A Note from the Co-Chairs

As 2016 closes, the CMDT and the MedTech Centre of Research Excellence (MedTech CoRE) are taking time to reflect on this busy year, both to celebrate and to look at what lies ahead.

The MedTech CoRE is two years old at the end of December and transitioning from a “start-up” to an “emerging” entity. In 2017, the CoRE will be reviewed by the Tertiary Education Commission (TEC) to determine if we are meeting our KPIs and are on track to achieving the goals we have set for ourselves. A favourable review outcome will see the CoRE with continued funding till December 2020. In any case, we need to start planning for the CoRE’s future.

The CMDT and the MedTech CoRE have worked closely together right from the inception of the CoRE – the CMDT being the industry face to the translational research and clinical face of the MedTech CoRE. The usefulness of having these two joint entities is the different lenses that each brings to our interactions with the greater sector, allowing initiatives and conversations to be focused accordingly. Commercialisation has been a primary goal, and in order to achieve widespread clinical uptake of our translational research, the self-analysis for the CoRE’s mid-term review is also a chance to reflect on the CMDT, its objectives and how we might focus these over the next few years to grow “medtech NZ” as well as the opportunities from the CoRE.

The CMDT is now the “knowledge bank” for the medtech sector and is recognised as a connector in its area. We have a trusted platform in the CMDT to facilitate open discussions between companies and to provide opportunities for partnerships. Much better dialog has also been achieved between the CMDT partners in the research, IP and technology transfer fields which has been invaluable to support and accelerate commercial outcomes from our research. The CMDT provides a panel for the CoRE’s seed funding rounds with the 6th just completed recently; this brings a commercial robustness to our funding decisions. The annual MedTech CoRE day, as part of HealthTech week and our involvement in the MTANZ Conference, has also been very successful, thanks in no small part to the excellent contributions of the CMDT organising committee.

The CMDT and MedTech CoRE are starting to turn attend to international connectivity. The CMDT plays its role in providing a NZ Inc perspective of the medtech sector to international organisations, representing its wide catchment of companies, researchers and clinicians, while the CoRE brings NZ’s research strength to the conversation. Two international collaborations with a commercial outcome focus that are currently in progress are an ICON project with the Fraunhofer Institute, Germany (co-funded by MBIE), and a doctoral training programme (IRTG ) with the University of Stuttgart. In March 2017, we will jointly host a Japanese research-industry delegation to explore opportunities in elderly care and welcome expressions of interests from NZ companies who would like to be part of the workshops. We continue working with MBIE to develop a relationship with the Texas Medical Centre, Houston to provide new opportunities in market access, research and investment for NZ Inc.

MedTech CoRE has contributed with its business spin-outs to NZ’s dynamic high tech manufacturing sector. This sector grew by $1B over the last year and now contributes $10B to the economy. The CoRE is averaging two new medtech companies per year with our most recent examples being Fleximap and Objective Acuity, both of which have received help from MedTech CoRE Seed funding.

In related news, we would like to celebrate the success of several of the CoRE’s Investigators – A/Prof Iain Anderson, University of Auckland, was recognised by the Royal Society with the award of this year’s Pickering Medal partly for his role in an earlier spinout, StretchSense which is now making its mark in the rapidly emerging wearable market; A/Prof Mark Sagar, University of Auckland has attracted a philanthropic grant by the Li Ka Shing Foundation which recognises his success in creating another medtech spinout Soul Machine; and Distinguished Prof Geoff Chase, University of Canterbury received the HRC award for his outstanding contribution to medical technology, particularly in the areas of diabetes, cardiovascular and lung dysfunction and care. Geoff is also co-founder of the medtech start-up, Tiro Medical. Geoff works closely with Prof Meryn Tawhai, University of Auckland in the CoRE and she has also been recently awarded the MacDiarmid Medal by the Royal Society for her research to create anatomically detailed models of the respiratory system, providing new tools for diagnosis, prognosis and treatment of lung disease.

2016 has been an exciting year for both the CMDT and MedTech CoRE. However, it is our stakeholders that have made us a success and we would like to take this opportunity to thank you for your support, and wish you all the best for 2017. Happy holidays!

Peter Hunter and Diana Siew
The Christchurch Regenerative Medicine and Tissue Engineering (CReaTE) group is becoming an international leader in hydrogel bio-ink development, with a focus on translational research and, ultimately, the 3D-bioprinting of cartilage and bone.

The group is based at the University of Otago, Christchurch, within its Department of Orthopaedic Surgery.

Group leader Associate Professor Tim Woodfield says one aspect of its work is developing a new bio-ink—a gel-like substance carrying living human or stem cells that degrade over time in the body to help regenerate damaged or diseased tissues.

The group has developed a novel visible-light bio-ink that does not need expose to ultra-violet light to ‘harden’ into 3D-bioprinted bone or cartilage shapes like most other bio-inks used currently.

“Our bio-inks give significantly higher stem cell viability because visible-light technology is gentler and more cell-friendly than ultra-violet light,” Woodfield says.

An article on the novel bio-ink was recently published in leading bioengineering journal ACS Biomaterials Science and Engineering. CReaTE Research Fellow Dr Khoon Lim who led the work says the novel bio-ink enabled the 3D bioprinting of high precision large, engineered implants that matched patient anatomy.

“This is an impressive feat with important clinical impact as approaches using ultra-violet light are not able to achieve this scale, and few groups have been successful in bio-printing the large, thick constructs needed in surgery.”

The technology, invented by Lim and Woodfield, has been provisionally patented.

Woodfield says CReaTE’s strengths are its collaboration with clinicians; its multidisciplinary nature; combining its 15 years of expertise in 3D printing with biomaterials science and cell biology; and its collaboration with New Zealand companies such as Ossis and Enztec who are pioneers in 3D printing patient-specific titanium implants.

Woodfield says New Zealand researchers are at the fore of the rapidly growing fields of biofabrication and bioprinting. He sits on the Executive Board of the International Society for Biofabrication (ISBF).

CReaTE is part of the MedTech Centre of Research Excellence (MedTech CoRE), a translational research collaboration aimed at developing applications for economic growth and healthcare outcomes.

“Our group and the MedTech CoRE enables postgraduate research and training for talented bioengineers and clinician scientists in multidisciplinary regenerative medicine and biofabrication technologies. This will not only shape future surgical and medical procedures but the medical device industry as well.”

CReaTE hosted New Zealand’s largest congregation of international regeneration medicine researchers at this year’s Queens-town Molecular Biology (QMB) Conference. In December, it will co-host a ‘MedTech in Christchurch’ event to encourage collaboration and knowledge sharing amongst organisations involved in healthcare and medical device development. As part of its Ministry of Business, Innovation and Employment-funded collaboration with South Korea, CReaTE will also host a delegation of stem cell and regenerative medicine researchers and industry representatives from that country.
Oral e-Guard: a wireless equipment to protect oral health

A research team of the Sir John Walsh Research Institute led from Prof Mauro Farella has developed wireless equipment to protect oral health. A small patch incorporating electromyographic sensors is attached to the cheek and continuously measures jaw contractions. This device will help to diagnose and treat the clenching and grinding of teeth, also known as bruxism.

This condition affects up to 20% of the population and is difficult to diagnose in dentists’ clinics, as it mostly occurs during everyday life or sleep, with the patient being often unaware of the harmful jaw contractions. Bruxism can cause headache, jaw pain, and damage to the teeth. The developed device will help to prevent damage to, and extend the lifespan of, costly dental treatments, such as tooth implants, crowns, and veneers.

The team has also developed a small wireless in-mouth device to measure oral pH and temperature. Oral pH may significantly drop during sleep in patients suffering with gastro-esophageal reflux, a condition that may affect up to 20-30% of the general population. Untreated reflux often causes esophagitis, painful swallowing, chest pain, and tooth erosion. Chronic acid reflux may also increase the risk of esophageal cancer.

The developed equipment represent a non-invasive diagnostic alternative to esophageal pH monitoring, which is performed by passing a catheter through the nose to the stomach. The pH device can also be used to test the effect of various beverages on oral pH, and to determine whether or not they are tooth-friendly.

Both the patch and the in-mouth unit wirelessly transmit data in real-time to a smartphone data logger for over 24-48 hours. Software has been developed for quantitative analysis of jaw contractions episodes and of time when salivary pH is below a threshold at risk.

The Oral e-Guard will allow dentists to accurately detect bruxism and implement appropriate measures to mitigate its consequences. The equipment will alert the wearer to either teeth clenching or low pH by feedback, which will enable them to consciously stop clenching by cognitive behavioural treatment, or seek appropriate treatment for acid reflux. This will be particularly advantageous in patients with sleep disordered breathing, who often present with both bruxism and acid reflux and are at high risk of damage to the dentition.

Several sources of funding have been used to develop this equipment including the Lottery Health Grant, the New Zealand Dental Association, and the University of Otago Research Grant. This novel equipment will provide researchers with new knowledge about the association between bruxism, headache, orofacial pain, oral acidity, and tooth decay.

Rehabilitation Innovation Centre: Standing Trial Population

The Rehabilitation Innovation Centre (RIC) is a partnership between AUT University, the Burwood Academy of Independent Living and Callaghan Innovation. The RIC aims to:

- bring together clinicians, end-users, researchers and industry stakeholder
- accelerate the development, evaluation and implementation of rehabilitation technologies
- promote the health and well-being of people experiencing disability.

The RIC is instigating a Standing Trials Population for the development of rehabilitation technologies. A standing trials population is a group of patients and clinicians who are willing to consider participating in iterative development and validation studies of rehabilitation technologies.

For ongoing RIC projects, accessing their services, or for more information, visit: www.ric.org.nz

For information on other Standing trial population centres, visit www.standingtrialpopulations.nz
Funding option in NZ—A word with Snowball Effect

A range of online capital raising options have emerged over the past 2 years. We ask Simeon Burnett, co-founder and CEO of Snowball Effect, to describe the options for companies and how the market has evolved to date.

What is Snowball Effect?

Snowball Effect is a marketplace which simplifies access to a range of investment opportunities. We provide vetted deal flow so investors can discover and invest in a range of interesting growth companies.

90% of offers have been successful at raising funds in our marketplace. The average raise size is ~$1m. The average investment is ~$8,500.

In a little over 2 years we’ve amassed an audience of over 10,000 investors who we reach via email. Most of these investors are Kiwis. Some are expats. A few are international investors.

How have the funding options evolved over the first 2 years?

We started with public offers through the new “equity crowdfunding” regulations. These regulations allow for companies to make a public offer without developing a “product disclosure statement”. This drastically reduces the cost of making a public offer, and therefore opens up the wider equity capital market to cash-hungry early stage growth companies.

For companies, we provide a complete capital raising package and access to a wide investor audience, so it’s a quick and efficient way to raise funds. For investors, we provide a simple channel to discover and invest in growth companies.

NZ med-tech company Veriphi has made use of these new regulations through 2 capital raising events this year.

We also facilitate private offers, where the offer is made to a selected audience, and not publicly visible. For example the company could be targeting high net worth investors that are investing 6 figure amounts and looking to contribute capability alongside their cash. Or it could be seeking to get its customers involved more closely with the business.

What is your motivation?

We’re on a mission to simplify investment into high growth Kiwi companies.

We want to create a simple way to channel some of our national savings into wealth-creating assets. Investors benefit from vetted and consistent deal flow, quality investment information, standardised investor protection (where possible), and a simple online process.

We’re driven by the significant positive economic impact we can make by building a thriving marketplace to connect growth companies with the capital they need.

Along the way we hope to develop the general financial literacy of the New Zealand public, and bring far more meaning, engagement, and excitement to investing.

Check out this infographic for an overview of the first 2 years of activity in Snowball Effect’s marketplace.
Upcoming Events

Japanese Agency for Medical Research and Development (AMED)

NZ and Japan are exploring a research and industry collaboration around technologies for the elderly care including medical robotics. The Japanese delegation will be in Auckland for a workshop on 2-3 March, 2017. Anyone interested, please contact Jyoti Chugh at jyoti.chugh@callaghaninnovation.govt.nz

More information will be available on CMDT website in early 2017.

Save the date for Healthtech Week 2017

NZ Healthtech Week 2017 is scheduled for the week of 19th June, 2017. It will host a series of events for the many stakeholder groups who are part of the MedTech sector, and host investors and developers from around the world.

Keep up to date on the CMDT website,

In the spirit of Holiday Shopping—Heart vs Brain

Let us know what you think...

For any feedback or story you would like to contribute to our quarterly CMDT newsletter, please email: Jyoti.Chugh@callaghaninnovation.govt.nz

We would love to hear from you!

Don’t forget to keep an eye out on what’s happening at cmdt.org.nz or follow us on twitter at @medtechnz