



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.



Scott Kesteven, pictured here with his wife Susan and daughters, Ruby, 16, and Olivia, 18, is grateful to every person who has ever given to heart research

“THANK YOU FOR HELPING TO BRING ME BACK FROM THE DEAD”

Last September, Scott Kesteven, 55, woke up with nausea and a pain that felt like a hot tennis ball in his chest. He knew what it meant. It's his job to know - he's an expert in heart function at the Victor Chang Cardiac Research Institute. But despite going immediately to hospital knowing it was a heart attack, Scott still suffered a sudden cardiac arrest on the operating table.

Scott Kesteven thinks you might have helped bring him back from the dead.

You see 30 years ago, without recent heart research and the advanced techniques now being employed to diagnose and treat heart attacks, Scott may well have died, or at least been severely disabled for the rest of his life.

Medical advances of this magnitude couldn't be made without people like you who give to heart research. Thank you.

Scott was the victim of a silent killer – atherosclerosis or “hardening of the arteries” – a creeping build-up of plaque in one or more of the key arteries going into the heart. 1 in 4 people presenting with heart attacks have no apparent risk factors and as a super fit athlete who rides more than 250 km a week, Scott definitely fell into this mysterious category.

“When my heart stopped pumping,” said Scott, “There were no bright lights, doors or angels. I felt incredibly euphoric. The pain and extreme nausea I was suffering disappeared.”

“Moments later they hit me with the

defibrillator and all the agony and nausea came flooding back.”

“I went from being blissfully unconscious and euphoric to extremely agitated and in pain.”

“But I was alive.”

Heart disease kills more Australians every year than any other disease, with heart attacks alone claiming the lives of 8,600 Australians every year.

Professor Roland Stocker and his team at the Victor Chang Cardiac Research Institute are, with your help, delving deep into the causes of heart disease, particularly atherosclerosis.

One project the team is looking into is the



Professor Roland Stocker, Head of the Vascular Biology Division is leading a team looking into atherosclerosis, the major cause of heart attacks.

role of Coenzyme Q10, which every cell in the body needs for energy. For some reason, there is more Coenzyme Q10 in the heart than in any other part of the body, so it may well hold some secrets that open up new research paths.

This is just one of a series of research projects you're helping to fund. The goal is to find out more about the way the heart functions to try to identify new ways of preventing, predicting and treating heart disease.

Thankfully, Scott survived to go home to his wife Susan and daughters Ruby, 16, and Olivia, 18, who are both very relieved to have their father back.

'I thank my lucky stars every day that Dad survived. I know others aren't so fortunate, so our family is feeling really blessed,' Ruby said.

After just a week of recovering, Scott has returned to work explaining that his research has taken on a whole new meaning now and he feels even more driven than before to unlock the mysteries of heart disease.



Cardiovascular disease
kills more people
than ANY other disease
in the world



Heart disease remains the
single biggest killer
OF ALL AUSTRALIANS

20,000

Australians suffer a cardiac arrest
outside of hospital every year.

INNOVATION & DISCOVERY



Professor Sally Dunwoodie

WHY ARE SO MANY BABIES BORN WITH HEART DEFECTS?



Professor Sally Dunwoodie and her team have discovered that short term oxygen deficiency during pregnancy can affect the development of the heart and other parts of the body.

For the first time, scientists believe they've discovered that multiple types of birth defects can be triggered by environmental stresses.

Every expectant parent wants to have a healthy baby, but 1 in 100 are born with a heart defect.

It's the most common form of birth defect in the world. But the genetic and environmental components have been very poorly understood.

Now, in an important breakthrough, scientists at the Victor Chang Institute have found that cellular stress could be the key to understanding why many babies are born with defects of the heart, vertebrae and kidney, among others.

The research, led by world renowned, Professor Sally Dunwoodie, analysed the effects of short-term oxygen deficiency on heart development in an embryo.

"We obviously know that smoking is terrible for an unborn baby's health. But oxygen deficiency in an embryo can be caused by many things, like anaemia, a tangled cord, carbon monoxide, certain drugs and various other factors," says Professor Dunwoodie.

Professor Sally Dunwoodie is the head of the Victor Chang Institute's Embryology Laboratory.



Every year around **45,000** Australians suffer a heart attack. That's one every **12 minutes!**

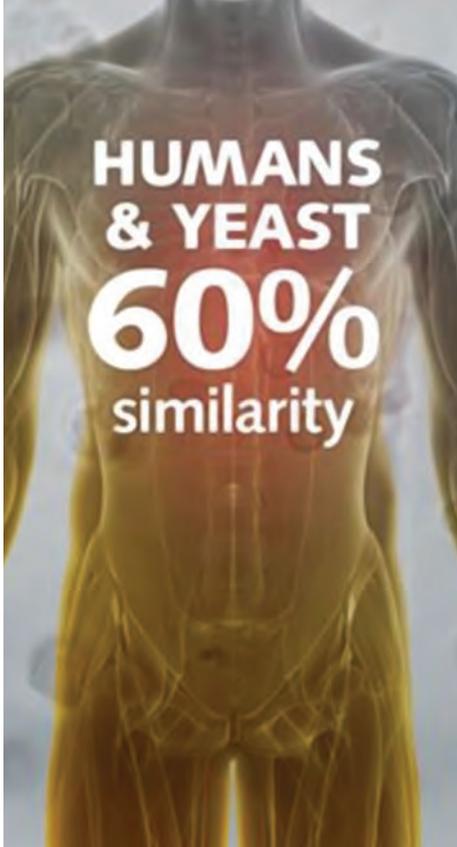


42 babies are born with a heart defect every week.



50 Australian women have a heart attack every day

RESEARCH UPDATE



Could humble yeast cells tell us how to stop your heart weakening with age?

With help from kind supporters like you, brilliant young scientist, **Dr Anita Ayer**, is studying yeast cells to better understand how our own cells work, so that the information can be used to develop new treatments.

Believe it or not, yeast cells and human cells have about 60% of their genes in common.

That's why cell biologist, Dr Anita Ayer, is analysing yeast cells – so that she can develop simple models for investigating the effect of certain changes, like removing a gene.

“It's only when you know how something is regulated in a cell, such as Coenzyme Q10, that can you then work out how to make a therapy from it.”

Coenzyme Q10 is an important fat used by all cells but especially the heart, for energy

production. But as you age, less is made by your heart cells.

Although there are tablets of Coenzyme Q10 available, it is absorbed very poorly (about 1-2%) and most of it is simply wasted.

Dr Ayer is using a yeast model to better understand how to increase Coenzyme Q10 production to protect the heart from weakening.

This kind of deep level research is unlikely to attract either commercial or government funding, as cells can't be patented, and it can't be demonstrated that there is a direct application to disease.

That's why your gifts to the work of the Victor Chang Cardiac Research Institute are so critical. Without you, this basic research, which may only yield breakthrough outcomes in years to come – might never be done. And it could be the source of extraordinary new knowledge.

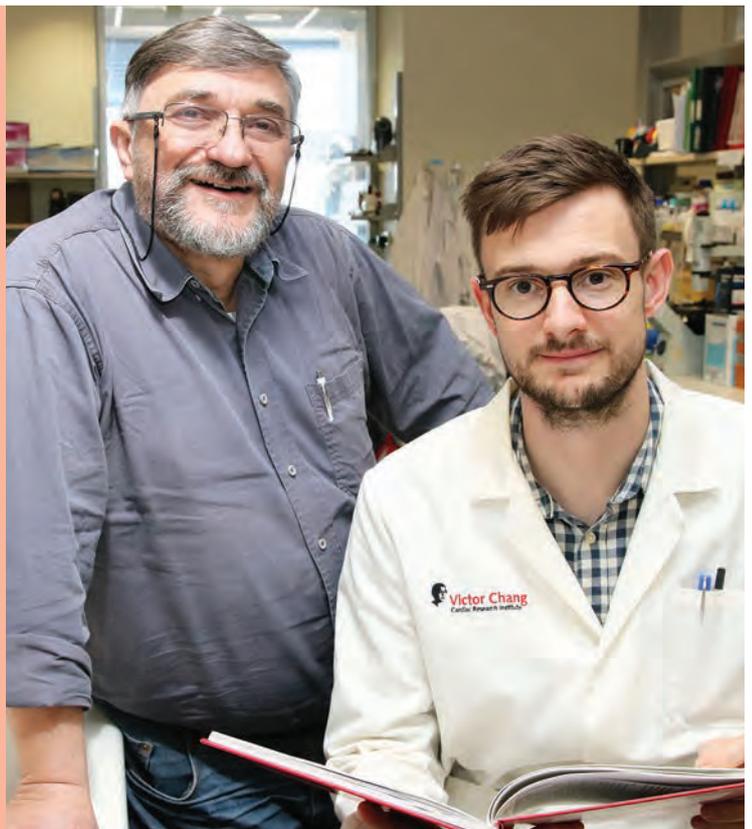
NEWS

Scientists Discover How Protein Senses Touch

Professor Boris Martinac, head of our Mechanosensory Biophysics Laboratory, and Dr Charles Cox, (pictured), have collaborated with scientists at The Scripps Research Institute in California, to discover how a unique protein, is directly responsible for sensing touch.

The mechanism of how this specific protein senses things like touch or blood flow, is very old and most likely goes back some 4 billion years to the very beginnings of life on our planet. Similar proteins can be found in bacteria. These proteins also sense mechanical stretch caused by differences in water pressure outside and inside bacterial cells in the very same way.

These new findings suggest that this protein has a “built-in” sensor. It responds not only to touch, but it also monitors the flow of blood in our arteries. This breakthrough could help design better pain medications and future therapies for blood disorders, high blood pressure and more.



With your help ...

2016

Victor Chang Institute scientists have found powerful evidence, that dad's nutrition and metabolic health can influence his sons, and even his grandsons.

2016

For the first time, Victor Chang scientists believe they've discovered that environmental stresses can cause birth defects.

2016

In a world first breakthrough, scientists at the Victor Chang Institute might now be able to prevent the onset of a deadly heart condition that has haunted a family of more than 50 for decades.

OPEN UP YOUR MIND

School Science Awards: Helping to protect and preserve the field of science.

Last year, 235 bright, young Year 11 students were commended for excelling in science and presented with a Victor Chang School Science Award at local ceremonies across NSW.

The awarded students demonstrated the highest level of educational achievement, innovation, and creativity in their science class in 2016. Winners were selected by the school, in conjunction with representatives from the school's local municipal council or the NSW Department of Education.

The award has been developed to foster and encourage an interest in science among secondary school students. The Victor Chang Institute is committed to promoting science in the broader community and believes that in order for Australia to be at the forefront of innovation and medical advancements, we need to encourage our young people to pursue science.

The importance of these awards comes at a critical time. Since 1992, there has been a steady decline of students choosing to study science in their senior years.

To honour the students and encourage further study, a number of our leading scientists attended ceremonies to congratulate the winning students and share their insights into why they should consider studying science.

"The best part about having a career in science is that it allows you to contribute newly discovered knowledge to the world, which can directly better society," said our Executive Director, Professor Robert Graham.

Congratulations to all of our incredible 2016 School Science Award winners!



Dr Ralph Patrick (centre) with students from Wollongong receiving 2016 Victor Chang School Science Awards.

SPOTLIGHT ON

Would you like to make a difference in the 'myheart' campaign?



Help raise awareness of heart disease by sharing your story like Mel



February is **Heart Month**, the perfect opportunity to increase awareness of heart disease. You could help save lives.

Celebrated annually in February, Heart Month is dedicated to raising awareness about cardiovascular disease in Australia. In honour of this special event, every day in the month of February, the Victor Chang Cardiac Research Institute plans to profile a different person living with heart disease, through Instagram, Facebook and Twitter.

The goal is to raise awareness of heart disease. More and more people with no risk factors are presenting with heart problems including fit, athletic men, like our very own scientist, Scott Kesteven (see cover story), as well as relatively young and seemingly healthy women. Also 1 in 100 babies are born with a heart defect.

If more people read personal stories about heart disease, it can inspire and comfort others in a similar situation. It can even help them learn what to look for and precautions they can take that might help. In this way, your story might even save someone's life!

If you or someone you love has been affected by heart disease and would like to be part of the Victor Chang Institute's February 'myheart' campaign, please get in touch at myheart@victorchang.edu.au.

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 or 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.





If you have a cardiac arrest outside of a hospital, you have a chance of survival

10%

Congenital heart disease

is the most common form of birth defect



The first 3-5 minutes

of a cardiac arrest holds the key to survival

RESEARCHER PROFILE



Our Heart Hero

Name: **Prof. Robert Graham**

Faculty: **Head of Cardiac Receptor Biology Laboratory**

There are an overwhelming number of Australians suffering from coronary heart disease – 1.2 million people to be exact. There's also an overwhelming lack of solutions to help these people when their hearts begin to fail. This terrible disease kills one Australian every 26 minutes!

On top of his role as Executive Director, Professor Graham heads the Molecular Cardiology and Biophysics Division at the Victor Chang Institute. He is also a practicing cardiologist who, after decades of experience, has become the go-to doctor on the most complex of cases.

Professor Graham started researching stem cells and cardiac regeneration after witnessing the limited options available to hospital patients suffering from severe coronary heart disease. For these patients, time was sadly not on their side and Professor Graham felt compelled to dedicate his research to the cause.

Recently his team made a breakthrough that has overturned more than a century of scientific dogma. Previously it was believed that soon after birth heart muscle cells lost their ability to divide and make new cells, limiting ability of the heart to repair itself after an injury, such as a heart attack. But scientists at the Victor Chang Institute have discovered that heart muscle cells retain the ability to make new cells until at least just before they become an adolescent at 10-11 years of age. At this very important time heart muscle cells actually increase by more than 40 percent, and the ability of the heart to recover after injury is remarkably enhanced.

The implications of our findings could be huge! It may give us a significant window of opportunity to repair the hearts of babies born with heart defects, or even to reactivate heart muscle cells damaged after a heart attack in adults. That's also good news for the millions of Australians suffering from coronary heart disease. The next step is to build on this discovery to buy these patients a little more time with their loved ones.

Given this wonderful discovery, it's no surprise that Professor Graham was honoured with the Ministerial Award for Cardiovascular Research Excellence in 2016, presented by the Hon Pru Goward. This Award recognises and celebrates the dedication and achievements of NSW's most gifted senior cardiovascular disease researchers and clinicians.



Welcome

Happy New Year! I have a good feeling about 2017. Life at the Victor Chang Institute is (as always) busy! We are growing bigger and stronger every year; we now have almost 200 dedicated scientists working across our 22 laboratories. That means there are even more life-changing discoveries on the cards, as we build on our extensive achievements from last year.

In 2016 we discovered how obesity can be passed from generation to generation, putting children at risk of developing metabolic disease. It's believed the breakthrough could have immediate ramifications for the public's health, with more than 14 million Australians now overweight or obese.

In another breakthrough we also managed to pinpoint the genetic mutation in a family suffering from a genetic form of excessive heart enlargement (dilated cardiomyopathy), which causes the heart to fail. Previously the family didn't know who would develop the terrible disease, but now we can tell who is at risk, just from their DNA. That means early intervention!

And that's just two of the blockbuster breakthroughs from last year...

In this newsletter, you'll also read a powerful story about one of our senior heart researchers, Scott. He almost died at the breakfast table. I hate to think how close we came to losing one of our own. But it has brought our team closer together and made us even more dedicated to finding cures for heart disease.

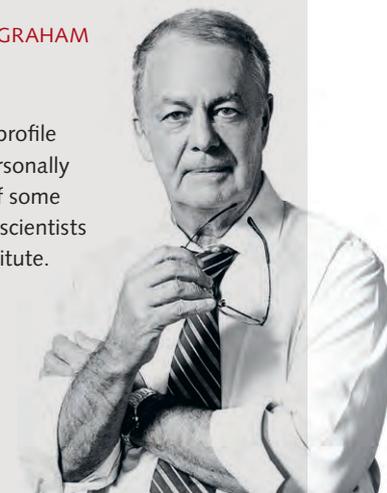
Your support of this enduring mission is as important as ever, for we know we cannot win the fight against heart disease without your help.

Robert M. Graham

PROFESSOR ROBERT M GRAHAM

EXECUTIVE DIRECTOR

PS There is also a small profile on the research I am personally leading, with the help of some extraordinarily talented scientists at the Victor Chang Institute. I hope you find it as interesting as I do.





Dates
for your
Diaries...

FRIDAY 17 MARCH, 2017
The Bay Soirée

Location: Watsons Bay Beach
(in front of the Watsons Bay Boutique Hotel)
Time: 6:30pm
Cost: \$250 per person

THURSDAY 29 JUNE, 2017
**Women Against Heart Disease
Lunch 2017**

Location: Shangri-La Hotel Sydney
Time: 12:00pm – 3:00pm
Cost: \$180 per person

25-31 MARCH, 2017
**Chain Reaction NSW
Ride – The Ultimate Corporate Bike
Challenge**

Location: North Island, New Zealand
More info: www.chain-reaction.org.au

SAVE THE DATE



The 2017 Bay Soirée

Celebrate the last of Sydney's hot summer nights with friends and family on the beach at Watsons Bay. With the sand between your toes and the sun setting over the harbour you will be treated to a shared three course gourmet feast prepared by the Watson's Bay Boutique Hotel, accompanied by champagne, cocktails and premium wines.

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

The Bay Soiree and the Watson's Bay Boutique Hotel proudly support the next generation of cardiovascular researchers through funding the prestigious Victor Chang PhD Scholarship Program.

Supporter Cocktail Party 2016

The annual Cocktail Party brings together staff, the Board of Directors and some of the most active supporters of the Victor Chang Cardiac Research Institute.

The overwhelming support we receive from our donors continues to amaze us and this celebration gives the Victor Chang Institute the opportunity to say thank you to these individuals, organisations and our wonderful staff.

Each year at the Cocktail Party we honour researchers who have received awards for their work during the year and we also honour supporters who have made a significant contribution to our fundraising efforts.

In 2016 Ruth Zukerman was presented with a Victor Chang Ambassador award in recognition of her exceptional contribution to the Victor Chang Institute fundraising activities over many years.

A big
thank
you to



ENS International for their generosity in providing pro-bono negotiation training.

This kind offer allowed the Victor Chang Institute's leaders to enhance their negotiation and influencing skills, which are critical for the work we carry out both internally and with external partners.

Managing director and founder of ENS International, Michael Hudson has been a long term supporter of ours and is very passionate about heart research. In his own words Michael says he provided these pro bono services as 'ENS wants to make the world a better place'.

The training was very well received with our Executive Director, Professor Robert Graham saying: *"I've been to a lot of courses like this but this is the best I've ever been to. It was stimulating and very useful for us in leadership positions that have to negotiate on a regular basis."*

Thanks again ENS International for your kind support!

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



NEW EVENT – SOHN AUSTRALIA HEARTS & MINDS INVESTMENT LEADERS CONFERENCE 2017

FRIDAY 17 NOVEMBER, 2017

Location: Drama Theatre,
Sydney Opera House
Time: 8:00am – 3:00pm

The Sohn Australia – Hearts & Minds Investment Leaders Conference is a one day, fast-paced conference guaranteed to inspire.

Sold out in 2016, distinguished global and local investment professionals will once again share their expertise and exclusive investment ideas.

The conference is a unique opportunity for the investment community to raise funds, drive awareness and understand the need for medical research funding in Australia.

Sohn Australia Hearts & Minds Investment Leaders Conference is dedicated to raising funds for medical research because strong investment in medical research is the only clear and direct avenue to curing many diseases.

Don't miss out, register now
www.heartsandminds.com.au

