



# Bachelor of Biomedical Sciences

The web of life

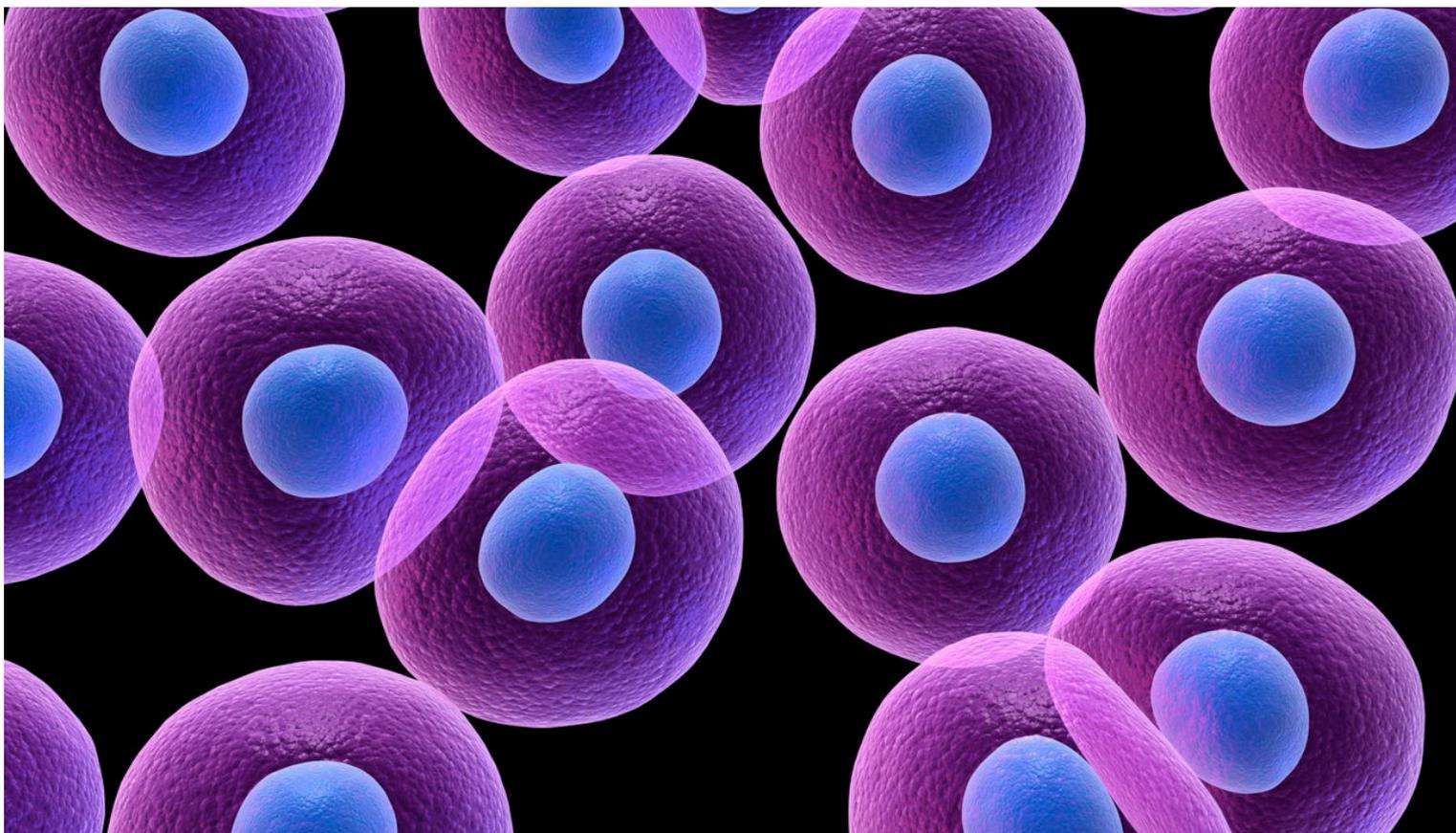
"I particularly liked how you could take such a variety of subjects, even within the one major. During my undergrad degree, I studied a combination of biochemistry, physiology, pharmacology and genetics – so I really felt like I could get a feel for what I enjoyed the most."

Jessica Macindoe BBiomedSc(Hons)

The Bachelor of Biomedical Sciences at Otago provides a broad, interdisciplinary approach to understanding the science of health and disease. You will have the opportunity to study your own unique combination of biomedical subjects within one of six majors.

This flexible programme of study will equip you with a comprehensive grounding in the principles and ideas that underpin current biomedical science.

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## BBiomedSc majors

### Drugs and Human Health

Medicines play a major role in human health. Scientific advances continue to provide new drug targets, and the search for improved therapeutics has widened from traditional sources, such as plant and animal products, to include rationally designed drugs and novel biologics. This major covers the main drug classes used to treat disease, drug toxicology, and drug safety, and the discovery process for translating molecules with therapeutic potential into clinical use.

### Functional Human Biology

Ultimately human health depends on the correct functioning of the cells, tissues and organ systems of the body. Understanding disease, in turn, rests upon knowledge of the pathological processes on these systems. This major provides an overview of the functional mechanisms of the multiple systems in the human body and explores specific areas in depth with a research-informed focus.

### Infection and Immunity

The human immune system defends the body from disease-causing microbial invaders like viruses and bacteria. This major provides in-depth knowledge of the immune system: how it develops, how it functions, its role in health and disease, and what happens when it fails to function. It covers the microbes responsible for infectious diseases such as HIV, tuberculosis and meningococcal disease, how these infectious diseases are controlled, and how antibiotic resistance arises. The major also includes how the immune system can be used to treat diseases such as cancer.

### Nutrition and Metabolism in Human Health

This major focuses on the biochemistry and metabolism of essential nutrients, including carbohydrates, fats, protein, vitamins and minerals, with an emphasis on human health and disease across the lifecycle. Topics covered include nutritional assessment, energy balance, and the role of nutrition in the development and treatment of chronic disease.

### Reproduction, Genetics and Development

One of the key objectives in current biomedical science research is to understand the interplay between our genes and physiology during reproduction and development. In simple terms how do our genes guide our development and what happens when this goes astray? In this major, you will examine the biology of reproduction, embryo formation and development, and the genetics underlying these events. You will also have the opportunity to explore key anatomical and genetic techniques.

### Molecular Basis of Health and Disease

This major explores the molecular mechanisms underpinning cellular communication as they relate to human health and disease. Some of the topics covered include pathways of cell growth, cell survival and death, protein interactions in cell signalling pathways, dysregulation of metabolism, and the expression of disease phenotypes.

## Why study Biomedical Sciences?

The key answer is because you are interested in, and motivated by, the science that will allow us to improve human health. Our BBiomedSc students have a reputation for excellence and are sought-after by a wide range of employers both here in New Zealand and overseas. Your working life might begin with a company in the biotechnology, pharmaceutical, biomedical or agricultural sectors. Alternatively, you might be employed by a research institute, in a university, government agency or local authority and use the scientific skills you have learned during your studies to provide policy, technical or diagnostic advice. Many of our BBiomedSc graduates continue on to further study in biomedical research or gain postgraduate entry into professional health programmes such as Medicine, Dentistry and Pharmacy.

## Background required

Taking chemistry and biology to Year 13 is recommended. Students who have not done chemistry are strongly advised to complete Introductory Chemistry (any time) or Concepts in Chemistry ( Summer School), prior to their first year of study.

## How do I structure my BBiomedSc degree?

In your first year you will take seven papers, including Cell and Molecular Biology (CELS 191), The Chemical basis of Biology and Human Health (CHEM 191), Foundations of Biochemistry (BIOC 192) and Human Body Systems (HUBS 191 and 192) by enrolling in Health Sciences First Year or Biomedical Sciences First Year. You choose your major at second year, with each major offering an interdisciplinary and coherent programme of study.

## Is the BBiomedSc degree different from a BSc?

Yes. The BBiomedSc allows you to retain an interdisciplinary diversity throughout your three years of study. In the final year of a BSc, most students are required to take four 300-level papers in one subject. In contrast, final year BBiomedSc students have the opportunity to select their required papers from two or more subjects.

## Postgraduate study options

Many graduates from this programme develop a taste for research and pursue further study. Our BBiomedSc(Hons) degree allows suitably qualified students to undertake a two-semester guided research project in a Biomedical Sciences department. Successful completion of honours provides entry into a PhD or our master's programme (MBiomedSc).

For questions about  
Biomedical Sciences  
[otago.ac.nz/biomedsci](http://otago.ac.nz/biomedsci)



## PROFILES

### Keresoma Leaupepe BBiomedSc, BBiomedSc(Hons), MSc and PhD candidate

Keresoma Leaupepe's interest in health and disease, and in particular how they impact on his Samoan community has been his motivation all through his study at the University of Otago.

When Keresoma received a scholarship from NZAid he had no trouble deciding which university in New Zealand he wanted to study at.

"I was so interested in health-related stuff and I heard that Otago University has the best reputation."

Keresoma completed a BBiomedSc(Hons) degree, which allowed him to study a wide range of areas including genetics, anatomy, biochemistry and pathology.

"I was also interested in disease-based research, where we can look specifically at the molecular level of a particular disease.

"I can't wait to give back to my community from all the knowledge that I have learnt at the University of Otago."

### Claudia Lewis BBiomedSc, BBiomedSc(Hons) and MBChB student

Claudia Lewis has long held a dream of becoming a doctor. She gained graduate entry to Medicine but deferred for a year in order to complete a BBiomedSc(Hons) degree in Infection and Immunity, working on a project that may eventually aid in the development of a vaccine to treat tuberculosis.

The BBiomedSc, with its wide range of human-focused papers, really appealed to Claudia.

She chose her major as she wanted to broaden her horizons and take something that seemed a little different to the papers in Health Sciences First Year.

"I have never regretted this choice and believe that the experience will prepare me well for Medicine, and also give me the edge for specialty training, perhaps in Paediatrics or Oncology."

