



Biotechnology in New Zealand

New Zealand PhDs research for a healthier world

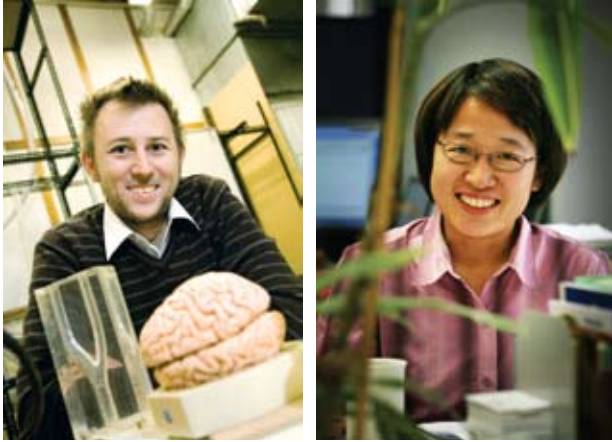
New Zealand has a worldwide reputation for cutting edge agricultural and food science research, but there is also groundbreaking research going in this South Pacific study destination that has nothing at all to do with farming. New Zealand is a leader in biotechnology, and research students from around the world flock to Kiwi universities to discover the medical treatments and diagnostic tools of the future.

In October 2009, University of Auckland scientist Dr Vickie Shim won the “Young Investigator Award” at the World Congress on Medical Physics and Biomedical

Engineering in Germany. Her research on developing a state-of-the-art computer model of the human knee could help to improve the design of knee braces and knee implants. With the world’s population ageing, knee injuries are becoming more common and more serious. Dr Shim’s work could save patients from painful and expensive surgery.

“We wanted to create an anatomically correct computer model of the knee that can be customised to take into account a person’s own measurements. We can then predict what’s happening inside the knee without having to cut it open,” says Dr Shim.

Besides helping to diagnose knee injuries, this technology could help clinicians design better knee braces and knee implants, based on the patient’s individual anatomy.



International research students in New Zealand:
Nicolas Buchman and Vickie Shim

“New Zealand is a leader in biotechnology, and research students from around the world flock to Kiwi universities to discover the medical treatments and diagnostic tools of the future.”

Meanwhile, down at the University of Otago in Dunedin, Indian PhD student Pranav Karmwar is using the latest developments in nanotechnology to find better ways to deliver medication.

While most of us prefer to take medication orally, some types of drugs have had to be taken by injection because they could not survive the digestive system. These include peptide and protein based therapeutics which target the colon. Pranav is exploring the use of nanoparticles of pectin as a way to make the drugs more durable as they make their way through the digestive tract to their final destination.

Using nanotechnology for medical treatments is still science fiction to most people, but for Pranav, the applications of this new technology are very real. Completing his PhD in New Zealand has given him the opportunity to push the technology forward in ways that may someday benefit all of us. His unique background in both nanotechnology and pharmacy are combined in his PhD project, and the great research facilities at the University of Otago made it the perfect place to pursue his studies.

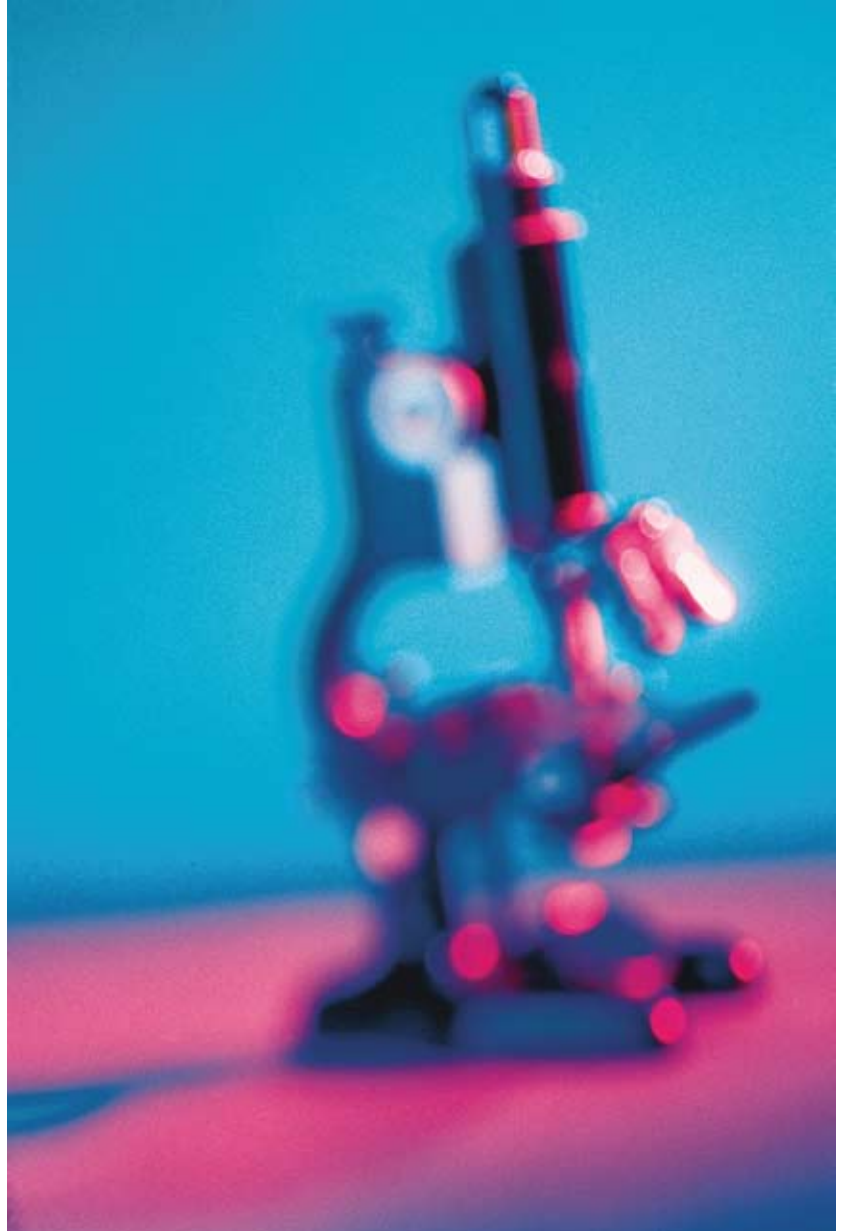
Mechanical Engineering is a subject not often associated with medical research, but German student Nicolas Buchmann has found a link. He is studying at the University of Canterbury in Christchurch, and his PhD research involves simulating the patterns of blood flow through the human brain.

“Understanding the fluid dynamics of blood distribution throughout the brain provides insights to the risk factors of stroke and enables better clinical decision-making and reduced treatment costs.” says Nicolas.

“Our results can be related to stroke and the development of vascular diseases such as arteriosclerosis.” he explains.

For Nicolas, doing his research in New Zealand was the perfect combination of a great academic choice and a great lifestyle choice. Having studied in New Zealand for a year in 2003, he was very keen to return.

“I love the country, the outdoors, especially skiing and climbing, the lifestyle and the people. Plus, the research was very interesting and I was given the opportunity to incorporate my previous experiences and to help build a



research group around my topic.” he says.

Another German student, Natalie Lorenz, agrees that the New Zealand lifestyle is part of the attraction for international students.

“I have found a great pleasure in the New Zealand outdoors culture and lifestyle. Fishing, sailing and the general beach culture have all become an essential part of my life.” she says.

Natalie doesn't spend all of her time on the beach, though. She is doing a PhD in molecular biology. Her research will hopefully help to reduce the incidence of staphylococcus aureus, better known as staph infections, occurring in hospitals. If she is successful, Natalie could help to save countless lives, as staph infections are a major cause of hospital deaths around the world. Her work at the University of Auckland is launching what she hopes will be a long career in immune system research. 📍

Pranav Karmwar, Nicolas Buchmann and Natalie Lorenz are all recipients of the New Zealand International Doctoral Research Scholarship (NZIDRS), a scholarship which allows the best international students from around the world to take on PhD research at New Zealand universities with their tuition and living costs paid. More information about the NZIDRS and about studying in New Zealand can be found on www.newzealandeducated.com.