Professor Rob Shepherd has recently announced that he will be retiring from his role as Director.

While leading the Institute, Professor Shepherd has overseen the expansion of the Bionic Ear Institute into the Bionics Institute. During this time, the Institute has broadened its research portfolio to include bionic vision and neurobionics, along with increasing engagement with industry to ensure that effective health outcomes are delivered to the public.

The Institute is happy to announce that it will not be losing the services of Rob. He will continue to pursue with the organisation his key interests of research and development of safe and effective bionic devices, along with mentoring the next generation of researchers, and help champion the cause of the Institute.

The Institute’s Board of Directors is currently in the process of recruiting for the next CEO, to take the Institute into its next phase of growth in leading the world in the development of innovative bionic health solutions through research.
Dear Friends,

I have immensely enjoyed the last 11 years as Director of the Bionics Institute. It has been a privilege to lead such a talented group of researchers. While I have decided to retire from this role, I am delighted to be remaining at the Institute to pursue my research interests. I am looking forward to the opportunity to be more closely involved in a range of cutting-edge research projects, and continue to develop innovative medical devices.

We held an event in June to celebrate some wonderful developments in hearing research and the contributions of our Ambassadors. This event was a delightful afternoon in which we heard from leading researchers, as well as personal accounts from our Ambassadors who have benefited from modern hearing devices and early intervention programs.

We thank our generous Ambassadors who, through giving their time and commitment, continue to be so important to our achievements at the Institute.

We recently said farewell to Patrick Thien, one of our PhD students, who left us to gain industry experience in the USA. The Institute values the contributions and hard work of all its students. We have developed a supportive research environment in which to learn the skills necessary to establish themselves as the next generation of innovators and leaders within the field of medical bionics.

A former Bionics Institute board member, Kathleen Jordan, recently launched her book about her road to recovery following a stroke. Kathleen’s book, entitled ‘Standing Up!’, is available from our reception (03 9667 7500), with proceeds being generously donated to the Bionics Institute and Stroke Foundation. I highly recommend this inspiring and beautifully written book.

I hope you are enjoying the first signs of Spring after a chilly Winter and enjoy reading this issue of Bionic Connections.

Kind regards,

Rob Shepherd
Bionics Institute Director

In the news

Episode 4 of the new ABC series Keeping Australia Alive followed patient ‘Danny’ who was about to undergo deep brain stimulation surgery to deliver targeted electrical impulses to the brain to treat his symptoms of Parkinson’s disease.

Typical deep brain stimulation (DBS) surgery involves implanting electrodes into both sides of the brain and a battery-powered stimulator is implanted below the collarbone in the chest. Danny’s surgery required a high level of precision and pinpoint accuracy from his neurosurgeon, while his neurologist, Dr Wes Thevathasan, worked out the trajectory and target of the electrodes that were being implanted in the brain. Dr Thevathasan is the Institute’s Lions International Neurobionics Fellow and is part of a talented research team developing an advanced deep brain stimulation device to treat movement disorders.

Danny, who has early onset Parkinson’s disease at the age of 53, underwent four hours of surgery at St Vincent’s Hospital, Melbourne and was awake throughout the procedure. Surprisingly, following the operation he tells the medical staff he would much rather go through the DBS surgery than a visit to the dentist.

Parkinson’s disease affects an estimated 10 million people worldwide and 70,000 people in Australia. For some of these patients in which medications are not effective, DBS may be an alternative treatment.

The DBS devices currently available are usually effective, but there is room for significant improvement. The Bionics Institute is applying a new approach based on our extensive experience in the development of bionic devices. Our advanced electrodes will incorporate more stimulation contacts, will be more flexible to minimise trauma during implantation, and will be smaller and hence easier to insert and position. Our DBS system will also have the capacity to record brain activity continuously after implantation. This feature will allow automatic adjustment of stimulation to suit a patient’s symptom state; that is, it will be able to adapt to a patient’s needs.

A link to the telecast can be found on our website news section: www.bionicsinstitute.org/news

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Celebrating our supporters

In June we held a fantastic afternoon celebrating hearing research at the Bionics Institute and our supporters.

It was wonderful to hear from our Ambassadors and friends of the Institute about how cochlear implants have made such a profound difference in their lives. Their personal stories inspire so many others on the same journey, and inspire our researchers’ work to improve this technology and the quality of hearing that it provides.

We also welcomed our newest Ambassadors – the Feller family. Daniel, father of bilateral cochlear implant recipient Harry, spoke of the importance of early intervention programs, while twelve year Tess spoke confidently about her little brother Harry.

Tess said, “Thanks to today’s technology, Harry is just like any other five year old boy. The things he wears on his head allow him to hear but that doesn’t make his personality different to anyone else’s. He loves trains, trucks, Star Wars and watching TV.”

We heard from our senior researchers including Professor Colette McKay, who spoke about a project that is close to her heart.

Her aim is to improve language outcomes in young children by understanding how the brain responds to the hearing provided by cochlear implants. She continues her quest to raise funds to establish her dedicated infant hearing laboratory with child-friendly brain imaging equipment.

Following the presentation, we enjoyed sharing afternoon tea and discussing some of the opportunities on the horizon, including the next Ambassador event which will be held later this year.

We are grateful for our ambassadors’ contributions and efforts. We are truly privileged to have such passionate representatives who generously volunteer their time to promote research that will change the lives of many people.

Outstanding service to audiology

At Audiology Australia’s national conference held in late May, Professor Colette McKay was awarded a special certificate for Outstanding Service to Audiology.

The Bionics Institute congratulates Colette for this well-deserved recognition of her contributions to research, teaching, and professional development in the field of audiology.

Colette has an impressive track record of contributing to real and significant improvements in cochlear implant outcomes. She is the leader of our Translational Hearing Research program and her goal is to understand why some people do not understand speech with a cochlear implant as well as other people. One of her research projects has used a new brain imaging method called fNIRS in adult cochlear implant recipients to see how their brains are responding and adapting to their hearing device. With this knowledge we will be able to determine the best training for each person after they receive their implant, so that the benefit from their implant is maximised.

Colette’s ambition is to expand her brain imaging research to investigate how the hearing brain develops in deaf infants and children. The fNIRS technique is both child-friendly and compatible with implanted devices, and uses light sources and detectors incorporated into a head cap.

“The earlier deaf children get access to hearing, the better the outcome they will have with language development,” Colette said.

Our goal is to help each child to reach their full potential by understanding the source of variability in language outcomes and then applying this knowledge to give each child the best possible access to hearing and language development.

To establish a dedicated infant hearing laboratory for this research, Colette needs help to buy specialised brain imaging equipment. The gift of hearing is one of the most profound gifts a child can receive.
New horizons

We recently said farewell to one of our bright PhD students, Patrick Thien, who left us at the end of June to gain valuable industry experience in the USA. He is putting his PhD studies on hold so that he can help develop another technology, this time for the company behind Amazon Echo.

Patrick commenced his PhD in 2015, working within the bionic vision research team. Part of his research has been to advance a core component of the next generation bionic eye being developed at the Bionics Institute with its collaborators.

Patrick has worked to improve the stimulator that determines the electrical impulses that are sent to the electrodes implanted behind the retina. His aim has been to improve the stability of the visual images evoked by the bionic eye.

“I was drawn to the Bionics Institute by the work being done on bionic eyes and was fortunate enough to be placed here through the Undergraduate Research Opportunities Program during my undergraduate studies. With my background in biomedical science and electrical engineering this research was a perfect fit. I have immensely enjoyed working with such intelligent and enthusiastic people,” Patrick said.

Patrick has joined a team working on the development of speech and language solutions for the Amazon Echo product. This is a hands-free device that can be controlled by the voice and used to play music, provide information, news, weather, and more.

We look forward to welcoming Patrick back to the Institute on completion of his internship with Amazon.

The joy of movement

With her training in physiotherapy, Joy Tan understands the impact of movement problems on a person’s life.

This impact is extreme and debilitating in those living with Parkinson’s disease.

Joy joined the neurobionics research team in 2014, first as a research assistant and then as a PhD candidate.

Her project is investigating posture and balance in those with Parkinson’s disease. Walking and balance disturbances commonly emerge in the advanced stages of this disease and result in reduced mobility, increased risk of falls, and diminished quality of life.

Working closely with clinicians, she is examining the effectiveness of a new target for deep brain stimulation to alleviate posture and balance deficits. Part of her project has been to work with our engineers to develop a new instrumented system to precisely measure balance.

“The Bionics Institute is a stimulating and supportive environment to undertake my research as a PhD student. Senior researchers and other students are always approachable and helpful.

Working with a team of supervisors from different professional backgrounds brings many fresh ideas and perspectives to my project.

Discovering new methods for providing the best treatment outcomes for patients is extremely rewarding: It drives me to keep doing what I’m doing,” Joy said.
**Reaching her goals**

Profound deafness is not a barrier for Alana. The confident and happy eleven year old is a bilateral cochlear implant recipient who loves life, with a passion for dance, music, and netball. She really enjoys school, especially subjects such as reading and writing.

Alana was born profoundly deaf but her parents Peter and Donna didn’t initially suspect deafness because she was such an alert and vocal baby. However, after a series of tests she was diagnosed profoundly deaf at the age of 13 months old.

Within the next few months she received her first cochlear implant and at 22 months she received her second. By the age of two years she demonstrated normal language development compared to her peers.

Donna says about her daughter, “She amazes us every day with her achievements and her eagerness to live life to the fullest. Because she received this cochlear implant technology, we know she will have all the same opportunities as all the other children - thank you for this amazing gift.”

The cochlear implants Alana received originated from the research of Professor Graeme Clark and his team at the University of Melbourne in the ’70s and ’80s. Several of those original team members are the Institute’s current research leaders.

For Alana, this technology has been life changing.

“If I didn’t have cochlear implants then I wouldn’t be able to do the things that I love, like music and dancing - it’s a miracle to have them,” Alana said.

Soon after receiving a cochlear implant young children have extensive training in speech recognition and language skills. However, musical training is usually left to the parents and to the child’s desire to learn. Alana always had a passion for music and dancing from a quite young age which has assisted her to develop the skills for music perception.

While cochlear implants are highly effective at conveying speech in quiet conditions, it can be difficult to hear in noisy environments such as at a restaurant or party. The rich texture of other complex sounds, such as music, also presents difficulties for cochlear implant users.

Our research aims to improve upon current cochlear implant technology and the quality of hearing that they provide.

**Standing up!**

Former Bionics Institute board member, Kathleen Jordan, has recently written a book about her journey to recovery after stroke.

"Standing Up! My story of Hope, Advocacy and Survival after Stroke",

conveys her tremendous courage and determination after a fateful morning in 2011 when her world was changed forever. This book gives hope to other stroke survivors as well as those facing a major health ordeal.

Kathleen is generously donating half of the proceeds of her book to the Bionics Institute, with the other half donated to the Stroke Foundation.

Please contact us on (03) 9667 7500 if you wish to purchase a copy.
Entrepreneur of the year

The Institute congratulates Dr Elaine Saunders of Blamey Saunders Hears who has received the Clunies Ross Entrepreneur of the Year award.

This award recognises Elaine’s work in making high performance hearing technology as accessible and affordable as possible. Clunies Ross Awards are given in recognition of the outstanding application of science and technology for public benefit.

“Good hearing aid technologies result from good research. Australia has contributed significantly to international hearing aid development,” Elaine said.

Dr Saunders founded the hearing aid company Blamey Saunders Hears with Professor Peter Blamey who has contributed greatly to hearing device research at the University of Melbourne and the Bionics Institute over many decades.

Donor list

The Institute would like to thank the following individuals, organisations, trusts and foundations that have contributed over $200 since February 2016.

- Colonial Foundation
- Gillespie Family Foundation
- Harold Mitchell Foundation
- Hilton White Estate
- Lions Club of Kalgoorlie Inc
- Nell & Hermon Slade Trust
- Pierce Armstrong Foundation
- Prescott Family Foundation
- Probus Club of Melbourne
- Professional Advantage
- Reuben Peterman Benevolent Foundation
- Robert C Bulley Charitable Fund
- The Calvert-Jones Foundation
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- Mr John Stanhope
- Mrs Yvonne Sullivan
- Dr Wes Thevathasan
- Mr & Mrs P Thomas
- Mrs Katrina Tull
- Mr Stephen Wargula
- Mr Ian Young

Chairman of the board honoured

Congratulations to the Bionics Institute Chairman, Mr John Stanhope, who was appointed a Member of the Order of Australia (AM) in the General Division in The Queen’s Birthday 2016 Honours List.

The Order of Australia recognises outstanding members of the community. John received his award for his significant service and leadership in the financial and national communication sectors.

Bionics Institute Director, Professor Rob Shepherd, said, “This is a wonderful recognition of John’s active participation across a broad area of community activities. On behalf of the Institute’s Board and staff, I congratulate John on receiving this great honour.”

Be a part of the great advances happening in medical bionics right now

Take Action

Get involved by raising awareness about bionics research through your club, school or workplace or host an event to raise funds for bionics research.

Donate

You can donate to a specific theme of research: Hearing, Vision, Neurobionics or give to our general appeal via our website www.bionicsinstitute.org.

Our fundraisers and ambassadors are fundamental to supporting our research at the Bionics Institute. If you would like to get involved or share your story with us, contact us today.

For editorial enquiries or to receive our eNewsletter, please email PRTeam-Enquiries@bionicsinstitute.org or reception at (03) 9667 7500.

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