Annual Report 2017–2018

Transforming lives

Bionics institute

The Bionics Institute is a world-leading research organisation working in the field of medical bionics—an exciting area of science where biology, engineering, and medicine intersect.

20 conferences attended—14 keynotes

Contents

45 seminars

The year at a glance

10 patents filed

Nine awards and prizes

Nine new peer-reviewed grants

26 publications —two high impact

One new start-up company

15 new appointments

47 research students

Net deficit decreased by over 67 percent

Revenue up by over 16 percent

23 news stories —six on TV

Chairman's message

This is an exciting time to be the Chairman of the Bionics Institute. With an increased focus on translating and commercialising our research, we are now actively developing key opportunities.

I would like to highlight a number of achievements we made this year, which we hope will bring significant benefits to the Institute in the years to come. In June, we were very pleased to announce the launch of a new Australian venture—Epi-Minder Pty Ltd—to develop a breakthrough monitoring device aiming to improve management of epilepsy and seizure-related conditions. In conjunction with our collaborators from St Vincent's Hospital Melbourne and the University of Melbourne, this start-up venture has received initial investment from Cochlear Limited and Australian private investors.

The establishment of Epi-Minder Pty Ltd is an example of what the Institute strives for—to create a pathway for commercialisation and actively engage with industry, to deliver our devices and clinical innovations to patients, and make a tangible difference to their lives.

Our research excellence has attracted significant funding from both Australian and international granting bodies this year. These successes will allow us to rapidly progress the development of a drug delivery system for the inner ear aimed at treating noise-induced hearing loss; develop significantly improved techniques for diagnosis of hearing disorders in babies; and to improve the lives of people with Parkinson's disease by offering new and improved methods of deep brain stimulation.

While hearing and deafness research remains a core focus and strength of the Institute, our programs continue to diversify as we pioneer new technologies to transform the treatment and early diagnosis of sensory impairments, and diseases of the brain and peripheral nervous system.

In December 2017, we were pleased to announce two new leadership appointments—a Chief Technology Officer, Professor Hugh McDermott, and a Research Director, Associate Professor James Fallon. Collectively they bring five decades of experience in signal processing, pre-clinical and clinical studies, and electronic design. Their expertise is complemented by another recent key appointment: Dr Erol Harvey joined the Institute in February 2018 as Strategic Advisor. As the founder and former CEO of MiniFAB (Australia) he now works closely with our scientific and leadership teams to develop manufacturing strategies for our technologies and develop focused pathways for translation from bench to clinical validation.

I have greatly enjoyed working alongside our CEO, Mr Robert Klupacs, and the leadership team as they guide the Institute through the changes needed to support a flexible business model in line with our translational research. I gratefully acknowledge the support of the Board members and thank them for their continued involvement on the Board and sub-committees.

Our goal to transform clinical practice and reduce the burden of disease on individuals underpins everything we do. We have achieved many successes this year and I would encourage you to learn more about our projects and the year's highlights in this report.

I look forward to the continued growth and development of the Institute in the coming year.

John Stanhope AM
Chairman

CEO's message

This past year has been a very important one for the Bionics Institute as we seek to achieve our mission of translating extraordinary research into clinical products that improve human health.

The Institute continued to build on its rich history in hearing research, and our growing reputation in the area of neurobionics. We were very proud to be awarded significant peer-reviewed grants from government and philanthropic agencies. Professor Colette McKay and her team are working on an innovative clinical system called EarGenie™, designed to assess hearing and language development in hearing-impaired infants. In April 2018, the Federal Health Minister, Mr Greg Hunt, announced that this project had been awarded a $1M grant to assist in further development and clinical validation.

Associate Professor Andrew Wise is leading a program that is developing a novel drug delivery system capable of introducing therapeutic agents into the inner ear to treat hearing loss. In April 2018 we were advised that the United States Department of Defense had recognised his group as a world leader in this area, with the award of a US$1.1M grant. Over the next three years, drug candidates will be examined and experiments will test that the damaged cells within the inner ear are being repaired. We are aiming to commence clinical trials of this therapeutic system within four years.

One of the Institute's strengths is bringing together scientists, engineers and clinicians to achieve the most effective outcomes for patients. Our neurobionics team, led by Professor Hugh McDermott, has worked closely with neurologist, Dr Wes Thevathasan, and neurosurgeon, Dr Kristian Bulluss, from St Vincent's Hospital Melbourne for several years, in order to improve the outcomes of deep brain stimulation (DBS) therapy in those living with Parkinson's disease. In May 2018 the team published an exciting discovery in the prestigious journal *Annals of Neurology*. They identified a unique brain signal that promises to improve the accuracy of DBS surgery and, importantly, the possibility of patients being able to undergo this procedure without being awake. We are very thankful to the Colonial Foundation for their ongoing support of this project.

A highlight for the year was our launch of the start-up biotechnology company, Epi-Minder Pty Ltd, in collaboration with Cochlear Limited, the University of Melbourne, St Vincent's Hospital Melbourne and private investors. This company is developing a device called Minder™, a seizure monitoring system designed to improve the diagnosis and management of epilepsy. It is the culmination of over a decade of research and development by clinicians, led by Professor Mark Cook, and our engineering team. We are working towards a first-in-human clinical trial of Minder™ in 2019.

Philanthropic agencies provide an important source of funding for our research and we gratefully acknowledge the support of the Garnett Passe and Rodney Williams Memorial Foundation, and Action on Hearing Loss (United Kingdom). These organisations have supported an exciting area of hearing research using a cutting-edge technique called optogenetics. This research, led by Dr Rachael Richardson, is exploring the use of light stimulation to improve the perception of sounds conveyed by cochlear implants. The advantage of light is that it can activate the hearing nerve more precisely than electrical stimulation.

We gratefully acknowledge the funding we receive from the Victorian Government through its Operational Infrastructure Support Program, and the Federal Government through its National Health and Medical Research Council grant schemes and infrastructure support (IRIISS). This funding continues to be vital for enabling our research programs.

Lastly, I'd like to extend my sincere thanks to everyone who donated to the Bionics Institute this year. Any contribution, large or small, helps ensure that our research can continue, so we can strive to improve the lives of those living with otherwise debilitating conditions.

Our journey to translate our world-class research into clinical outcomes to improve human health is challenging, but exciting and rewarding. I look forward to continued success in the coming year.

Robert Klupacs
CEO

Over 250,000 Australians are currently living with epilepsy

Minder™—a device to improve management of epilepsy and seizure-related conditions

Prof Mark Cook holds the Minder™ device with the Bionics Institute development team. L-R, A/Prof Chris Williams, Dr Yuri Benovitski, Mr Owen Burns and RMIT's Mr Dave Hill
Image credit: David Caird/Newspix

Over 250,000 Australians are currently living with epilepsy—one of the most common serious brain disorders worldwide.

Epilepsy can affect people at any stage of their lives, with 30 to 40 percent of patients unable to be adequately managed with drug therapy.

Minder™ is the first step towards more effective management of epilepsy and seizure-related conditions. Minder™ is a minimally-invasive, implantable device for the long-term monitoring of brain seizures. Patients will wear the device while undertaking regular daily activities—all while the device is providing them and their doctors with detailed data on seizure activity and frequency.

Minder's long-term monitoring of patients outside of a controlled clinical environment will lead to more effective diagnosis and treatment of underlying conditions, including the ability to more accurately determine the effectiveness of drug therapies.

Our device will also provide greater independence to those living with epilepsy. Subject to clinical outcomes, later generations of the device are planned to include prediction and warning signals of impending seizure events.

This research program achieved a significant milestone in 2018 with the Institute's launch of a new start-up company, Epi-Minder Pty Ltd, supported by generous investment from our industry partner Cochlear Limited and private investors. Cochlear Limited are sharing their expertise in implant design and development, as well as their world-leading implant manufacturing capabilities.

Minder™ was developed by the research team led by Associate Professor Chris Williams from the Bionics Institute and Professor Mark Cook, Neurologist at St Vincent's Hospital Melbourne. Epi-Minder Pty Ltd will undertake further development of the Minder™ technology for use in initial clinical trials expected to commence in 2019.

Professor Cook expressed his excitement over the new technology, acknowledging the potential of the device to improve the lives of those living with epilepsy. He stated that at least one third of those living with epilepsy around the world cannot be treated effectively with today's solutions.

It's difficult to treat patients when doctors can't obtain an accurate seizure history to objectively measure effects of the treatment. There is a need for a cost-effective way to monitor patient seizures 24/7 to gather the data needed to diagnose and treat patients.

We are extremely excited by the potential of Minder™ to provide that information.

One in 1,000 babies are born with permanent hearing loss in Australia

EarGenie™—a system to improve language outcomes in babies with hearing impairment

Child in a brain imaging (fNIRS) cap

One in 1,000 babies are born with permanent hearing loss in Australia. The ability to hear in early life is crucial for the development of brain networks that are involved in language perception and speech. Many children with a hearing disability will start their educational journey a long way behind their classmates—a gap that starts in infancy and puts them at a life-long disadvantage.

There are early interventions such as cochlear implants (bionic ears); however, the outcomes vary greatly between children. Moreover, infants can't communicate if their hearing device is working optimally, so problems can go undiagnosed until much later in life—when it's too late.

We are creating a new clinical system that will change children's lives—EarGenie™.

EarGenie™ aims to optimise language development in hearing-impaired infants by using several measures of brain activity, including a technique called functional near-infrared spectroscopy (fNIRS), to provide a detailed hearing assessment.

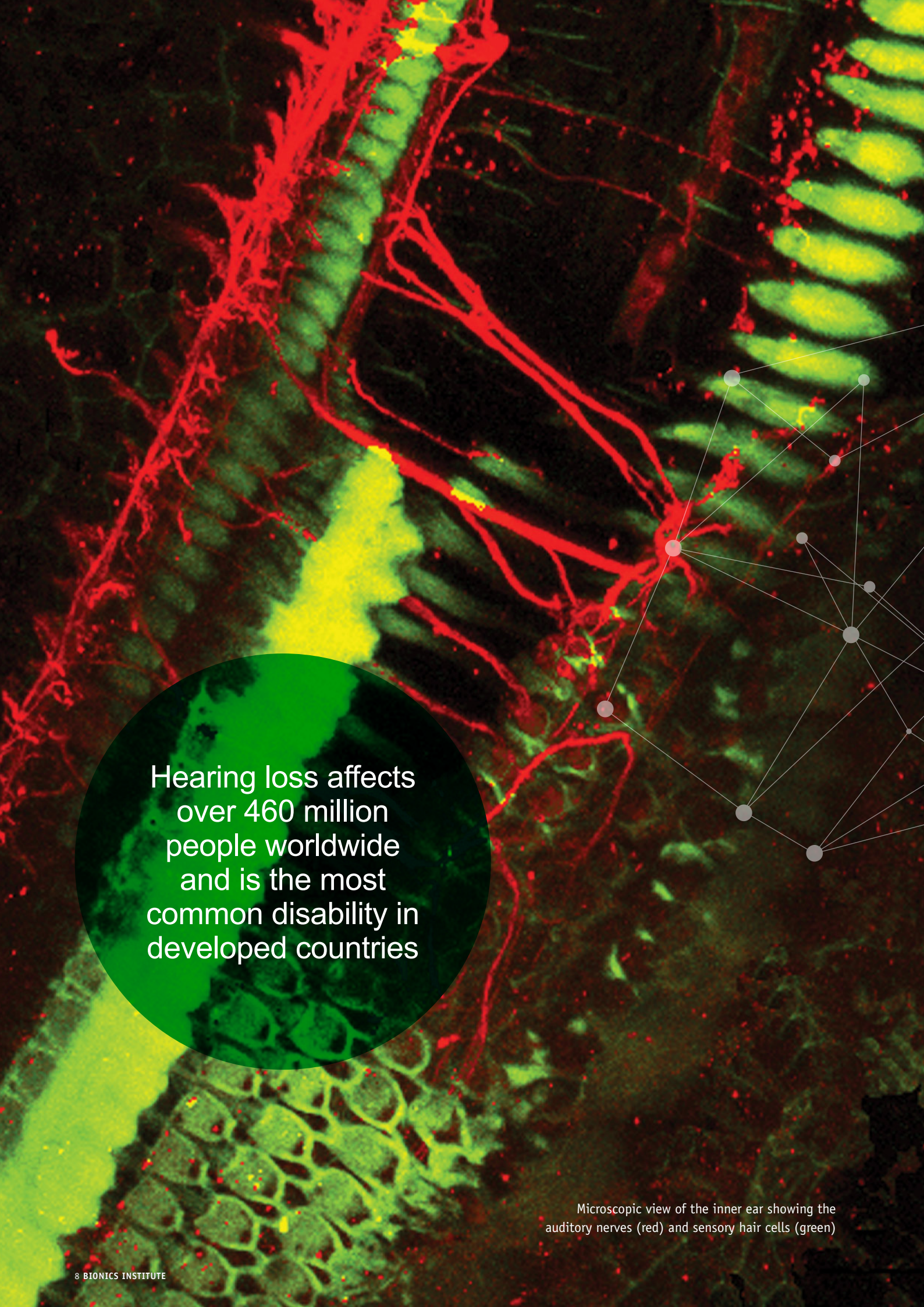
fNIRS provides a non-invasive way to image brain activity using light sources and detectors which are placed in a cap on the head. This technique allows us to see how infants' brains are responding to speech sounds in more detail than that offered by current clinical tools.

At diagnosis, EarGenie™ will enable a more comprehensive hearing assessment so that an appropriate hearing device can be confidently selected and programmed. It will allow clinicians to confirm if an infant can hear through their hearing device and adjust it to their individual needs.

This research will ensure a future where audiologists can establish the optimal settings of infants' hearing devices so they can hear a full range of sounds, and their opportunity for normal language and brain development is maximised.

Earlier this year, the research underpinning the development of EarGenie™ was funded by a BioMedTech Horizons grant under the Federal Government's Medical Research Future Fund initiative. Related research was also supported by the Garnett Passe and Rodney Williams Memorial Foundation. Our Translational Hearing Research Program leader, Professor Colette McKay, said these generous grants will allow the project to progress rapidly to the next stage of development and clinical validation.

EarGenie™ addresses a critical, unmet need for hearing assessment in infants. With the help of recent funding, accelerating the development of this new clinical system will give hearing-impaired children the best possible start in life.

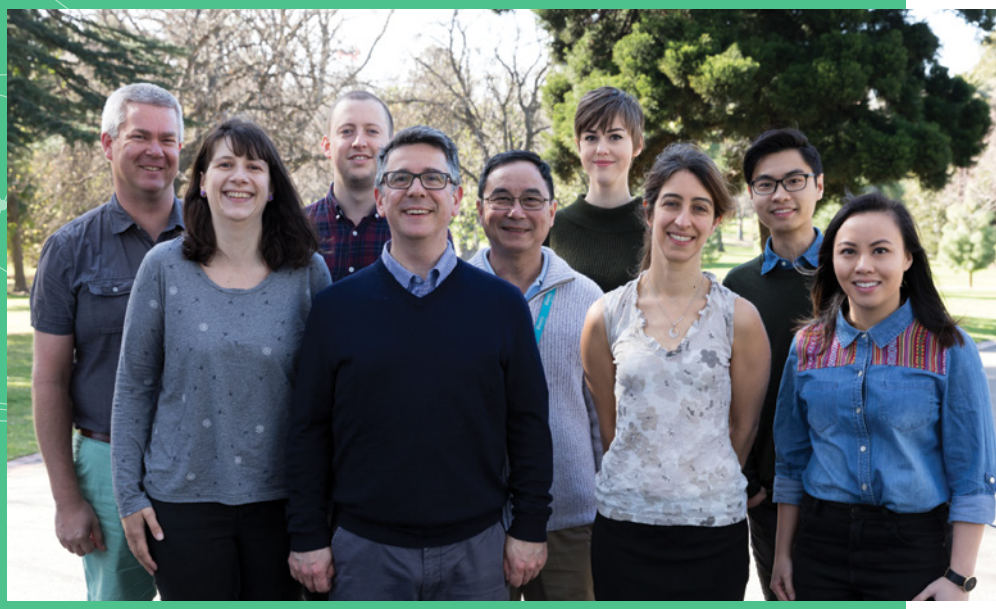


Hearing loss affects over 460 million people worldwide and is the most common disability in developed countries

Microscopic view of the inner ear showing the auditory nerves (red) and sensory hair cells (green)

Repairing the inner ear following noise damage

The Hearing Theraputics team. L-R A/Prof James Fallon, Ms Amy Morley, Mr James Firth, A/Prof Andrew Wise, Dr Trung Nguyen, Ms Caitlin Singleton, Dr Rachael Richardson, Mr Patrick Lam, Ms Ella Trang



Hearing loss affects over 460 million people worldwide and is the most common disability in developed countries. Around one third of cases are related to noise exposure.

In Australia alone, the economic cost of hearing loss is estimated at $33.3 billion per year—a cost that is rising with the ageing population.

Hearing loss not only impacts our ability to communicate with loved ones, but is associated with cognitive decline, social isolation, and depression. The need to develop a therapeutic intervention to treat hearing loss is a high priority and the most effective strategy would be to repair cochlear damage before it becomes a debilitating condition.

The inner ear, or cochlea, can sustain significant injury before a person notices the impact on their hearing. Most adults have damaged connections (synapses) between the cochlea's delicate sensory (hair) cells and the auditory nerve cells that transmit sound information to the brain.

Cochlear damage can result from noise exposure throughout life and the consequence is typically noticeable in noisy situations, such as a crowded restaurant. Unfortunately, this condition is likely to worsen as more hair cells and their connections are lost. Once established, such hearing loss is a permanent impairment and hearing devices are the only treatment option available.

There is compelling evidence that delivering nerve survival factors (neurotrophins) to the cochlea can restore synapses following noise exposure. The challenge is determining a method to safely and effectively deliver neurotrophins to this hard-to-reach area.

Together with researchers at the University of Melbourne, we've been working on different drug delivery methods and have developed a way to administer neurotrophins by "loading" them into tiny particles created through nanoengineering. We are now conducting preclinical studies to determine how well this therapeutic system works in repairing cochlear damage.

We were pleased to receive grants towards this research program from the National Health and Medical Research Council and the Garnett Passe and Rodney Williams Memorial Foundation in 2018.

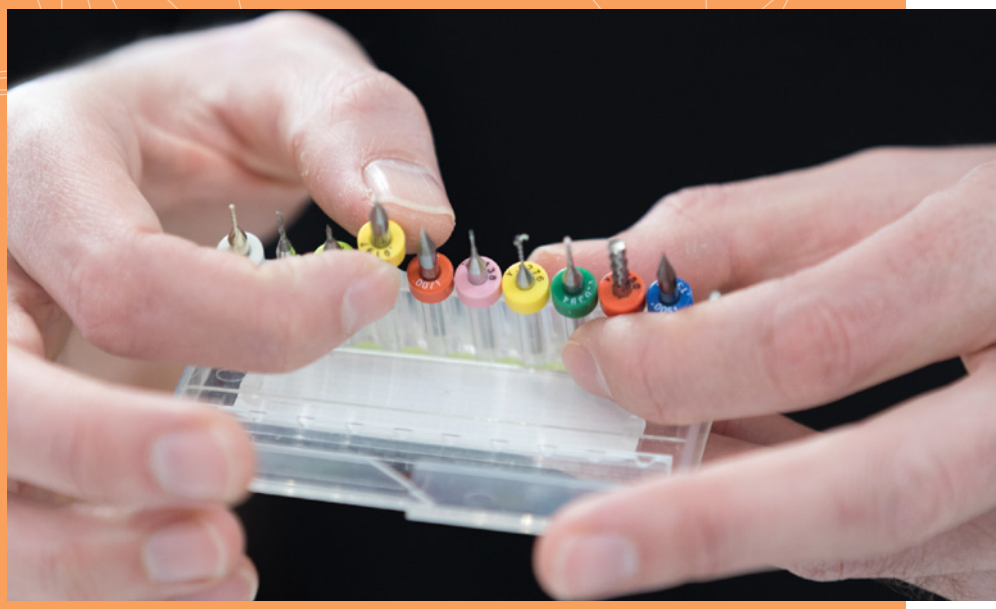
The Bionics Institute's lead researcher, Associate Professor Andrew Wise, said these grants will allow him and his team to progress their research to the next phase, explore several potential drug candidates, and determine in detail that the nano-particle delivery system is both safe and effective in restoring functional connections in the inner ear.

This funding will move us a step closer to developing the first therapeutic approach to restore hearing in people following noise damage, and the program will provide the key data to be used in the first-in-human clinical trial aiming to restore hearing.

Parkinson's disease is a degenerative brain disorder that affects around 81,000 Australians

Image credit: Tony Gough/Newspix

Enhancing deep brain stimulation to treat Parkinson's disease



Parkinson's disease is a degenerative brain disorder that affects around 81,000 Australians.

It's caused by the progressive loss of certain nerve cells in the brain networks responsible for controlling movement. This leads to a loss of motor function with debilitating symptoms, such as muscle stiffness, slowness of movement, and tremor.

These symptoms mean that everyday tasks we take for granted—using cutlery, preparing food, driving a car—can become impossible.

Up to one-third of patients do not get adequate symptom relief from drug treatments and must consider deep brain stimulation (DBS) therapy.

With DBS therapy, electrodes are surgically implanted into the motor control areas of the brain. Electrical pulses are delivered to the target areas, blocking abnormal activity and alleviating symptoms.

While existing DBS systems can significantly improve quality of life, they have several shortcomings that mean some patients aren't getting optimal levels of symptom relief from this therapy.

Lead researcher and neurologist, Dr Wesley Thevathasan, said that even if DBS candidates could benefit from therapy, current surgical techniques can be just too anxiety-provoking for a subset of patients.

Dr Thevathasan said that DBS therapy has a tremendous ability to transform people's lives, by literally controlling someone's brain signals through a handheld device.

This surgery has been around for 20 years, and unfortunately very little has changed over that time. That's why our developments are of great importance, because we can shift the whole field forward; making a good therapy better.

Together with clinical experts including Dr Thevathasan, we've been working on an extensive research program to produce an advanced DBS system to address the therapy's current drawbacks.

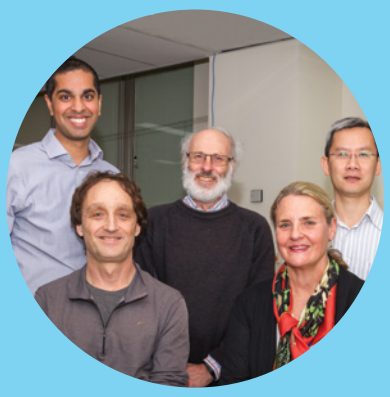
Currently, patients need to remain awake during electrode implantation surgery, which can deter people from receiving DBS therapy. We've discovered a unique brain signal that could allow surgery to be performed under general anaesthesia, and improve the accuracy of electrode placement.

Another shortcoming with existing technology lies in the electrical stimulation remaining at a constant level despite the day-to-day fluctuations in a patient's symptoms. We're addressing this by making a device which will instead work like a car on cruise control, continuously and automatically adapting to the changing needs of the patient. We have also designed a smaller electrode array with more sites along its tip for brain stimulation. This design is less invasive and will enable better targeting of the correct brain area.

To assess the effectiveness of new DBS strategies, we need ways of accurately measuring rigidity, tremor, balance, and gait. Our engineers have designed a range of clinical tools that will not only enhance Parkinson's disease research but will also help in the assessment of motor function in other medical conditions.

A year in review

The Best Development Grant application is shared by the developers of the implant. L/R Dr David Nayagam, A/Prof Chris Williams, Prof Peter Seligman, Dr Penny Allen (CERA) and A/Prof Chi Luu (CERA)



Eye implant grant wins top NHMRC award

We were thrilled that a novel eye implant being developed here at the Institute, with colleagues at the Centre for Eye Research Australia (CERA), was recognised as the Best 2017 Development Grant application at the highly competitive National Health and Medical Research Council (NHMRC) Research Excellence Awards.

The world-first device has been dubbed the "Minimally Invasive Retinal-degeneration Arrestor" (MIRA). MIRA aims to use low-level electrical stimulation to prolong and extend the years of useful vision in patients with degenerative retinal disease.

NHMRC Development Grants are designed to drive research toward real-world applications for clinicians and patients; a core value of the Bionics Institute and its researchers.

Philanthropy supports a new direction for cochlear implants

Senior Research Fellow, Dr Rachael Richardson, is exploring whether light stimulation could be used to improve the perception of sounds conveyed by cochlear implants.

Dr Richardson and colleagues are using an exciting new research tool called 'optogenetics' to activate the auditory nerve with light, which can be focussed more precisely than electrical stimulation.

We gratefully acknowledge recent grants from Action on Hearing Loss, a UK-based philanthropic organisation, and the Garnett Passe and Rodney Williams Memorial Foundation.

Prof Graeme Clark, Director Emeritus of the Bionics Institute, with Prof Mark Cook (left) and Bionics Institute CEO Robert Klupacs (right)

Graeme Clark Oration

American Nobel Prize-winning scientist, Professor Harold Varmus, was the visiting guest speaker at the 2017 Graeme Clark Oration held at the Melbourne Convention and Exhibition Centre.

This annual event run by the Convergence Science Network honours our Founding Director, Professor Graeme Clark AC, and his contribution to medical science and innovation.

Congratulations Thushara—Finalist for BUPA's 2017 Emerging Health Researcher

Research Fellow, Dr Thushara Perera, was one of six finalists for BUPA's 2017 Emerging Health Researcher award, which recognises future leaders in Australian health and medical research.

With expertise in electronic engineering and software development, much of Thushara's work is focussed on developing precise instruments to quantify and track patient health.

Miracle Hospital TV series

Dr Wesley Thevathasan, Neurologist and our Lions International Neurobionics Fellow, was featured in an episode of National Geographic's Miracle Hospital on 21st April 2018. The episode featured Dr Thevathasan helping a patient with Parkinson's disease. Dr Thevathasan is working to advance a form of deep brain stimulation (DBS) for Parkinson's disease that targets a different brain region, which has laid an important foundation for our DBS research program.

Dr Erol Harvey appointed as Strategic Advisor and wins prestigious award

This year, we were proud to welcome Dr Erol Harvey as Strategic Advisor to the Institute. As the Co-Founder and Director of Mini-Fab, a world-leading engineering company, Dr Harvey brings decades of experience in the commercialisation and development of novel technologies.

Originally trained in laser and plasma physics, and having been involved in the commercial and academic development of micro- and nano-production techniques, Dr Harvey has a wide berth of expertise. Indeed, his outstanding contributions to Australia through MiniFAB, his distinguished academic career, and his enthusiasm for research commercialisation and entrepreneurship were recognised this year by the Australian Academy of Technology and Engineering (ATSE). Dr Harvey received the prestigious ATSE Clunies Ross Entrepreneur of the Year Award for 2018.

We both congratulate Dr Harvey and welcome him to the Institute. Dr Harvey will assist us in translating technology advancements into products to help patients with debilitating diseases.

NTT Data Innovation Conference 2018

Our researchers and engineers are always interested in keeping up with the latest technologies. We were grateful that Dimension Data sponsored two of our Senior Research Engineers, Nick Sinclair and Owen Burns, to attend the Nippon Telegraph and Telephone (NTT) Data Innovation Conference 2018 in Tokyo, Japan.

New leadership appointments

This year, we appointed two new leadership roles. The Chief Technology Officer, Professor Hugh McDermott, and Research Director, Associate Professor James Fallon, will work closely with our CEO to drive the development of new and improved medical bionic technologies.

Fridays at the Institute

For many years, the Bionics Institute has hosted seminars on a Friday afternoon, which are free and open to the public. These seminars are not only a chance to showcase our research, but are also a chance to network with people from other institutions and potential collaborators.

In 2018, the Bionics Institute appointed Dr Sophie Payne as Seminar Coordinator. Since her appointment, Sophie has invited many international and high-profile speakers who have shared their diverse knowledge.

Notable guest speakers

Professor Diego Ghezzi holds the Medtronic Chair in neuroengineering at the Interfaculty Institute of Bioengineering, Schoolof Engineering, of the Ecole Polytechnique Fédérale de Lausanne, Switzerland.

His research primarily focusses on the implementation of novel technological approaches for sight restoration, and more broadly on the development of neuro-artificial interfaces and tools for non-invasive brain stimulation with light. Professor Ghezzi presented: Novel technologies for restoration of functional vision

Professor Thomas Lunner, Dr Søren Riis and Dr Pierre Stahl visited the Institute from Oticon Medical and the Eriksholm Research Center in Denmark.

We were lucky enough to have these international experts visit, partly thanks to our existing relationship with Oticon, who have sponsored our PhD student, Alicia Carabali.

The trio consisted of senior representatives of Oticon, a hearing aid manufacturer based in Copenhagen. As such, they presented a seminar on hearing technology titled: Hearing research and future technology: insights from Oticon Medical.

Another visiting speaker was Professor Simon Malpas, the Chief Scientific Officer of Telemetry Research in Auckland, New Zealand.

Professor Malpas' research interests lie in the development of novel implantable devices for clinical and research use. A specific area of focus is in the development of a device to improve the lives of people with hydocephalus. His work on blood pressure sensors and his commercialisation journey was presented in a seminar, titled: Development of an implantable device for the long term sensing of pressure.

Professor Douglas Jones is currently the William L. Everitt Distinguished Professor in Electrical and Computer Engineering at the University of Illinois, USA.

He also holds appointments in the neuroscience program, the Coordinated Science Laboratory, and the Beckman Institute for Advanced Science and Technology.

When visiting the Institute, Professor Jones lived up to his international reputation as an expert in his field, by presenting an outstanding seminar on neural coding (modeling) titled: Optimal energy-efficient coding in sensory neurons.

Dr Linzi Wilson-Wilde (OAM), recipient of a Medal in the Order of Australia for her work, and 2014 inductee into the Victorian Honour Roll of Women, was invited to present at the Institute earlier this year.

Dr Wilson-Wilde has over 20 years' experience in forensic science working for Victoria Police, New South Wales Police and the Australian Federal Police. She's cracked many forensic cases in her time, worked on a number of high-profile cases, cold case reviews and the highly publicised mass DNA screen in the town of Wee Waa, NSW. She is also currently Director of the National Institute of Forensic Science Australia New Zealand.

Dr Wilson-Wilde's seminar was titled: Future of forensics DNA. She discussed forensics, new technology and new methodology.

Philippe Guichard, the man behind The Cablestop Kickstarter campaign; the sustainable Revology chair; D2 design and development, and recipient of multiple #1 design awards presented at the Institute in July.

Philippe is an award-winning, international industrial designer—thanks partially to his background in mechanical engineering. Overall, Philippe's designs have reached over $200M in sales.

The Revology chair which is made from 100% recyclable materials has won several international awards, including the Gold Melbourne Design Award. Philippe's vision is to help change the way we produce and consume "things" by designing purposeful products and companies, ultimately for the triple bottom line: profit, environmental sustainability and social responsibility.

Philippe discussed his experience in industrial design and commercialisation, with his seminar titled: Innovate using Design Tools.

Where are they now?

The Bionics Institute houses some of the brightest academic minds in their fields from Australia and beyond. Our students begin their careers with these brilliant minds, and they leave with the skills and knowledge to succeed in any endeavours they embark on.

We take this opportunity to thank all the local and international students and visitors we have had the pleasure of hosting at the Institute. We are delighted to have been part of their journey and success and, in many cases, enjoy ongoing research collaborations. We continue to follow their research and career progression, and would like to share and celebrate some of their recent achievements and appointments with you.

Tim Brochier and Research Participant Sarah Tracton at Sarah's first solo art exhibition, *Hearing it for Silence*

Dr Shefin Sam George

PhD awarded in 2016

Shefin was the first graduate through the Medical Bionics Department at the University of Melbourne. Her PhD thesis investigated new stimulation techniques to improve the quality of hearing provided by cochlear implants, under the supervision of Associate Professor James Fallon and Professor Robert Shepherd. Shefin is now a Postdoctoral Research Fellow in the Department of Otolaryngology (Head & Neck Surgery) at Stanford University.

Tim Brochier

PhD submitted in 2018

Tim recently completed his PhD at the Bionics Institute through the Medical Bionics Department at the University of Melbourne, supervised by Professors Colette McKay and Hugh McDermott. His research was focussed on the development of signal processing strategies to improve speech perception for cochlear implants. Tim has achieved ongoing recognition and success, receiving a Harold Mitchell Travelling Fellowship in 2018 and securing a postdoctoral position at Cambridge University to continue working on ways to improve cochlear implants.

Giorgio Auxilia

Masters student during 2018

Giorgio spent six months with the Bionics Institute this year as a visiting Masters student from the Polytechnic University of Turin, Italy, working with Dr Joel Villalobos and Associate Professor James Fallon to optimise graphene-based electrodes for biomedical applications. He successfully completed his Masters in Nanotechnologies for Information and Communication Technology (ICT) and was offered a position as a Research Fellow with the University to continue his innovative research started at the Bionics Institute.

Xin Zhou
PhD submitted in 2018

Xin recently submitted her thesis after arriving in Australia to undertake her PhD in 2014. During this time, she worked on the language processing of cochlear implant recipients under the supervision of Professor Colette McKay. We congratulate Xin on her recent appointment as Research Associate working with Professor Ruth Litovsky in the Binaural Hearing and Speech Lab at the University of Wisconsin-Madison, USA.

Dr Nicholas Apollo
PhD awarded in 2017

Nicholas was appointed this year as a Postdoctoral Researcher at the University of Pennsylvania's Centre for Neuroengineering and Therapeutics. He successfully completed his PhD in Physics (Materials Science) in 2017 under the joint supervision of Dr David Nayagam from the Bionics Institute and Dr David Garrett from the University of Melbourne. His research is focused on the development of medical devices, with his thesis entitled, Carbonaceous wires for neural interfacing: electrode development, surgical implantation, and device integration.

Dr Tomoko Hyakumura
PhD awarded in 2017

Tomoko was awarded her PhD from the Department of Audiology at the University of Melbourne in 2017, where she focused on the development and regeneration of the auditory nerve: much of her research was carried out at the Institute, under the supervision of Associate Professor Bryony Nayagam. We recognised Tomoko's skillset complemented our research, specifically her experience in histology, microdissection and explant culture work in vitro. She was offered a Research Fellow position this year and is now applying her skills across multiple projects including the development of devices for Parkinson's disease and inflammatory bowel disease.

Giving and community outreach

Mr Sam McLarty presenting the cheque to our CEO Robert Klupacs and Dr Hamish Innes-Brown

The Bionics Institute is a not-for-profit research institute which relies heavily on the support of our generous donors. These contributions are vital to the continued success of our work by supporting our dedicated research teams with their projects and facilitating equipment purchases and fellowships.

Australia's funding of health research and development falls behind many other western nations. With NHMRC government grant success rates less than 15 percent, there is a greater need for additional funding sources, such as philanthropic contributions.

In this context, the Institute recognises the importance of community outreach and engagement. Our researchers have been invited to showcase their research at a number of public events over the past 12 months and we welcome the new and continuing support of both individuals and community groups.

New fellowship supported by anonymous donor

We gratefully acknowledge an anonymous donor for their generous gift to establish our first Clinical Hearing Research Fellowship to accelerate the EarGenie™ project. The project aims to optimise language development in hearing-impaired infants by using several measures of brain activity.

While we still have a way to go in raising the funds needed to retain the Fellow over six years, we are excited to be able to start recruiting a clinical hearing researcher to work within the translational hearing research team.

AFL Players' Association donation

The AFL Players' Association and Collingwood Football Club contributed a generous donation via the AFL Players Care fund program. We welcomed this contribution on the back of Sam McLarty's success, as not only the top draft pick for Collingwood in 2017 but the first person in the league with a cochlear implant. Sam and his family have been long-time supporters of the Institute and we wish them and the Magpies all the best in this exciting time for the Club.

Bertalli family donation

The Bertalli family's generosity helped the Institute to establish the Diana and Neville Bertalli Research Fellowship. The inaugural Fellow is Associate Professor James Fallon, our newly appointed Research Director. The Bertalli family has had a long association with the Institute, and this new Fellowship shows their continuing and unstinting support for our research.

Mr Neville Bertalli and Mrs Diana Bertalli with Fellowship recipient A/Prof James Fallon (right)

Ms Sarah Tracton holding a sculpture from her exhibit

Ms Suzanne de Pelsenaire's Garden

Open Garden event

On the 28th and 29th of October 2017, Suzanne de Pelsenaire, a Bionics Institute volunteer and cochlear implant recipient, opened her garden to the public for the benefit of the Institute for one last time. Approximately 180 people visited Suzanne's garden in Melbourne's outer east over the weekend, raising $2,770 to be used towards infant hearing research in the EarGenie™ program. This was the fifth and, sadly, final year that Suzanne opened her breathtaking garden as a fundraising event.

"I am now celebrating nine years since I myself received the gift of hearing again with a cochlear implant, which has transformed my life. My gratitude is boundless for these wonderful researchers and this marvellous technology," Suzanne said.

We'd like to extend our gratitude for volunteers and supporters like Suzanne and thank them for all their efforts and generosity over the years.

Lions Clubs of Victoria

The Institute continues to enjoy its longstanding and close relationship with the Lions Clubs of Victoria, extending back to its infancy when several Lions Clubs supported Professor Graeme Clark in the early stages of the development of the cochlear implant. Now the Victorian Lions Foundation is funding a number of research fellowships including the Hearing Research Fellow, Professor Colette McKay, and the Neurobionics Research Fellow, Dr Wesley Thevathasan. Dr Thevathasan is a neurologist working to improve deep brain stimulation systems for patients with Parkinson's disease and movement disorders.

We are also privileged to regularly host the meetings of the Victorian Lions Foundation at Mollison House in East Melbourne. Additionally, every year our researchers have the opportunity to visit a number of Lions Clubs to talk about their science. This year Associate Professor James Fallon travelled to Sale, Victoria, to present an overview of our work to the 201 V3 district.

We appreciate the longstanding and continued support of the Victorian Lions Foundation and the Lions Clubs of Victoria.

Hearing it for Silence

Ms Sarah Tracton is a multi-disciplinary artist and one of the Institute's most generous research participants. After Sarah lost her hearing in her 20s, her cochlear implant influenced her creative expression. Sarah participated in several studies conducted by PhD candidate, Tim Brochier, which focused on improving signal processing strategies for cochlear implants. This year, Sarah's first solo exhibition, Hearing it for Silence, was held at St Heliers Gallery at the Abbotsford convent.

Both Sarah and Tim were invited to chat with ABC legend, Myf Warhurst, live in studio about Sarah's deafness, cochlear implants and the influence on her art.

"I've been a research participant four times for different projects at the Bionics Institute. The cochlear implant gave me hearing; it's illuminated me; it's given me more energy; it's just given me more access to the world." Sarah said.

Volunteers like Sarah are crucial for our research, and we sincerely thank all participants for their continued engagement with the Institute.

Our donors

$250-$999

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- Percy Baxter Charitable Trust
- The Robert C Bulley Charitable Fund
- Victorian Lions Foundation

Leave a legacy with the Bionics Institute

This year we have revitalised our messaging on planned gifts and bequests, highlighting the importance and the benefits of making a gift through an inclusion in a Will, or adding a codicil to a Will.

Having a Will that is up-to-date and articulates the express wishes of the donor is a responsible thing to do. It helps loved ones manage and deliver the donor's decisions with ease, when often it is a highly emotional and sensitive time. The benefit of making a bequest is that it costs nothing now, but can give the satisfaction of helping to secure the future of the Bionics Institute.

A planned gift allows the donor to retain control of their assets during their lifetime, and modify their charitable designations if they so choose. For those wishing to notify the Bionics Institute of a bequest, they will be included as a member of our new Bionics Council which we hope will bring them closer to our work. It is always a privilege to be able to thank and recognise our generous donors now. Should a donor wish their bequest to remain anonymous, we will respect this and acknowledge your gift privately.

Making a Will ensures the opportunity to say how an estate is to be divided among those who are important to the donor. Where a Will already exists, and circumstances change, clarity of intention can be made by adding a codicil to the Will.

Declaring a bequest as a 'general' contribution, allows access to both the capital and the income to support the Institute's research and scientific purposes. A bequest as an 'endowment' can be characterised as a legacy when the capital is invested, and generated income from the corpus is utilised for the Institute's purposes.

Bequests can simply name the Bionics Institute in a Will as a beneficiary for a specific amount or percentage of an estate. A residual bequest refers to the remainder of an estate to be given to the Institute after all debts, expenses and beneficiaries have been paid. A contingent bequest operates in favour of the Bionics Institute as an alternative beneficiary, only if other named beneficiaries of the estate do not survive the person making the Will.

All bequests should be made to the Bionics Institute of Australia.

Research staff and collaborators

Research staff and students

- Ms Nicola Anglin
- Mr Angus Begg
- Dr Yuri Benovitski
- Mr Nathan Bordonaro
- Mr Tim Brochier
- Mr Owen Burns
- Ms Alicia Carabali
- Mr Scott Chambers
- Ms Nicole Critch
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- Dr Hamish Innes-Brown
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- Dr Julia Wunderlich

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- Ms Olivera Krstevski
- Ms Kylie O'Neill
- Ms Caitlin Porter
- Mr Andrew Purnama
- Mr Stanislaw Surowiecki
- Ms Leah Wallenaffer

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- Dr Carla Abbott (Centre for Eye Research Australia)
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- Dr Patrick Atkinson (Stanford University)
- Dr Lauren Ayton (Centre for Eye Research Australia)
- Ms Elizabeth Baglin (Centre for Eye Research Australia)
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- Dr Jonathan Yeoh (Centre for Eye Research Australia)
- Ms Kiera Young (Centre for Eye Research Australia)
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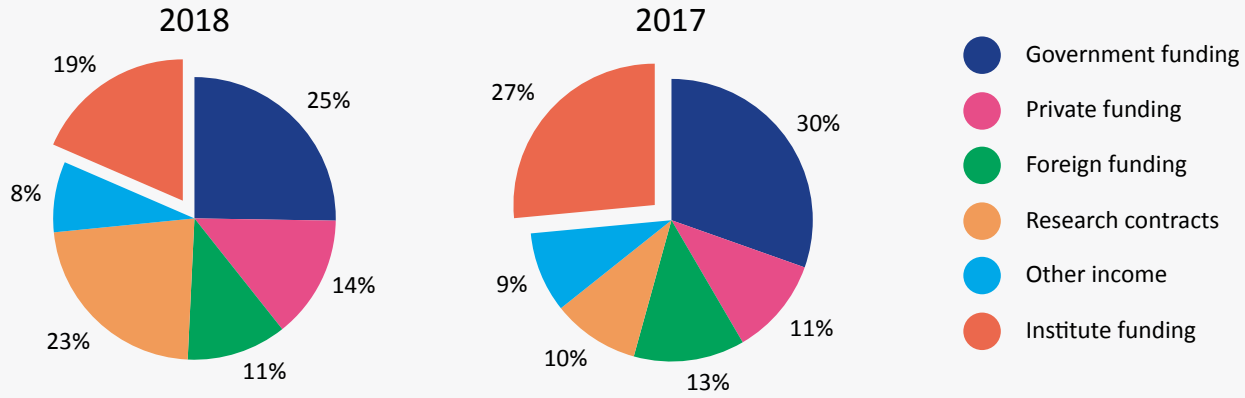
Abridged Financial Statement for the year ended 30 June 2018

Consolidated Income Statement	2018 $	2017 $
REVENUES FROM ORDINARY ACTIVITIES		
Federal Government grants	1,711,943	2,078,891
Victorian Government grants	517,335	456,243
Foreign grants	1,009,156	1,059,123
Trusts & foundations	957,090	756,425
Public fundraising	285,211	174,757
Research contracts	2,000,397	833,541
Investment & interest income	642,145	606,638
Other income	713,146	767,522
TOTAL REVENUE FROM ORDINARY ACTIVITIES	**7,836,423**	**6,733,140**
less expenditure on ordinary activities	(8,826,848)	(8,334,318)
DEFICIT ON ORDINARY ACTIVITIES	(990,425)	(1,601,178)
Gain/(loss) on sale of available-for-sale financial assets	468,113	(648)
NET DEFICIT	**(522,312)**	**(1,601,826)**

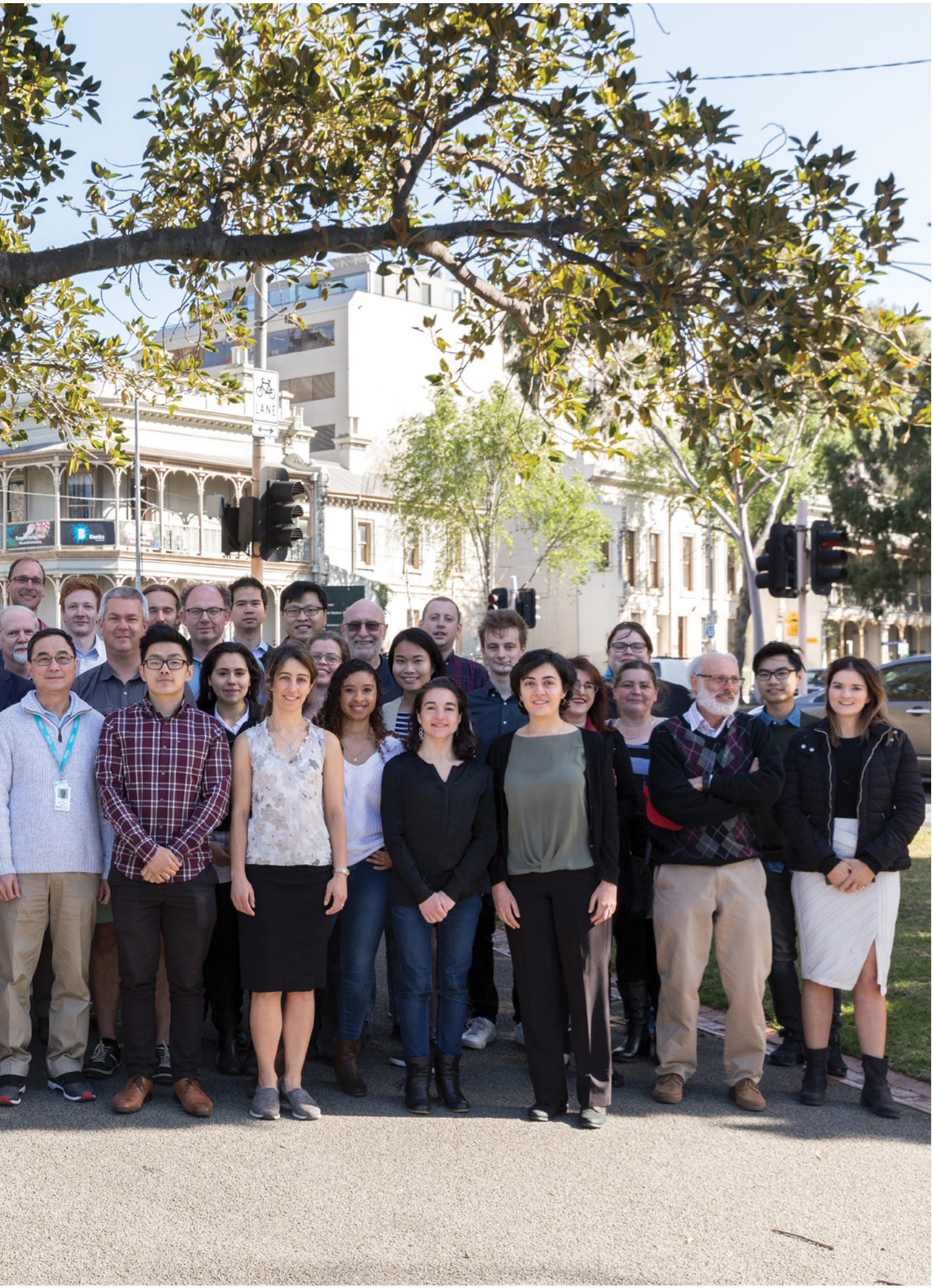
How research is funded



Consolidated Statement of Financial Position	2018 $	2017 $
Current Assets	5,749,207	3,900,883
Non-Current Assets	13,134,133	13,052,921
TOTAL ASSETS	**18,883,340**	**16,953,804**
Current Liabilities	4,759,472	3,028,205
Non-Current Liabilities	370,717	285,036
TOTAL LIABILITIES	**5,130,189**	**3,313,241**
NET ASSETS	**13,753,151**	**13,640,563**
TOTAL INSTITUTE FUNDS	**13,753,151**	**13,640,563**

Full audited financial statements are available from the Institute's registered office by request.

The team transforming technology and changing lives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