

Bionics Queensland Prospectus



BIONICS
QUEENSLAND



Bionics Queensland: Putting people at the heart of bionic innovation, uplifting human capability, changing lives

It's no longer science fiction. Bionic devices, limbs, implants and treatments are on the evening news! And yet this is still the 'tip of the iceberg'. For Bionics Queensland, telling the stories of the life-changing innovations already changing lives (there are many!), connecting everyday people to the latest breakthroughs and ensuring those impacted by trauma, disability and disease are 'front and centre' in the co-design of new bionic solutions sits at the heart of what we do.

Today, people from all walks of life are reaching out, seeking to share their 'lived experience' with scientists, clinicians, researchers, start-ups, device designers and engineers. And their journey, be it linked to road accident injuries, a chronic disease or other health condition, provides many valuable signposts to bionics R&D leaders and innovation teams. More than ever before, bionics end users are in the room and in the game as ground-breaking discoveries come to life. At Bionics Queensland, our community of innovators (and our proposed Human Bionics LivingLab™) and annual Bionics Challenge each play a vital role in achieving this outcome.

Engaging consumers and a wide suite of partners is the key to our success – from the outset, the collective efforts of a vibrant ecosystem have underpinned the vision, dream and life's work of our Bionics Queensland founder and Chair, Dr Dimity Dornan AO: "A commitment to consumer and patient-centred design will see us shape a truly inclusive human bionics era. Working at the grassroots of the community and with the 'best and brightest minds' in leading hospitals, universities, medtech businesses and manufacturing will enable us to fast-track the next generation of bionic innovations to market".



Pictured: Matthew Ames & Dr Dimity Dornan AO.

Nowhere is the need for acceleration, collaboration and co-ordination of the bionics industry more humanised than in the words of engineer, Bionics Queensland Board member and quadruple amputee, Matthew Ames.

"Everything I do from the moment I wake up each day involves some form of device. My bionics are part of me. They need to be expertly designed, locally sourced, easy to repair and masterfully programmed to help me live life to the fullest. This requires great communication, expertise and collaboration between many bionics industry professionals. There are still many challenges to overcome for improved devices to transform not just my life, but the lives of many."

Local-Global Participation

With hubs of excellence in bionic innovation and medical device development across Australia, the time is right to engage local and global innovation leaders in an exciting dialogue to accelerate our Human Bionics LivingLab™, expand our Bionics Challenge and kick-start deeper and wider participation in the bionics revolution.

This Prospectus opens the door to new conversations with our Core Partners, Major Associates and Innovation Leaders. Equally, it opens the door to new conversations with bionics end users, leading charities, health interest groups, the medtech industry, SMEs, para-sports experts and sports-tech innovators and others.

An era of human bionic innovation is upon us that merges incredible advances in regenerative medicine, new insights to brain-computer interfaces, human health and performance, robotics and new bio-electronic interfaces, artificial intelligence and quantum computing. The landscape is dynamic and there is much to be achieved by establishing new partnerships and alliances now, within and across borders.

Delivering Impact – Our Key Priorities



Together with our university and hospital partners, we will:

- Continue to map the needs and 'lived experiences' of end-users (and their families, carers, and supporting charities) aligning the co-design of new bionic devices and treatments to their journey.
- Educate and engage everyday Australians about the power of human bionics to restore or improve limb and spinal mobility, deliver new or enhanced bionic senses, bionic implants and organs and accelerate new treatments for brain trauma, chronic disease, and complex health conditions.
- Identify and showcase local and global bionics R&D and link end-users to the most up-to-date insights available on bionic devices and technologies (invented in Australia and offshore).
- Enable new collaborations, creating multi-disciplinary, cross-institutional R&D teams and encouraging early-stage innovators 'to team up and skill up' in order to pioneer, test and refine bionic devices, treatments and implants.
- Minimise the time to market for bionic solutions using vertical collaborations that 'leapfrog' start-ups from concept to design, MVP and market validation to clinical trials, manufacturing, and distribution.
- Link bionics founders with funders, accelerating devices to market with the assistance of an array of funding agencies and investors.

At Bionics Queensland our vision for human bionics is far-reaching...more than ever before, the 'improbable seems possible' for people living with spinal cord injuries, debilitating diseases and health conditions that have so far been untreatable.

Since the launch of Bionics Queensland in 2019, we have seen extraordinary advances in medical bionics around the world and in our own backyard. We've seen the Australian-born Stentrode device, a tiny fully implantable, take home wireless technology undergo in-human trials that demonstrate its capacity to give everyday freedoms back to people with severe disabilities or a neurodegenerative disease. In Queensland, we've seen a late-stage prototype of the Laronix Bionic Voice Box emerge and new milestones reached with the Diabetes Neuromathix Bionic Pancreas.

By 2035, our concept of "human" will be shaped by a new generation of bionics devices and treatments. Bionics Queensland is already actively supporting the delivery of full or partial solutions to disability and disease, new-to-the-world treatments for chronic health conditions and pathways to optimise human performance (including para-sports participation). Today, human bionics (a marriage of biology and technology) spans a diverse suite of interfaces, interventions, and implants within the human body.

Across Australia, more bionics R&D and start-ups are emerging, helping to fulfill our shared goal of creating a **Human Bionics LivingLab™** community of innovators and end-users across **four exciting domains:** bionic mobility, bionic senses, bionic implants and organs, and, neurobionic devices, implants and treatments.

CHALLENGE

01



Bionic Mobility

Bionic-robotic technologies, devices and power sources to optimise bionic limbs, hands and feet; robotic gloves and exoskeletons; plus bionic interfaces that seek to restore spinal sensation and movement.

CHALLENGE

02



Bionic Senses

Devices and technologies focused on: hearing, vision, taste, smell, touch and other senses – balance, skin tension, pressure, pain & temperature.

CHALLENGE

03



Bionic Implants & Organs

Bio-robotic and AI-enabled organs or organ software; biofabricated tissue-engineered implants; bionic organs and organoids; nano-devices and treatments.

CHALLENGE

04



Bionics, the Brain, Neurotech and AI

Neural or AI-enabled implants; bioelectric stimulation therapies or treatments, novel optogenetic therapies, brain-computer-interface devices, electroceuticals and related rehabilitation technologies.



Our Bionics Challenge

Delivered in partnership with MAIC Queensland, the Bionics Challenge has proved to be an especially exciting annual event on the calendar of medtech innovators. The Challenge sees start-ups, R&D leaders and everyday innovators work head-to-head with others to fast track an array of new devices, implants and treatments.

Our winners receive healthy 'kick-start funds' (\$50,000 for each of 4 major category prizes and 4 x \$10,000 Early-Stage Bionic Innovation Awards in 2021 funded by MAIC) plus a National Bionics Innovation Prize and mentoring (combined value of \$50,000) provided by Morgans Finance Ltd.

Our *Bionics Deeptech Commercialisation Training Program* for Challenge participants and other medtech startups delivers customised coaching on business model planning, establishing value inflexion milestones, market forecasting, device design and development, patents and trademarks, market validation, clinical studies/trials, regulatory frameworks, investor relations, capital attraction and liquidity.

To date, Bionics Queensland has distributed \$470,000 in 'kickstart' funds to emerging bionic startups and R&D leaders and we have opened the door to new partnerships and further funds attraction by grassroot innovators. Bionics Challenge 2022 is again set to deliver healthy financial support and customised mentoring to help fast track an array of new innovations to market.

The Game-Changers – Our Bionics Challenge 2021 Major Category Winners



Bionic Mobility Major Winner
Professor Laurent Frossard & Team



Bionic Senses Major Winner
Dr Anna Hatton & Team



Bionic Implants & Organs Major Winner Dr Farzane Ahmadi & her Laronix Team



Bionics, the Brain, Neurotech & AI Casey Pfluger & Amy-Rose Goodey, Cortex



National Bionics Innovation Prize Winner Dr Nigel Greenwood & the Diabetes Neuromathix Team

Creating a Human Bionics LivingLab™

Looking ahead, a Human Bionics LivingLab™ with satellite projects and exhibits in various cities and regions will welcome people from all walks of life (and all levels of ability).

Visitors will engage with a *Global Bionic Innovation Exhibit*, dive into a virtual Bionics Discovery Hub, help co-design and test new-to-the-world bionic devices and participate in or attend our annual *Bionics Challenge*, Bionics Innovation Symposium and other meet-up events.

Our Human Bionics LivingLab™ (HBLL) is not a single lab, but rather a vibrant *community of collaborators, projects and activities* working together to deliver next gen bionic breakthroughs across multiple sites (city and regional) and industry sectors (public, private and charity organisations).

Our LivingLab will boost public awareness and participation in the co-design, development, manufacture and commercialisation of lifechanging bionic solutions. The HBLL will showcase a wide array of bionic mobility devices and prostheses, breakthroughs in the bionic senses (hearing, vision, touch, taste and smell), bio-robotic and tissue-engineered implants and organs, brain-computer interface (BCI) devices; neurobionic and e-stimulation treatments and sensory feedback systems.



A place to explore, learn and be excited about our human bionic future! Engage with new technologies, test devices and discover new bionic breakthroughs

Telling the story of what is possible is a ‘must do’ for Bionics Queensland alongside educating students, clinicians, GPs, and allied health practitioners about the widening scope of bionics alongside regenerative medicine.

Universities and hospitals with advanced models of patient-centred R&D and medical innovation, allied health charities, rehabilitation centres, corporate medtech and health insurance leaders are our logical partners in the roll-out of the *Human Bionics Living Lab™*.

Alongside our **Global Bionics Innovation Showcase**, a virtual **Bionics Discovery Hub** plus feature projects and demonstrations, the LivingLab will be the home of our highly successful **Bionics Challenge** and **Bionics DeepTech Mentoring and Commercialisation Training Program** to support start-ups and R&D leaders (our Challenge winners and others).

Join us now to fast-track bionic innovations and transform lives!

Bionics Queensland is seeking new Partners and Associates to accelerate the growth of our bionics-medtech ecosystem and transform lives. A new level of collaboration and teamwork with Australian universities, metro and regional hospitals, medtech companies, health insurance firms, corporate and allied health leaders will see a fast uplift in bionics R&D and a healthy pipeline of new devices, implants and treatments.

Together, we will amplify our reach and impact, actively identifying nextgen innovation opportunities and proactively supporting bionics start-ups and promising R&D. An alliance of bionic innovation leaders across universities, hospitals, corporate leaders and medtech companies will see a vibrant *Human Bionics LivingLab™* community emerge plus sustained growth and expansion of our *Bionics Challenge* and *Bionics Deeptech Commercialisation Training Program*.



Bionics Queensland Membership

Level 1 – Core Partners / Sector Leaders
(Above \$50,000 pa)

Level 2 – Major Associates (\$50,000 pa)

Level 3 – Innovation Leaders (\$25,000 pa)

Level 4 – Small Business and Charities (\$350 pa)

Level 5 – Individual Associates
(\$150 pa professional fee, \$0 for students)

Our Core Partners, Major Associates and Innovation Leaders are *visible trailblazers* who actively lead, support and encourage bionic innovations and participate in collaborative projects that take bionic devices, implants and treatments to the next level.

Partner & Associate Benefits include:

- The opportunity to lead and collaborate with others to stimulate new bionic healthcare discoveries and build a multi-region industry cluster.
- A widely recognised Bionics Queensland leadership and 'ambassador' role, stimulating ground-breaking bionics R&D, product or process design, manufacture and commercialisation. Our sector leaders play a vital role in promoting new research and encouraging co-design of bionic solutions with end users.

- An active role in shaping plans for the Human Bionics LivingLab™. Bionics Queensland will progress the LivingLab concept in concert with its Partners and Associates, creating collaborative, interactive learning exhibits and a technology-driven bionics discovery environment to excite visitors from all walks of life.
- The opportunity to showcase human bionics projects, products, treatments and services in a dynamic, future-focused bionic innovation precinct plus ongoing inclusion in Bionics Queensland's national and global publicity efforts to showcase our bionic and regenerative medicine breakthroughs and related excellence in biomedical science and engineering.
- The opportunity to co-design, host and sponsor Bionics Queensland events e.g., an annual Bionics Innovation Symposium; consumer co-design workshops and vertical collaboration events (to fast-track product development and in turn, clinical trials and end user access to devices and treatments).
- Active participation in shaping and implementing a Bionics Queensland Roadmap and Action Plan outlining steps we will take collectively to create a unique, Queensland-led bionics industry cluster with robust links to national and global health innovation precincts and medtech investment communities.

Visit our website for Terms & Conditions.



BIONICS QUEENSLAND

Key Projects and Initiatives

Launch of Bionics Queensland – 2019
Delivery of Australia's first-ever Bionics Challenge™

- Bionics Challenge 2020
(Sponsor – Advance Qld)
- Bionics Challenge 2021
(Major Partner – MAIC Qld)

Bionics Innovation Opportunities / End User Needs Study (MAIC Qld funded project)

Bionics Innovation Ecosystem Mapping
MAIC Qld and Advance Qld funded

Clem Jones Foundation Young Neuroscientist Prizes for Neurobionics Research & Discovery

Human Bionics LivingLab™ Vision & Plan

Bionics Medtech Commercialisation Training
(supported by MAIC Qld, Hydrix, FB Rice, Morgans Financial Ltd)

Bionics Queensland Funded Projects

Startups

- Laronix Bionic Voice Box (Dr F. Ahmadi)
- DNx Bionic Pancreas (Dr N. Greenwood)
- Cortex Brainwave Technologies
(C. Pfluger & A-R. Goodey)
- Deep Connections Wearable for Fine Motor Control (N. Marshall)
- Hearoes App for Cochlear Implant recipients (E. Miller)
- Symbinno Brain-Machine-Interface (A. Scott)
- Cyrite Haptic Wearable for Balance Control (A & D Peterson)

R&D Projects

- QUT: TEVG Project (T. Brooks-Richards)
- QUT: Bionic Hand Sense of Touch (Dr A. Pandey)
- GU: Thomax 2.0 – Testing Bionic Limb load (Dr L. Frossard)
- UQ: Augmented Vibrotacture Insoles (Dr A. Hatton)
- UQ: VR/AR Rehabilitation of Upper Limbs (Dr A. Bo)
- UQ: Brain imaging & E-Stim – Stroke Recovery (Dr M. Balbi)
- CQU: E-Stim for SCI Patients (Dr V. Bochezianian)

Our Current Partners, Associates and Project Sponsors

