amongst 26 recipients of the Victor Chang Institute's Heart of Gold Awards, an annual event that recognises individuals who have demonstrated great courage and composure in the face of crisis, pain or grief – in an effort to prevent death or irreversible damage to the heart.



There are various ways you can support vital cardiac research. You can choose to become a **One Heart Supporter** by making a regular monthly gift, hold a fundraising event, organise donations in lieu of presents or even leave a Bequest to the Victor Chang Institute in your Will. To find out more please visit our website at www.victorchang.edu.au or phone our Donor Care Coordinator on (02) 9295 8759.

10%

chance of survival if
your cardiac arrest is
outside a hospital

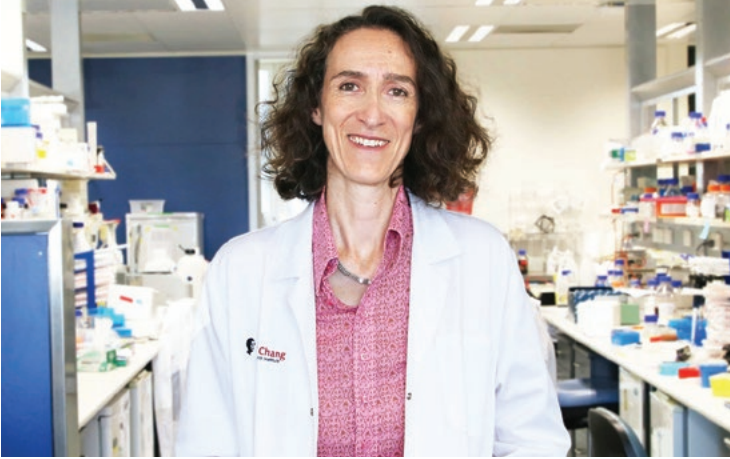
90%

chance of survival
if your heart attack
occurs in a hospital



10 minutes
how often an Australian
has a heart attack

RESEARCHER PROFILE



Some heroes wear capes. Others wear lab coats.

Professor Sally Dunwoodie

"I always knew I wanted to be a scientist," says Professor Sally Dunwoodie.

Sally heads up the Embryology Laboratory at the Victor Chang Cardiac Research Institute.

She's dedicated her life's work to helping babies born with heart defects, and works at the frontier of genetic coding as head of the largest Australian genome sequencing initiative in congenital heart disease.

Professor Dunwoodie established and leads a Congenital Heart Disease research program supported by Chain Reaction, which aims to discover the genetic and environmental causes of heart defects, family by family, with the promise that genetic diagnosis of birth defects will become routine.

In August 2017 it was announced that Sally and her team had identified in some families a new cause of recurrent miscarriages as well as heart, spinal, kidney and cleft palate abnormalities in their babies..

At the same time the team identified a promising preventative solution in the form of *vitamin B3*, also known as niacin.

The cause of 80% of birth defects is unknown, which makes this research particularly important.

This discovery could change the way pregnant women are cared for around the globe and may well be among Australia's greatest ever medical advances in pregnancy research.

In recognition of her work, Sally was awarded the 2017 NSW Premier's Prize for Excellence in Medical Biological Sciences.



Professor Sally Dunwoodie has
dedicated her life to finding a cure
for congenital heart disease.



Happy New Year

Chris Hewgill, the Nambucca Heads gentleman featured on the cover, is a very lucky man.

Only 1 in 10 people who have a cardiac arrest outside a hospital survive, compared to 9 out of 10 who do survive if they're in hospital when it happens.

Atherosclerosis, which is what Chris has, is the number one cause of heart attacks.

Chris is a telling example of exactly why your support for the work of the Victor Chang Cardiac Research Institute is so important – and so urgent.

We must end heart disease. That's our vision, our mission and our goal.

And with your help, we are making progress.

Professor Sally Dunwoodie's double pregnancy breakthrough and our exciting next steps in this vital research towards preventing congenital heart disease, with something as simple as adequate Vitamin B3 in the earliest stages of pregnancy, may change the treatment of pregnant woman around the world.

You helped do that.

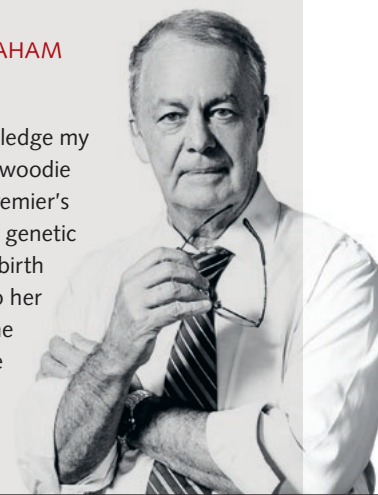
Professor Harvey's research into the causes of birth defects is a major world first, and Dr Kazu Kikuchi's work with the special immune cells in zebrafish could lead to a revolution in the future in the restoring damage organs.

We can't do it without our generous supporters. It's going to take a team effort so thank you from all our scientists and researchers, and the children, parents, siblings, friends and family who benefit from this work.

Wishing you a happy and healthy 2018.

PROFESSOR ROBERT M GRAHAM
EXECUTIVE DIRECTOR

PS I'd like to specially acknowledge my colleague Professor Sally Dunwoodie for winning the 2017 NSW Premier's Prize for her research into the genetic and environmental causes of birth defects. It's a fitting tribute to her and her team, and to everyone who supports the work of the Victor Chang Institute.





Dates for your Diaries...

FRIDAY 9 FEBRUARY, 2018

The Bay Soirée 2018

Location: On the beach, Watsons Bay Boutique Hotel

Time: 6:30pm – 9:30pm

Cost: \$250 per person including GST

Master of Ceremonies: Todd McKenney

FRIDAY 17 AUGUST, 2018

Women Against Heart Disease Lunch 2018

Location: Shangri La Sydney

Time: 12noon – 3:00pm

Cost: \$180 per person including GST

SAVE THE DATE – 2018 BAY SOIREE

Don't miss out on the 2018 Bay Soiree

Fancy a three course gourmet feast on the beach prepared by the Watson's Bay Boutique Hotel, accompanied by champagne, cocktails and premium wines. And at the same time raise support for the next generation of cardiovascular researchers.

Tickets are selling fast and places are limited so buy your tickets now at www.victorchang.edu.au/bay-soiree and be part of this very special evening.



Supporters enjoying the 2017 Bay Soiree, which was hosted by Todd McKenney.

JOH BAILEY LA DOLCE VITA LUNCH

Celebrating the sweet life

La Dolce Vita, loosely translated as 'the sweet life' is a perfect description of the new Victor Chang Institute event to raise funds for vital research into heart disease in women.

Held at Bar Machiavelli in Rushcutters Bay in Sydney on 24 November 2017, guests were treated to a gorgeous three course lunch, hosted by Kerri-Anne Kennerly.

The event was generously presented by Joh Bailey, famously known as 'hairstylist to the stars'.

Our heartfelt thanks go out to everyone who attended and the organisers; Joh Bailey, Marilyn Koch (whose father's life was saved by the late Dr Chang), Carla Farah and Kate Sorrenti.



Thanks to everyone who supported La Dolce Vita 2017. Pictured Joh Bailey, Marilyn Koch, Hoda Waterhouse and Carla Farah.

An extraordinary \$98,000 was raised, showing that when a small group of committed people want to make a change in the world, they can.

Thanks again to everyone involved.

CHAIN REACTION 2018



A huge thanks to Chain Reaction riders raising funds for research into heart diseases affecting children.

1,000 km in 7 days for sick kids

There are many ways to help end heart disease, and the Chain Reaction Challenge is one of them.

The event raises money for sick children by challenging senior executives with a passion for cycling and an awareness of their corporate social responsibility to ride a 1,000km course in 7 days.

The Victor Chang Cardiac Research Institute is proud to be a beneficiary.

Cyclists from the Chain Reaction NSW ride have raised over \$2.3million for Victor Chang Institute researchers since 2012. The 2018 ride takes place from 7th to 13th April, around Adelaide.

For more information or to register for the ride visit:
www.chain-reaction.org.au

All event enquiries:
Events Coordinator
events@victorchang.edu.au
or (02) 9295 8761.

A BIG THANKS TO HEARTS & MINDS

\$3 million dollars were raised for investment in vital medical research by the Sohn Australia Hearts & Minds Investment Leaders Conference in November 2017.

The funds were shared between four organisations, including the Victor Chang Institute.

Special thanks to the speakers who graciously supported the conference, major partner Commonwealth Bank of Australia, Mr Len Ainsworth, the Paul Ramsay Foundation, Sky News Business & Fairfax Media.

The Hon Malcolm Turnbull, Prime Minister of Australia addressing guests at the 2017 Hearts and Minds Investment Leaders Conference.

