RESEARCH
New equipment funded

FUNDRAISING
Touching tributes

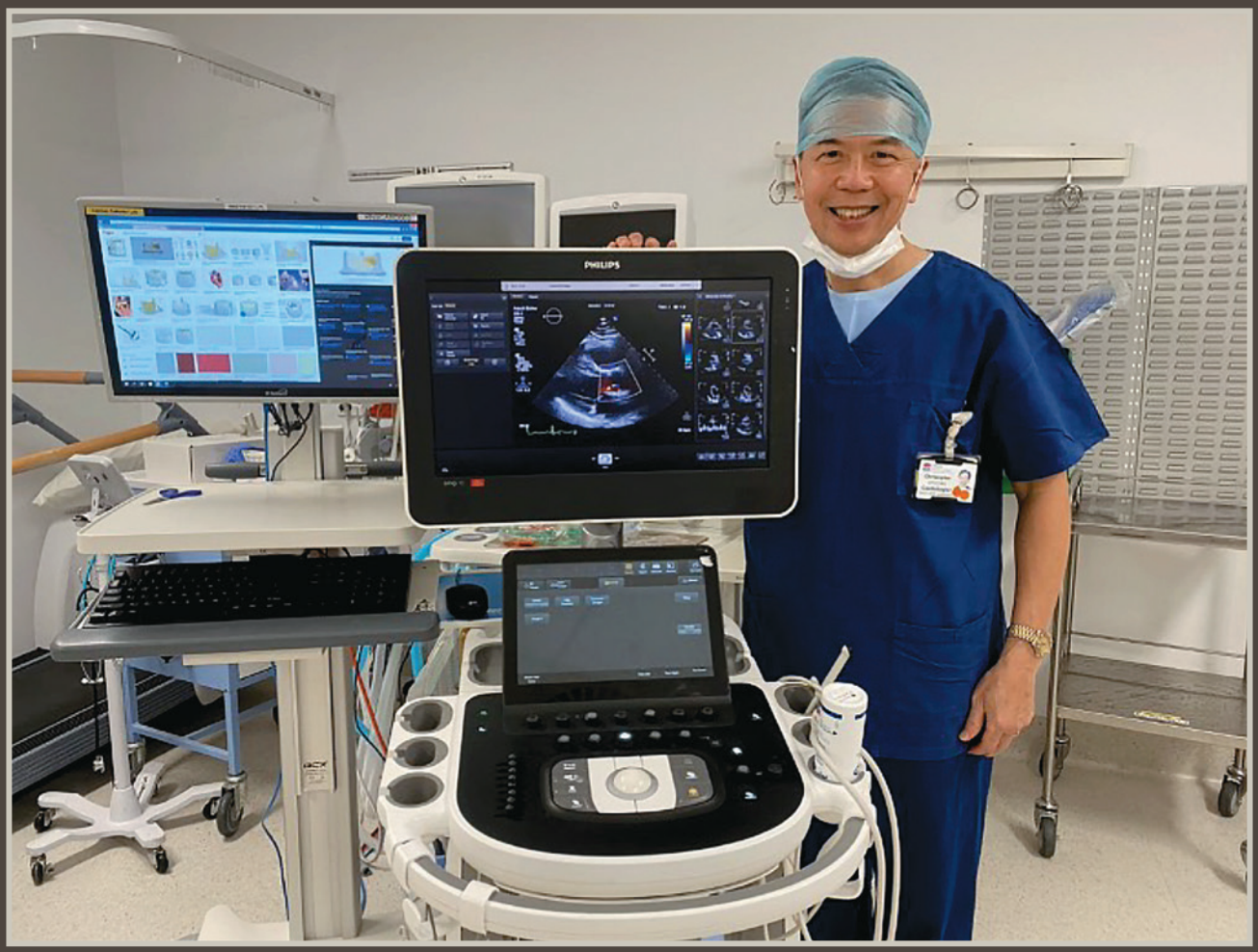
INTERVIEW
Meet Dr Owen Tang

We Life®

NEWSLETTER – ISSUE 2, 2021

Heart Research Australia

Funding of ultrasound equipment



Looking to the future

In these difficult times it can seem like we are stuck and not moving forward, which is why I find it so reassuring to speak with our researchers. Their passion, drive and belief that the future can be improved for those with heart disease, is so inspirational and I trust you too will feel the same way after reading their stories.

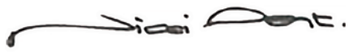
When we are looking at funding, we look at many different areas. From direct support of researchers and their projects, through to their support staff, who manage the day-to-day workings in the laboratories, and the equipment used to improve patient outcomes. In this newsletter you can learn a bit about all these exciting areas.

Below, Dr Chris Choong explains the impact on patients from the funding of new and upgraded ultrasound equipment. Prof Rasmussen also discusses the way a gift has enabled him to fast track some life-saving research into pre-eclampsia - which is still killing pregnant women today.

There is also an interview with Dr Owen Tang on his role as Laboratory manager for The Cardiovascular Group - which undertakes the BioHEART project. Plus, we have a research update on Dr Eveline's Staub's work with pre-term babies – plus much more!

So, enjoy the read, stay safe and thank you as always for your continued support – which is, in itself - inspirational!

Warm Regards,

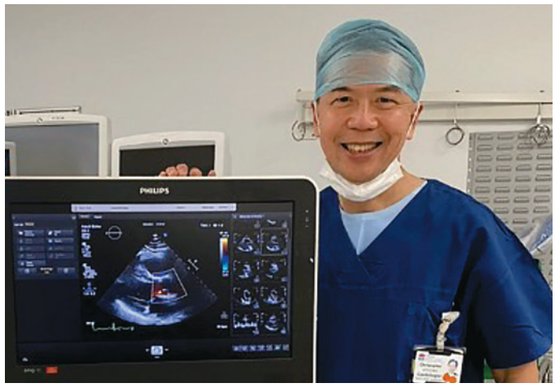


Nicci Dent - CEO, Heart Research Australia

State-of-the-Art Ultrasound machines to improve patient safety & outcomes

Our cover features Dr Chris Choong, Director of the Echocardiography at Royal North Shore Hospital, beside an ultrasound machine which is being upgraded. His laboratory is receiving funding for a new machine, an upgrade and monitors. Here Dr Choong explains the impact that this investment will have on patient outcomes and safety in the future.

The taking of ultrasound images of the heart to assess the intricacies of its structure and function, is known as echocardiography. It plays an essential role in the diagnosis and management of patients with known and suspected heart disease. Each year at the Echocardiography Laboratory at the Royal North Shore Hospital (RNSH) alone, they perform around 6,500 studies.



In recent years there have been major developments in the cardiac subspeciality known as Structural Heart Disease. These procedures typically involve the repair

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or replacement of faulty heart valves and the closure of holes within the heart using devices (eg, clips, seals, plugs or prosthetic valves), introduced from the patient's leg or arm.

This crucially avoids open heart surgery, which might carry higher risks or is impractical.

These developments have enabled Interventional Cardiologists, such as Professor Ravinay Bhindi and Dr Peter Hansen at RNSH, to help a greater number of patients due to the wider range of heart conditions that can be treated.

In keeping with these advances there is a need for more precise imaging to guide diagnosis and the execution of these tasks. The ability to access optimal ultrasound images therefore plays a key role in the performance and success of these procedures, leading to better safety and outcomes for patients.

To this end, Heart Research Australia has secured funding for a new state-of-the-art Philips EPIQ CVxi ultrasound machine with it associated 3D X-8 transoesophageal echocardiogram probe, a comprehensive hardware and software upgrade of an existing Philips EPIQ 7 echocardiogram machine, and 3 large high-definition monitors for image analysis in the Echocardiography Laboratory at RNSH. Dr Christopher Choong, says "this new ultrasound system is widely considered to be one of the best, and in my opinion is the best on the market. The increasing complexity of the procedures in Structural Heart Disease calls for superior precision in imaging and greater sophistication in image processing and presentation. This new equipment will be able to deliver that. With the new Philips EPIQ CVxi we are now able to instal a novel imaging system called EchoNavigator. This marvellous feat of modern engineering provides, on one screen, instantaneous synchronisation and over-laying of the 3D ultrasound images of the heart obtained by the echo-cardiologist, with the Xray images obtained simultaneously by the interventional cardiologists. This gives us the exceptional ability to relate in real time the positions of the catheters and other mechanical devices placed inside the heart, which are best shown by Xray, to the cardiac structures such as the chamber and valves, which are best shown by ultrasound. This huge leap in imaging technology, in addition to improving accuracy, safety, and overall results, will open up new avenues in research and development. So, understandably,

EPIQ CVxi with EchoNavigator A.I.

I am excitedly waiting for delivery! It goes without saying that I am incredibly grateful to be receiving the substantial funding for this equipment. It will undoubtedly improve our ability to provide the best care and outcome for our patients".

Pilot-study completed

Dr Eveline Staub's research into cardiac implications for pre-term babies has entered an exciting phase, as the pilot study has now been completed.

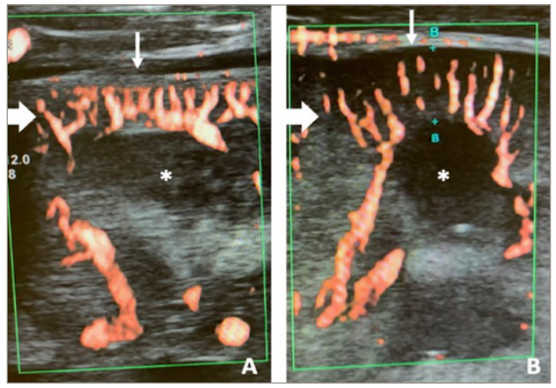
Pilot studies are a crucial step in preparation for the larger research project. The purpose of a pilot study is to increase the likelihood of success of the main research project by testing key elements of the trial, including ethics, governance, recruitment and retention strategies, intervention delivery, data collection methods, adherence to the study protocol and it provides data to prove the concept of the main study.

After a successful pilot study, work has now begun on the recruitment stage for the larger study, which will compare and monitor full-term and pre-term babies over next three years - from birth until age 1.

Dr Staub is looking at why teenagers and young adults, who are born prematurely, have higher blood pressure, more heart disease, and more kidney disease than babies born full-term. It has been established that a baby born more than three months early is more than twice as likely to require treatment for arterial hypertension as a young adult, compared to a baby born at term. Even babies born 5-6 weeks early have an increased risk of suffering from hypertension as an adult.

And when you consider each year in Australia around 26,000 babies are born pre-term – this poses a significant burden on both the individual and health care system, especially if hypertension goes unrecognised in young adults.

Dr Staub's research, with the help of Heart Research Australia funding, is testing the concept that the small blood vessels don't grow and develop as well for those babies born pre-term. With not enough small blood vessels and others underdeveloped, the heart is required to work harder and generate higher pressure to pump blood around the body. This puts these individuals at risk of higher blood pressure and strains the heart muscle, as it has an increased workload to pump blood into the too few and too narrow small blood vessels. Overtime this can cause heart failure.



SMI ultrasound in the kidney of a baby born at term (A) and of baby born 15 weeks early who has reached term age (B). There is obvious reduction in the blood flow in small arteries (red colour doppler signals) in the outer layer of the kidney.

"I am passionate about my work. It's wonderful to be on the front line working to save the lives of these beautiful babies, but equally we want to ensure they go onto have full and healthy lives.

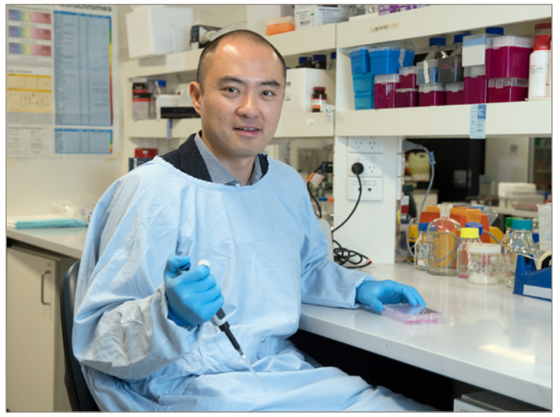
That's why the insights from this study will be so important. If we can shed light into the cardiovascular consequences of premature birth, and identify the highest risk groups, we can raise awareness with their families and GP's, allowing for early intervention to prevent later heart disease. Hopefully, this will not only reduce the stress on individuals and their families, but also on our health system.

We are also always looking at ways to improve our management of these babies and as part of this study we will look at the ways we treat pre-term babies to see if we can better protect the circulatory systems, and therefore their long-term heart health.

Last, but not least, I want to thank you all – we are all so grateful that with the help of your generous donations we are able to undertake this essential research."

Dr Eveline Staub

Meet your researcher: Hands-on Laboratory Manager, Dr Owen Tang



Here at Heart Research Australia, not only do we fund researchers working on specific projects, but we also fund laboratory managers. A laboratory manager is key to the running and the overall output of the research projects. Because not only do they often directly work on the research project itself, but they are also responsible for driving research output, management of the laboratory, mentorship of post-graduate and early career researchers and collaboration with national and international research teams.

With your donations we have been lucky enough to fund Dr Owen Tang since 2014. Dr Tang works with Professor Gemma Figtree, in The Cardiovascular Discovery Group, which focuses on identifying novel mechanisms and therapeutic targets for the treatment of cardiovascular disease, with research projects such as BioHEART.

Despite the heavy impact of COVID-19 on facilities, Dr Tang has successfully completed the metabolomic analysis of 1500+ patient samples from the BioHEART study using a state-of-the-art HPLC-Mass Spec equipment, with the aim of identifying novel blood biosignatures of early coronary artery disease.

What inspired you to get into research?

Ever since I was a small boy, I have been interested in how things work and the rules and processes which must be followed to make things happen. This led me to undertake a Science degree at Sydney University, followed by a PhD in Molecular Biology and Genetics. I have always been fascinated by the genetic coding in the DNA and how robust that is. It essentially determines what you are and what you'll become. By studying genetic mutations on the DNA, we can learn about implications for diseases.

Even in my spare time, you'll find me playing with genetics. I have a balcony laden with plants, which I experiment with. I graft plant stems of different species together to try and make hybrids. I find a harmony in observing how different species live and work together.

What does a typical day for you look like?

For me I am in the unique position that a typical day has evolved over time. When I started the role there were only 2 Post Doctorate and Prof Figtree – but now we have a much larger team with 3 Post Doctorate and 3 PhD students, with plans for more to join the team.

It is a very diverse role, which is what I like. Essentially it is my responsibility to ensure that the laboratory and research runs smoothly, and safely. This includes mentoring and supporting graduate and post grad students, and liaising with other research groups, nationally and internationally.

On top of this I am now running my own research projects related to BioHEART which includes extraction and statistical analysis of data.

What does the future hold for you?

I especially love the teaching and the learning process. So, going forward, I'd really like to continue to support and pass on my knowledge to young students, or even to other senior researchers, who are new to our team. I see myself as "a go to" person. Someone who can inform and inspire new generations.

I also really want to be at the forefront in the use of new and developing research techniques and molecular biology tools in our research.

But overall, I am just really happy where I am – I love what I do and so I feel lucky – so thank you to the support from Heart Research Australia donors for making it possible.

Touching tributes and Desert Adventures

Despite having to postpone some fundraising events, such as our Golf Day, we are still being supported by our community through touching tributes and inspiring adventures – so we are so grateful.

In Memory of Simon Atkinson - Peak Body Health and Fitness

Simon Atkinson

The Peak Body Health and Fitness crew

As a part of celebrating their 11th birthday weekend, Peak Body Health and Fitness chose to raise money for Heart Research Australia in memory of their good friend Simon Atkinson who was a personal trainer there. Simon had been a personal trainer for almost 30 years and helped so many people become the best versions of themselves. His passion for health and his drive to always help others are just some of the many reasons Simon was such a loved member of the club.

Simon was only 53 and sadly passed away from a heart attack earlier this year. Heart Research Australia are so truly grateful for all the generosity Simon's community has shown, with his In Memoriam page raising $1,245 for Heart Research Australia to help our researchers change the future of heart disease. Peak are also making this an annual event in honour of Simon and in support of Heart Research - so his legacy lives on – thank you.

Crossing the heart of Australia

Some people go to great lengths to raise money for Heart Research, like our Board member Brigid Shute and friend Rob Porcaro who set out on a 750K trek of the Simpson Desert on July 1st. The trip was supposed to take 25 days and cross 700 sand dunes.

Despite months of hard training and work, one of the 3 support vehicles had a clutch issue which meant that the trek had to be cut short, (the support vehicles carry food and water/supplies).

However, due to the generosity of their sponsors: Blackett Commercial (major sponsor); Garmin; Telstra; Paddy Palin; Kanguru; Radix; Don Smallgoods; and Sydney University; they still managed to raise an incredible $8,843 which goes directly to funding vital heart research.

"The sheer magnificence of the experience and of being so off the grid has left an endurable memory that we will both cherish for years to come, and it definitely remains unfinished business. So, it's likely that we will not have the hiking gear packed away for long!" says Brigid.

It was an amazing effort, and we are so grateful to Brigid, Rob and all their sponsors for their generous support.

The impact of a special gift

We are always thankful to anyone who leaves a gift to Heart Research Australia in their will. No matter how small or large, any amount benefits the advancement of new and early heart research projects. Recently a generous gift was received from the Late Wendy McCormick in support of research undertaken by Professor Helge Rasmussen. We spoke to Prof Rasmussen about his plans for it and how it will impact his work.

How did you come to know Wendy?

I met Wendy when her husband came under my care over 25 years ago for treatment of a heart condition. They really stood out for me as he was such a nice man, and she was a really devoted wife. Over the 25 years I looked after her husband we developed a close bond. I also ended up looking after Wendy's sister.

What does the gift mean for you and your work?

Receiving a gift in this way expedites the internal approval process, meaning we can get started on projects sooner. This is especially relevant for the project which I am looking at applying the funding to, which is finding what causes preeclampsia and how to treat it.

Preeclampsia remains the leading cause of maternal and foetal death worldwide. It is characterised by high blood pressure and women who have had preeclampsia—especially those whose babies were born preterm—have an increased risk later in life of kidney disease, heart attack, stroke, and high blood pressure. Children born preterm are also more likely to suffer hypertension later in life.

There are currently no medical treatments for preeclampsia and this research has the potential to lead to a major advancement in protecting mothers and infants, both at the time of pregnancy and birth, but also in their future lives.

What will the research be investigating?

Put simply, we are trying to discover an effective treatment of the molecular cause of preeclampsia.

In preliminary work we have discovered a specific molecular modification inhibits the placental cell membrane Na+-K+ (sodium) pump in preeclampsia. The pump is one of nature's most fundamentally important protein molecules and it is essential for the functioning of most cellular processes. It has been the long-standing focus of my research.

The pump generates large differences in concentrations of sodium and potassium inside relative to the outside of cells. These concentration differences drive the movement of nutrients across the placenta from mother to baby and of waste products from baby to mother in the opposite direction. From other work in my laboratory, we have shown a drug already approved for human use for other purposes can reverse the Na+-K+ (sodium) pump modification we have discovered in preeclampsia. We will examine if treatment with the drug can reverse the placental nutrient transport deficiency. Wendy's generous gift is enabling us to move forward with the project with minimal delays, so we are very grateful.

A bit about Wendy

Wendy McCormick (nee Lawson) was born in Willoughby in 1938 and was educated at St Thomas Catholic Primary School, Willoughby and Monte Sant' Angelo Mercy College, North Sydney. She was a regular attendee at the Old Girls' Reunions. After leaving school, Wendy worked at radio station 2GB in the Production Department. Wendy loved to travel and made many trips overseas with her late husband Peter and her late sister Julie. She was an avid skier and loved ballroom dancing with Peter. They were both long time members of Cromer Golf Club, where Wendy also regularly played bridge. Wendy loved her pet cats and dogs.

A legacy for the future

"When I started working on the cardiology ward as trainee cardiologist at Royal North Shore Hospital back in 1976, many heart attack victims didn't survive because we did not have enough options to treat them. Today, 45 years later, it is wonderful to see the progress and improvement in patient outcomes. Now, with quick intervention, patients can be walking out of hospital in 3 days.

And this is all because of research. Research from pacemakers, through to stents and bypass surgery and everything in between. Truly, it doesn't get much better than seeing the research you or others have been working on applied in clinical environment to save lives and improve outcomes for patients"

Dr Greg Nelson.

Photo Jean Coulton, private

Dr Nelson (2nd from right) and cardiologists at Royal North Shore Hospital in 1976.

Dr Greg Nelson is a recently retired Board Member for Heart Research Australia who knows the impact gifts in wills have on heart research, in fact – about half of the research is funded in this way.

Would you please consider leaving a Gift in your Will to Heart Research Australia, so we can continue live-saving heart research for future generations?

If you would like more information on how to leave a Gift in your Will go to:
www.heartresearch.com.au/gifts-in-wills

Or contact: Diane van de Merwe on (02) 9436 0056 or bequest@heartresearch.com.au

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Thank you so much! ***Any legacy, small or large will have a positive impact on generations to come.***