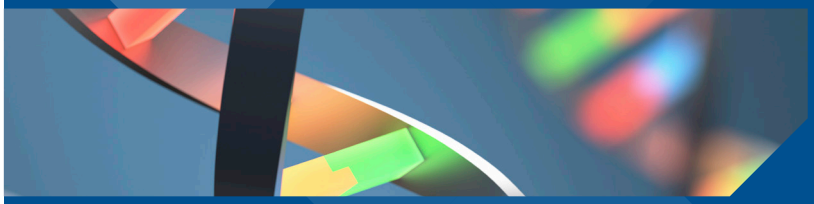

UNIVERSITY of OTAGO
Te Whare Wānanga o Otāgo
NEW ZEALAND
SAPERE AUDE

Genetics

Our past, our present, our future

"I've gone from athlete and sports nutritionist to community nutritionist, to research study co-ordinator and consultant, to science communicator, thanks to a solid base of knowledge and support from Otago, and continued curiosity and persistence."

Kieran Hyslop BSc

The world of genetics is enormous. It touches our everyday lives in ways we can't even begin to imagine. Genetics is a rapidly-progressing science, a central theme of modern biology, and a critical component of most biological research. With a high demand for genetics graduates within New Zealand and overseas, a degree in this ground-breaking and practical discipline will provide you with many career options.

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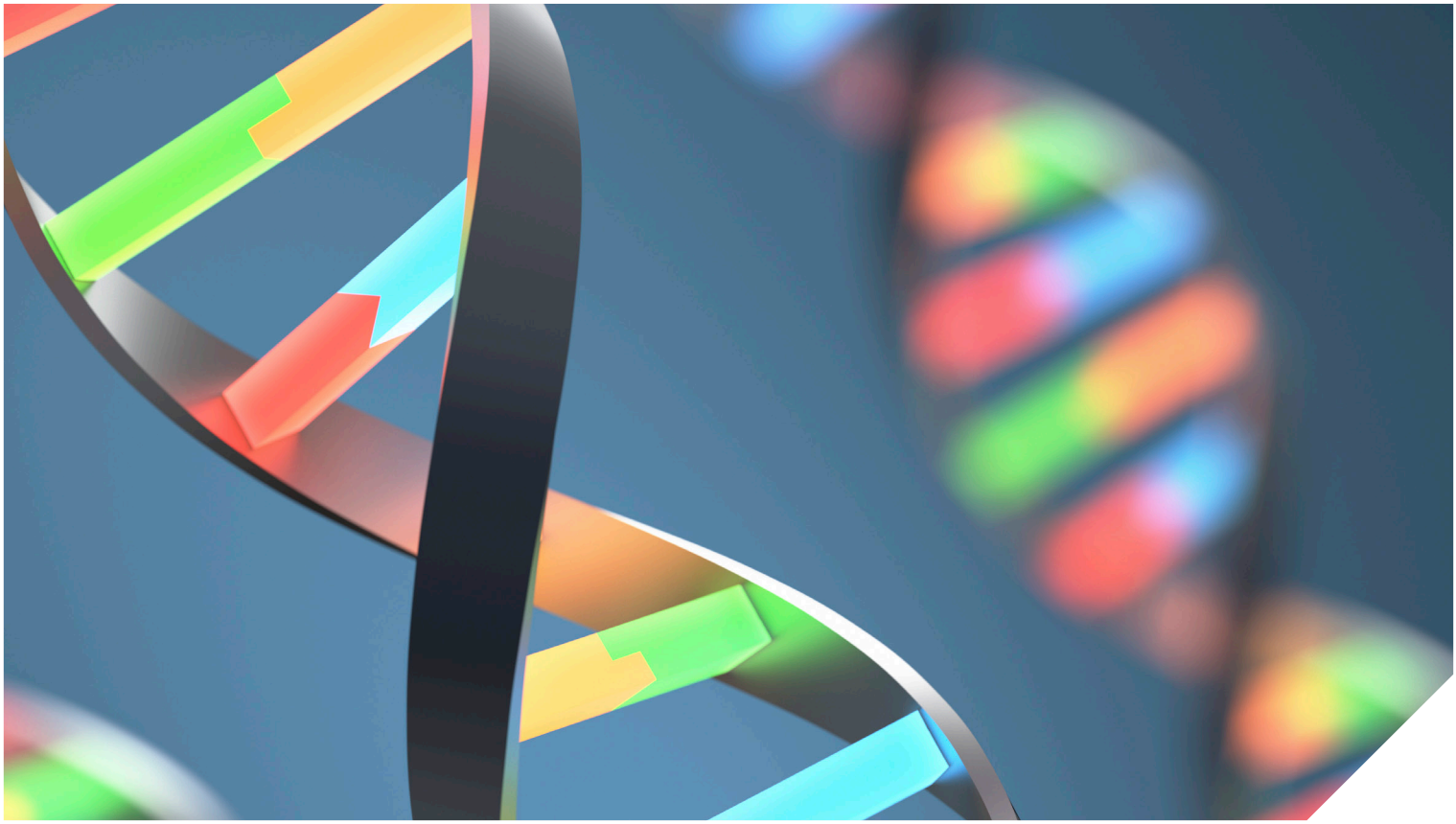

Genetics at Otago

Genetics is a rapidly-progressing science, a central theme of modern biology, and an indispensable component of most biological research.

The Genetics programme at Otago draws together the departments of Anatomy, Biochemistry, Botany, Microbiology and Immunology, Pathology, Pharmacology and Toxicology, Women's and Children's Health, and Zoology.

This allows staff and students to interact and share ideas across a broader sphere than is possible in any one department.

Why should I study Genetics?

Genetics is the study of genes and inheritance. It's fun, interesting, challenging and relevant to everyday life! It's a very diverse subject, in which you'll learn about the molecular basis of life right through to the study of whole organisms, populations and evolution.

You will learn to make informed decisions about topics such as genetic engineering, cloning and your own health. In your lectures, you'll also learn about the cutting-edge research being undertaken at Otago and you'll have many opportunities to undertake hands-on research.

Background required

You need to have an interest in the world around you! Year 13 Chemistry, Biology and Mathematics are strongly recommended (but not essential).

What papers do I take for a BSc? You must pass *CELS 191 Cell and Molecular Biology, CHEM 191 The Chemical Basis of* Biology *and Human Health* and *STAT 115 Introduction to Biostatistics* in your first year to major in Genetics from the second year. It is also recommended that you take *BIOC 192 Foundations of Biochemistry*.

Material from these papers forms the foundation for the compulsory 200-level genetics papers:

- GENE 221 Molecular and Microbial Genetics
- GENE 222 Genes, Chromosomes and Populations
- GENE 223 Developmental and Applied Genetics

In second year, we highly recommend you take:

- BIOC 221 Molecular Biology

We also recommend you take at least one of:

- MICR 221 Microbes to Medicine
- ZOOL 222 Evolutionary Biology

In third year, you need to take at least four of the following papers:

- BIOC 352 Advanced Molecular Biology
- GENE 312 Evolutionary Genetics
- GENE 313 Medical Genetics
- GENE 314 Developmental Genetics
- GENE 315 Genomes
- MICR 335 Molecular Microbiology

Other papers are also possible depending on your interests.

Can I combine my Genetics degree with other subjects?

Yes! Genetics and almost anything is a marketable and desirable combination. Popular subjects include Law, Commerce, Bioethics, Mathematics, Statistics, Information Science, and Computer Science. You can combine Genetics with other biological sciences such as Anatomy, Biochemistry, Botany, Microbiology and Zoology; and other science subjects such as Anthropology, Geology and Psychology. It is also possible to take Genetics papers as part of a BBiomedSc degree. In particular, Genetics is an integral component of the Reproduction, Genetics and Development major.

How will I study?

Genetics is an experimental science with a strong theoretical background, so you will have a combination of lectures and lab-based practicals.

The lab classes in second and third year are extremely varied. You'll examine everything from viruses and bacteria through to fruit flies, worms and humans. For example, in second year you create genetically-modified bacteria and test for genetically-modified organisms in supermarket products. During third year you'll have the opportunity to look at your own chromosomes, and to analyse a portion of your own DNA to determine which 'Daughter of Eve' you are descended from. You also get to design and carry out your own group projects. Computer simulation labs enable you to study evolutionary genetics.

Postgraduate study options

A Bachelor of Science (BSc) in Genetics can lead to a Postgraduate Diploma in Science (PGDipSci), a Bachelor of Science with Honours (BSc(Hons)), Master of Science (MSc), or PhD degree. You can apply to enter these postgraduate programmes during the third year of your BSc.

If you have a degree with a major other than Genetics, but wish to study postgraduate Genetics, you can study for a Diploma for Graduates endorsed in Genetics.

Career opportunities

Graduates with a genetics degree from Otago can be found all over New Zealand and around the world, doing all sorts of interesting things. A degree in Genetics gives you a wide range of marketable skills suitable for employment in biologically-based industries, research organisations and government departments. You could be a research associate, policy analyst, biotechnologist, conservation worker or biosecurity analyst, to name but a few!

With further study you could be a patent lawyer, science journalist, or a researcher in human, animal, plant, or microbial genetics. A Genetics degree from Otago also provides an excellent foundation for the further training required to be a genetic counsellor or forensic scientist.

PROFILE

Sam Brierley BSc

Chip Group Training and Education Manager

The enthusiasm of a high school science teacher, and the cool idea that all life can be coded by simple A, T, G and C molecules arranged in various combinations, led me to study Genetics at Otago. I learnt more about the complexities behind the science – and how much we don't understand – and this increased my interest in learning more about this topic.

I chose Otago because my high school counsellor knew about the great Genetics department and, because I grew up in Kerikeri in Northland, I also wanted to experience life in the South Island.

My favourite undergraduate paper was GENE 315 Genomes; a highlight was doing lab work analysing our own mitochondrial DNA.

An added bonus of studying at Otago is life outside university and I enjoyed doing some sailing coaching for a local club in Dunedin – although the sailing season is not as long as it is in the Bay of Islands!

I am currently working in the Biosecurity and Pollination team at the New Zealand Institute for Plant and Food Research. Long-term, data management really appeals and I'd like to be the main person handling 'big' data sets. Although I am not directly applying my genetics degree in my work, I still recall and draw on many of the skills and a lot of the knowledge I gained at Otago. It's great to hear about how the research I studied in my undergraduate degree is being applied in the real world.

For questions about Genetics

otago.ac.nz/genetics

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