

MedTech

Innovation Showcase





Nāu te rourou, nāku te rourou, ka ora ai te iwi.

With your food basket and my food basket the people will thrive.

Welcome to the **MedTech Innovation Showcase**

The 12-year journey of New Zealand's MedTech innovation community is primed to take its next big step – Medtech-iQ Aotearoa.

This next step is audacious, bold – and obvious: a national medical devices and digital health innovation hub to scale and accelerate research translation, commercialisation and company growth.

Medtech-iQ Aotearoa brings together a virtual collaborative ecosystem with four physical hubs. It puts MedTech innovation into the equivalent of a high-vis jacket – visible, active, directing the way forward. It will attract new prospects in education, research, healthcare, business, investment, and international partnerships. It will help turn science into health solutions and it will support wellbeing while helping to resolve health inequities. We will work closely with our Te Tiriti partners to co-create new opportunities for Māori in all of these areas.

As a country, we need to 'up our game' in translating research to support our population, wellbeing and economy, as outlined in Te Ara Paerangi – Future Pathways paper. Medtech-iQ Aotearoa can help the country increase productivity, develop an equitable healthcare system and grow a new and diverse workforce.

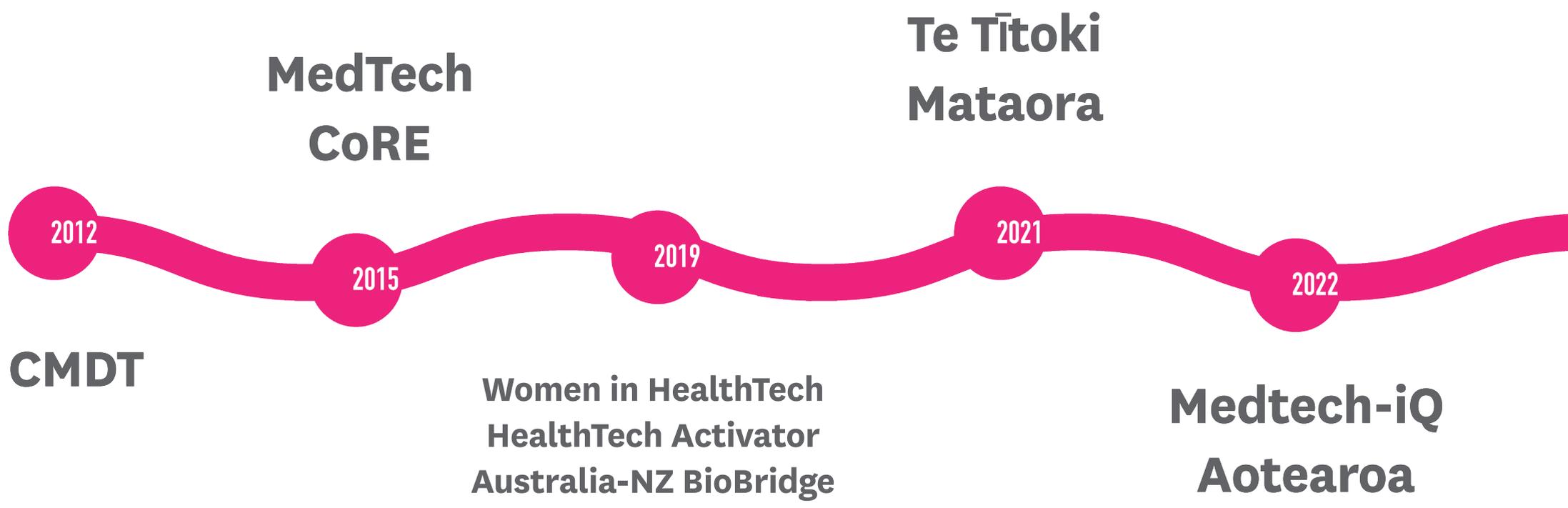
There were 40-50 companies in the New Zealand MedTech sector 12 years ago; today we have more than 200 and the sector is worth around NZ\$2.1 billion. The global market was worth USD\$815 Billion last year: Medtech-iQ Aotearoa is one way we can have our share of that market.

On behalf of the CMDT partnership, please join us and the MedTech Innovation community to celebrate our success thus far and hop on the journey to help Aotearoa New Zealand grow and prosper.

Peter Hunter and Diana Siew
CMDT Co-Chairs

Our MedTech Innovation Journey

Initiatives from the Consortium for Medical Device Technologies (CMDT)



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About the CMDT

The Consortium for Medical Device Technologies (CMDT) is a partnership between the universities of Auckland, Canterbury, Otago, Victoria University of Wellington, AUT and Callaghan Innovation that began in 2012.

It expanded in 2022 to include several Te Whatu Ora Health New Zealand regions – Waitematā, Te Toka Tumai Auckland, and Capital, Coast and Hutt Valley. The CMDT is now a national resource linking research at our universities, Crown Research Institutes and agencies with companies, healthcare providers, regulatory and industry bodies, the Health Innovation Hub, and the Commercialisation Partner Networks.

This network:

- Provides easy access to research providers as a one-stop portal
- Facilitates collaborations with researchers, companies, and government organisations
- Connects researchers and start-up companies to the CMDT’s wide international network
- Develops and implements strategic initiatives to grow Aotearoa New Zealand’s medical devices and digital health (MedTech) innovation ecosystem.

The major initiatives of the CMDT include the MedTech CoRE, the Australia-NZ BioBridge, Te Tītōki Mataora and Medtech-iQ Aotearoa.

Our research translation foundation: Medical Technologies Centre of Research Excellence (MedTech CoRE) 2015-2021

The MedTech CoRE was the first programme to bring the research translation community together. It helped apply proven science concepts to an unmet clinical need with commercial opportunity.

The outcome of the translational pilot from the MedTech CoRE was 18 deep-tech spin-outs. By 2021, 14 companies from this cohort delivered 100+ new jobs and were valued at \$102 million. These are continuing to scale.

This section contains a sample of these companies.



Alimetry



Alimetry was founded in 2019 following a decade of ground-breaking science and engineering research at the University of Auckland. Alimetry is an innovative digital health company that designs, manufactures, and distributes system solutions for screening, monitoring and diagnosis of functional diseases of the gut.

Alimetry's primary product, Gastric Alimetry, is an innovative medical device to help diagnose gastric disorders. The test is indicated in the routine testing of patients with chronic gastric symptoms, including nausea and vomiting, dyspepsia, and upper abdominal pain. It is wearable and non-invasive, using advanced flexible electronics to sense the movements of the stomach from the skin surface. Patients simultaneously log their symptoms into the Gastric Alimetry App, resulting in a report which helps to define the correct management strategy for individual patients.

Gastric Alimetry is FDA cleared and currently available for clinical use in the USA, UK and New

Zealand. In the UK and NZ, the test is indicated for use on adult and adolescent populations ≥ 12 years old. In the USA, the test is indicated for adult patients ≥ 18 years old.

Studies have shown that Gastric Alimetry uniquely profiles subgroups of patients into those suffering from neuromuscular dysfunction vs other causes. Benefits of the test can include reductions in trial-and-error treatment and the enabling of targeted therapy.

Alimetry has been privileged to be a beneficiary of MedTech CoRE funding over the years.

www.alimetry.com



Swallowing Technologies



Imagine if you could not swallow. If you could not have a drink with your mates, enjoy your child's birthday cake or share a family dinner with loved ones. This condition – dysphagia – is unseen but not uncommon and is a complication of a range of medical conditions across the lifespan. In New Zealand, dysphagia is present in a conservative estimate of 6,000 new patients each year due to stroke and Parkinson's disease alone. Dysphagia increases the cost of a patient to the health system by an estimated 50%, but the impact on quality of life is immeasurable.

SwalTech is imagining solutions for this condition and bringing those solutions to the patients and clinicians that need them. Their first product down the pipeline is BiSSkApp (Biofeedback in Strength and Skill Application). Using a small sensor under the chin, swallowing is displayed by a waveform on a tablet screen. By learning to control the line on the screen, the patient learns to control the way they swallow. This technology is designed for use in the healthcare or home environment, allowing patients to complete

intensive swallowing rehabilitation exercises that can be monitored and adjusted remotely by the speech-language pathologist overseeing their care.

BiSSkApp allows for rehabilitation when it is needed and where it is needed, without draining healthcare resources with face-to-face treatment sessions. SwalTech's engagement with the MedTech CoRE and Te Titoki Mataora provided the early seed funding and support needed to develop the concept and spark the possibility of moving this product to market.

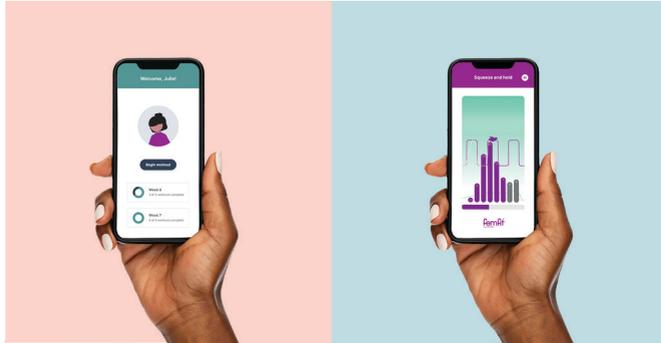
www.swaltech.com





JUNOFEM

femfit®
by JUNOFEM



JUNOFEM

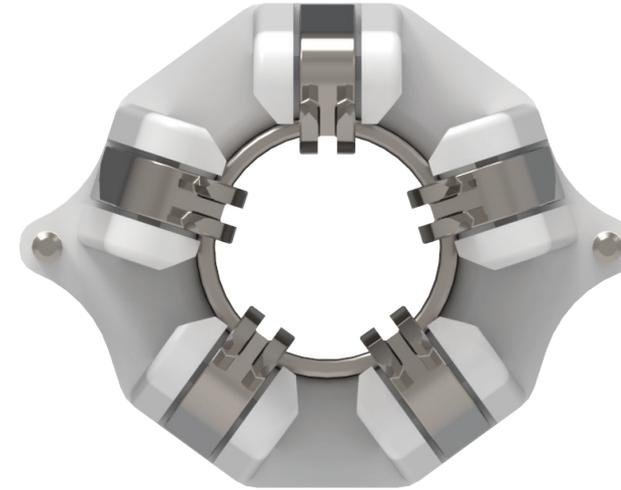
femfit® by JUNOFEM is a pelvic floor training system powered by advanced biofeedback technology, clinically proven to resolve up to 80% of urinary incontinence symptoms in just 12 weeks. Backed by a decade of research, femfit® combines a state-of-the-art, discreet medical device with clinically validated strength training programmes delivered via mobile app, plus ongoing support from a trusted clinician and the expert JUNOFEM team. No more hiding when you cough, laugh, run or exercise—find your way to a healthier, stronger pelvic floor with femfit®.

JUNOFEM received 50K from the MedTech CoRE funding in 2018. This was to enable R&D of the pressure sensor array and to support clinical testing in women with pelvic organ prolapse. This funding enabled the team to validate the use of femfit® for this population group. This has allowed JUNOFEM to promote femfit® to urogynaecologists, who are an important channel to market.

www.junofem.com



Avasa



Avasa is an innovative medical device company developing the only clinically effective device designed to connect both microvascular arteries and veins with unparalleled speed and precision. Surgeons have designed Avasa's device to help restore form and function in patients who suffer from disease and deformity. The innovative device involves novel IP and a fast 510(k) regulatory pathway to an untapped multibillion dollar market.

The MedTech CoRE and Te Tītōki Mataora (TTM) has been instrumental in helping Avasa through its commercialisation journey. The infrastructure provided has enabled Avasa to set up a solid foundation for its operations and product development activities. TTM has provided key contacts, networks, and opportunities for

growth. The mentorship provided by the TTM network has proved invaluable across the board from operational requirements to critical quality assurance activities. Additionally, training workshops run through TTM have provided essential capability and skills development for Avasa staff to function successfully in the medical device industry.

avasa
Simplify microsurgery.





The Insides Company



The Insides Company is a leading designer and manufacturer of purpose-built chyme reinfusion solutions for patients with intestinal failure.

The Insides Company's flagship product, The Insides System, is an award-winning solution that enables patients to reinfuse intestinal contents into their stoma or fistula. Chyme reinfusion improves patient nutritional outcomes, reduces the risks associated with intravenous nutrition, and allows them to return home from the hospital.

The company's devices demonstrate significant improvements in clinical and economic outcomes for patients requiring intestinal rehabilitation.

The Insides System has now treated more than 150 patients in ten countries and has been used by 80% of the New Zealand public health system.

The Insides Company is a spin-out of the Auckland Bioengineering Institute and Faculty of Medicine at the University of Auckland.

The Insides Company has received tremendous support from the New Zealand MedTech ecosystem, including the MedTech CoRE for its research translation funding, CMDT for enabling access to key MedTech stakeholders, and UniServices and Return On Science for the provision of commercialisation support and access to seed capital.

Callaghan Innovation has also supported The Insides Company by providing various R&D and project grants and introductions to key industry contacts.

The Insides Company is an NZTE F700 company, which has enabled us to access market validation and consultancy services from experienced MedTech customer managers and beachhead advisors, both locally and internationally.

www.theinsides.co



OPUM Technologies



OPUM is a medical device and AI company - their first product is the Digital Knee®. OPUM offer orthopaedic data analytics, powered by AI. The Digital Knee® ecosystem is built around a goniometer-based sensor and the Digital Knee® Twin, a clinical data standard designed specifically for the knee health. A Digital Knee® Twin is a digital representation of a patient's real knee which incorporates clinical data across four categories to build a holistic clinical picture of knee health:

- 1. Anatomy:** Active and passive terminal knee flexion / extension to within 1°
- 2. Function:** Gait analysis including functional knee and hip range of motion and other parameters such as stride length, speed & cadence
- 3. Activity:** Daily living and posture recognition using AI algorithms as well as adherence to surgical and rehabilitation protocols

4. Symptoms: Based on gold standard patient reported outcome measures including the Knee Injury and Osteoarthritis Outcome Score (KOOS) and pain scores

Studies have validated the accuracy and reliability of the Digital Knee® in the real world. Physicians can now trust remote data to make clinical decisions, identify at-risk cases and determine follow-up clinic efficiencies.

OPUM received a \$50k grant from the MedTech CoRE early in its journey that helped with initial algorithm development and validation. This was an essential step in OPUM's commercialisation journey.

www.opumtechnologies.com

OPUM



Te Tītoki Mataora

The MedTech Research Translator



Te Tītoki Mataora supports Aotearoa New Zealand's health technology ecosystem through two linked programmes that encourage collaboration for the development, testing and translation of their ideas into sustainable clinical solutions.

- The Research Acceleration Programme (RAP), funded by the Ministry of Business, Innovation and Employment (MBIE), is a contestable fund for early-stage medical devices and digital health development.
- The HealthTech Capability Programme (HTCP) is funded by the University of Auckland and in-kind contributions from the CMDT partners. It is a series of five modules focusing on Mātauranga Māori, Pacific Engagement, Future Leaders, Clinical Translation, and Commercial Translation.

This multi-faceted, national initiative focuses on growing Aotearoa New Zealand's deep tech sector. The programme is an extension of the successful pilot established by the MedTech CoRE. It has become a valuable component for growth and development of the national MedTech industry.

The name 'Te Tītoki Mataora' has been gifted by Mātua Te Wharekōtua Turuwheua (Ngāi Tūhoe) following kōrero with Jason Turuwheua (Ngāi Tūhoe, Ngāti Porou), the Auckland Bioengineering Institute's Associate Director Māori, and the wider whānau. Te Tītoki Mataora refers to the strengthening/binding of the waka by way of traditional pegs or 'Mataora'. The Tītoki tree is also known for its health-giving properties. Together, Te Tītoki Mataora conveys the bringing together of health and engineering.

Research Acceleration Programme (RAP)



The Research Acceleration Programme (RAP) creates the pipeline of very early-stage medical device and digital health projects working towards clinical application and commercialisation.

1. Stage I: Collaboration and Ideation (\$10K-\$20K per project)

Supports the formation of collaborative relationships between researchers, clinicians, companies, and partnerships with Māori and Pacific communities.

2. Stage II: Concept Seeding (\$40K-\$80K per project)

Identifies concepts with the potential for clinical application and commercialisation.

3. Stage III: Acceleration (\$100K per project)

Supports projects to refine proven concepts and prototypes including small-scale clinical trials and preparation for commercial readiness.

The RAP de-risks, and curates opportunities for medical devices and digital health technologies, with an emphasis on those addressing accessibility and inequity issues. It is funded by MBIE for \$2.7 million per year for three years and is hosted by the University of Auckland at the Auckland Bioengineering Institute (ABI) on behalf of the CMDT partners.

This section contains an example of projects funded by the RAP.

More information including application forms are available at:
<https://www.cmdt.org.nz/research-acceleration-programme>.

Mate Wareware

Understanding dementia from a Māori perspective



TTM Themes: Interventional Technologies for Prevention, Care and Management, Emerging New Technologies in Healthcare

The Mate Wareware App is a proof-of-concept app that aims to raise awareness about mate wareware (dementia) and provide education and strategies to assist affected whānau. The app has received positive feedback from whānau and generated many suggestions for improvement and development.

RAP Stage I funding has enabled us to host interviews and focus groups with Māori of different generations to finalise priorities for app development. Priorities include transitioning from a website to a mobile app, upgrading the user interface, expanding content on brain structure and disease, promoting risk reduction through healthy lifestyle advice, increasing support for caregivers, and exploring how interactive games or exercises could be promoted within the app.

To address these priorities, we have used our RAP Stage I funding to support the development of a relationship with Te Whānau Tahi, a social enterprise IT company. This new collaboration will support the continued development of the app to increase its value for Māori and support its ongoing maintenance into the future.

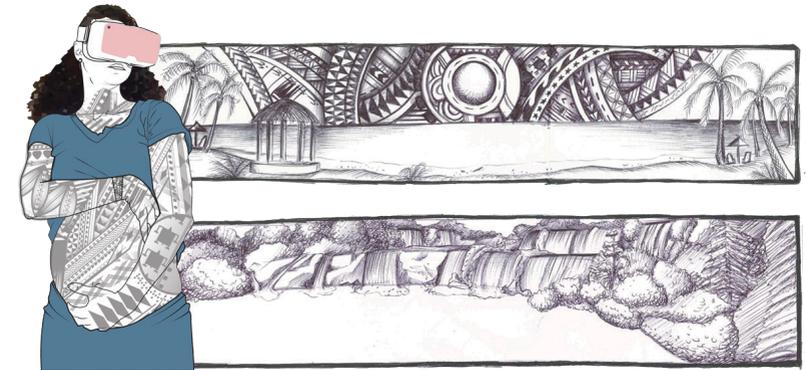
<https://www.matewareware.co.nz/>

Project Lead: Dr Makarena Dudley (University of Auckland) m.dudley@auckland.ac.nz

Collaborators: University of Auckland, AUT, Whānau Tahi, Te Whatu Ora Te Toka Tumai Auckland, Kaumatua Roopu O Waipareira, Manurewa Marae.

Giving Birth on a Beach

Using virtual reality for labouring women



TTM Themes: Interventional Technologies, Emerging New Technologies in Healthcare

Immersive virtual reality environments (VR) have been shown to be effective in the management of acute pain in healthcare, particularly burn pain, and anxiety in a diverse range of clinical settings. Consumer-ready VR environments have recently been demonstrated as effective during labour and birth, however it was identified that a labour specific VR environment is required for use in the clinical setting. In developing a clinically relevant tool, our goal is to engage with Māori and Pacific communities to inform the integration of tikanga Māori and traditional Pacific practices in the design and development of a prototype for labour specific VR environments for women.

The RAP Stage I funding will help us to identify and connect with relevant experts and groups to organise hui and fono and develop meaningful involvement with Māori and Pacific communities around traditional birthing practices. We will also collaborate on the design of the prototype VR

environment with designers, software engineers and midwives using the latest VR head mounted displays (HMDs). These incorporate physiological sensors, such as heart rate monitoring, which could be used to create VR experiences that adapt to patient discomfort during the birth process.

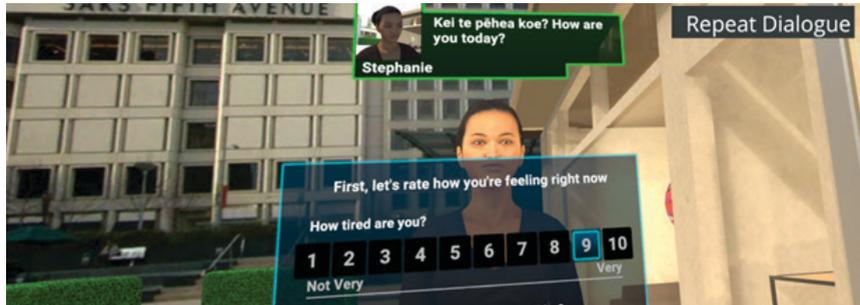
This is the first collaboration between The Empathic Computing Laboratory, University of Auckland and the School of Nursing, Midwifery and Health Practice, Victoria University of Wellington.

Project Lead: Dr Lorna Massov, (Victoria University of Wellington) lorna.massov@vuw.ac.nz

Collaborators: Victoria University of Wellington, University of Auckland, Te Whatu Ora Capital, Coast and Hutt Valley, Te Ao Mārama and Moana Connect.



Virtual Reality Rehabilitation For Traumatic Brain Injury



TTM Themes: Interventional Technologies, Rehabilitation Technologies & Assistive Devices, Digital Technologies for Prevention, Care, and Management, Emerging New Technologies in Healthcare

Virtual Reality (VR) provides a safe, controllable environment to enhance rehabilitation for people recovering from serious disabling conditions such as traumatic brain injury (TBI). NeuralXR is a VR program co-designed with clinicians and patients to understand and manage cognitive fatigue (a subjective lack of mental energy perceived to interfere with everyday activities).

NeuralXR recreates a café environment where patients recovering from TBI experience challenges ranging from ordering a quiet coffee with a friend, to being in a large group with noisy distractions. The VR experience is designed to induce cognitive fatigue, and the program allows people to practise practical coping strategies as well as teaching other essential skills, such as social interactions, conversation, information processing and problem solving.

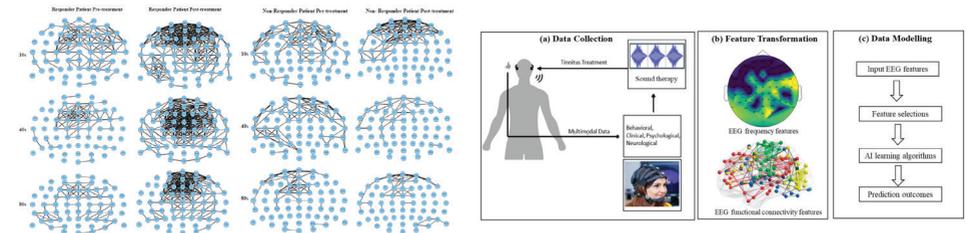
With RAP Stage II funding we have developed a prototype of NeuralXR which we are currently testing with patients in a clinical setting. This will help us identify how virtual rehabilitation could increase patient motivation and validate the approach. NeuralXR could also be delivered remotely, with the potential to improve services to populations such as Māori, Pacific, and rural communities.

Project Lead: Dr Jo Nunnerley (University of Otago), jo.nunnerley@otago.ac.nz

Collaborators: University of Otago, University of Auckland, Laura Fergusson Brain Injury Trust, Cerebral Fix, He Waka Tapu.

Your Head is Humming, and It Won't Go

Developing an AI-driven wearable EEG array for guiding tinnitus treatment



TTM Themes: Rehabilitation Technologies & Assistive Devices, Digital Technologies for Prevention, Care, and Management, Emerging New Technologies in Healthcare

Tinnitus (ringing in the ears) is created by brain activity in response to ear injury. Tinnitus can be catastrophic: reducing life-quality, disrupting hearing, attention, and sleep, with risk of anxiety, depression and suicide. Currently there is no cure. Therapy is possible but is inefficient and time consuming as not everyone experiences tinnitus equally and response to treatment varies.

RAP Stage II funding has enabled the formation of a multidisciplinary scientific team, with co-design with Māori and Pasifika. We have developed and demonstrated that Artificial Intelligence (AI) can accurately predict tinnitus treatment outcomes from EEG which records electrical activity from the brain. The EEG has a signature pattern for people who respond to tinnitus treatment.

Based on AI modelling we are developing an earphone headset that will enable easy EEG recording. Using this data, a mobile-phone based program will indicate which of several therapy options should be applied, and when. The technology will enable a brain-computer interface for automatic real-time therapy selection. It will be used in the comfort of the user's own home. Pathways for commercialisation have been identified with the University of Auckland spin-out company TrueSilence Therapeutics Inc.

Project Lead: Associate Professor Grant Searchfield (University of Auckland) g.searchfield@auckland.ac.nz

Collaborators: University of Auckland, AUT.



Ensuring Equitable Access to the Best Diabetes Technology and Care

Developing a Low-cost Equitable Artificial Pancreas System (LEAPS)



TTM Themes: Screening / Diagnostic Technologies, Digital Technologies for Prevention, Care, and Management, Emerging New Technologies in Healthcare

The constant need to monitor glucose levels for insulin dependent diabetics can be a prick. Expensive devices combined with the frequent need to purchase consumables (needles, insulin tubes, test strips, Continuous Glucose Monitors, etc.) to monitor glucose and deliver insulin adds an extra financial burden. We in the LEAPS project believe everyone should have equitable access to the best diabetes technology and care.

LEAPS.nz is a Science for Technological Innovation (SfTI) project developing affordable diabetes management technology reflecting an artificial pancreas system. RAP Stage III funding has allowed for continued clinical trials of the non-invasive light-based glucose sensor for a painless option to measure glucose. This RAP funding has also supported engagement with rural communities to allow for the unique

development of the LEAPS devices by Māori with Māori.

Key collaborations with Middlemore Hospital, Auckland Hospital, and the University of Canterbury's Ngāi Tahu Research Centre have all ensured that this project continues to be a success. Our ongoing engagement with healthcare providers and community will ensure our devices are fit for purpose and accessible to the people who need them.

www.leaps.nz

Project Lead: Dr Jake Campbell (University of Canterbury) jake.campbell@canterbury.ac.nz

Collaborators: University of Canterbury, Middlemore Hospital, Auckland Hospital.

Fixing (Surgical) Drains

A secure, comfortable and accessible drain retention system

**APERCURE
Surgical Ltd**



TTM Themes: Interventional Technologies

Surgical drains are put in by surgeons and radiologists to remove unwanted fluid from the body, often avoiding a larger procedure. These drains must be fixed to the skin so they do not come out, but current solutions fall short, and no surgical drain retention device meets all requirements of security, comfort, usability, and wound care.

We have developed a unique design for a secure, comfortable drain fixation device that has the added advantage of allowing access for wound care. RAP Stage III funding has provided timely support at the stage of clinical evaluation which is a critical step towards commercialisation.

From this research our team has founded Apercure Surgical, a spinout company which will work to maximise impact on clinicians and

patients alike by taking on widespread problems in daily practise, then rapidly prototyping and testing to find simple and effective solutions. Apercure Surgical aims to bridge the gap between the clinical environment and engineering experience and is predominantly focused in the realm of surgical medicine and interventions.

Project Lead: Professor John Windsor (University of Auckland) j.windsor@auckland.ac.nz

Collaborators: University of Auckland, Victoria University of Wellington, Ara Manawa at Te Whatu Ora Te Toka Tumai Auckland, Obex, Cook Medical.



HealthTech Capability Programme (HTCP)



The HealthTech Capability Programme develops and advances Aotearoa New Zealand's expertise in HealthTech research translation. It is available to all researchers, clinicians and entrepreneurs. The programme specifically brings together the MedTech Research Network and the Aotearoa Brain Network communities to create new relationships.

The Programme is comprised of five modules;

- Mātauranga Māori
- Pacific Engagement
- Future Leaders
- Clinical Translation
- Commercial Translation

These modules allow researchers to take their work into real world applications that benefit Aotearoa New Zealand.

More information and contact details are available at:
<https://www.cmdt.org.nz/healthtech-capability-programme>

Mātauranga Māori



MedTech has huge potential to improve Māori health outcomes and expand Mātauranga Māori. We respond by enabling and ensuring.

We enable Māori to be creators and navigators in the development of new health technologies.

- Our summer studentships are for Māori and non-Māori to upskill our next generation of clinicians and researchers.
- We partner with the Bachelor of Nursing Māori Programme at the Manukau Institute of Technology to provide students and researchers with a unique opportunity to engage and collaborate. In 2023 we are engaging with kura to encourage students to pursue science subjects.

We ensure the research community is confident to engage with Māori, through learning opportunities such as:

- A unique series of workshops in partnership with Māori experts. Researchers gain the insights, tools and frameworks needed to engage more effectively with Māori in research and clinical contexts. To date, 50 participants have attended two series of workshops across the country and there is a growing waiting list.

- Access to bespoke ideation services to ensure our researchers' work is promoting and reflecting Māori values and Te Tiriti o Waitangi principles. This has proven especially popular with those submitting RAP proposals.

Module leads:

Prof. Suzanne Purdy and Dr. Jason Turuwhenua - University of Auckland

In collaboration with Iwi United Engaged (iue.net.nz) which provides Kaupapa Māori informed project execution services, research ideation through consultancy and documentation preparation, and cultural competency.



Pacific Engagement



Increasing engagement between Pacific communities and the Aotearoa New Zealand MedTech sector is important to improve our health outcomes. We want to encourage Pacific peoples to participate at the research, commercialisation and start-up levels by first understanding the Pacific HealthTech landscape.

Work began in 2022 and included a literature search for activities in Pacific health research and talanoa with Pacific students, researchers, clinicians and health providers involved in the HealthTech space. From this we will identify future partnerships, collaborations and workforce support and development.

We are enabling Pacific people to be involved in and lead the development of next generation health technologies. We have started with our student cohort through summer studentships to increase awareness among Pacific communities about the potential benefits of being involved in the HealthTech sector. This includes cultural support for Pacific students and a workshop exploring Pacific Worldviews for students of all ethnicities.

We are ensuring the research community gains the right skills for confident engagement with Pacific peoples by increasing its awareness of Pacific peoples' health and wellbeing priorities.

Current initiatives include:

- Workshops to support cultural responsiveness of those in the healthtech sector to the needs of Pacific communities.
- Facilitated opportunities to partner on co-designed healthtech solutions underpinned by Pacific values, languages, and cultures.

Module Leads:

Amio Matenga Ikihele – Moana Connect

Natalie Solomona – University of Auckland

Dr. Vanda Symon – University of Otago

Future Leaders



Aotearoa New Zealand's future success in MedTech depends on us creating and supporting a pipeline of early- and mid-career researchers (EMCRs).

Our ability to deliver scientific advances that improve health and wellbeing here and overseas is tied to the potential of that EMCR pipeline where we must:

- support their career development, from an emerging track record in research through to influencing how MedTech and MedTech devices are developed and used
- help them navigate the complexities and conflicting priorities of funding, publishing and collaboration
- attract, develop and retain our most talented EMCRs to give them to best possible opportunity to be future leaders.

Regular events that encourage networking and collaboration across disciplines and institutions are critical. Our flagship event is held as part of Healthtech Week with opportunities for EMCRs to display their research, learn from established researchers, and workshop ideas. The 2022 event attracted 160 EMCRs from across the country.

Our activities to date include:

- six panel discussions on topics as diverse as entrepreneurship, community engagement and funding applications
- workshops on Māori cultural competency specifically designed for EMCRs
- news media training.

We have supported EMCRs to lead RAP proposals as a part of their leadership development. This led to ten successful early-career researcher-led projects in 2022.

In 2023, we will extend into practical training to equip EMCRs with the necessary skills to establish high impact research collaborations.

Module Leads:

Dr. Julie Choisne, Assoc. Prof. Peng Du, Dr. Helen

Murray, Dr. Brigid Ryan - University of Auckland

Dr. Gillian McCarthy - Victoria University of Wellington



Clinical Translation



Successful MedTech developments require well-designed clinical trials and an upskilled workforce to match.

To achieve this, a series of initiatives have been developed to enable efficient early-stage clinical trials for verification and validation of new technologies.

- We have established a network of experts in clinical validation and clinical trials who offer assistance and advice. To date, this group has assisted 11 research groups and start-ups.
- We have published a series of carefully curated tools to assist with clinical validation and clinical trials of MedTech start-ups / research groups, developed by the National Institute of Health Innovation. These resources map the clinical validation journey so that researchers and entrepreneurs can identify when and how they should be used.

We also aim to provide greater connectivity between clinicians, researchers, and industry via virtual and in-person networks.

- We have joined the e-Health Forum, an online platform for researchers and

industry to connect with like-minded clinicians and collaborate, whilst clinicians have the opportunity to provide clinical insight and expertise.

- In 2022, we initiated the Te Titoki Mataora Clinical Experience Programme, where PhD students were placed in a clinical setting to observe MedTech in action. This programme has been piloted at Te Whatu Ora Waitematā and Te Toka Tumai Auckland and will be expanded throughout Aotearoa in 2023.

Module Leads:

Prof. Robyn Whittaker - Te Whatu Ora Waitematā and University of Auckland

Prof. John Windsor - Te Whatu Ora Te Toka Tumai Auckland, STaR Centre, and University of Auckland

Dr. Brian Robinson - Victoria University of Wellington

Commercial Translation



Commercialisation skills are essential to create a scalable and sustainable MedTech company from research. We provide tools, programmes, and networks to support and better navigate the commercialisation process.

- The Bridging Business and Science programme is an internship for University of Auckland Master of Bioscience Enterprise students to conduct market research for start-ups and research groups. In one year, four interns have assisted eighteen research groups and four start-ups.
- In 2022, we ran six expert panels across topics such as ethics, equity, sustainability, raising capital, entrepreneurship, and intellectual property. These attracted 250 people from research, clinical and business communities.
- We published a collection of Tools and Templates to guide people through the commercialisation process.

We are continuing to upskill the community in regulatory strategy and quality management through 1:1 support and workshops. This is in partnership with Callaghan Innovation's HealthTech Activator.

In 2023 we are adding new workshops in health economics and user centred design.

Module Leads:

Ella Dixon, Prof. Grant Searchfield and Dr. Diana Siew - University of Auckland

Jamie Attenborough - HealthTech Activator, Callaghan Innovation

Dr. Sarvnaz Taherian - Ara Manawa, Te Whatu Ora Te Toka Tumai Auckland

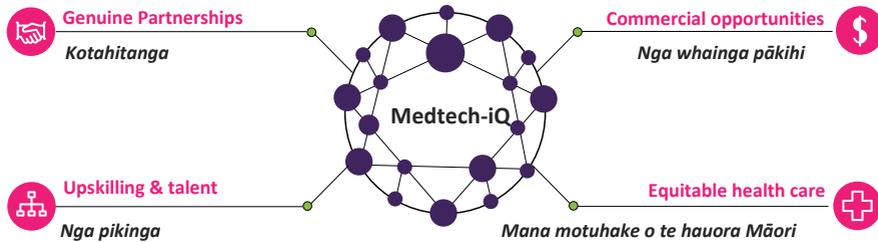
Prof. Simon Fraser and Assoc. Prof Edgar Rodriguez-Ramirez, Victoria University of Wellington

Dr. Sam Richardson - Alimetry



Medtech-iQ Aotearoa

Creating tomorrow, today



Aotearoa New Zealand's MedTech sector has significantly grown in the last 12 years. We now have an effective collaborative ecosystem and our industry has propelled from 40-50 home-grown MedTech companies to over 200 companies today. Our nation is increasingly contributing to global health innovation.

Medtech-iQ Aotearoa is our exciting national initiative to grow and accelerate the momentum in the current MedTech ecosystem, to drive prosperity and increase productivity across all of New Zealand. It is also a unique opportunity for Māori and tangata Tiriti to work together to create a new future in healthcare, career, business and investment opportunities.

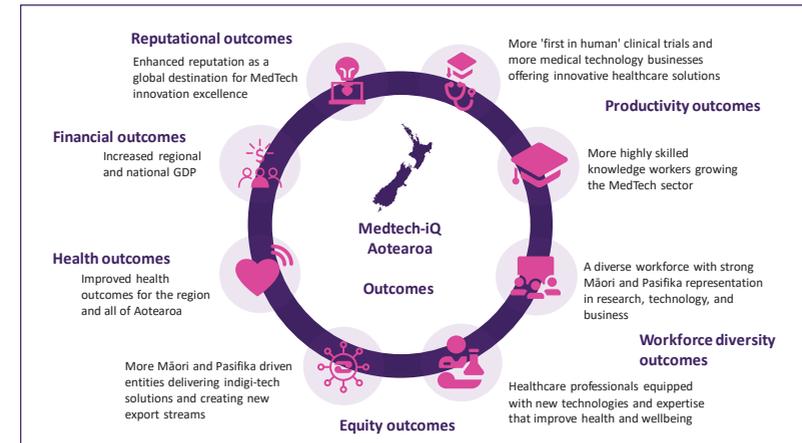
Medtech-iQ Aotearoa has three key goals:

- Putting New Zealand on the international map for medical device and digital health innovation. This will attract new partners and investment into the ecosystem for research, clinical trials and grow companies.
- Fostering start-ups with business models based on high tech innovation in engineering or major scientific advances. These deep tech companies offer significant potential for growth.
- Creating a MedTech innovation ecosystem that is accessible to all and delivers new healthcare solutions, putting the health consumer at the centre.

Medtech-iQ Aotearoa is the umbrella entity that provides direction, influences policy, coordinates activities and runs programmes which everyone across the country can access. It is connected to four main regional hubs that are led locally and together form a visible backbone for MedTech innovation; Tāmaki Makaurau, Pōneke, Ōtautahi, and Ōtepoti.

In the hubs, partners and communities work together to coordinate and provide specific expertise into the national ecosystem so this is shared. These hubs provide a physical and virtual place for multi-disciplinary and cross-industry collaboration to develop and deliver new health technology at pace and at scale. When taken together, the linked regional hubs create a huge innovation ripple across New Zealand, the sum being greater than the individual parts. The hubs are currently at various stages of development.

Strategic & Economic Case for Medtech-iQ Aotearoa



New Zealand's MedTech industry is a high value export sector that can contribute strongly to productivity growth post the COVID-19 pandemic. We can take a larger slice of the USD \$815 Billion global MedTech market within the next decade if our Government takes a more deliberate approach to innovation policy as evidenced in successful small advanced economies (SAEs) such as Sweden, Denmark, Ireland, the Netherlands, Israel and Singapore. Future competitiveness and sustainability of NZ's MedTech sector is rooted in the establishment of deep-tech enterprises founded on sound translational research and a strong commercialisation strategy for clinical translation.

New Zealand is in the midst of a once-in-a-generation transformation of the health system. Transformational innovation delivered by an initiative such as 'Medtech-iQ Aotearoa' will be a key driver in the success of that transformation. This initiative aligns with the reforms described in Te Ara Paerangi Future Pathways, the government's vision for reforming the research, science and innovation system. Medtech-iQ Aotearoa provides an opportunity to transition healthcare from medical facilities (whether they be hospitals, testing laboratories or clinics) into the home. This empowers individuals and communities to take ownership of their health and reduces financial, social and cultural barriers, and will help address inequities in the health system. Health inequities are not unique to New Zealand, and we have an opportunity to work with communities in Aotearoa to develop digital health solutions that are appropriate for these communities and address their health issues. These solutions and/or the processes used to develop them will be internationally transferable. There is an opportunity for NZ to become a leading digital health/MedTech laboratory and product nursery not only for our local needs but also to address global issues and attract global investment.

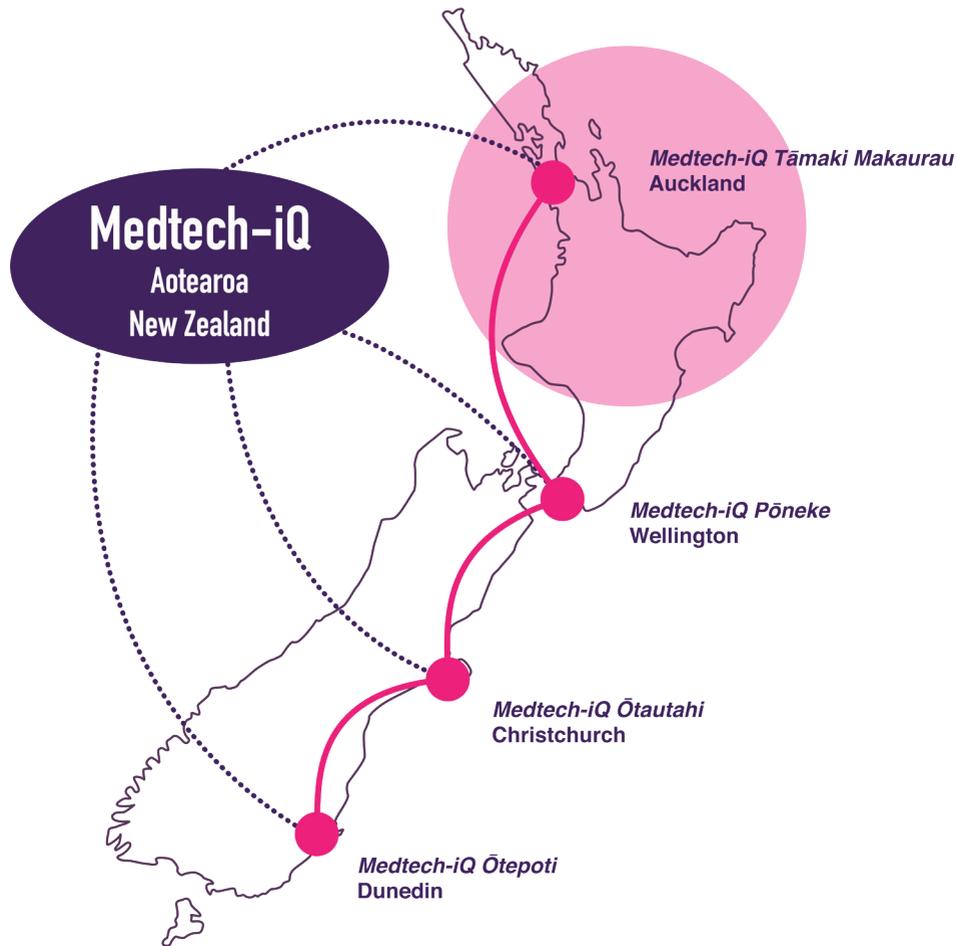
Deloitte Access Economics modeling shows Medtech-iQ Aotearoa has the potential to generate substantial positive impacts for NZ's economy. Headline impacts to Gross Domestic Product (GDP), employment, and wages modeled to 2050 are available in the full case.

The time is now to invest into growing Aotearoa's local talent and innovation ecosystem. You are invited to join us 'Creating Tomorrow Today' – ask us how.

Scan here for the full strategic and economic case



Tāmaki Makaurau Auckland Regional Hub



130 MedTech Companies
53% of 246 NZ MedTech companies call Auckland home - including Fisher & Paykel Healthcare & Orion Health

33 University Spin Out Companies
from University of Auckland, AUT, and Massey University Auckland Campus between 2001-2021

30 Investors, Accelerators, Incubators
actively support innovation in Auckland

88% MedTech Revenue
nationwide is generated from Auckland

9,050 MedTech Jobs
worldwide are created by Auckland based companies

Advancing the Tāmaki Makaurau Auckland hub is a vital step towards delivering future focused medical technology at pace and at scale that will benefit New Zealand. The commercialisation and translational infrastructure needed to become a global player in MedTech is found within the Tāmaki Makaurau Auckland region. The hub has proven strengths in deep tech innovation and contributes to a thriving MedTech industry including established and emerging companies.

Located within New Zealand's biggest multi-cultural city and home to large populations of Māori people and Pacific people, we promote inclusive design of transformational solutions that are for communities, by communities.

Tāmaki Makaurau is home to the majority of Māori and Pacific HealthTech companies. Building on our existing relationships with Māori and Pacific researchers, clinicians and entrepreneurs, we can generate more opportunities across the sector.

Links to Te Pūkenga and other organisations that engage with Māori and Pacific students across the region will be important in growing our future diverse workforce.

Our headquarters are based in the heart of Tāmaki Makaurau's health and learning precincts. The hub founders include Auckland University of Technology, University of Auckland, Te Whatu Ora Te Toka Tumai Auckland and Ara Manawa, Te Whatu Ora Waitematā and i3 Institute for Innovation & Improvement, Callaghan Innovation, and Tātaki Auckland Unlimited. This partnership links us to education and research centres, clinical centres, and communities across the region - in Tāmaki Makaurau, Whangārei, Waikato, Tauranga, Rotorua, Whakatāne, Hāwera, and Tairāwhiti.

Tāmaki Makaurau is home to New Zealand's only dedicated space to nurture MedTech startups; known as Cloud9 at the Auckland Bioengineering Institute.

We excel in medical devices and digital health development; end-user design of products, experiences and spaces; clinical trials, and technology commercialisation.

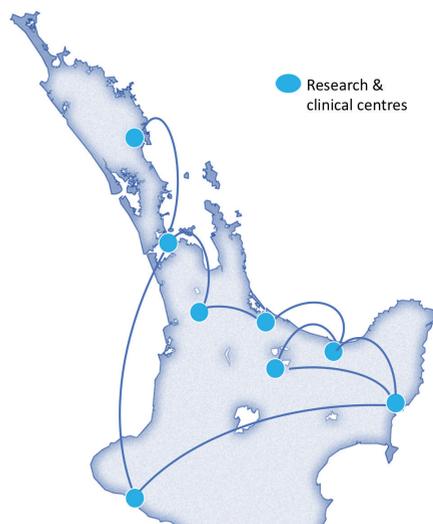
The Tāmaki Makaurau hub is globally connected to business, research and investment partners.



Our regional areas of expertise drive new technologies for diagnosis, therapies and prevention that will help the healthcare challenges in New Zealand as well as globally.

1. Modelling human physiology and pathology for new healthcare solutions including the development of Digital Twins for personalized care.
2. Applying digital technology and AI to healthcare such as technologies to help patients manage their own day to day health.
3. Improving health in aging & rehabilitation with technologies that help people maintain control of their lives, stay mobile, and connected in their communities.
4. Applying augmented human technologies in healthcare such as using virtual reality to support the rehabilitation of people with traumatic brain injuries
5. Medical and surgical devices, sensors and instrumentation
6. Exploring new boundaries in space health and neurotechnology

The Tāmaki Makaurau hub exhibition demonstrates our future focused research in digital twins. It also demonstrates commercial strength and vibrancy of our region through Kitea Health – our newborn start-up – through to Fisher & Paykel Healthcare – New Zealand's largest multi-national medical device company.



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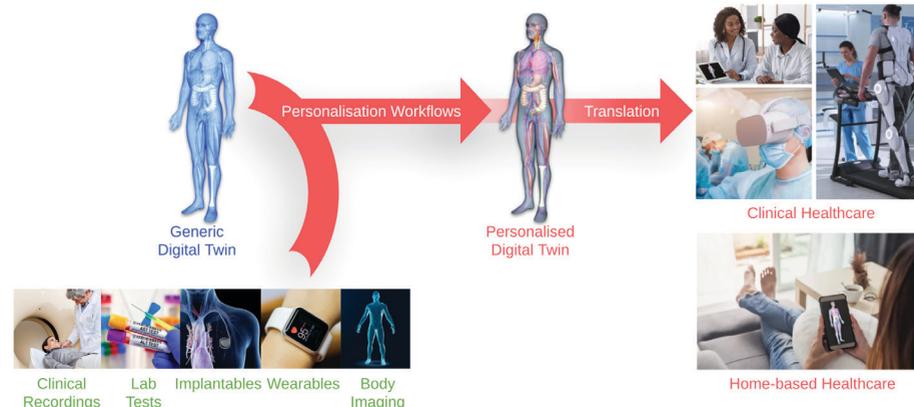
Justin Kennedy-Good. Director, Ara Manawa, Te Whatu Ora Te Toka Tumai Auckland jkgood@adhb.govt.nz

Andrew Clews, Head of HealthTech Activator, Callaghan Innovation andrew.clews@callaghaninnovation.govt.nz

Digital Twins

Personalising future healthcare

Integrating data and physiological modelling



Personalised whole-body “digital twin” models are a major advancement in healthcare when coupled with continuous home-based monitoring from wearable or implantable devices. Whilst this technology is still some way from being a realistic possibility in practice, it has the potential to track physiological changes and detect early signs of disease.

The Auckland Bioengineering Institute (ABI) at the University of Auckland is playing a leading international role in developing these whole-body models of human anatomy and physiology that can be used to help with the clinical diagnosis and treatment of disease and disability. This work is funded by an MBIE Catalyst grant called ‘12 Labours’ and a US NIH grant called ‘SPARC’. The models encompass both anatomy at the organ and organ system scale as well as the molecular, cellular and tissue level processes that govern physiological function. Based on 20 years of

research developing computational models of cells, functional tissue units and organs, these models now combine multiscale modelling to create whole-body physiology.

MBIE has recently funded three new projects on the application of Digital Twins in healthcare in collaboration with the New Zealand Avatar company Soul Machines (an ABI spinout). We are also collaborating with a number of European groups to submit Digital Twin proposals for funding under the new Horizon Europe opportunity that New Zealand has recently joined.

Contacts:

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Professor Merryn Tawhai. m.tawhai@auckland.ac.nz



Kitea Health



Kitea Health offers more than just medical devices. They offer peace of mind to parents of young children suffering from a medical condition that affects a million people in the US alone.

Hydrocephalus is a condition caused by excess cerebral fluid around the brain. Current treatment involves the use of shunts to drain that fluid, but this approach has a failure rate of 50 percent in the first two years. Some patients have 10-15 surgical revisions of shunts. There is no technology capable of monitoring brain pressure, which would indicate shunt failure. This places uncertainty on parents who must attempt to analyse symptoms for hints that the shunt has failed. Early symptoms can be as mild as a simple headache, meaning parents are constantly on high alert. Physicians admit patients for CT scans, MRI and invasive procedures only to find that two-thirds of the time it's a false alarm.

Kitea Health's technology solves this problem. It allows patients and parents to monitor brain pressure remotely at home, enabling informed decisions. They have developed an implantable device, the size of a couple grains of rice, which uses wireless power to deliver this information. The brain is only the first step. There's potential for use in the spinal cord, cardiovascular system and anywhere else in the body. Kitea Health is at the forefront of what's possible with implantable technology.

Fundamental research was funded through the MBIE Endeavour Fund, HRC, and Cure Kids. Later work was supported by RAP Stage III funding.

Founded in 2022.

www.kiteahealth.com

Fisher & Paykel Healthcare



Fisher & Paykel Healthcare is a leading designer, manufacturer and marketer of products and systems for use in respiratory care, acute care, surgery and the treatment of obstructive sleep apnea.

Their purpose is to improve care and outcomes through inspired and world-leading healthcare solutions. Fisher & Paykel Healthcare's consistent long-term growth strategy is to increase its international presence, change clinical practice, expand our range of innovative products and deliver sustainable, profitable growth.

Fisher & Paykel Healthcare manufacture products at facilities in New Zealand and Mexico and sell them in more than 120 countries worldwide. They employ over 6,000 people around the world including more than 700 staff dedicated to research and development.

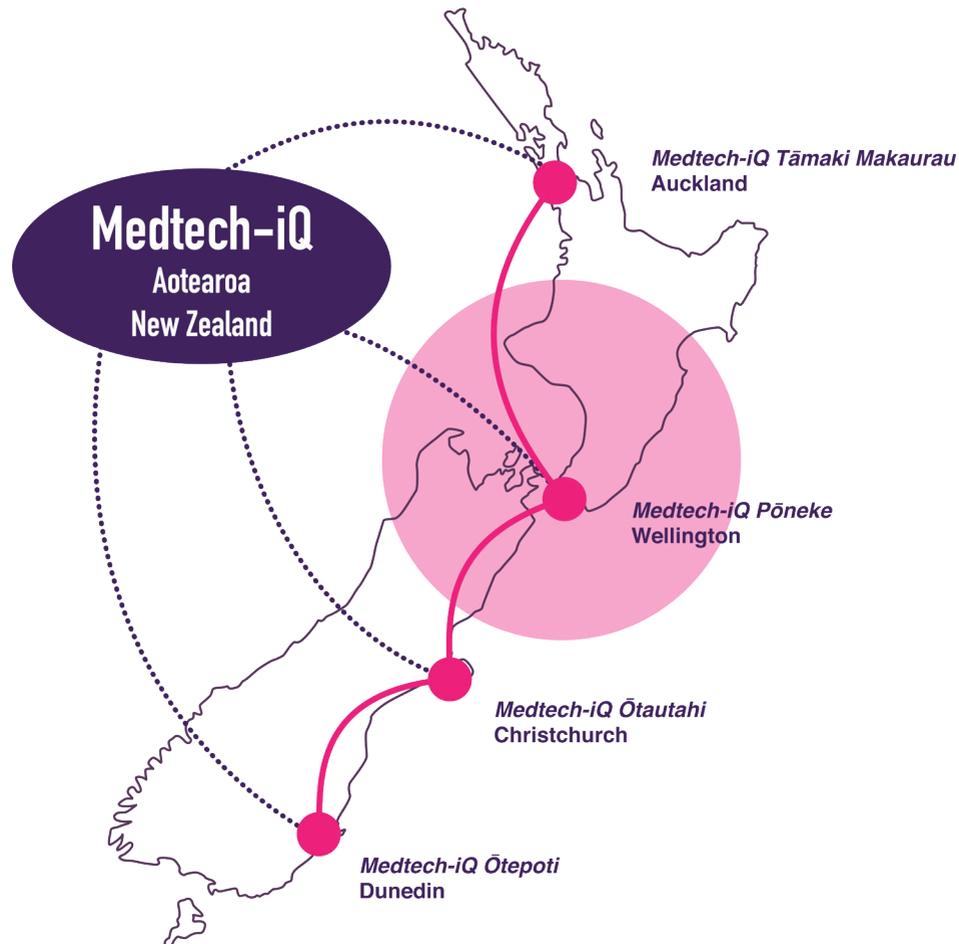
Founded in 1969.

<https://www.fphcare.com/nz/>

Fisher & Paykel
HEALTHCARE



Pōneke Wellington Regional Hub



The Pōneke Wellington Hub will expand on Medtech-iQ's commitment to 'community engagement, participation and co-design' with a co-lab as a trans-institutional shared facility at Wellington Regional Hospital. It will facilitate research 'on location' by bringing together researchers and students with clinicians and patients to solve real life health problems emerging within community and clinical settings.

The co-lab aspires to complement the national MedTech translational research capability with three areas of research focus: Digital Health, Human Centred Design and Design-led applications of emerging digital technologies, with specialisations in digital mental health, AI and big data for healthcare, serious games, 3D & 4D printing for simulation and data analysis, amongst others.

It will call on a multi-disciplinary regional collaboration with Te Whatu Ora Capital, Coast and Hutt Valley, Victoria University of Wellington, Otago University Wellington and Massey University, as well as existing national collaborations with complementary partner organisations such as the Auckland Bioengineering Institute and Ara Manawa at Papakainga Atawhai/Auckland City Hospital.

In developing a distinctive capability, our capital city location offers real opportunity to work with government organisations such as Te Whatu Ora's Emerging Health Technology & Innovation Group or Te Aka Whai Ora, or to capitalise on synergies with our internationally acknowledged Digital Creative Sector. The Medtech-iQ's Pōneke Wellington Hub also offers enthusiastic support for MBIE's recent 'Wellington Science City' proposal as an additional opportunity to grow a regional capability of national and international significance.

Contacts:

Simon Fraser. Professor, Victoria University of Wellington. simon.fraser@vuw.ac.nz

William Levack. Dean, University of Otago Wellington. william.levack@otago.ac.nz

Richard Perry. Improvement and Innovation Manager, Te Whatu Ora Capital, Coast and Hutt Valley. Richard.Perry@ccdhb.org.nz



Medtech-iQ Pōneke



Te Whatu Ora / Capital, Coast & Hutt Valley

The Improvement and Innovation team at Te Whatu Ora / Capital, Coast and Hutt Valley (CCHV) District is made up of clinicians who support health staff to improve and innovate in their area of work. We use a range of evidence-based improvement and innovation approaches with a strong focus on equity and honouring Te Tiriti, to improve outcomes and experience for consumers, their whānau and staff. We partner with other CCHV district teams and organisations including Research, Consumer Engagement, Simulation and Skills Centre, Clinical Governance, local universities and the wider improvement and innovation community. We also deliver the training and tools to staff to run their improvement and innovation initiatives. Contact: Richard.Perry@ccdhb.org.nz

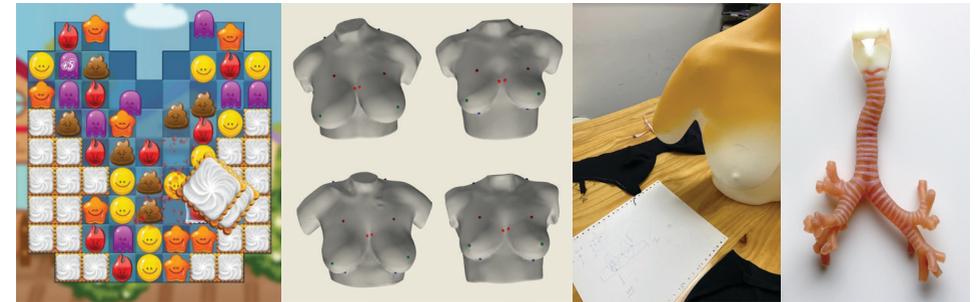
University of Otago / Wellington Campus

The University of Otago, Wellington is a satellite campus of the Dunedin-based University of Otago. We are a medical and health sciences campus, home to around 1,000 students and an inspirational teaching team of leading health educators and researchers. The Pōneke Wellington campus offers a wide range of postgraduate qualifications in health sciences, as well as an undergraduate degree in Radiation Therapy and final years of study for undergraduate Medicine, Physiotherapy, Dietetics and Pharmacy. Our staff and on-campus students learn and work from locations close to the Wellington Regional Hospital in Newtown, and in the central city. Our main academic block in Newtown is currently being upgraded but teaching and research programmes remain in full swing. Contact: william.levack@otago.ac.nz

Massey University / Wellington Campus

The College of Health offers learning and research opportunities in public health, health sciences and nursing. Guided by the philosophy of hauora, our teaching and research focuses on health and wellbeing for all, taking account of people's diverse needs, situations, communities, and the influence of social and environmental factors. It hosts the Research Centre for Hauora and Health, which conducts research in epidemiology and mātauranga and kaupapa Māori, focused on non-communicable diseases, Māori and Pacific health, and environmental and occupational health. We are a founding member of the Virtual Health Information Network, involving researchers, analysts and other professionals who use big data to generate novel insights that support the health and wellness of all New Zealanders. Contact: J.Douwes@massey.ac.nz

Medtech-iQ Pōneke



Te Herenga Waka / Victoria University of Wellington

Te Herenga Waka / Victoria University of Wellington offers a wide range of Medtech focussed expertise. Showcase snapshots include:

Digital Mental Health

The Digital Mental Health Catalyst is a new initiative by THW/VUW, aims at leveraging technology to enhance mental health and equity. E-therapies, apps and other digital innovations for mental health are often as effective as face-to-face therapies in clinical trials but frequently face low adoption and engagement in communities. The Catalyst unites academic, community, and cultural knowledge to drive impactful projects for mental health. Contact: terry.fleming@vuw.ac.nz

Statistical Shape Model for customised post-breast surgery bras (RAP II Funding)

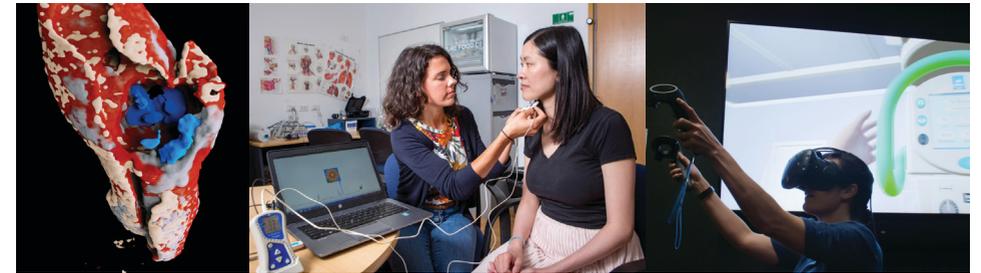
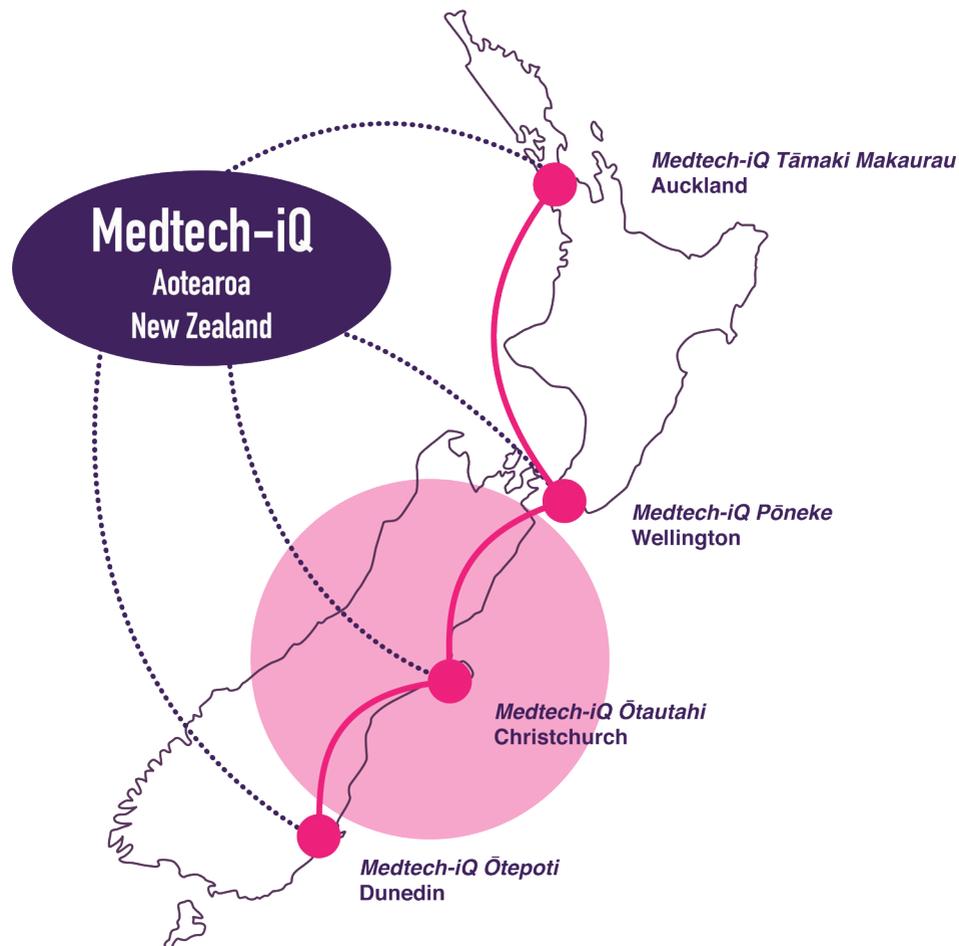
The Tangible IX design lab (VUW) studies in depth the human experience of interacting with medical technologies to offer physical and digital solutions. In this case, Te Titoki Mataora RAP II funding supports Dr Edgar Rodríguez and PhD students Xuxu and Aïda Amoozegar-Montero to collaborate with Dr Julie Choisne (ABI) to develop a Statistical Shape Model that will help produce digitally manufactured bras for post-breast surgery use, with highly customised features (size, padding, and others). Contact: edgar.rodriguez@vuw.ac.nz

3D and 4D Printing for physical simulation

The School of Design Innovation offers the only high-resolution, multi-material full colour 3D printing research capability in NZ. Our research expertise is creating physical 3D printed models from medical imaging data that simulates the complex colouration, textures, movement, and pathologies of the human body. Applications include dynamic anatomies for simulation and surgical planning through to novel physical representations of computational data. Collaborations include Auckland Bioengineering Institute and Te Whatu Ora Capital, Coast & Hutt Valley and the University of Otago CReATe group. Contact: bernard.guy@vuw.ac.nz



Ōtautahi Christchurch Regional Hub



The Ōtautahi Hub will support and advance medical technologies to enable access, achieve equity and improve health outcomes in Canterbury and across Aotearoa, aligning with Medtech-iQ's vision to strengthen medical technologies to address complex health issues.

The Ōtautahi Hub is supported by Te Papa Hauora Health Precinct and its partners. Te Papa Hauora is a strategic partnership between Canterbury's major tertiary and health institutions; the University of Canterbury, the University of Otago, Ara Te Pūkenga and Te Whatu Ora Waitaha, with support from Ngāi Tūāhuriri, our Mana Whenua.

Te Papa Hauora is founded on the principle that collaboration, innovation and working together has many advantages. Te Papa Hauora brings together health research and development partners, the health system and industry partners to design, develop and prototype MedTech solutions, enabling the rapid translation of research findings and technology solutions to the clinical environment.

Key areas of strength within the Ōtautahi MedTech sector include:

- Next-generation medical devices, sensors, and diagnostics
- Translational modeling and digital twins
- Medical implants, wearables and biometrics
- Medical software and software as a medical device/service
- Technology driven workflow and health data management solutions

The Ōtautahi hub will bring people together and maximise the benefits of their knowledge for the wider community.

The Ōtautahi Medtech-iQ hub exhibition displays the research and start-up space of Christchurch with the University of Canterbury research group and an early stage start-up, Tiro Medical.

Contacts:

Pip Griffin. Executive Officer, Te Papa Hauora Health Precinct.
pip.griffin@healthprecinct.org.nz

Rebecca Warr. Commercialisation Manager, University of Canterbury
Rebecca.warr@canterbury.ac.nz



University of Canterbury Biomedical Engineering Research Group



Goal: Step-changes in the personalisation, productivity, and equity-of-access of intensive care and chronic disease treatment.

Research: Model-based digital twins for personalising care in major areas of intensive care and chronic disease. Specifically, model-based, digital twin management of blood sugar levels, lung mechanics and breathing, and cardiovascular care.

The intensive care unit (ICU) provides a foundation to develop outpatient chronic disease solutions, where ICU care consumes 8-10% of all healthcare spending, and chronic diseases like diabetes, chronic obstructive pulmonary disease (COPD), and cardiovascular disease cost a further 20-30% of health spending.

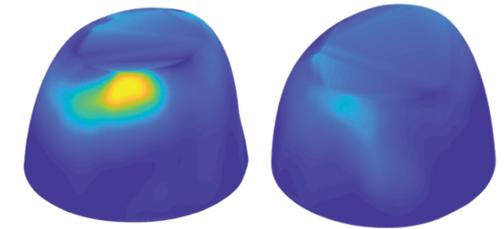
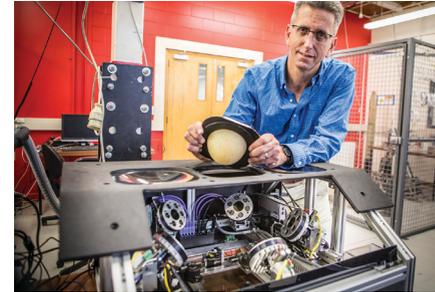
These areas offer the opportunity for maximum impact reducing the cost of care, while improving its outcomes, to ensure future New Zealanders have maximum equity-of-access to both care and quality outcomes.

Impact: University of Canterbury Biomedical Engineering has several major impacts:

- First ever digital twins for ICU glucose control used in four countries in both ICU and/or Neonatal ICU. This has been used by Christchurch hospital for 17 years, saving \$1M/ year and 15-20 lives/year (~NZ\$200M value).
- First ever digital twins for mechanical ventilation. Related products are in use in Malaysia and Singapore.
- Created novel, non-invasive breast cancer screening technology; equivalent/better performance to mammography at 5x lower cost.
- Development of first working light-based glucose sensor.
- Development of insulin pumps with 10x lower cost than current devices, open designs published.
- Research translation supported by large patent portfolio and formation of three spin-out companies.

Contact: Geoff Chase. Distinguished Professor, University of Canterbury
geoff.chase@canterbury.ac.nz

Tiro Medical



Tiro Imaging is a branch of Tiro Medical and is focused on developing a non-invasive breast cancer screening solution. The solution is x-ray free, portable and requires no breast compression. It is safe for women of all ages and can be facilitated in GP clinics or taken to rural communities, increasing equity of access. The technology works by analysing low-amplitude vibrations in the breast and using surface motion to detect underlying tissue properties, where cancerous tissue is 4-10 times stiffer than healthy tissue. Diagnosis with this technology is fully automated using algorithms and therefore requires no skilled personnel, reducing screening costs. Diagnostic results to date show sensitivity 92-100%, much higher than that of mammography. Commercialisation of this technology has the opportunity to provide more accessible and comfortable early detection options, increasing breast screening equity, improving outcomes for all women and reducing breast cancer mortality.

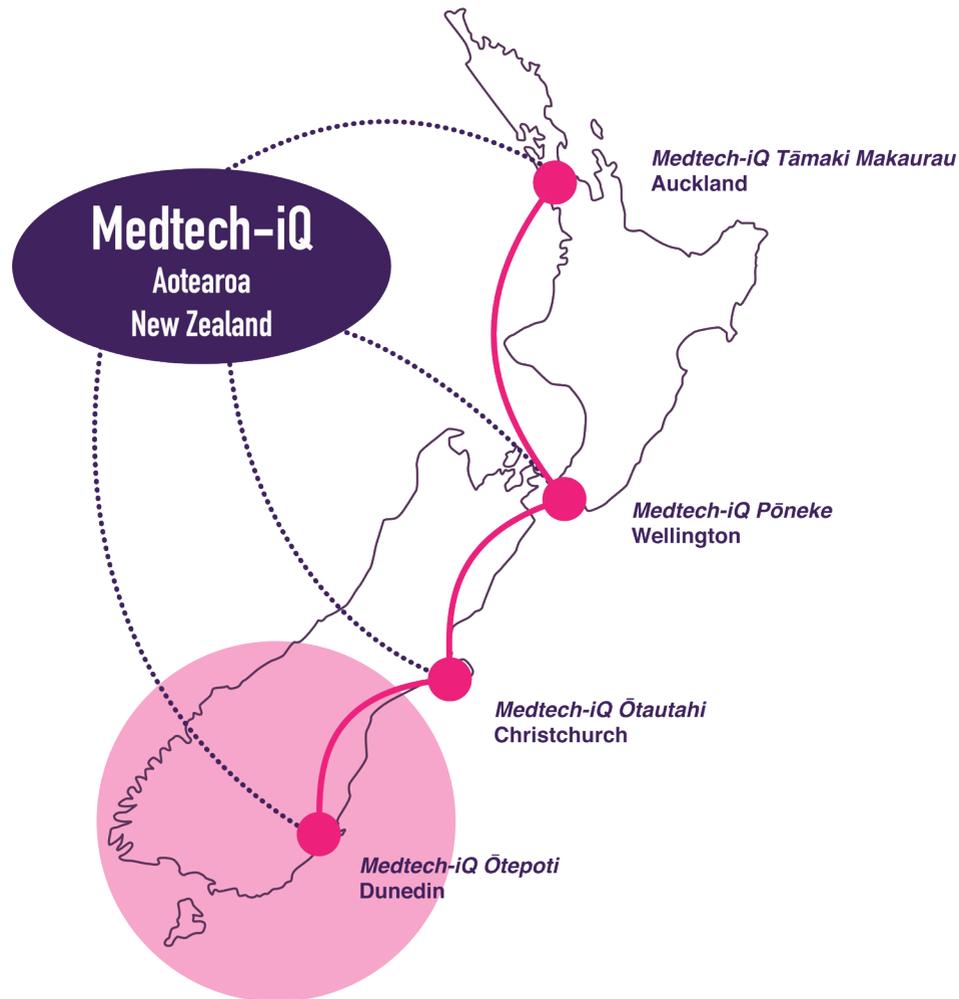
Tiro Medical is a start-up born out of and collaborating closely with the UC bioengineering lab. The company has recently embarked on a new capital raise to develop a new prototype and run a second clinical trial following highly successful diagnostic results (sensitivity 92-100%). The company continues to be involved in available workshops to improve their capabilities and connections, such as the quality and regulatory workshops run by Te Titoki Mataora and the HealthTech Activator.

<https://tiromedical.com/>

Tiromedical



Ōtepoti Dunedin Regional Hub



The Ōtepoti/Dunedin Hub will embody cross-disciplinary innovations underpinned by Te Tiriti principles, and capability/capacity building through student recruitment into University of Otago's world-class postgraduate programs.

It will complement the national MedTech translational research capability – from bench-to-bedside - with four areas of expertise:

- Bioengineering, biomaterials and nanomedicine
- 3D bioprinting and regenerative medicine
- Combining artificial intelligence with teaching and medical device design
- Digital health and point of care diagnostics for dental and medical services

Opportunities for Dunedin:

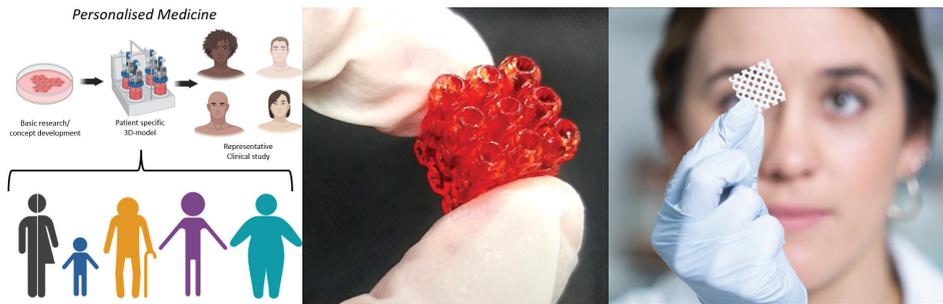
- A hub to connect with community, hospital, industry, businesses and academic institutes in the lower South
- Connections to other major hubs through University of Otago's campuses in Christchurch and Wellington, and strong presence in Invercargill and Auckland
- Dunedin boasts the only Dental School in New Zealand
- New Zealand's first digital hospital to be built in Dunedin will influence the development of medical technologies for the real world

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3D Bioprinting and Regenerative Medicine Research and Translation



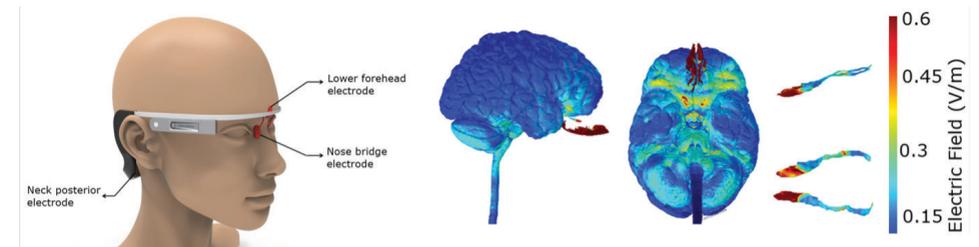
With joint disease rates skyrocketing worldwide, the need for manufacturing implants that repair or regenerate diseased joints will increase 670% by 2030. Our multidisciplinary 3D Bioprinting and Regenerative Medicine research at University of Otago Christchurch combines advanced engineered biomaterials and bioinks, stem cell biology, 3D bioprinting and orthopaedic device biomanufacturing. We house Aotearoa New Zealand's most advanced Biofabrication Facility and develop biomaterials to deliver patient's (stem) cells - 3D bioprinted to their specific anatomy - to allow repair of damaged cartilage and bone in osteoarthritic hip or knee joints, or to

regenerate large sections of tissue removed due to cancer. We have pioneered the development of light activated biomaterials and Aotearoa New Zealand's first licenced bioink for the global 3D Bioprinting market, as well as 3D printed spine implants. Our CReaTE@Otago group is pioneering surgery of the future and researching right at the edge of what is possible in Regenerative Medicine.

Contact:

Tim Woodfield. Professor, University of Otago.
tim.woodfield@otago.ac.nz

Wearable Olfactory Nerve Stimulator



The olfactory system, the sensory system for smell, is known to be dysfunctional in the earliest stages of Parkinson's disease, Alzheimer's disease and in post-Covid patients. It is also shown that intact olfactory function is a key role player for regaining consciousness after brain injuries. To alleviate olfactory dysfunction and associated neurological disorders/dysfunctions, in collaboration with Soterix Medical US, Associate Professor Yusuf Cakmak (the University of Otago) determined the optimised electrode placements to stimulate the olfactory nerve by leveraging electrical stimulation fields from the superficial

tissues into the brain for a novel non-invasive wearable olfactory nerve stimulator. Our results pave the way for developing the first non-invasive electrical stimulation wearable system for targeting the olfactory regions and clinical tests are initiated.

Contact:

Yusuf O. Cakmak. Associate Professor, University of Otago. yusuf.cakmak@otago.ac.nz



Australia–New Zealand BioBridge



The BioBridge connects clinicians, researchers, and industry within the health innovation ecosystems of Australia and New Zealand. This Trans-Tasman collaboration helps spark conversations and build anchored science and business partnerships with long-term outlook for the development of new healthcare technologies and business opportunities.

It is open to researchers, clinicians, and companies within the MedTech space. Researchers across the Tasman have used this platform to develop new partnerships with complementary expertise and knowledge, whilst companies have used this to help identify key

opinion leaders and specific business expertise. These connections are supported through one-on-one meetings and through workshops with a unique focus topic.

The BioBridge links the CMDT partners to the Liverpool Innovation Precinct in Sydney.

Stage 1 of the BioBridge project has been funded as an MBIE Catalyst Influence Activities Project from 2020 to 2023.

HealthTech Activator

Supporting success across the HealthTech sector



POWERED BY

CallaghanInnovation
New Zealand's Innovation Agency

Callaghan Innovation's HealthTech Activator (HTA) works with innovators - no matter where they come from across the research, science, and innovation (RSI) sector - whether through the university system, as an entrepreneur, or clinician looking to establish a healthtech business.

To date, they have worked directly with over 150 healthtech businesses in bio-pharma, therapeutics, medical devices, and digital health. They're engaging effectively across the healthtech commercialisation landscape with more than 1000 HTA subscribers.

The HTA delivers personalised advisory support, capability-building modules, workshops, and webinars, all developed with stakeholders across the sector. The HTA website acts as a go-to hub for healthtech information, providing a point of coordination and connectivity for the sector. The HTA also provides database search support, sharing data and sector intelligence using international partners like Gerson Lehrman Group (GLG) and Global Data.

The wraparound service can offer guidance around capital planning, market validation, regulatory preparedness, reimbursement, and clinical trial preparedness, focusing on addressing the unique aspects of the healthtech commercialisation journey.

What's more, the HTA can connect innovators to other commercialisation services provided by Callaghan Innovation and New Zealand Trade and Enterprise (NZTE).

As a constituent part of the CMDT, the HTA works in partnership with Te Tītoki Mataora MedTech Research Translator (TTM).

For more information or to keep up with the latest resources and information from the HTA, head to the website at www.hta.callaghaninnovation.govt.nz



Return on Science



What is Return On Science?

Return On Science is a national research commercialisation programme that leads the establishment of best practise to deliver new research to market from universities, research institutions, and private companies. Our services include connecting science, technology and project teams with strategic management, top-tier advice and guidance, world leading best practice process, and efficient access to high value capital.

Return On Science is a foundation partner in the government's Commercialisation Partner Network, a programme designed to increase commercial outcomes from publicly-funded research. Return On Science provides facilitated access to best in class commercialisation resources, networks and expertise to directly increase the quantum and quality of the commercial opportunities arising from New Zealand's research effort.



Specialist Investment Committees

Five specialist Return On Science Investment Committees represent centuries of combined domain specific knowledge and experience from around the globe. Comprised of academic, industry commercial and investment experts, the committees provide tailored recommendations on market viability, research and product development direction, and connections to relevant individuals and companies.

The Investment Committees provide access to capital needed to progress a project. Either through approving investment from the devolved PreSeed Accelerator Fund, or through connections to local and international investors and investor groups.

The Investment Committees are available at any stage to review progress and provide additional advice and guidance to help direct the team to the earliest development of a minimal viable product, and connections to the best international people able to provide market analysis and later, market validation.

Kiwi Innovation Network (KiwiNet)



KiwiNet is the combined power of 19 of New Zealand's Universities, Crown Research Institutes, and other research organisations, working together to transform early-stage discoveries into products and services that will have longstanding social, environmental, and economic impact for NZ. Through PreSeed Accelerator funding from MBIE, training programs, support, and industry connections, KiwiNet helps commercialisation teams and entrepreneurial scientists take their discoveries from the lab to the world.

There is an impressive variety of medtech research coming through the KiwiNet pipeline at present, proving that Aotearoa has a vital role in addressing the health and wellness needs of citizens across the globe. From medical devices streamlining treatment and apps supporting patients' healthcare, to components in immunotherapy vaccines, antitoxins for infections, and gene manipulation, our research sector is contributing towards world-leading technologies in healthcare.

In 2021, KiwiNet supported RespirAq and AUT Ventures to spin-out their novel humidification technology through the KiwiNet Spin-out Programme, which fast-tracks commercially viable research outcomes. RespirAq is now well-advanced on their commercial journey, with prototype product, pilot facility, a clearer pathway to regulatory clearance and promising potential commercial relationships. Recently, the US FDA designated the RespirAq Active Humidifier as a Breakthrough Device, a major achievement for a New Zealand company.



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Thank you to all our exhibitors and everyone who has supported this
MedTech Innovation Showcase.





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