Riddet Institute
KAI | WHAKAAUAHA | HAUORA

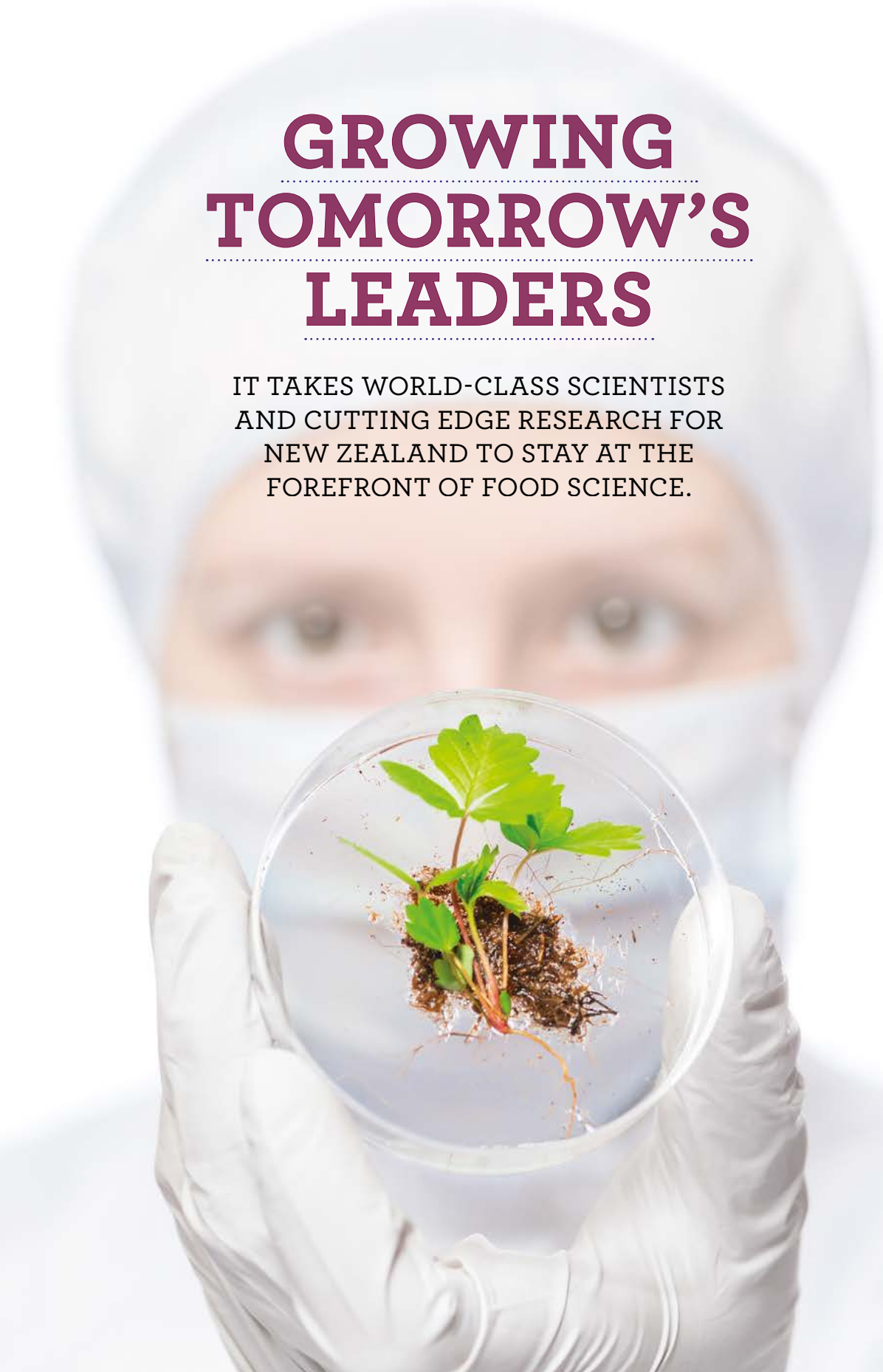
APRIL: **2017**
IMPACT CASE: **04**

FRONTIER

OUR INNOVATIONS FOR A HEALTHIER FUTURE

GROWING TOMORROW'S LEADERS

IT TAKES WORLD-CLASS SCIENTISTS AND CUTTING EDGE RESEARCH FOR NEW ZEALAND TO STAY AT THE FOREFRONT OF FOOD SCIENCE.



SINCE BECOMING A CoRE, THE RIDDET INSTITUTE HAS TRAINED

73
students who have graduated with PhDs

23
students who have attained other postgraduate qualifications

Food is central to New Zealand's economy. Over half of New Zealand's export income derives from food products. Today, more than ever before, our food industry relies on science and technology to ensure premium products, efficient processes and, increasingly, the development of high-value, IP-embedded specialty food ingredients.

At the Riddet Institute, our purpose is to keep New Zealand at the frontier of food science and we play a pivotal role in bringing scientific excellence to the New Zealand food industry. People are at the heart of this endeavour. And developing our people so that they are equipped to become the industry leaders of tomorrow - in New Zealand and around the world - is at the core of what we do.

› Creativity, excellence, scholarship and learning

The Riddet Institute was established as New Zealand's only Centre of Research Excellence (CoRE) in food science in 2008. Since then, we've welcomed scientists from across New Zealand and the globe to provide opportunities and leadership training to inspire them to achieve at the highest levels of their field.

The Riddet Institute students gain the opportunity to work and collaborate with internationally regarded scientists and with commercial businesses both here in New Zealand and overseas. In studying with the Riddet Institute, they get to form a part of the exciting food research, education and industrial collaborative networks that benefit New Zealand's agri-food industry.

Through our intensive research-teaching approach, we've created a dynamic culture that highly values creativity, the pursuit of excellence, scholarship and learning. It's an approach that positions us to attract and train top graduates and prepare them for leadership in some of New Zealand's and the world's most prestigious research institutions and food industries

Today, more than half of the Riddet Institute's graduates have remained in New Zealand, with most now working in research institutions, Universities or the food industry for companies including Fonterra, Synlait, Goodman Fielder. Others who have left to gain experience in overseas most often remain part of the Riddet Institute's collaborative networks, and in this way, continue to extend the depth and breadth of New Zealand's food sector.

› THE BEST OF THE BEST

During the last nine years the Riddet Institute has trained

24

POSTDOCTORAL SCIENTISTS

nine of whom both attained their PhD and completed their postdoctoral research with us.

Currently Riddet is supporting

48

POSTGRADUATE STUDENTS

We aim to extend that number to 65 over the next four years.

› Building people, growing networks

Two programmes introduced in 2017 are enhancing the learning experience for our science and research students, and strengthening and extending our relationships with collaborators and industry:

OVERSEAS PLACEMENTS

available to second or third year PhD students to gain new skills and access new techniques.

INDUSTRY PLACEMENTS

places for five interns each year to spend up to six months working with food companies in New Zealand.

These placements will help sharpen the training focus of the industry's future leaders and, at the same time, will grow our academic and industry networks.

› SNAPSHOTS OF EXCELLENCE

The following bios provide a select sample of the breadth and depth of scientific talent that has been – *and is* – part of the Riddet Institute story.

Dr Lisa Te Morenga

Senior Research Fellow,
University of Otago

"My research has contributed to updates of World Health Organisation recommendations."

Currently an Associate Investigator with the Riddet Institute, Dr Te Morenga completed her PhD at the University of Otago under the supervision of Professor Jim Mann (University of Otago), a Riddet Institute Principal Investigator. Dr Te Morenga is currently researching better methods for assessing sugar intake.

"I have been developing better methods to predict with greater confidence the relationship between sugary food and drink on the increasing rates of non-communicable diseases."

Dr Te Morenga's research into dietary carbohydrates is leading the way for the food industry to create healthier foods. This includes investigating wholegrain foods to see whether the physiology of people - with and without diabetes - is affected by keeping grain structures more intact through different food processing.

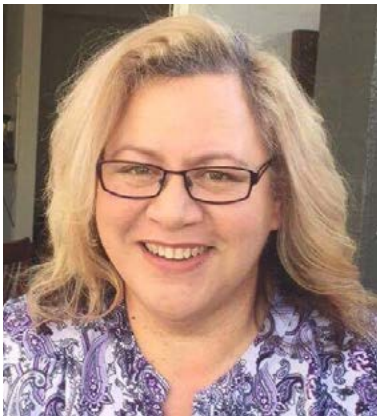
Already, the research has contributed to world health guidelines. It has informed the updated recommendations for carbohydrate intake for adults and children and also recommendations on sugars, saturated fat and carbohydrates.

"Covering both health and food technology, Riddet helped broaden my research and link it with current science."

Dr Mullaney graduated from Massey University with her PhD in 2013, while based at Plant & Food Research. Her research project examined the way glucosinolates convert into bioactive compounds. In late 2013, she took up a Postdoctoral position with the University of Queensland's Diamantina Institute (UQDI) where her work on gut microbiota fitted with UQDI's focus on the link between genes, microbes and the autoimmune disease type I diabetes.

In March 2017, Dr Mullaney moved to AgResearch, where her microbiome-based work will be focussed more towards using food-based approaches for improving gut health. Dr Mullaney plans to collaborate with colleagues from the University of Auckland to explore the development of high value food-based products based on Mātauranga Māori.

"The Riddet Institute helped me broaden my research and link it with current science. It has people from different disciplines working together. Health does not have clear boundaries and we need this overlapping of disciplines. The Riddet Institute sits in the space that covers health and food technology, and its collaborative networks offer tremendous scope for improving our knowledge."



Dr Jane Mullaney

Research Scientist,
AgResearch

Dr Anwesha Sarkar

Lecturer/Assistant Professor,
University of Leeds, UK

"The Riddet Institute helped build my real-world perspective on science, which has shaped me as a scientist and as an educator."

Dr Sarkar, from India, was a Riddet Institute PhD scholar from 2007 to 2010. Supervised by Distinguished Professor Harjinder Singh (Massey University), Dr Sarkar's thesis focused on food emulsions and food colloids. After graduating as a top Massey University PhD student, Dr Sarkar left Riddet to work at the Nestlé Research Centre in Lausanne, Switzerland. It was there that she discovered an interest in working on challenging scientific problems especially those with long-term societal and health implications. In 2014, she moved to the University of Leeds to become a Lecturer in Food Colloids.

"I've gained rich insights from studying at the Riddet Institute and also from working in the industry and now in academia. It's given me a broad background of a unique real-world perspective on science, which has shaped me as a scientist and educator.

Dr Sarkar continues to collaborate with the Riddet Institute.

"Recently, Associate Professor Ye, Professor Singh and I published a paper in Food Hydrocolloids unravelling crucial aspects of the role of bile salts in lipid digestion."

"The Riddet Institute opened the door for me to collaborate internationally"

Originally from Brazil, Dr Thum gained her PhD from Massey University in 2015. Dr Thum did her PhD at AgResearch supervised by Riddet Institute Principal Investigators Profs Warren McNabb and Nicole Roy. She is currently doing a Postdoctoral Fellowship at AgResearch, investigating the health effects of milk oligosaccharides and lipids on early life development.

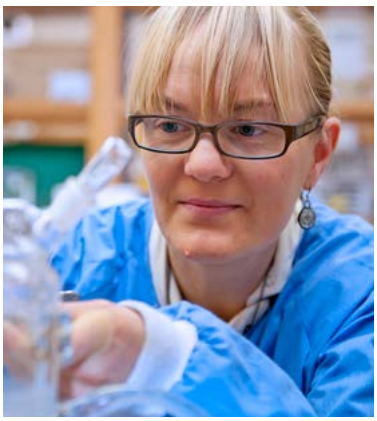
Dr Thum is seeking to understand how these components might be used to enhance milk products so that formula-fed infants gain the same benefits as breast-fed infants. Dr Thum is researching the milk oligosaccharides and specific lipids that could be beneficially added to the diets of breast-fed infants.

In order to be able to harvest milk components on the scale needed for such research, the Riddet Institute and AgResearch have collaborated with the Department of Food Science and Technology at the University of California. Dr Thum is working for a year at the Department alongside world leaders in the field of milk oligosaccharides.

"The Riddet Institute gave me the opportunity to form international networks for collaboration and the chance to attend many international conferences, such as the collaboration with a microbiologist from the University of Tokyo, Japan. In this way, not only has my own career progressed, but I've been able to contribute to the growth of the Riddet Institute's scientific network."

Dr Caroline Thum

Postdoctoral Scientist,
AgResearch



Dr Sophie Gallier

Senior Research Scientist,
Fonterra

"The Riddet Institute gave me the freedom to research 'outside the box'."

Dr Gallier became a Riddet Institute Postdoctoral Fellow in 2010 after completing her PhD at the University of Otago. The fellowship allowed Dr Gallier to focus on – and become an expert in – food structure and digestion of lipids. In seeking to investigate the impact of food microstructures on the digestion of natural lipids, she saw the opportunity to utilize the Riddet Institute's partnership network to collaborate internationally.

In July 2013, Dr Gallier took up the role of Scientist at Danone Nutricia Early Life Nutrition, in Utrecht, the Netherlands, examining the structure of human milk and infant formula. She later became Nutrition and Research Manager at Danone Nutricia, Auckland, working on product development and clinical research. Currently, she is Senior Research Scientist at the Fonterra Research and Development Centre, a role which offers many challenging cross-functional projects for markets around the world.

"It's been great to work closely with many experts in dairy science and nutrition. I have the opportunity to manage large clinical trials in the field of maternal and infant nutrition, a field I find extremely rewarding as the research we are conducting can make a difference for future generations."

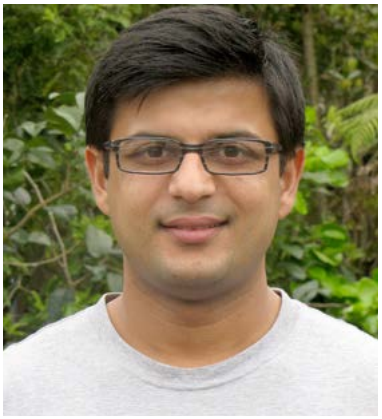
"The Riddet Institute has a great vision of bringing innovation in food through scientific research and product development."

Dr Taneja arrived from India and began his postgraduate studies in Food Technology in 2004 and joined the Riddet Institute as a Food Technologist in 2005.

Dr Taneja has a desire to gain as much experience in the global food industry as possible. He took up the role of Senior Technologist in the R&D Technical team at Japanese Beverage company Frucor Beverages, the current market leader in the Australasian energy drink sector. Then in early 2015, Dr Taneja moved to Auckland-based Danone Nutricia Infant Nutrition, a global company specializing in early life nutrition. Now in the role of Technology Manager for Danone, Dr Taneja manages the project portfolio for all base powder and packaging development.

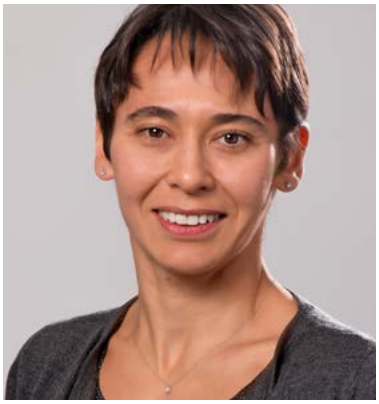
Ultimately, Dr Taneja wishes to be a leader and innovator in food and health R&D:

"Without R&D, innovation in the food area can't happen. A lot of the work that happens in the Institute's product development/innovation team has the consumer in mind. This has really helped shape my thinking and the way I now design projects."



Dr Amit Taneja

Technology Manager (NZ),
Danone Nutricia Ltd



Dr Maria Ferrua

Research Engineer,
Fonterra

"My work contributes to the development of new products with unique functionalities."

Dr Ferrua joined the Riddet Institute in 2009 after 12 months as a Postdoctoral Fellow at the University of California, following her completion of a PhD in Biological Systems Engineering. Dr Ferrua is a specialist in computational fluid dynamics and, while at the Riddet Institute, she undertook research exploring the forces and fluid motions that breakdown and mix gastric contents.

"My research focused around a central question, which is what happens to food structures when food is chewed and swallowed – how they are broken down, and how this disintegration affects the nutrients that are then released."

Today, Dr Ferrua is a Research Engineer at the Fonterra Research and Development Centre, where her work contributes to the development and manufacture of new products for New Zealand's largest food exporter.

"The Riddet Institute provided the opportunity for me to present my research nationally and internationally."

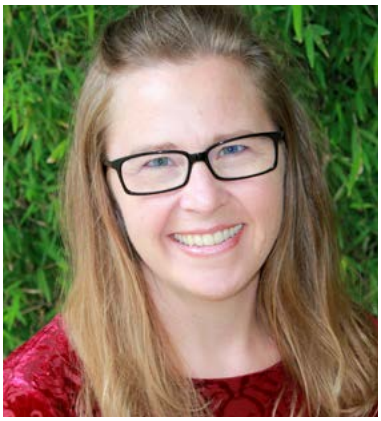
Dr Angeli joined the Auckland Bioengineering Institute as a Riddet Institute PhD scholar after completing his Master of Science at the University of Michigan in 2009. His PhD centred on *in vivo* measuring and monitoring of gastrointestinal electrophysiology. Graduating from Auckland University in 2014, Dr Angeli became a Research Fellow at the Auckland Bioengineering Institute to continue his research developing new diagnostic devices.

Dr Angeli recently secured a prestigious Edith C. Roan Research Fellowship through the Auckland Medical Research Foundation. He aims to continue building his academic research career in New Zealand to ultimately attain professorship and run his own biomedical engineering lab.

"The Riddet Institute provided an incredible atmosphere of support, innovation, and collegiality during my PhD. I'm particularly grateful for the opportunities that it opened for me to present my research at national and international venues."

Dr Tim Angeli

Research Fellow,
The University of Auckland



Dr Amy Van Wey Lovatt

Postdoctoral Scientist,
AgResearch

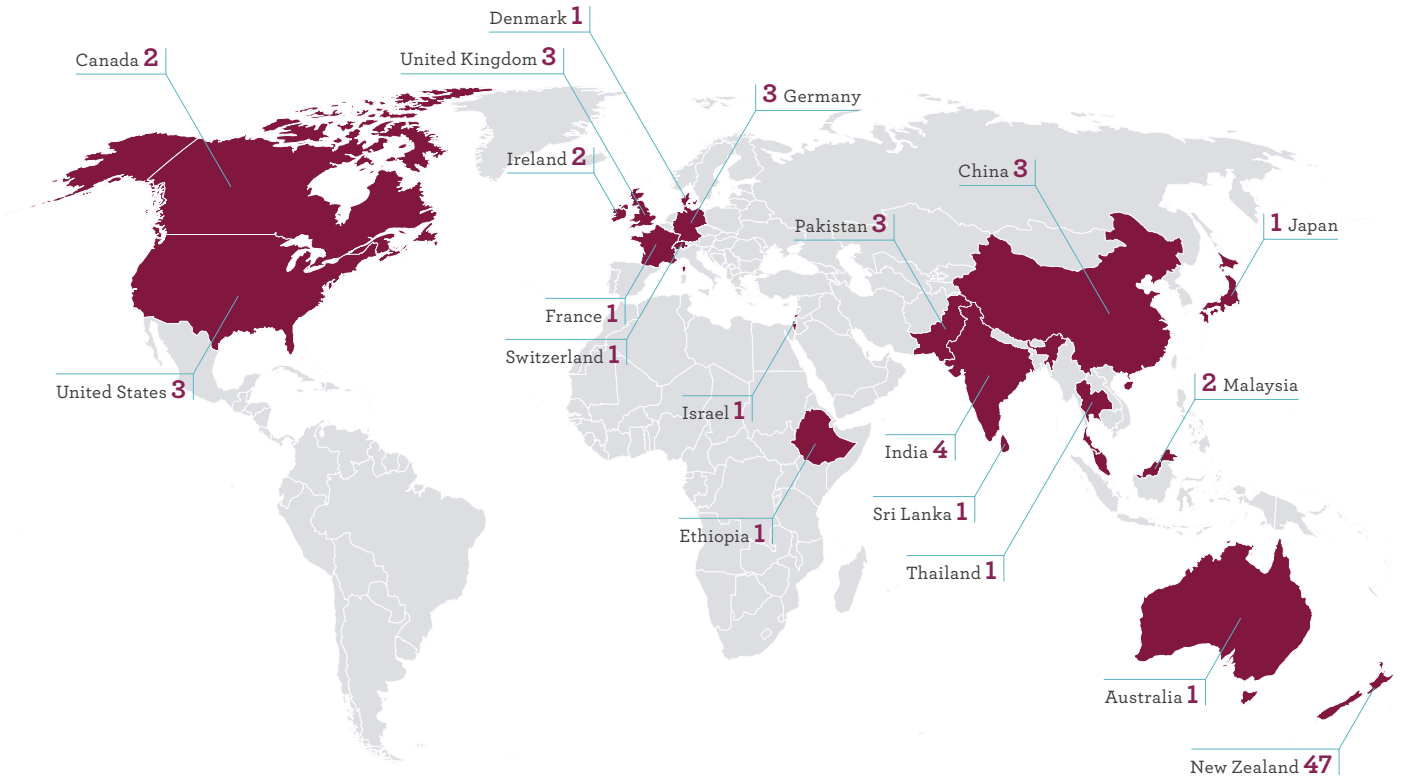
"The Riddet Institute's links with partner organisations and international and national networks significantly impacted my career."

In 2009, mathematician Dr Van Wey Lovatt moved from the United Sates to take up a Riddet Institute PhD Scholarship, which she completed in 2013. Her thesis was mathematical models of biofilm growth and food particle degradation in the gastrointestinal tract and was supervised by AgResearch's Profs Warren McNabb, Nicole Roy and Dr Paul Shorten. Dr Van Wey Lovatt's model of how particles are broken down by acids is the first accurate model of its type and clearly shows why the mechanism works as it does.

As a mathematician, Dr Van Wey Lovatt uses mathematics to bring insights to science. In June 2016, she became the first mathematician to win the Zonta Science Award. Now in her last year of a three-year Postdoctoral Fellowship, she hopes to use the award to pursue new collaborative projects.

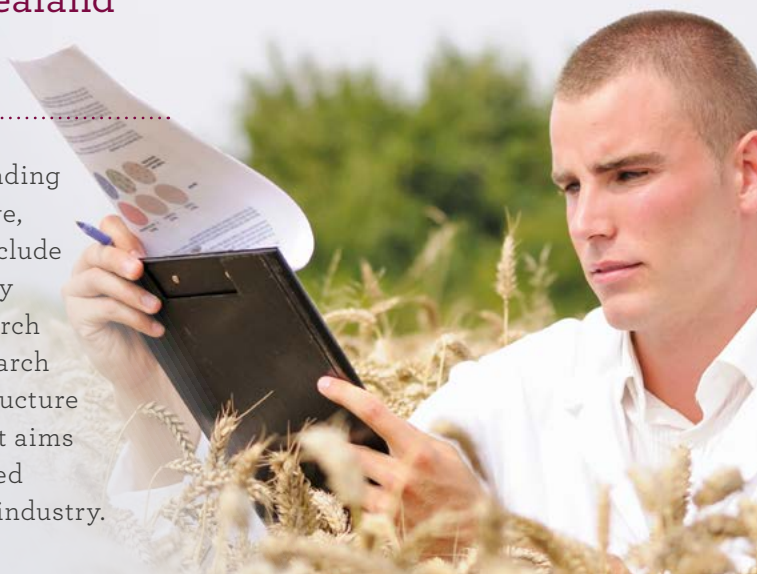
"Being within the Riddet Institute for my PhD gave me the flexibility of location, as I was able to conduct my research at AgResearch, a Riddet Institute partner. This has significantly impacted the forming of my future career. The relationships I've formed through the Riddet Institute have been the fulcrum for international, and national networks for collaboration."

Postgraduate Destinations



The Riddet Institute is a New Zealand government-funded Centre of Research Excellence

The Institute brings together New Zealand's leading scientists in food and nutrition in a collaborative, multidisciplinary national network. Partners include Massey University (host partner), the University of Otago, The University of Auckland, AgResearch and Plant & Food Research. The Institute's research programme is focussed on the effect of food structure on digestion and health, and through its work, it aims to be a catalyst for innovation to create sustained competitive advantage for New Zealand's food industry.



› The Riddet Institute Partners

MASSEY UNIVERSITY TE KUNENGA KI PŪREHUROA UNIVERSITY OF NEW ZEALAND

agresearch āta mātai, mātai whetū

Plant & Food RESEARCH RANGAHAU AHUMĀRA KAI

THE UNIVERSITY OF AUCKLAND NEW ZEALAND Te Whare Wānanga o Tāmaki Makaurau

UNIVERSITY of OTAGO Te Whare Wānanga o Otāgo NEW ZEALAND

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