THE BAIRD INSTITUTE Applied heart & lung surgical research

# becember 2021



In Iran, April 2010

# Reflections

# FROM PAST PATIENTS OF PROFESSOR DOUGLAS BAIRD, AM

# Enid Eyles

In December 1989 I arrived in Kathmandu, Nepal, with close friends to go trekking, having been there previously in the early 1980's. We were doing the Helambu Circuit Trek, a relatively low altitude trek with beautiful scenery. For me it was a night-marish experience. The descents were relatively easy but for every descent there seemed to be at least two ascents. They were extremely taxing, and I lagged seriously behind my companions. I was breathless and had to rest very frequently. On our return to Australia my friends told me they had fears of bringing me home in the proverbial green bag.

I returned to work but was hesitant to go bushwalking. Eventually one of our fellow bushwalking group, suggested I might have a heart problem. This thought was strengthened when my blood pressure couldn't be taken because of a very erratic heartbeat. In 1993 I was referred to a cardiologist, who ascertained that I had rheumatic heart disease.

Nearing the end of 1993, I had to rest several times between the station and my workplace and a decision was made for me to have a mitral valve replacement. In early December of that year, I was admitted to Strathfield Private Hospital and Professor Douglas Baird replaced my mitral valve with a mechanical valve and repaired my aortic valve, which had also been damaged.

After convalescing with family in Orange I returned to Sydney for my post-operative visit to Professor Baird. He pointed out to me that at that time, we were the same age and that there could be no more trekking in Nepal or for that matter, trips to countries that were considered third world. I should look to New Zealand if I wanted to go adventuring. It was my final visit to Prof. Baird and I felt dispirited but comforted by his humanity and his almost fatherly approach to telling me I had to look to gentler, safer pursuits.

My life went on as normal and in 1995 I learnt that Professor Baird had very sadly died, well before his time and at the peak of a brilliant career. I could not believe that the man who had given me a new lease on life had lost his own through one of the scourges of our time - cancer.

In 1996 I attained the statutory age of retirement for women - 55 - and retired. Because of my yen to travel in exotic places, in 1997 I started on two decades of travel to many places which are now destroyed or too unsafe to visit. I have visited Uzbekistan, Iran, Jordan, Mongolia, Morocco, Oman, Syria, East and West Turkey and Yemen. I have found people everywhere to be kind, helpful, interested and hospitable.

In 2017 I went on my last visit to Iran. During this trip I realised that my aortic valve was slowly becoming more diseased. My travels were going to come to a halt, just before everyone was grounded by COVID.

In February of this year, 2021, just before my 80th birthday, my aortic valve was replaced using the TAVI (Transcatheter Aortic Valve Implantation) process. I am well, beyond belief, and I am sure that if Professor Baird were still alive, he would be very proud of the RPA cardiothoracic team. I owe them an enormous debt and hope that through monies raised by The Baird Institute they will be able to fund more ground-breaking cardiothoracic research.

I can never sufficiently thank Professor Baird for his skill and expertise in giving me a second chance to live the life I aspired to, especially as he was denied such an opportunity. While my gifts to The Baird Institute are meagre, I am so grateful to be able to give at all, in exchange for the gift of "new life" that I was given in 1993.



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In Turkey in 2011

# Marie-Hugues Savy

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Without the Late Professor Baird I would have been a dead man a long time ago. Prof Baird convinced me to have the operation - a nasty triple by-pass - which has been successful for exactly 41 years and is still going strong.

He prolonged my life, and I am very grateful to still be alive. Thanks to the Professor, I have seen the birth of my four grandsons and one granddaughter and these births took place many many years after the operation.





# Ian Cook

I had my first open heart bypass surgery at RPA in 1977 with Professor Douglas Baird at the age of 38.

23 years later, in the year 2000, I returned to hospital, to have a stent inserted into the artery graft and was back in hospital once again, 20 years later in 2020, at 80 years of age for another Coronary Artery Bypass Graft as it was decided that it was not possible to do another stent. This time Professor Bannon was my surgeon. Looking back, I can only think how lucky I was!

It all started just before Christmas in 1978 with a visit to my G.P. Following an examination, an appointment was arranged with my cardiologist, A/Prof Richmond, who was extremely busy but managed to fit me in the next day due to the urgency of the situation. At the appointment Dr Richmond, advised me to go to hospital A.S.A.P. In fact, he decided to take me there. I phoned work (I was a Police Officer stationed at Police Headquarters in Macquarie Street, Sydney) to explain the situation and my wife to arrange for appropriate clothing for the hospital. I went straight to I.C.U and had all the necessary tests. Coronary Artery Bypass Surgery was arranged and Prof Baird was my surgeon.

My memories of Prof. Baird are unfortunately nonexistent, likewise with Prof. Bannon, which is unfortunate considering the status of these two men – I believe they live up to their reputation as two of the best men in their field. They certainly looked after me, but I can only blame that dreadful complaint T.M.B (too many birthdays) for my lack of memory.

If I had to compare the two surgeries, the main difference for me is the enormous cut up the middle of my chest for the first, compared to the little holes and cuts for the second surgery – the second was much more comfortable and I recovered much quicker.

# Savas Savidis

In September, 1995 at 60 years of age, Professor Douglas Baird saved my life. I had surgery for six bypasses at the "Page Pavilion" at RPA where Chris O'Brien's Lifehouse is located today.

In 1985, when I was 50 years old, I was driving to work when I started to feel very unwell. I was losing strength in my arms, feeling very cold and perspiring. I pulled over because I was quite breathless. After a short rest, I continued on my way to work. When I arrived at work, my boss said I looked very pale and suggested I go home. Instead, I drove to the GP which in hindsight was not a sensible thing. The GP did an ECG and then immediately called the ambulance to get me to hospital as soon as possible.

I was in RPA for around 3 weeks but although open heart surgery was suggested as the best option for me I chose to NOT go down the surgery path but instead I chose to follow the Pritikin diet - a low-calorie, low-protein, high-carbohydrate eating plan that recommends a fat intake as low as 10 percent of your daily calories. Developed in the 1970s by Nathan Pritikin, the program is designed to help lower your risk of heart disease. I followed this diet for close to 10 years and kept up a fitness program of walking and jogging during this period, even though my cardiologist felt I shouldn't be doing these types of activities with a heart like mine.



In September 1995, after 10 years on the Pritikin diet, I was back in hospital at RPA. Testing by my cardiologist revealed that I had 6 blockages and no longer could avoid the need for open heart bypass surgery. The surgery was undertaken by Professor Baird and took many, many hours. I remember the tremendous pain post-surgery and having been connected up to so many tubes and wires. I was in hospital for around 2 weeks.

From Doug Baird's surgery in 1995, jump forward 26 years to August, 2021 when I had another heart procedure - the insertion of a stent and a new valve. This time there was no need for my chest to be open, instead it was minimally invasive surgery.

Doug Baird was a very humble man who had a personality that the ordinary people could connect with. We talked like old acquaintances without any pretentions. Although the surgery he performed on me was more than 25 years ago, I remember him distinctly. I was very sad to hear that he passed away from cancer in that same year I had surgery. A surgeon at the top of his field gone too soon!

#### Dear Valued Supporters

In December last year, when I completed my entry in this newsletter, my presumption was that we were through the worst of COVID-19. We were relatively isolated from the rest of the world and had managed to keep it at bay. But how wrong I was! Further lockdowns followed, longer than we had previously experienced — in NSW anyway. However, as we head towards 2022, it is exciting to see the beginnings of a return to a more 'normal life'. How wonderful that we have reached a 90% vaccination rate — amazing that the community has come together in this way! Let's hope that lockdowns - although they have been necessary - are a thing of the past.



Although research and training has been impacted by lockdowns, they have continued in a modified format. Inside you will read an interview with one of our Scholarship holders, Dr Charis Tan, on the research project she has undertaken for her MPhil.

In this newsletter we are happy to include some stories of patients of the namesake of our Institute, Professor Douglas Baird, who passed away in November 1995. Many of his ex-patients tell of a caring and humble man without pretension but with great skill and expertise. As our Patron, the Honourable Michael Kirby, described him, "a very modest man, very unassuming, but very brilliant".

Finally, I am very excited to announce that Professor Paul Bannon, Chair of The Baird Institute, has just been named the top researcher in Australia in the field of cardiology by The Australian Newspaper's 2021 Research Magazine. This ranking is based on the number of citations for papers published in the top 20 journals in his field, over the past five years. As this is hot off the press, there will be more on this in our next newsletter.

On behalf of the team at The Baird Institute, a sincere thankyou to all of you for your continuing trust and support. I couldn't be more thankful for our dedicated supporters, who have continued to be so generous throughout these difficult times. Our work is possible because of you.

Best wishes to you and your families for the holiday season and for a healthy and happy 2022.

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Catherine Rush CEO, The Baird Institute

### A NOTE FROM OUR PATRON

The Hon. Michael Kirby AC CMG

#### The Ongoing Gifts of Doug Baird

This year, 2021, is the 20th anniversary of the establishment of The Baird Institute. Our celebrations had to be 'virtual' because of the severe impact of the COVID-19 pandemic on us all. However, we hope that 2022 will afford us a renewed opportunity to celebrate, in a properly festive way, the 21st anniversary. We hope to do so actually and in the presence of our team and its wonderful supporters.

Vivid recollections of our founder, Doug Baird in the early days will be included in the celebrations. I had known him in university days where he stood out for his brilliance and innovation. This issue of the newsletter will contain memories of Doug Baird, the surgeon. My mother, Jean Kirby, was one of his early bypass patients. How revolutionary his techniques



seemed in those days! However, research and scientific experimentation must continue at The Baird Institute. During the COVID lockdowns in 2021, some laboratory research and recruitment for clinical trials had to be suspended. They will be revived in 2022.

The new Vice-Chancellor of the University of Sydney, Professor Mark Scott AO, organised a splendid public conversation with Professor Sean Lal, a director on the board of The Baird Institute, who described his work at the Sydney Heart Bank.

Patrons sometimes get closer to their commitments than they necessarily expected. I myself will undertake a renewal of my 2005 CAGS procedure and also replacement of my aortic valve in 2021. This is the ultimate tribute to the early initiatives of Doug Baird and colleagues at the Page Pavilion decades ago. What was then often experimental, is now established surgical practice. But the needs of first-rate data, research and clinical practice remain at the forefront of the legacy Doug Baird and his colleagues bequeathed to us. We must maintain and strengthen this legacy.

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Patron, The Baird Institute

# **EDUCATION AND TRAINING**

#### UPDATE

#### Dr. Brian Plunkett and Ms Kimberley Schoonens

The Cardiothoracic department continues to support the implementation and development of interesting and exciting education topics for the registrars and junior doctors in the team. Whilst Covid-19 certainly stymied many of our more involved teaching opportunities such as the face to face wet and dry labs in partnerships with the Institute of Academic Surgery (IAS) and the Charles Perkins Centre (CPC), the department was able to pivot and utilise other teaching components. These included telehealth and videoconferencing, as well as utilising smaller and specific skill-based simulation sessions such as the Robotics simulation sessions done in partnership with the Robotics Institute. Our robust didactic teaching sessions continue year-round, utilising alliances with key partners in critical care and cardiology.

We are looking to further cement these alliances and partnerships in 2022, utilising them to ensure our teaching program remains exciting and innovative, hoping to resume more face-to-face opportunities and focus once again on the amazing technology and skills for teaching that is available to our team.

#### CARDIOTHORACIC SURGICAL EDUCATION WEBINARS

Aortic Surge A WEBINAR PRESENTED BY RPA INSTITUTE OF ACADEMIC SURGERY AND THE BAIRD INSTITUTE

In the past 6 months we have held 2 webinars educating ICU, operating theatre and ward nurses, junior doctors and medical students on various forms of cardiothoracic surgery.

Aortic Surgery: 23 July 2021 Presenter: Professor Paul Bannon

This webinar was designed to give an insight into patients undergoing aortic surgery. There were three focus areas as follows:

Pre-operative Assessment: Including the classification of dissection, the types of aortic aneurysms, a case study of emergency vs elective (non-urgent/chronic) clinical presentation in ED/clinic.

Intra-operative: Including brief knowledge on surgical techniques, demonstration of grafts and valves for replacement and bypass

Post-operative: Including explanations for why chests are left open after procedure and postoperative complications (early signs and symptoms)

#### Advanced Robotic Surgery for Lung Cancer: 11 November 2021

Presenter: Associate Professor Christopher Cao.

This webinar was designed to give an insight into patients undergoing advanced robotic surgery for lung cancer. The featured topics were: Wedge Resection, Sleeve Resection, Segmentectomy and Lobectomy

for Lung Cancer A WEBINAR PRESENTED BY RPA INSTITUTE OF

AND THE BAIRD INSTITUTE

ACADEMIC SURGERY

**Robotic Surgery** 

Advanced





#### SCHOLARSHIPS AND GRANTS **PROGRAM**

#### An Interview with Dr Charis Tan

Cardiothoracic surgical registrar, a Master of Philosophy candidate at University of Sydney and the recipient of a Baird Institute Scholarship

#### What is your research topic?

My Master of Philosophy research topic is titled: "Optimising Medical and Surgical Treatments of Tricuspid Regurgitation". The Tricuspid valve is one of 4 heart valves that helps with blood flow. Tricuspid regurgitation (TR) unfortunately is a common disease/ manifestation of the tricuspid valve, caused by various factors (Primary or Secondary) and affects 65-85% of the population.

#### What is the aim of your research?

The main aim of my research is to understand the impact of current management strategies for Tricuspid regurgitation. Therefore, the first study is to look at patients who have been referred late for TR surgery where they've been suffering with right heart failure prior to surgery and understanding their outcomes vs those who have not had right heart failure before surgery. The second paper then investigates patients who have Tricuspid regurgitation due to atrial fibrillation (AF; a type of irregular heart rhythm) and outcomes after these patients have TR surgery as AF is the newest and currently

under-studied cause of TR. Lastly a systematic review will be performed to understand the various outcomes of TVR for atrial fibrillation induced TR. Ultimately these studies will help us to optimise the timing of surgical treatment strategies for patients with Tricuspid regurgitation before it is too late.

#### What is the potential impact of your research?

Unfortunately, the Tricuspid valve has been the most neglected valve to treat until recently where TR has been recognized to be associated with deleterious outcomes. But even despite the acknowledgement of its significance, TR remains undertreatedwhere patients are rarely referred for surgery or often referred late for surgical intervention, and most end up never making it to surgery in time. Current European and American guidelines describe vague treatment strategies and therefore current medical and surgical strategies for Tricuspid regurgitation (TR) remain understandably controversial due to the limited data available.

Recent studies have also shown that isolated TR is independently associated with high mortality, recommending more attention to diagnosis, grading and optimum treatment strategy. However, these guidelines do not address the fact that these patients are usually at an extreme end of their tricuspid valve disease before being referred for surgery. There is a possibility that their longevity could be improved if surgery was offered earlier. Therefore, the grand plan for my research is to provide cardiologists and cardiothoracic surgeons a better understanding of the natural

# **RESEARCH REPORT**



## THE YEAR IN REVIEW Professor Paul Bannon

We continue to fo- : cus as always on the areas of research that can be expanded so as to support the different surgical

programs we have in the Cardiothoracic Department at Royal Prince Alfred Hospital. Our pillars of research are outlined below.

**CLINICAL TRIALS:** Our clinical trials have been significantly impacted by COVID but the team have worked extremely hard to try to keep the trials going in both the public and the private institutions. The key areas are on blood transfusion practices (the continuations of the TRICS 3 trial into TRICS 4) as well as the new CLIP 2 trial on cryopreserved liquid platelet transfusions. These two trials will really add significantly to the international literature and the management of transfusion practices in major cardiac surgery around the world.

BIO-BANKING PROGRAM: Some of the bio-banking has been impacted by COVID but despite that our strategy in this area has really come to maturity this year with the joining of the aortic biobank and the cardiac muscle biobank. The biobank is already beginning to generate some basic science projects in the Charles Perkins Centre in the area of heart failure in conjunction with Dr Sean Lal and Dr John O'Sullivan. We have also been able to continue our support for the vascular surgical department at RPAH by helping them to develop their biobanking strategy.

BROKEN HEART PROGRAM: We have wrapped up all of our experimental work for the Broken Heart Program and chief researcher, Dr Laurencie Brunel, is preparing to submit her thesis and the third and final publication in that area of work. For this program we, predict and model individualised surgical corrective techniques. We then test the model in the research theatre by looking at the structural integrity of the repair. This research work sets the scene for what we want to do in this area in the future. We have also put in an application for a collaboration with Stanford University in the USA and we are waiting to hear the result of this.

#### SURGICAL OUTCOMES PROGRAM:.

The Centre for Health Record Linkage (CHeReL) links multiple sources of data and maintains a record linkage system that protects patient privacy. Data linkage transforms routinely collected data into a powerful resource for research and evaluation. Our Clinical Trials team has submitted the data for 12,500 patients to the CHeReL system This data on long-term follow-up and reintervention rates, will : the different areas of interest.

give us the answers to our questions on comparative surgical strategies and how well we have done over the years.

**INNOVATIVE ROBOTICS:** This has had to take a back seat during COVID as the lab in the Charles Perkins Centre has been shut down for a large part of the last 6 months. The lab has just started to re-open in the last few weeks and as a result, planning for further research in this area is now underway.

The Baird Institute is currently providing support for two research staff members; Cassandra in the biobanking program and Dhairya in the cardiothoracic research office. These two positions provide an excellent link between the surgical outcomes and the biobanking programs, both of which are inextricably linked. In addition, Dhairya will be assisting with clinical governance research and clinical trials in the Cardiothoracic department.

Finally, we have made a decision to commit to the development of a translational research group in The Charles Perkins Centre and we are currently advertising for a candidate to fill a post-doctoral position. This person will most likely be a biomedical engineer who will support our higher degree research students across

# WELCOME TO DHAIRYA VAYADA

history of Tricuspid regurgitation and to recommend an optimum time for surgery... before they reach a stage where it's too late and palliation ensues.

#### How has your scholarship from The Baird Institute helped you?

It has been a true honour to have had the support of The Baird Institute by means of a scholarship throughout my Master of Philosophy candidature. Not only have I managed to present at local and international conferences but also have managed to gain access to statistical software and undergo training courses to use them. Being around masters in this field by way of Professor Paul Bannon, has certainly opened doors to meet other experts in the field and broadened my vision for this project. Additionally, the scholarship has also allowed me to spread the word on this under-recognised area of cardiac surgery in hopes of raising more interests in research for future students and researchers at Uni presentations and conferences that I would not otherwise have had the opportunity to attend.

Once again, I cannot thank The Baird Institute and its supporters enough for this huge opportunity to learn and develop as a budding researcher. I look forward to sharing the end results once its completed.

## Data Research Assistant



degree, Dhairya was extensively involved in research, working as a research assistant at the Queensland Brain Institute in the Computational. Systems and Developmental Neuroscience Laboratory. His passion for cardiothoracic research was strengthened while working at the University of Queensland Thoracic Research Centre, assisting in data management for the International Lung Screen Trial.

Dhairya says: "I was extremely fortunate to have been offered a job as a data research assistant at The Baird Institute. I am very excited to contribute to cardiothoracic surgical research and assist in ensuring the quality, integrity, and confidentiality of the research data and databases. I am also looking forward to utilising my programming skills to make research workflow processes more efficient.'

The recruitment of Dhairya is another important investment in the team which supports the high-impact research conducted by our researchers. We really appreciate the generous support of our donors who have made this additional investment possible.

# **RESEARCH REPORT**

#### **CLINICAL TRIALS**

The cardiovascular research team at Royal Prince Alfred hospital consists of Lisa Turner, Carmel Oostveen, Lorna Beattie and we welcome our new recruit, Dhairya Vayada. Dhairya has extensive knowledge in implementing data science principles to a clinical research setting.

2021 has continued to be a challenge for the Research Department, working within pandemic conditions. However, despite the difficulties, research has continued and we find ourselves managing many interesting projects. One of our projects, Vision, is completed. This has been a lengthy process involving the recruitment and data collection of 500 patients. The purpose of this project was to provide useful information to help predict who may be at risk of having complications following heart surgery. This information will be an invaluable source as the total worldwide recruitment was 15,000.

The tissue bank projects have continued to run throughout this year and we are excited about the addition of patients from Strathfield Private Hospital for participation in these study projects. Heart failure represents a leading cause of morbidity and mortality both in Australia and Internationally. Heart failure is the final common clinical pathway for a number of pathological processes including atherosclerotic disease, cardiomyopathies, valvular disease, myocarditis and infection. The tissue bank provides an invaluable source for research projects to expand our current understanding of heart failure pathophysiology.

#### VASCULAR SURGICAL EXPANSION OF THE BIOBANKING PROGRAM AT THE SYDNEY HEART BANK

Dr Jacky Loa

#### Vascular Surgeon RPA and IAS Vascular Research Lead

The Sydney Heart Bank is a well-established biobank that procures aortic and valvular tissues. It is a joint collaboration between The Baird Institute, Royal Prince Alfred Hospital and the University of Sydney. With the expansion of the biobank to include vascular surgical tissues, the Sydney Heart Bank would be one of only a handful of biobanks established in the world that would include arterial tissues from the head down to the feet. This would provide a comprehensive understanding of disease processes starting from the heart and their similarities throughout the whole body.

A major area of interest with this new expansion would include the carotid artery. The carotid artery is the main blood vessel to the brain and can develop atherosclerosis (build-up of plaque in the arteries). If the carotid artery becomes narrowed, this may eject plaque into the brain and cause a stroke. Research into the carotid artery aims to understand if there are similarities between the atherosclerotic process that occurs in the heart and the brain. The hope is this research would lead to the prevention of strokes.

Another area of interest with the new expansion would include research into the femoral artery. The femoral artery is the main blood supply to the leg and atherosclerosis and narrowing of this artery lead to decreased blood supply to the leg and ultimately amputations. Research into this area would also look for similarities of the atherosclerotic process within this region and the rest of the body. The aim is to find therapeutic targets in this area and prevent amputations in the future.

The vascular surgical unit at the Royal Prince Alfred Hospital is excited to contribute to the Sydney Heart Bank and help facilitate world leading research.



# PUBLICATIONS

# ACS - Annals of Cardiothoracic Surgery

The Annals of Cardiothoracic Surgery (ACS) is delighted to announce that its continued strong growth has been reflected in a new higher Impact Factor of 4.101 as released by Clarivate Analytics. This means that the journal is ranked first in Asia-Pacific and fourth in the world and is one of the leaders in the communication and advancement of academic research

The ACS is a bi-monthly, peer-reviewed publication dedicated to the field of cardiothoracic surgery. Highlights in recent AC publications include: "Bioprosthetic Valve Fracture: a practical guide"; "The Ross procedure is the optimal solution for young adults with unrepairable aortic valve disease"; "Direct transcatheter mitral valve implantation in severe mitral annular calcification: technique and evidence" and "A step-by-step guide to trans-axillary TAVR".

For the latest issue and articles, visit http://www.annalscts.com/

#### **OTHER RESEARCH PUBLICATIONS**

For a full list of The Baird Institute's research publications, please go to our website at: www.bairdinstitute.org.au/our-publications/



Our thoughts are with Penny Mowat whose husband Reg passed away on the 27th May, this year. Reg and Penny were longstanding supporters of The Baird Institute. We wish Penny strength and peace at this difficult time.



Longstanding supporters of ours, Norm and Pat Kroehnert, both passed away a week apart from each other on the 20th and 27th October 2021. Our thoughts are with their family at this sad time.



# HARP TO HEART CONCERT

Sunday 25th September 2022

# Musicus Medicus

We are working with Musicus Medicus (Latin for Musician and Physician) to promote a performance called "Harp to Heart" which will be held at Verbrugghen Hall at the Conservatorium of Music, Sydney on 25 September 2022. Much of the proceeds from this event will go to The Baird Institute so we would love all of our supporters to join us.

Now in its seventeenth year, the NSW Doctors Orchestra comprises of around 80 medical students and doctors from metropolitan Sydney and regional NSW, who are also talented musicians. This annual fundraising concert promise to be an entertaining afternoon of inspiring music from French, Russian and Australian composers. It will feature guest conductor Joanna Drimatis, and star soloist Alice Giles playing the beautiful Boieldieu Harp Concerto in C major, Opus 77. The program includes the wonderfully passionate Tchaikovsky Symphony No. 6 in B minor, Opus 74 Pathétique, and a lively short work, "Roar", by Australian composer Maria Grenfell. Our Harp to Heart concert was originally scheduled for May 2020, it was rescheduled to September 2020 and once again to March 2021 due to COVID. We have now set a new date of 25 September 2022. Please check our website www.bairdinstitute.org.au for updates and a link to ticket purchases. Tickets will go on sale early next year.

# Many Thanks to Our Supporters

Every one of our donors has contributed in a significant way to our research and training programs and we are very grateful for their support, however we would particularly like to thank our principal supporters.

