



TRANSLATIONAL RESEARCH INSTITUTE
AUSTRALIA

Delivering on its potential

March 2017

Overview - TRI delivering on its potential

The Translational Research Institute (TRI) is well on the way to achieving its Vision of world recognition as a translational research centre of excellence:

1. It is Australia's first translational institute conceived and constructed to interface with patients, clinicians, scientists, mathematicians, health economists and engineers. It was also one of the first in the world - possibly the first.
2. It was inspired by, and funded because of, the translational success and experience of Founding CEO Prof Ian Frazer's Gardasil vaccine. A project with outcomes providing improved healthcare, income, jobs and an international following.
3. TRI has drawn together established and demonstrable strengths of clinical and scientific research and translation excellence on a hospital campus.
4. TRI is progressively building a culture of excellence based on the collaborative strengths of multi-disciplinary teams to deliver improved outcomes.
5. TRI's ability to draw on the excellence of its members, to address clinically important questions and translate to outcomes is steadily increasing. The metrics are on an upwards trajectory.
6. TRI can give productive new dimensions to the long-standing individual shareholders. These shareholders could individually make incremental advances, but in the national and international arena, the structured collaboration that TRI can facilitate makes a significant difference.
7. The State of Queensland can capitalise on TRI's potential to contribute in a big way to the 'Advance Queensland' declared aspirations.
8. TRI has flagship collaborative programs due to deliver products, as well in the planning stage. These, with Gardasil, form the examples of scientific discovery, and translation to clinical improvement and commercial productivity with international contributions.
9. There is an adjacent bio-manufacturing facility leased by TRI to Patheon and as such has a vaccine pipeline to contribute to Australia's Biosecurity Program.
10. Links with CSIRO have commenced in the eHealth space with discussions on how TRI can help CSIRO to translate.
11. Proximity to the Ecosciences Precinct, at Boggo Road, forms a Knowledge and Health Precinct being promoted internationally by the Queensland Department of Science, Information Technology and Innovation and Brisbane Marketing

Enabling TRI to fulfil its vision would help to address the OECD Report that concludes Australia needs an innovation re-think as academics and entrepreneurs don't get on.

<http://www.afr.com/technology/oecd-report-shows-australia-needs-innovation-rethink-20170305-gurd39>

Message from the Founding TRI Chair



The opening of the Translational Research Institute in 2013 marked a significant milestone in the history of medical research in Australia.

The vision is to allow innovation to be translated in Australia as opposed to being sent overseas.

People were sceptical about combining the research capabilities and resources of previously independent institutes. However, we were able to demonstrate the advantages of a collective expertise and the efficiencies of scale and access to world standard laboratories and technologies that could be achieved.

Added to these advantages was the chance to co-locate with the first major biopharmaceutical manufacturing facility in Australia in close proximity to the major teaching hospital with leading clinician researchers.

TRI was built with interactions in mind. The unique design of the building inspires creativity. There are vistas to the city and mountains, a landscaped atrium, and rooms and breakout areas where people can talk and exchange ideas.

These interactions have led to new **collaborations** and created new **interfaces** between academics, clinicians and the commercial sector to form multi-disciplinary teams that can bridge the chasm between biomedical research and patients who need the discoveries.

While collaborations and interactions are an essential element of 'bench to bedside', which is the process of translating scientific knowledge into practical benefits for the community, there also needs to be an agreed **roadmap**. That is why the TRI Translational Pathway was developed.

Dr David Watson
TRI Chair

Funded to be different – bench to bedside

TRI is a disruption to business as usual. TRI connects scientists with clinicians to solve healthcare problems. It is a catalyst for change. The goal is to improve the percentage of medical innovations that are translated and made available worldwide. The ultimate outcome - improved healthcare, jobs and new manufacturing industries.

The Federal Government, the Queensland Government and The Atlantic Philanthropies funded TRI on the back of the international adoption of the Gardasil vaccine, one of Australia’s most successful examples of translational research. Gardasil faced a funds’ shortage that saw the management of the business move overseas as further funds were needed. The vision for TRI was to try to stem the need for innovation to move overseas to go to product. To achieve this goal, a raft of infrastructure needed to be put in place. The TRI facility was the first step.

TRI recognises that there are levels of human infrastructure missing in Australia making it difficult to take the innovation through the “Valley(s) of Death”, which are the gaps between the innovation and the real-world implementation.

It is at these stages that innovations are usually lost to overseas. This requires education programs and mentoring to develop these innovations in Australia and maximise the return to the people of Australia. The need for an “Innovation Fund or Medical Research Future Fund” has been recognised by the Federal Government and its Advisory Board, chaired by the Founding TRI CEO.

See **Appendix 1** more detail on how TRI started and its achievement against the Strategic Plans.



*Gardasil was the first translation that provided learnings for TRI members. Using this model, Prof Frazer created the publicly-listed **Admedus**, based in commercial space at TRI with four other start-ups*

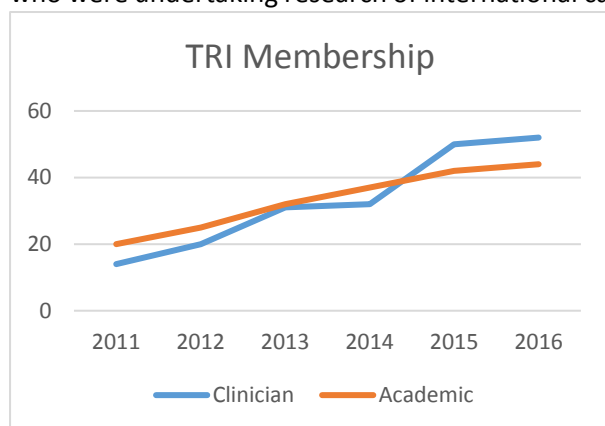
*Using a different model to take an innovation to product, the current TRI CEO Prof Mountford takes imaging innovation to market with a long-term commercial partner, **Siemens Healthcare**.*



Collaborations

1. TRI Membership: the strength behind the vision

The TRI membership in 2013 was made up of scientists, from each of the shareholder organisations, who were undertaking research of international caliber that is translatable. They were recommended



to the TRI Board for approval for a five year period following a process agreed to by the management committee.

In 2015, in order to support the bench to bedside vision, the clinicians from both the Mater and PAH were invited to become members providing an increased opportunity to communicate and solve problems. The same evaluation process was employed.

There are currently 96 members – 52 clinicians and 44 academics.

2. TRI Caucus: the new driver of innovation

TRI members constitute “The Caucus” which meets every two months under the Chairmanship of an elected leader and recently a deputy. During 2016, the TRI Caucus, under the leadership of Prof Jo Forbes (Mater), became proactive in the development of new TRI programs and **gaining a voice for all TRI researchers and clinicians in TRI R&D decision making.**

Importantly Caucus is now working towards coordinating and optimising collaborative translational research potential within TRI. Caucus is also promoting healthcare R&D at an international level by harnessing the skill sets and infrastructure of the entire TRI and their wider network. Continuing this global challenge are the Caucus leaders for 2017 Prof Rik Thompson (QUT) and Deputy Leader A/Prof Kiarash Khosrotehrani (UQ).

Clinical members of Caucus have requested that a second “junior” TRI membership category be considered so that less senior members have access to Caucus and can benefit from the process.

FLAGSHIP PROGRAM - MICROBIOME



At its next meeting on Tuesday 15 March, Professor Josephine Forbes, Chair of the TRI Caucus, and Professor Gerald Holtmann will host a discussion featuring presentations from TRI-based researchers and collaborators on projects that involve the Microbiome

How will a TRI translational microbiome program address key clinical questions?

Caucus members - come and have your say at the next meeting on 15 March 2016



VISIT WWW.TRI.EDU.AU/MICROBIOME FOR THE LATEST NEWS

3. TRI Student Society and TRI ECR Committee: the new generation

The TRI Student Society was formed to allow post graduate students from shareholder organisations to meet in a common forum. This has proven to be a very successful initiative ably assisted by the **TRI Communications and Marketing team** who guide the students through understanding the process of T1-T5 Translational Pathway.



The first Poster Symposium, organised by the **TRI Student Society itself** took place in 2014. At the 2016, Student Poster Symposium, TRI suggested to the Student Society they consider introducing additional categories to the traditional 'Science to Science' posters. The aim was to get students and Post Docs thinking about how to

communicate their work to a potential commercial partner (Science to Business) and to a general audience (Science to Public), which includes government, clinicians, potential donors and other key stakeholders. Each entrant was also required to present their research in the larger context of their team's research and its ultimate health benefit.

In 2017, it will become a Brisbane-wide Translational Poster Symposium open to medical and science students and young clinicians and early career scientists from at least three hospitals, two universities and three medical research institutes.

The Student Society was so successful that TRI was contacted in 2016 by Early Career Researchers (ECR) wanting to form a building-wide network as well. This Committee had its first professional development workshop late in 2016 and has a number of initiatives planned for 2017.

4. SPARQ-ed

Students Performing Advanced Research Queensland (SPARQ-ed) delivers a world-class science education program. Launched by Prof Ian Frazer, in partnership with the Queensland Education Department and The University of Queensland, the program aims to actively inspire young Queenslanders to pursue careers in the sciences. SPARQ-ed gives students a unique and practical introduction to biomedical research, mentored jointly by their science teachers and leading research staff.

5. Multi-disciplinary and multi-institutional collaborations

To achieve its vision and the expectations of the two major financial backers, the State and Federal Government, TRI identified the need to take the lead and drive innovative translational projects involving multi-disciplinary teams of researchers and clinicians collaborating across the partner institutes, to work with a commercial partner on unmet health needs. This is a process of **facilitation**.

Grants to support multi-disciplinary and multi-institutional translational successes

In 2014, there were four grants, with a total \$90,000, awarded to projects that demonstrated collaboration across the partner institutes; clinical inclusion; and a focus on innovation. In 2015, TRI implemented **Spore Grants**, which aim to seed innovation and fast track translation and

commercialisation of research. Since 2015, there have been seven Spore Grants allocated with funds totalling \$630,000.

To be successful, a project needed to include investigators from at least three of the TRI Shareholders, one active clinician and a commercial partner, with letters of support from the Shareholders for their financial contribution. The projects were then ranked on their scientific merit.

Recipients

In 2014, the successful recipients were:

- Dr Iulia Oancea's team is exploring therapies and treatments for irritable bowel diseases.
- Professor David Johnson's team is investigating pre- and pro-biotics in chronic kidney disease.
- A/Prof Glenda Gobe's team is working on how best to manage patients with kidney neoplasms.
- A/Prof Brian Gabrielli's team is defining how UV-specific mutations are escaping normal DNA damage repair in melanocytes, contributing to the development of melanoma.

The 2015 TRI Spore Grants were awarded to the following projects:

- Dr Michelle Hill's team is investigating obesity-induced Barrett's oesophagus and associated cancer: mechanisms and diagnostic tools.
- Dr Antje Blumenthal's team is working to define biomarkers that enable stratification of critically ill patients with sepsis, to provide tailored treatment strategies.
- Prof Rik Thompson's team is investigating the potential of a portable, single-sided MRI for routine, low-cost analysis of mammographic density.
- Dr Ken O'Byrne's team is targeting genome stability pathways to tackle cancer.

The 2016 TRI Spore Grants were awarded to the following projects:

- A/Prof Chamindie Punyadeera's team is finding better ways of assessing whether a head and neck cancer patient will respond to a novel therapy
- Prof David Johnson's team is bio-prospecting the gut microbiota for bacteria that can suppress Crohn's disease inflammatory response
- Dr Jyotsna Batra's team is finding treatments for advanced and metastatic prostate cancer

In 2016 a debate about IP interfered with the progress of providing a TRI **DRIVE Grant**, aimed at fast tracking translation and commercialisation of research, with a larger source of funds and a committed commercial partner. This grant will be offered in 2017.

6. New collaborations with clinicians

Dr Peter Malycha, TRI Clinical Director, is working to build relationships between researchers at TRI and the clinicians at PAH, the Mater and other hospitals around Brisbane. To date, TRI has established extensive collaborations between clinicians (of all disciplines) and biomedical scientific researchers through:

- **Clinician membership of TRI**
- **Defined collaborative groups** with ongoing productivity and regular meetings (drawing in participants from all four partners):
 - Immunotherapy
 - Metabolic – including renal, cardiac, hypertension, hepatic and dietetic
 - Genomics
 - Prostate cancer – Australian Prostate Cancer Research Centre Q
 - Head and neck cancer - Qld Head and Neck Cancer Centre (QHNCC)
 - Haematologic malignancies
 - Breast research involving imaging, genomics, skin cell regenerative scaffolding and other basic science (PAH, Mater Adelaide and Newcastle collaborations in spectroscopy)
 - Dermatologic – basic science, advanced clinical assessments and technologies
 - Melanoma – expanded the long-standing Qld Melanoma Project into the Melanoma Collaborative Group drawing together basic scientists, epidemiologists, statisticians and clinicians
 - Gynaecology – ovarian cancer study with Mater
 - Cardiology – Queensland Cardiovascular Research Network.
 - Orthopaedic Trauma Group drawing together basic biomedical and imaging scientists, biomedical engineers, social scientists, emergency physicians, intensivists and surgeons
 - Renal tumour study with Urology at PAH, Greenslopes and Wesley
 - Aging – outreach management
 - Adolescent development – Lady Cilento Children’s Hospital, TRIC
 - PTSD/MTBI/Blast Injury via TRI CRF
 - Imaging- PAH, Centre for Advanced Imaging
 - Nuclear Medicine/PET- PAH
 - Dieticians – trials at TRI CRF

7. New Brisbane-wide collaborations

Construction of an **Academic Health Science Centre**, Diamantina Health Partners (DHP), emanated from TRI. It was initially led by Prof David Theile Senior and was later expanded to Brisbane DHP drawing in broader clinical and scientific inputs from across Brisbane.

In 2014, Dr Ingrid Hickman and BDHP launched ‘**My Translation Rules**’ annual awards to reward dietitians for their translational research efforts. TRI is now working with Dr Hickman and BDHP to produce and promote an online educational package aimed at showing dietitians from Metro North, Metro South and Mater Hospital how to use research to improve practice.

The Innovation and Translation Summit - **Imagine2016** was the impetus for the establishment of the **Brisbane Research Imaging Consortium (BRIC)** that includes TRI, QIMR Berghofer, PA Hospital, RBWH, Mater, QUT and UQ.

8. New International collaborations

In October 2016, a TRI-led delegation visited a number of A*Star divisions and programs; SingHealth Duke-NUS and the Australian High Commission to:

- investigate synergies and areas of complementary expertise and technologies
- exchange knowledge and form relationships
- look at facilities, technologies and programs
- capitalise on the Australian and Singaporean Governments' Bilateral Agreement
- form collaborations in specific areas with specific research and commercialisation groups.

Overall, the Singaporeans were very impressed with the expertise and experience of the TRI delegation, in particular the partnerships between the academic and clinician translators. This visit, coupled with subsequent meetings at TRI with delegations from Singapore has resulted in:

- an application for the A*Star and NRMRC joint funding initiative, released in early 2017, in molecular mechanisms of metabolic diseases
- a Memorandum of Understanding (MOU) with four of A*Star's Biomedical Sciences Institutes
- Singapore's participation in the Asia-Pacific Microbiome Project
- negotiations to develop collaborative project with A*Star in skin research
- negotiations to develop a collaborative project with SingHealth Duke-NUS in breast cancer
- Singapore's interest in utilising TRI's expertise in clinical trials and imaging
- TRI's interest in utilising Singapore's expertise in commercialisation.

See **Appendix 2 Delegation Program and TRI and Singaporean participants**

Immunotherapy

Professor Ian Frazer's international research collaborations include:

- Cancer with Prof Paul Lambert, Director Cancer Research University of Wisconsin Madison
- HPV vaccines – MOH Vanuatu
- Merck SAB
- China (Wenzhou, Chengdu)

He has past international collaborations with SAB for Gates Foundation, WHO and IARC.

Genomics – China

Advances in genome sequencing technology in research laboratories have enabled the ability to identify the mutations which cause individual cancers, and which affect response to treatment like chemotherapy. This leads to better outcomes for patients, with treatment tailored to the actual cause of their cancer, rather than simply being determined by the organ in which the tumour arose.



TRI/QUT's Professor Matt Brown is Chief Scientist of a new Centre for Precision Medicine at First Affiliated Hospital, Wenzhou Medical University. It was the alma mater of Professor Zhou Jian, co-inventor of the Gardasil HPV vaccine. The Centre for Precision Medicine is a collaboration between Wenzhou Medical University and QUT, which is home to an international leading medical genomics and personalised medicine centre, the Australian Translational Genomics Centre itself an affiliated laboratory of TRI. The Wenzhou Centre for Precision Medicine will for the first time bring modern genomics to the clinic for Wenzhou's cancer patients.

Imaging

Professor Mountford's international research collaborations include:

- Draper Laboratory, Boston
- MGH/HST Martinos Center for Biomedical Imaging, Boston
- Brigham and Women's Hospital Boston
- Hospital Clínic de Barcelona , Barcelona
- University of Manitoba, Winnipeg
- Siemens Healthcare
- Agilent Technologies

Interface

1. Clinical interface

When TRI CEO and Director of Research, Professor Carolyn Mountford was appointed in February 2015, one of her first tasks was to more effectively connect clinicians and scientists, thus creating an environment for innovation, translation and commercialisation.

Dr David Theile, a senior surgeon and past CEO of Metro South Health, became Chair of the Clinical Research Facilities. He has led a concerted effort to get TRI clinical trial facilities operational and to build expertise in the design and management of clinical trials.

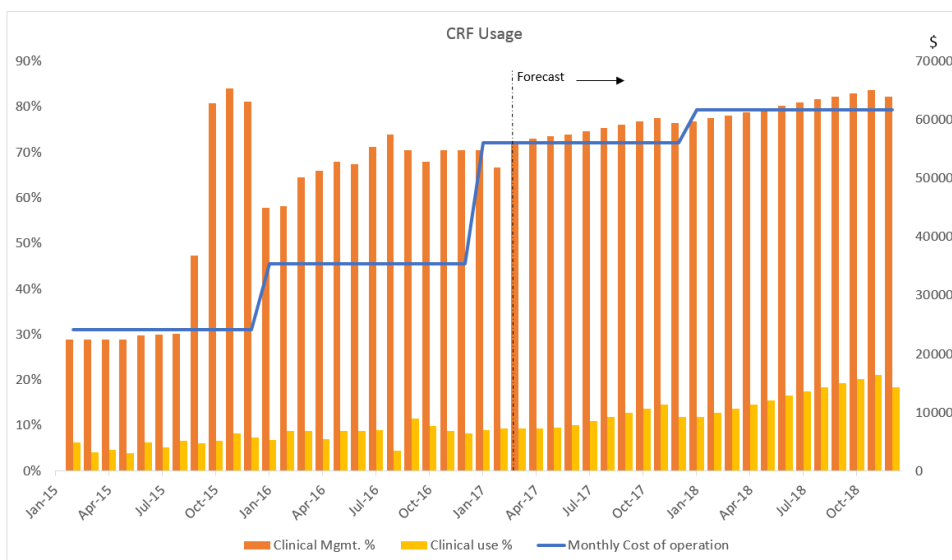
The TRI Clinical Research Facility (CRF)

In January 2015, the TRI Clinical Research Facility (CRF) opened. It is the culmination of a significant collaborative effort from the Princess Alexandra Hospital, Metro South Health, TRI and its partners including The University of Queensland, the Queensland University of Technology and Mater Research.

Among the first human studies undertaken during a three-month pilot phase, were trials on the treatment of obesity and of asthma. The CRF has now expanded its scope of operations and many new trials are underway. Operated by the Princess Alexandra Hospital, the CRF provides a controlled and safe environment to conduct patient research with ready access to hospital facilities and emergency response teams.

The CRF has more than 35 active studies currently underway, with growth projections well on target for achieving this year’s aim of doubling that number. The trials include evaluating treatments for obesity, rheumatoid arthritis, lymphoma, other malignancies, respiratory, liver, skin disorders and diagnosing Post Traumatic Stress Disorder (PTSD). Nurses in the CRF facilitate clinician interactions.

TRI and the PAH are currently working to enhance clinical research capability and improve the development and delivery of clinical trials by providing access to methodological, statistical,



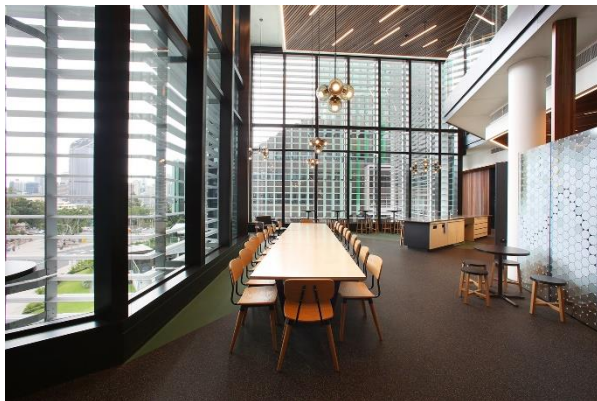
operation and skilled database staff with expertise in all stages of clinical research, design, conduct, co-ordination, trial and data management and statistical analysis.

The TRI Clinical Facility @ Centre for Children’s Health Research (TRIC)

This facility was fully operational in September and officially opened on 18 October 2016. Located on the Lady Cilento Children’s Hospital campus, on the fourth floor of the Centre for Children’s Health Research building, this purpose-built facility is designed to support high-intensity outpatient-based studies in babies, children and adolescents.

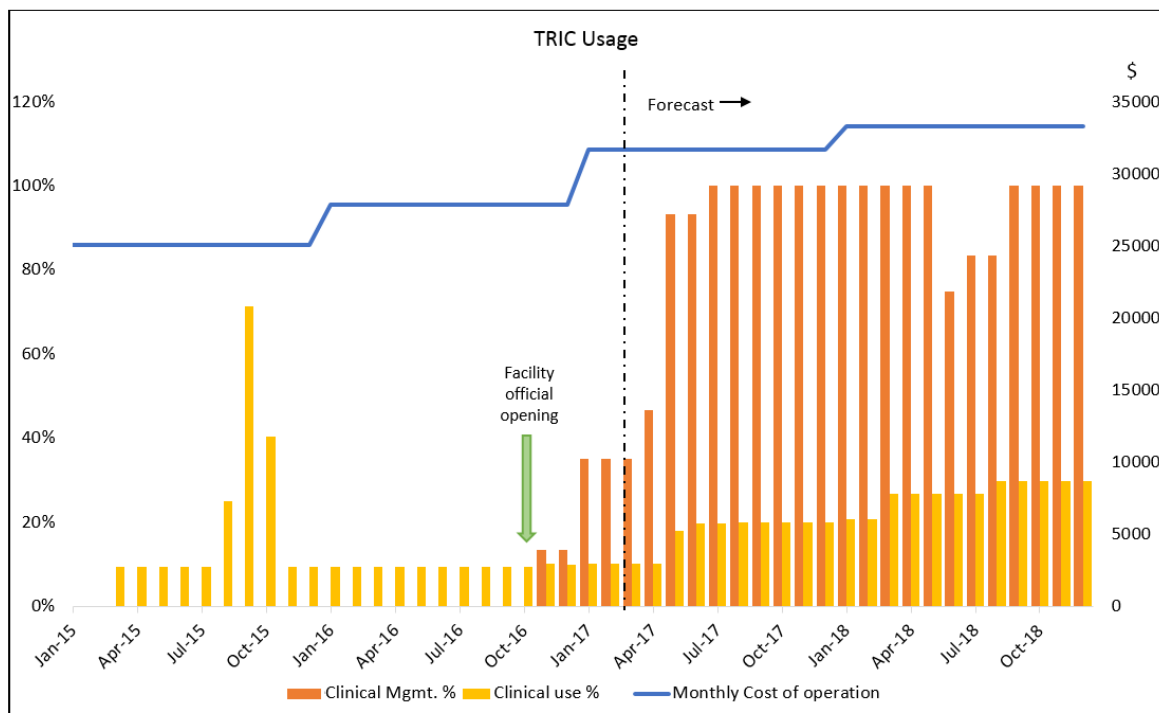
Services offered include assistance with:

- Biological sample collection and processing
- Participant/patient vital sign measures and other tests /observations
- Participant recruitment services for community-based populations

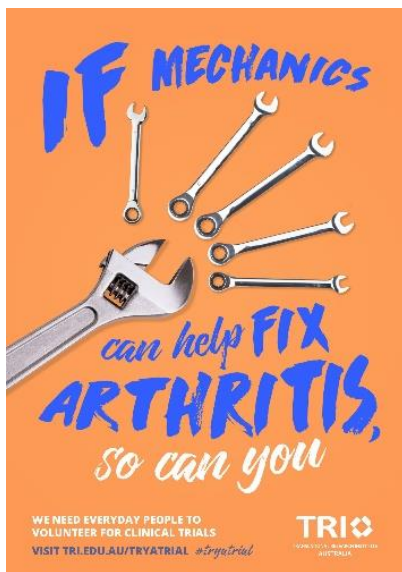


Low risk clinical research studies that can be accommodated in the TRIC include: Epidemiological, Experimental Medicine, Comparator, Observational, Healthy Volunteer, Phase I (requiring short-term observation), Phase II, Phase III and Phase IV.

There are currently trials underway for children’s asthma and acute respiratory infections and the use of probiotics in pregnancy, with another 10 other applications being considered.



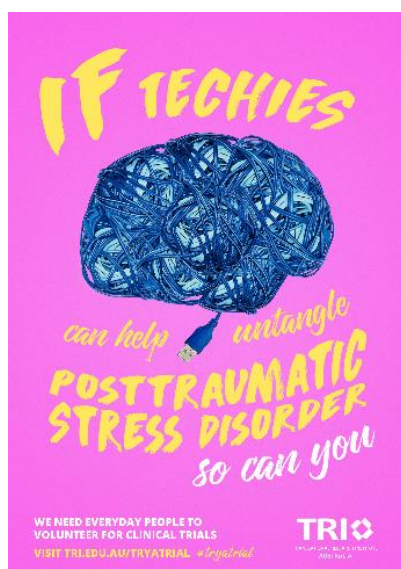
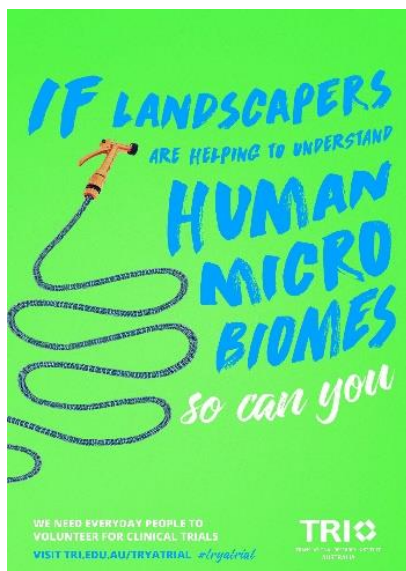
Campaign to recruit healthy cohorts for clinical trials: **TryaTrial Campaign**



Researchers and clinicians wanting to undertake clinical studies and trials report that it is really difficult to get healthy controls to volunteer.

To assist, TRI ran a **TryaTrial Campaign**, beginning in October 2016, to build awareness of the importance of volunteers for clinical trials and improved health; and to counter the current view that only sick people took part in trials. There was a two-week campaign on two radio stations and with posters at 65 bus stop shelters. It recruited around 100 volunteers.

This campaign was continued through TRI Social Media channels. To date, **over 150 people** have expressed interest in participating in a trial, with some already linked with specific trials. These volunteers receive a regular newsletter and have been invited to an afternoon tea and tour of TRI where they could see first-hand the research that they are helping translate into improved healthcare.



2. Commercial interface

As per the stated objective in the TRI Constitution: “to exploit commercially a facility, resource or intellectual property of the TRI, for the benefit of the TRI”, it is envisaged that any commercialisation arrangements will not only benefit TRI, but will benefit TRI shareholders financially and through increased interface with long-term industry collaborators.

TRI combines the people with the technologies for improved utilisation and value-for-money. It enables high quality platform capabilities through share technologies and expertise. TRI now manages Core Facilities in preclinical imaging, flow cytometry, microscopy, histology and proteomics. The improved utilisation of these technologies is evidenced by the increase in income. TRI also has access to the clinical imaging capabilities at the PA Hospital.

TRI collaborates with commercial enterprises, in house and external, as well as governments to be a world-test site for emerging technologies. These innovative technologies can be made available by spinoff companies, international commercial companies or by licencing the technology. By which ever means, the improvement in healthcare is usually alpha evaluated via an academic health centre. In TRI's case it is the PAH, Mater or Children's Hospital for initial evaluation. Beta test sites are chosen from around the world according to the choice of commercialisation pathway.

Start Ups

TRI licenses space to start-up companies, which includes wet labs and office space. In 2016, the annual revenue of \$410,000 generated by commercial occupants decreased shareholder contributions. These occupants are involved in commercialising medical innovations and all agreed to offer training and specialist services to TRI shareholder staff.

Company	Collaboration	Work	License Term	Revenue (ex GST)
Vaxxas	Provided grant, will provide TRI staff training in GMP / QA	Vaccine delivery methods	1 year (July 2017 exp)	\$267,209 + \$35,000 v4
Admedus	Prof Ian Fraser / Gardasil	Vaccines and immunotherapies	1 year (Jan 2018 exp)	\$79,880.37
Translational Cell Imaging Queensland (TCIQ)	QUT, engaging with both academic and industry partners	High content imaging and analysis	TBD - 1 year	Quote to still be supplied (\$14,700)
Queensland Kidney Trial Network (QKTN)	UQ Faculty of Medicine and PAH Kidney Trial network	Storage of multi-center clinical trial material	TBD – 1 year	Quoted @ \$12,375
TOTAL REVENUE PER YEAR SUBSIDISING SHAREHOLDER CONTRIBUTIONS				\$409,146

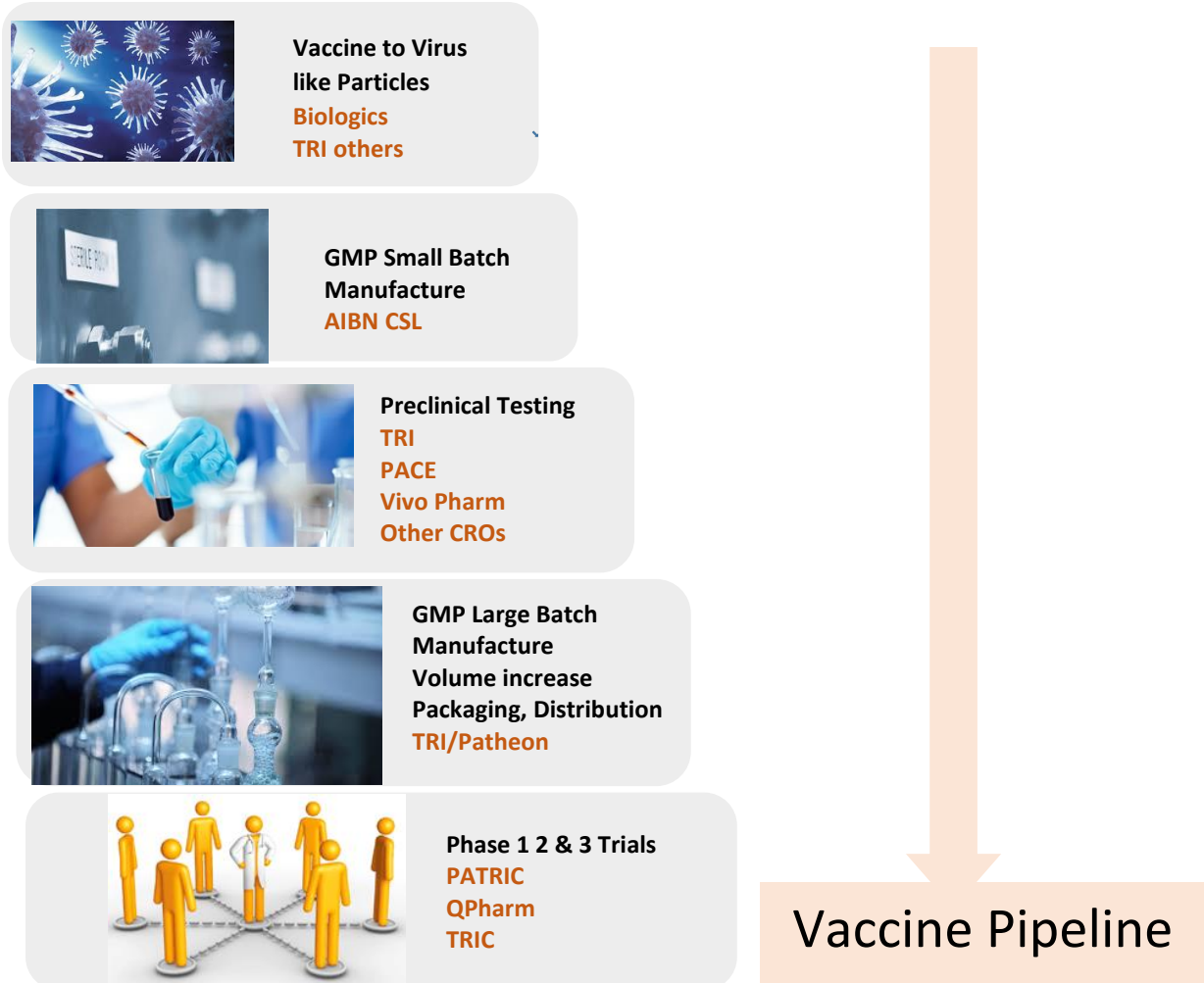


TRI leases one of its buildings to Patheon, the world’s leading provider of contract drug development and manufacturing services. This Brisbane facility is planned to grow revenue year-on-year by increasing the number of batches of pharmaceuticals manufactured within the facility. Two batches were manufactured in 2013, nine batches in 2014 and 15 batches in 2015. In 2016, 18 batches are planned. The facility became profitable by October 2015.

The progress of Patheon’s Brisbane facility from 2013 to 2015 represents a sustained and significant top line growth in the Brisbane business.

The biopharmaceutical capability, in TRI space and equipped with Patheon equipment, is the only non stainless steel capability in Australia. A second is planned for Monash. This has led to a project underdevelopment with CSIRO and the Australian Department of Defence to establish a ‘Vaccine pipeline’. This will add the capability of increasing the volume, packaging and distributing to the current capacity of manufacturing vaccines. The project is part of the national pipeline to protect Australians during an epidemic.

The upgrade of the TRI based facility would provide Brisbane with the full capability to either develop a vaccine, or take one from overseas.



TRI Innovation and Translation Centre in collaboration with Siemens Healthcare



March 2016 saw the official opening of the TRI Innovation and Translation Centre (IAT Centre) in collaboration with Siemens Healthcare by the Queensland Premier, Hon Anastacia Palaszczuk MP. The IAT Centre operates along the same lines as the highly productive Martinos Biomedical Imaging Centre linking Harvard Medical School, MIT and the Massachusetts General Hospital.



It represents the vision outlined in both the Federal Government's National Innovation and Science Agenda and the **Queensland State Government's Advance Queensland initiative**, which has already provided significant funding. The Centre is to be a pipeline for imaging technology including hardware, protocols and artificial intelligence. It also opens the door for hospitals like the PA to take a role in the development of a

future interface where hospital hardware with eHealth through artificial intelligence.

Siemens also has a non-imaging diagnostic business with a centre in Australia. Thus the IAT Centre is an opportunity for Queensland and Australia to use it as a pipeline for innovation.

Brisbane Research Imaging Consortium (BRIC)

BRIC emerged from the IMAGINE 2016 conference, where Brisbane imaging met as one. This initiative is now being led by an independent Academic Health Centre Executive from the Royal Brisbane and Women's Hospital. It's another example of TRI leadership State-wide and nationally.

Post Graduate Radiographers

As part of the IAT Centre, TRI has partnered with QUT in a program to train a new generation of researchers, with four PhD scholarships for Australian accredited radiographers. This addresses an international shortage of research-ready imaging technologists, who can become future research leaders, something that is essential for cutting-edge research, but also critical for teaching of future radiographers in advanced imaging technologies. The initial scholarships are in the following fields: brain development and injury, familial breast cancer and gene mutations, understanding pain and the gut-brain axis, chronic heart disease and cardiac tissue characterisation.

International Diagnostic Imaging Advisory Board

This Board was founded at the same time as the IAT Centre with Siemens Healthcare. The membership is Professor Graeme Jackson (Chair), Brain Research Institute; Professor Herb Kressel, Editor, Radiology and Harvard Medical School; Professor Markus Schwaiger, CEO, TUM School of Medicine, Munich; Professor Bruce Rosen, Director, Athinoula A. Martinos Centre for Biomedical Imaging; Dr Richard Slaughter and Professor Carolyn Mountford; with Ex Officio members Dr Kirby Vosburgh, A/Prof Radiography, Harvard; Dr Renate Jerecic, Siemens Healthcare; Professor Tayyaba Hasan, Harvard; Dr Susanne Jeavons, PAH and Professor Graham Galloway, TRI.

3. National and international interface

If TRI was just a beautiful building housing academic staff undertaking medical research, it would attract some interest. There are other beautiful research buildings. The Ecosciences Precinct, which can be viewed from TRI is one. However, none of these buildings host the number of tours and events that TRI does. **It is the vision – translational research – that draws people to the institute.**

International delegations

TRI hosts numerous tours for international delegations of scientists, politicians and media. This has been the case since 2013 when, the Statement of Intent (SOI) to have a jointly funded collaborative research program with the Chinese Academy of Sciences (CAS) was officially renewed at TRI.

In 2014 a VIP delegation from China visited TRI to celebrate 25 Anniversary of Sister City/State. The tour included the highest ranking member of the Communist party to ever visit Australia.

In June 2014, there were three G20 media delegations at TRI for 33 international media with an article on TRI in the People's Daily and other international press. The Team Brisbane commercial featured Professor Ian Frazer, TRI staff and facilities appeared. Two international magazines 'Monocle' and 'Metropolis' did features on TRI as part of the G20.

In 2015, TRI hosted an international media delegation with DFAT for 10 journalists who toured TRI and the CRF and interviewed researchers. TRI featured in the DFAT promotion of the four day, Australia-wide tour.

In 2016, TRI hosted a visit by Minister Ingrid Fischbach, Parliamentary State Secretary to the German Federal Minister of Health and her staff, who were extremely interested in how a research organisation works with a digital hospital to improve health outcomes.

Political visits

The Prime Minister, Kevin Rudd, his wife Theresa and the Federal Minister for Health and Medical Research, Tanya Plibersek, visited TRI on 20 August 2013.

The Premier of Queensland, Campbell Newman visited TRI on Thursday 16 May 2013 to award Professor Matthew Brown the \$1.25 million 2013 Premier's Science Fellowship to develop his work identifying genes that underlie the causes of rheumatoid arthritis and tuberculosis.

The Prime Minister, Tony Abbott, and the Minister for Health, Peter Dutton, visited on 19 May 2014, for a tour of TRI and to host a round-table discussion on Medical Research Future Fund and do the media conference to launch the fund. The Federal Minister for Health, Susan Ley, also visited TRI to announce the Advisory Board for the Medical Research Future Fund.

The Queensland Minister for Health, Cameron Dick, visited TRI in August 2015, for a tour of TRI and to officially open the TRI Clinical Research Facility.

The Premier of Queensland, Anastacia Palaszczuk, and the Minister for Science and Innovation, Leeanne Enoch, visited TRI in March 2016 to officially open the Innovation and Translation Centre in collaboration with Siemen's Healthcare.

Relationships with key stakeholders

TRI also uses events as a way to build relationships with key stakeholders such as donors, investors, funding bodies and government; and to showcase Australia's medical research and translational capabilities to international delegations and scientists. These events include:

- a. Defined regular forums and seminar series
- b. Regular open-invitation multi-disciplinary scientific meetings and conferences
- c. Specific meetings with international dimensions including Imagine2016 and 2017, Brisbane Diamantina Health Forums, Brisbane Cancer Conference
- d. Combined shareholder symposiums and professional development events organised by the TRI Personal Development and Talent Management Committee; the TRI Student Society and the TRI Early Career Researcher (ECR) Committee.

If available, TRI hires out the spaces to organisations and associations in the health and education sector to earn revenue. In 2016, there were 532 events held at TRI, which is close to full capacity.



The Roadmap

1. TRI Translational Pathway

The TRI translational pathway is both a communication and resource tool, used to explain, standardise and simplify a complex process across a wide variety of scientific and clinical research.

TRI AUSTRALIA - TRANSLATIONAL RESEARCH PATHWAY



- T1 Innovation - driven by clinical questions
- T2 Clinical study – translation to humans with small clinical studies
- T3 Clinical Trial - expanded trials with patients at a number of locations
- T4 Clinical Practice – innovation adopted into clinical practice
- T5 International Adoption and Assessment – proven health benefit worldwide.

Interfacing TRI output with potential collaborators, investors, the public and stakeholders

There are currently four T1 projects; three T2 projects; five T3 projects; one T4 project and one T5 project on the [TRI website](https://www.tri.edu.au) from which members can learn. These projects specify what is needed to progress on the translational pathway and are a call to action for investors, donors or media.

A list of the translational projects and descriptions can be found at <https://www.tri.edu.au/projects>

These projects are promoted at events like the World Science Festival, where the TRI's street science marquee aims to explain the TRI Translational Pathway.

An [In America documentary](https://www.tri.edu.au/about), which can be viewed at <https://www.tri.edu.au/about>, featured the translational pathway and projects. This documentary was shown on 190 regional US television stations and on primetime Fox Business Network on 16 and 17 June 2016. This documentary generated interest here and overseas providing a lens into science and clinical research in Queensland and Australia.

TRI is currently working with Brisbane Marketing and the Queensland Government on international campaigns to position Brisbane as a hub for innovation and translation in order to attract science conferences, innovators, investment and collaborations.

'Research investments pay off for Australian City' ([Nature Index](#) 25 Oct 2016).

"Brisbane is becoming an epicenter for high-quality science with research infrastructure, such as TRI, being a big drawcard for international scientists".

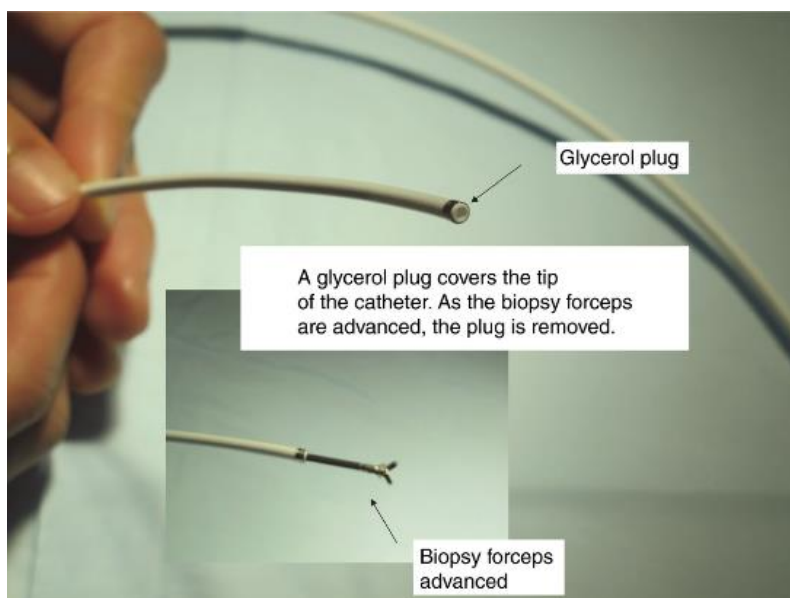
2. TRI Flagship Programs

In 2015, the incoming TRI CEO, Professor Carolyn Mountford agreed to lead by example, and with Board approval established a **Diagnostic Imaging** Program as the next of the 'Flagship' translational program. This with the Flagship Program **Immunotherapy**, led by translators such as Professor Ian Frazer and Professor Ranjeny Thomas provided examples of two different means of making new technology available worldwide. The Diagnostic Imaging program by collaborating with a longstanding commercial partner and the Immunotherapy by the "start-up" approach.

TRI currently has 14 translational projects (<https://www.tri.edu.au/projects>) in various stages of development. Some are well-established and undertaking clinical studies, while others are in the planning phase and awaiting ethics approval. Each addresses a clinical question with a potentially marketable solution. **All new TRI driven programs work with the shareholder chosen tech transfer company to drive the industry and commercialisation aspects.**

A major vision is for TRI to provide the environment for multi-disciplinary and multi-institutional programs in line with Federal and State governments' funding. In 2016, the TRI Caucus was asked, in a Board driven initiative, to agree on the next TRI Flagship. Following presentations and meetings, they agreed to support a **Microbiome** program.

This program, led by PAH gastroenterologist, Professor Gerald Holtmann, is being developed as an **Australasian-Pacific Human Microbiome Project**. It is to be run in parallel with the EU and USA programs seeking to establish region by region how the microbiome differs and where and how it relates to disease. This proposal identified short-term, medium-term and long-term objectives which ranged from establishing the microbe biobank to developing dietary and probiotic interventions. There are a number of interested **partners including Singapore's A*Star and CSIRO.**



One of the unique features of the project is the use of the patented 'Brisbane Aseptic Biopsy Forceps' which allows the collection of mucosal samples and culture, even anaerobic microbes.

This will enable better characterisation of the mucosa associated microbiome and identification of microbes that have potential therapeutic properties.

3. Mentoring, education and training

The TRI Caucus is now clearly enunciating that they need assistance in a range of aspects of the T1-T5 translational pathway. Interestingly they all fit within the Stanford SPARK initiative that TRI hopes to commence in 2017. These are:

- Help to advance promising early stage research discoveries along the translation pathway towards the clinic and market
- Help for academics and researchers to overcome the obstacles involved in moving their early discoveries from bench to bedside
- Facilitate education, training and mentorship to researchers, clinicians, post-doctoral fellows, students and staff on the discovery and development process for therapeutics, medical devices and diagnostics
- Enable translation of innovation in an efficient and cost-effective approach
- Provide or leverage increased access to proof of concept funding for value adding research outcomes to achieve an industry ready or acceptable Target Product Profile.

The Caucus has specifically requested support in the areas of clinical trials, FDA and TGA experience, and interface between clinicians and scientists (in both directions).

TRI Personal Development and Talent Management Committee is charged with achieving some of the areas of assistance through:

- Tuesday seminars featuring national and international ‘translators’, commercial investors, business and health system analysts, and health economists
- TRI Mentoring Program where staff can engage with researchers and clinicians, who have achieved ‘bench to bedside’ or are well on the pathway to achieving translation.
- Special Seminars featuring international translators that are open to the general public



Business Development & Education

A **building-wide survey** of TRI shareholder staff in 2016 identified key areas for professional development and education that would promote a culture more focused on translational research. These included how to initiate pro-active industry connections; mentoring and assistance in putting together business cases and emphasising the economic impact and importance of the research; introductions to clinical trial management including ethics and regulatory; and finding funding to traverse the 'Valley of Death' stages.

This body of work is overseen by the **TRI Strategy and Commercialisation Committee (SCC)** which includes TRI members as well as members of the business community that invest in innovation.

This committee, supported by the TRI Business Development and Commercialisation Manager, is working on an education symposia, through lectures and workshops, on the identified topics. It includes the opportunity to deliver a SPARK education program that will enable TRI to leverage the globally successful SPARK Stanford program and its resources to enhance translation.

The **TRI Strategy and Commercialisation Committee** organises workshops and mentoring designed to assist with the T1-T5 pathway.



International translators, such as Dr Kirby Vosburgh who is the Director, Clinical Image Guidance Laboratory, Brigham and Women's Hospital, and the Assistant Professor of Radiography, Harvard Medical School, run the workshops.

Dr Vosburgh has been active for more than fifteen years in applying image guidance techniques to medicine, including managing R&D Laboratories for General Electric, where he led teams that developed products including advanced MRI and ultrasound imagers and integrated circuits.

TRI organises business development activities that include promoting TRI core facilities and clinical research facilities to external stakeholders and industry. This will provide an alternative platform to increase industry/commercial engagement opportunities.

TRI is also assisting researchers and clinicians to access alternative revenue streams, such as moving from grants to contracts through Market Led Proposal (MLP) to both the Federal and State governments.

Appendix 1 How it all started in 2008

Professor Ian Frazer and Professor Derek Hart approached the Federal Government separately for funding to build a biomedical research institute in Brisbane. The Government told them to put in a joint application.

TRI's partners also successfully applied to The Atlantic Philanthropies in 2008 for funding to develop the Translational Research Institute on the Princess Alexandra Hospital campus. The proposal stated that: 'TRI offers a unique opportunity for Queensland to embed within the setting of its second largest hospital an intensive, high-quality research environment that will focus on the translation of research outcomes to clinical trials and practice, and on training of research personnel for Queensland and the South-East Asian region.'

In 2013 Australia got its first Translational Research Institute. The beautiful purpose-built facility in the grounds of the Princess Alexandra Hospital, a major research and teaching hospital, is home to 800 scientists and clinicians combining the research intellect and capability of the Queensland Government, the University of Queensland, Mater Research and the Queensland University of Technology.

The Road to Achieving the vision

Initially there was a **2008 TRI Business Case**, which was adopted as the first business plan for TRI at the time the Shareholders' Agreement was signed. This was basically the Plan for the construction phase with a new Strategic and Business Plan to be developed in 2013 for the operational phase.

In August 2013, the TRI Board approved the TRI Business Plan (2013 – 2015). The CEO was charged with:

- the integration of the partners to form an effective research unit for translational research
- the establishment and enhancement of TRI as an internationally recognised translational research institute.

At the conclusion of Professor Frazer's term as TRI CEO at the end of 2014, ***the Board agreed that the integration of the shareholder institutes into the TRI had progressed substantially and that the CEO had facilitated cross-collaboration for grants.*** This was demonstrated by the large number of successful NHMRC grants involving more than one shareholder institute.

It was also ***agreed that TRI had achieved substantial international recognition***, which was demonstrated by invitations to international conferences, publications in international journals and the delegations of people who visited TRI during the year.

In September 2013, the TRI Board approved the first Strategic Plan.

Board Approved 2013 -2015 Strategic Plan (Professor Ian Frazer)

TRI VISION

By 2020, TRI will be recognized globally as a leader in translational health and medical research, adding to the capabilities and enhancing the reputation of the partner organisations.

TRI GOALS

TRI will be recognized globally by:

- Achievement of improved health outcomes through excellent and innovative translational research
- Delivery of a distinctive educational outcome through training future leaders in translational research
- Building of collaborative research partnerships that leverage the strengths of the partner organisations
- Maximization of productivity in research and business operations
- Optimization of external partnerships to facilitate community engagement

Goal 1 – Achievement of improved health outcomes through excellent and innovative translational research

Strategies

- 1) Focus research support on programs demonstrating strength and innovation in translational research, building on existing strengths of partner organisations.
- 2) Facilitate future development of translational research programs responsive to local and emerging needs and opportunities
- 3) Support the effort of partner organisations to attract, up skill, and retain high quality staff focused on translational research, in alignment with the agreed research programs and with the TRI mission and goals
- 4) Build on the research strengths of the shareholder organisations

9 KPIs	6 Achieved	2 In progress	1 Not Achieved
--------	------------	---------------	----------------

Goal 2 – Delivery of a distinctive educational outcome through training future leaders in translational research

Strategies

- 1) Develop a distinctive translational research training program
- 2) Facilitate intellectual debate and discussion with the focus on translational research through inter-institute seminar programs across a wide range of research disciplines
- 3) Establish an inter-institute exchange program focused on translational research
- 4) Develop a formal postgraduate program in translational research leading to a qualification

conjoint between shareholder organizations

11 KPIs	6 Achieved	1 In progress	4 Not Achieved
---------	------------	---------------	----------------

Goal 3 – Building of collaborative research partnerships that leverage and add value to the strengths of the partner organisations

Strategies

- 1) Encourage and facilitate research collaboration between TRI partners, and between TRI partners and external academic educational and industrial organisations
- 2) Build links with research units of the shareholder institutions
- 3) Develop a social identity linking academic and administrative staff employed by TRI and by TRI partners
- 4) Promote shareholder satisfaction with TRI operations
- 5) Maintain a strong relationship with TRI-affiliated hospitals and with Metro South Health

12 KPIs	9 Achieved	0 In progress	3 Not Achieved
---------	------------	---------------	----------------

Goal 4. Maximization of productivity in research and business operations

Strategies

- 1) Ensure equitable access for TRI researchers to productive and state of the art research facilities appropriate to the agreed research programs.
- 2) Ensure equitable access for TRI partner researchers to a complete translational research pipeline, either through internal facilities or external collaborations
- 3) Optimize the effectiveness of TRI operations through appropriate leveraging of partners’ business and commercialisation capacity.
- 4) Ensure corporate compliance is industry best practice in all aspects at a level appropriate for the organisation
- 5) Maximize income to TRI from marketable assets including the café, car parking, and commercial space
- 6) Gain international recognition of the “TRI Model” of governance and management as one which enhances the reputation of the shareholders

12 KPIs	9 Achieved	2 In progress	1 Not Achieved
---------	------------	---------------	----------------

Goal 5. Optimization of external partnerships to ensure success and build community engagement and recognition

Strategies

- 1) Establish research staff at TRI as thought leaders in translational research through media and public outreach
- 2) Develop a significant public profile for TRI

- 3) Promote research at TRI with funding agencies, philanthropy and businesses as a worthy recipient of funding
- 4) Maintain and enhance the existing UQDI-TRI SPARQ-Ed program for training of primary and secondary school children in biomedical research
- 5) Participate in networks of biomedical research facilities, particularly in south-east Queensland
- 6) Build appropriate links with government, industry, and health service providers

15 KPIs	10 Achieved	2 In progress	3 Not Achieved
---------	-------------	---------------	----------------

Of the total 59 KPIs, **40 were achieved; seven are still in progress; and 12 were not able to be achieved** either because TRI could not access the data or because it was outside of the control of TRI.

**Board Approved 2015-2017 Strategic Plan
(Professor Carolyn Mountford)**

TRI VISION

TRI will be recognized as a global leader in translational health research and commercialization resulting in improved health and workforce readiness.

TRI GOALS

- Improve healthcare outcomes resulting from early innovative translational research
- Increase interaction between TRI and the health sector to build joint programs that leverage the clinicians' expertise and the researchers' innovation; and translate into real outcomes covering the five steps in the translational pathway
- Address questions of clinical importance, with government and industry involvement, to improve health outcomes and commercial income for Australia
- Train future leaders in translational research, in particular how to interface with industry and think globally; and in doing so expand Australia's medical technology and healthcare export industry
- Be recognised globally as a leader in translational research
- Provide a gateway for technology and medical advances into Australia and South East Asia, through TRI's relationship and co-location with industry partners

Goal 1– Improve health outcomes resulting from early innovative translational research

Strategies

- 1) Help develop translational research programs in response to emerging needs and opportunities
- 2) Maintain an academic environment that can interface with industry and government
- 3) Undertake health economic outcomes evaluation to generate commercial and government interest and support
- 4) Empower the members of TRI to contribute according to their interest and strengths

Goal 2 – Increase interaction between TRI and the health sector to build joint programs that leverage the clinicians’ expertise and the researchers’ innovation; and translate into real outcomes covering the five steps in the translational pathway

Strategies

- 1) Improve communication with the hospital-based clinicians
- 2) Take a problem-based approach to medical research
- 3) Build experienced, multi-disciplinary teams to address new problems as they arise
- 4) Use the strategies listed in Goal 1 to drive outcomes
- 5) Work to make the clinicians feel integral to the program and outcomes.

Goal 3 – Address questions of clinical importance, with government and industry involvement, to improve health outcomes and commercial income for Australia

Strategies

- 1) Choose the question(s) to be addressed carefully
- 2) Evaluate the human infrastructure needed
- 3) Decide on the team leaders and document the plan and milestones
- 4) Get early buy in from industry partner(s) and governments
- 5) Obtain or access the infrastructure needed to address the question
- 6) Put in place legal agreements relating to IP issues, milestones and deliverables
- 7) Undertake health economic evaluations.

Goal 4 – Train future leaders in translational research, in particular how to interface with industry and think globally; and in doing so expand Australia’s medical technology and healthcare export industry

Strategies

- 1) Develop a translational research and business capability training program
- 2) Develop modules of programs and demonstrate feasibility
- 3) Involve industry leaders and venture capital leaders
- 4) Engage with industry partners to create internships
- 5) Motivate and educate based on a global perspective.

Goal 5 – Be recognised globally as a leader in translational research

Strategies

- 1) Establish basic and clinical researchers at TRI as thought leaders in translational research through academic channels, timely media and public outreach
- 2) Develop a significant international and national public profile for TRI
- 3) Promote research, development and translation at TRI with funding agencies, philanthropy and businesses as a worthy beneficiary of funding
- 4) Maintain and enhance the SPARQ-Ed program for training of primary and secondary school children in biomedical research
- 5) Investigate opportunities to provide programs for the Year 4 to 6 primary school children.















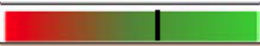






Goal 6 – Provide a gateway for technology and medical advances into Australia and South East Asia, through TRI’s relationship and co-location with industry partners

Strategies

- 1) Put in place the capability to consider the commercial, scientific, legal and financial implications of industry partners
- 2) Evaluate approaches made by industry to TRI, determine if a synergy exists, and if so, enter into a MOU.
- 3) Collaborate with industry and international partners to provide appropriate expertise across key translational disciplines
- 4) Where there are important synergies between the innovation, commercialisation and roll out of new technologies, consider approaches by industry to co-locate with TRI to benefit both parties.
- 5) Work with industry to translate outcomes of TRI research to impact on health outcomes.

Evaluation of the TRI Progress is made by the Chairs' Committee

IMPLEMENTATION PLAN: NEW TRI ACTIVITIES & PROGRESS

		Average Score
Goal 1 – Improve health outcomes resulting from early translational research		
a. Develop translational programs in response to emerging needs & opportunities		7.0
b. Empower TRI members to contribute to new programs according to their interests and strengths		7.6
c. Undertake health economic outcome evaluation to garner commercial and government investment		4.8
d. Maintain academic & commercial environment, interface with industry, patient advocacy & Government		7.4
Goal 2 – Increase interaction between TRI & health, build joint programs to leverage clinicians' expertise and researchers' innovation; and translate into real outcomes		
a. Improve communication with the hospital clinicians & health care workers		7.9
b. Take a problem-based approach to medical research and build multidisciplinary teams		8.1
c. Work to make the clinicians feel integral to the program and outcomes		7.6
Goal 3 – Address questions of clinical importance, with government and industry involvement, to improve health outcomes and commercial income for Australia		
a. Choice of clinical questions to be addressed carefully		7.4
b. Evaluate the human infrastructure needed, designate team leaders and document the plan and milestones		7.3
c. Get early buy-in from industry partner(s) and governments and put in place legal agreements		7.3
d. Undertake health economic evaluations		4.8
Goal 4 - Train future leaders in translational research, interface with industry, think globally; expand Australia's medical technology and healthcare export industry		
a. Develop translational research and business capability training program		5.1
b. Involve industry, government, venture capital and Innovation champions		7.3
c. Engage industry partners and create internships		6.8
d. Motivate & educate based on a global perspective		6.8
Goal 5 – Be recognized globally as a leader in translational research		
a. TRI established as thought leaders through government, industry, academia		7.5
b. Develop a significant international and national public profile for TRI		6.0
c. Promote translational outcomes with industry, funding agencies, philanthropy		7.3
Goal 6 – Provide gateway for technology & medical advances into Australia and SEA		
a. Develop capability for commercial, scientific, legal & financial structure for industry & flagships		7.0
b. Develop partnership strategies between industry & TRI, MOU		7.8
c. Work with industry to translate outcomes of TRI innovation to impact health outcomes		6.3
green	On or better than target	
Red	Below target and of concern	

Appendix 2 Delegation Program and TRI and Singaporean participants

Monday 10 October 2016

Presenter	Topic	Participants
A/Prof Tay Say Beng, Group Director and Ms Enny Kieswrer, COO, Research	Welcome and overview of SingHealth DUKE NUS vision, research and outcomes	Full list of SingHealth DUKE NUS participants at end
Prof Carolyn Mountford Dr David Theile Prof Gerald Holtmann Prof Graham Galloway	TRI Overview TRI/PA hospital collaborations: Clinical trials Microbiome Imaging	
Sebastian Jose David and Keddal Thulasiraman Ramya	SingHealth Experimental Medicine Centre (SEMC)	TRI Delegation and Professor Zee Upton, A*Star
Dr Sidney Yee	A*START Commercialisation Program for Start-ups	
Dr Thomas Li	A*Star Commercialisation Manager	

Tuesday 11 October 2016

Presenter	Topic	Participants
Prof Choon Peng Ng, Senior Director BRC	Corporate overview of A*Star and Biomedical Research Council (Govt)	TRI Delegation Prof Carolyn Mountford; Prof Gerald Holtmann; Dr David Theile; Prof Graham Galloway; A/Prof Kiarash Khosrotehraini Prof Matt Brown Prof David Johnson Louise Morland A*Star Participants Prof Birgit Lane, ED, IMB Prof Zee Upton, IMB A/Prof David Leavesley, IMB Dr Dario Stupar, IMB Dr Melissa Fernandex, IMB Dr Tom Dawson, IMB Dr Parbha Sampah, IMB Dr Bruno Reversade, IMB Dr Leah Vardy, IMB Dr Lim Yi Shan, IMB Dr Giulia Rancati, IMB Dr John Common, IMB Dr Oliver Dreesen, IMB Anthony Irudayaswamy IMB Prof Kishore Bhakoo, Deputy ED, SBIC Prof Malini Olivo, SBIC
Prof Birgit Lane, IMB ED	Opportunities to collaborate with IMB	
Prof Kishore Bhakoo, Deputy ED, SBIC	Overview of Institute and opportunities to collaborate with SBIC;	
Dr Laurent Renia, ED, SgN	Overview of Institute and opportunities to collaborate with SgN	
Lit Hsin LOO, BII	Overview of Institute and opportunities to collaborate with BII	
Prof Carolyn Mountford TRI CEO	Overview of TRI	
A/Prof Kiarash Khosrotehraini	Skin cancer	
Dr David Theile Prof David Johnson	TRI Clinical Trials capacity	
Prof Matt Brown, TRI	Personalised medicine – genetics	
Prof David Johnson	Diabetes and Nephrology	
Prof Graham Galloway	Imaging and Microscopy	
Prof Gerald Holtmann	Microbiome	

Presenter	Topic	Participants
Prof Birgit Lane/ A/Prof Kiarash Khosrotehraini 1. Dr Tom Dawson/ Prof Gerald Holtmann 2. Prof Kishore Bhakoo/ Prof Graham Galloway	Skin Microbiome Imaging and Microscopy	Dinish U.S., SBIC Gurpreet Singh SBIC Perumal Jayakumar, SBIC Lit Hsin Loo, BII Hao Fan, BII Vachiranee Limvipuvadh BII Dr Florent Gnhoux, SIgN Dr Laurent Renia, SIgN Prof David Becker, NTU Sven Pettersson, NTU Steven Thng, NSC Tey Hong Liang, NSC Roy Chan, NSC Chan Chun Yong, NUS Prof Kwong Ming Fock, CGH

List of SingHealth DUKE NUS Participants

NO.	NAME	DESIGNATION	INSTITUTION
1.	Dr Sng Ban Leong	Director, KK Research Centre, KK Women's & Children's Hospital (KKH), Academic Vice Chair (Research), Anesthesiology and Perioperative	KK Women's & Children's Hospital (KKH)
2.	Dr Tan York Kiat	Consultant, Department of Rheumatology & Immunology	Medicine Academic Clinical Program
3.	Ms Koh Jiayun	Research Coordinator	Medicine Academic Clinical Program
4.	Ms Abigail Wong Wai Lin	Research Coordinator	Medicine Academic Clinical Program
5.	Dr Joanne Ngeow	Senior Consultant, Division of Medical Oncology	National Cancer Centre Singapore (NCCS)
6.	Prof Teh Bin Tean	Deputy Director, National Cancer Centre Singapore (NCCS), Academic Vice Chair (Research), Oncology ACP	National Cancer Centre Singapore (NCCS)
7.	Dr Chao Yinxia	Associate Clinician Scientist, Research	National Neuroscience Institute (NNI)
8.	A/Prof Tchoyoson Lim Choie Cheio	Academic Vice Chair (Research), Radiological Sciences ACP	Radiological Sciences Academic Clinical Program
9.	Dr Tang Phua Hwee	Senior Consultant, Department of Diagnostic & Interventional Imaging	Radiological Sciences Academic Clinical Program
10.	Dr Vikneswaran SO Namasivayam	Senior Consultant, Department of Gastroenterology and Hepatology	Singapore General Hospital (SGH)
11.	Dr Andrea Low	Senior Consultant (Head), Department of Rheumatology & Immunology	Singapore General Hospital (SGH)
12.	Dr Katy Leung Ying Ying	Senior Consultant, Department of Rheumatology & Immunology	Singapore General Hospital (SGH)
13.	A/Prof Louis Tong	Senior Consultant, Corneal and External Eye Disease Department	Singapore National Eye Center (SNEC)
14.	Prof Celia Tan	Group Director, Allied Health, SingHealth	SingHealth, Group Allied Health
15.	Prof Salvatore Albani	Director, SingHealth Translational Immunology and Inflammation Centre	SingHealth, STIC
16.	A/Prof Lai Siang Hui	Director, SingHealth Tissue Repository Director, Advanced Molecular Pathology Laboratory, SingHealth	SingHealth, STR/AMPL



T +61 7 3443 7000 F +61 7 3443 7779 E info@tri.edu.au W www.tri.edu.au
A 37 Kent Street, Woolloongabba Qld 4102, Australia ABN 58 155 991 662

