

New bionic limb research Bionics Institute Newsletter

SPRING 2023

Alzheimer's trial begins

The power of a gift in your Will



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A word from our CEO

Marking a new era in Australian med tech innovation, we are thrilled to welcome senior researcher Professor Max Ortiz Catalán to lead a new research stream at the Bionics Institute.

Founder and Director of the Center for Bionics and Pain Research (CBPR), a joint initiative of Chalmers University of Technology, Sahlgrenska University and Gothenburg University in Sweden, Professor Ortiz Catalán is a world leader in bone implanted prosthetics and the development of treatments for phantom pain.

As Head of our Neural Prosthetics Research Program, he and his team aim to eliminate disability and pain for people with limb loss by combining the expertise of the Bionics Institute and CBPR. Chronic pain is also the focus of world leading research led by Associate Professor Rachael Richardson, who has developed new technology that enables highly specific nerve stimulation by combining the use of light, electricity and genetic targeting to treat chronic conditions, such as sciatica.

We're delighted to have commenced two first-in-human clinical trials earlier this year. We look forward to updating you on the progress of both our new and established research in the future.

We were proud to host the 2023 Bionics Institute Innovation Lecture in May. It was an enormous success attended by nearly 300 people from the med tech ecosystem.

Thank you to our kind and compassionate supporters who donate towards our research – our work would not be possible without your help.

Best wishes,

Pat-J-U

Robert Klupacs Bionics Institute CEO

Alzheimer's clinical trial commences

Thank you to our generous donors who have made possible the commencement of our Alzheimer's treatment trial. Professor Kate Hoy and her team are now able to recruit over 100 participants to trial a non-invasive brain stimulation treatment – called Transcranial Magnetic Stimulation – that shows promise in the fight against memory loss.

Interest in the trial has been significant, with over 850 people expressing interest and potential participants undergoing rigorous assessments to ensure suitability, including a referral letter from their treating doctor.

The trial aims to establish how Transcranial Magnetic Stimulation can restore dysfunctional connections in the brain using a personalised approach, with the aim of improving brain function and fighting memory loss in Alzheimer's.

The treatment involves scans of the brain to establish the exact locations requiring stimulation, which is provided 5 days a week for 6 weeks, then weekly for a further 6 weeks.

We urgently need funding to expand this trial across the country and help researchers turn this treatment into reality. Your generosity will give hope to people living with the distress of Alzheimer's disease.



Globally, the incidence of **Alzheimer's disease** and other dementias has increased by nearly

from 1990 to 2019

Li X et al (2022) Global, regional, and national burden of Alzheimer's disease and other dementias, 1990–2019. Frontiers in Aging Neurosci, 2022, 14:937486

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Supporting students to pursue a career in research

For Bionics Institute supporters Peter Griffin AM and Terry Swann, the decision to set up a scholarship fund to support a PhD student over four years was very straightforward.

"We see our role as assisting research institutes to fund bright, young people to advance knowledge into a range of problems still facing society today," Peter explains.

Peter and Terry were particularly keen to fund a student at the Bionics Institute because it is known for fast translation of research into the clinic to improve the lives of people living with challenging health conditions.

Peter says:

"The Bionics Institute is unique because their researchers are experts in the use of bioengineering to find solutions to health issues. I look forward to seeing the results of research into fighting memory loss in Alzheimer's undertaken by our Griffin Swann PhD Scholarship recipient."

Thank you to our kind and compassionate supporters who, like Peter and Terry, were moved to donate to our appeal in June to support PhD student scholarships. Your generous gifts will help high achieving students undertake PhD research into conditions such as hearing loss, rheumatoid arthritis and chronic pain which, without your support, would not be possible.





Taking tinnitus research to the next level

Unlike many other conditions, there's currently no reliable test to diagnose tinnitus. Without a diagnostic tool, researchers are unable to test the effectiveness of treatments to give relief to people living with constant ringing and buzzing in their ears.

This is despite the fact that severe cases can lead to sufferers stopping work and social activities, causing financial hardship and worsening mental health.

Bionics Institute researcher Dr Mehrnaz Shoushtarian and her team have been working on a test to diagnose tinnitus using a combination of light technology and artificial intelligence.

Pilot studies show that the test is over 80% effective in diagnosing the severity of tinnitus. Now we need the help of our supporters to take this test to the next level – a comprehensive clinical trial needed to get approval for use of the test in clinics.

This will be the next step towards developing lifechanging treatments for this auditory torment.

To find out more about our tinuitus research, watch this webinar:



Grant funding boosts drug-free approach to relieve chronic pain

Nerve damage caused by disease, injury or infection can lead to chronic pain, which affects a staggering 1 in 4 people worldwide.

Bionics Institute researcher Associate Professor Rachael Richardson says finding a drug-free alternative to medications has become her mission because they often give inadequate relief and cause unwanted side effects.

She says: **"My team has developed a** nerve stimulation technique that uses a combination of light and electricity and we've shown we can either activate or suppress nerve activity, which both have a role in the treatment of chronic pain."

Having shown that the new technique can be used to selectively activate the sciatic nerve, her team is now working on selectively suppressing parts of the sciatic nerve causing pain.

"We believe that using this technique will give us unprecedented control over the transmission of pain signals to the brain and remove the need for pain medication."

A/Prof Richardson was recently awarded a grant by the CASS Foundation to take this research to the next step and with further support, plans to take this research all the way to the clinic to help people suffering from chronic pain.



Bionics Institute celebrates National Science Week

To celebrate National Science Week 2023, we held an Open House event on 16 August.

Guided through our world-class laboratories by researchers and engineers, Open House guests gained an insight into the innovative devices and therapies we're developing to transform the lives of people living with challenging medical conditions.

Donors, supporters and students alike said it was fascinating to find out about our research into a range of conditions, including hearing, autoimmune conditions and Alzheimer's.

We would like to thank the Federal Government for funding this event through a National Science Week grant.





Thanks to a very special act of generosity, our researchers are another step closer to using nanotechnology to develop a world-first drug treatment for hearing loss.

Remembering the Bionics Institute in your Will is a wonderful way to make a difference in people's lives.

After taking care of your loved ones, leaving a gift in your Will enables you to continue supporting the research that was important to you during your lifetime, and leave a legacy for the future.

All gifts, no matter what size, have a meaningful impact on people living with challenging medical conditions and we will make sure your gift is used so that it has the greatest impact.

The Bionics Institute has partnered with Gathered Here, one of Australia's leading online Will platforms, so that

you can easily create your lawyer reviewed Will. It's a completely free service and in just a few clicks, you can easily and quickly create your free Will in the comfort of your own home.

Although there is no obligation when writing your online Will, after taking care of your loved ones, you may also wish to leave a gift to the Bionics Institute to help us future-proof our important work to transform the lives of people for generations to come.

For a confidential chat about leaving a gift in your Will and how you can join our Catalyst Community contact our team at philantropy@bionicsinstitute.org.



More information



Pick a fitness challenge in anything active and raise funds for medical research



Get *fit* and *help people* at the same time!



New research: thought-controlled bionic limbs

Professor Max Ortiz Catalán joined the Bionics Institute in June this year to lead research into ground-breaking bionic limb technologies as Head of Neural Prosthetics Research.

A world leader in this field, Professor Ortiz Catalán has developed bionic limb technology that integrates with the remaining bone, nerves and muscles of a patient's residual limb and enables thought-controlled movement similar to a biological limb.

Founder and Director of the Center for Bionics and Pain Research (CBPR) in Sweden, Professor Ortiz Catalán is also a full Professor of Bionics at Chalmers University of Technology in Gothenburg, Sweden. The Bionics Institute and CBPR are now working closely together on the mission to develop and clinically implement technologies to eliminate disability and pain due to sensorimotor impairment.

Improving quality of life for people living with limb amputation

In 2017, more than 58 million people were living with limb amputation worldwide.

Conventional approaches to attaching prosthetics to the human body result in artificial limbs that can cause pain and discomfort and are difficult to control.

New research at the Bionics Institute

The Neural Prosthetics Research Program is focused on creating bionic limbs that are highly integrated with the human body, restoring the functionality of a limb lost through amputation or congenital limb malformation.

Surgical and engineering techniques are being used to connect an individual's prosthesis with their nervous system, resulting in bionic limbs with more reliability and dexterity than current options.

The electronic control system of the prosthesis is then connected to the patient's nerves and muscles, creating a neuromusculoskeletal human-machine interface.

This interface supports brain signals to travel through the nerves and muscles safely and reliably to the bionic limb, giving the patient movement control and sensory awareness.

New surgical procedures, neural interfaces and artificial intelligence algorithms are currently being used to further increase dexterity and the richness of sensory feedback.



See this technology in action

Join our community of donors and help us develop life-changing treatments. Please give this Spring. Bionicsinstitute.org/donate

