

Physiology

The living science

“The facilities are of an international standard, which allows us to carry out cutting-edge experiments that contribute towards the understanding and treatment of human disease. The people are talented and friendly, which makes the Department of Physiology a great place to work in.”

Aleisha Moore
PhD student

Physiology is the study of how our bodies work at the molecular, cellular, and organ systems levels. Understanding human physiology is therefore a key part of knowing ourselves. And of course, knowing what's normal is crucial to understanding the abnormalities that lead to disease, and enabling development of effective treatments.

The importance of Physiology is recognised by the fact there is a specific Nobel Prize category for Physiology and Medicine.

Although much has been learned, mysteries still remain – will you be involved in solving them?

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Why study Physiology?

A university-level understanding of how the body works is an excellent preparation for a wide range of career options. Some Physiology graduates go on to higher degrees in Physiology because they wish to become full-time researchers and academics, designing their own research and leading research teams.

Other graduates use their Physiology degrees to gain access to a wide range of jobs where employers are looking for specific knowledge of human biology, including as laboratory research technicians, advisors to TV and movie productions, in medical technology companies, aviation and space medicine research, hospital sleep laboratories, and marketing pharmaceuticals – to name just a few.

Furthermore, a Bachelor of Science (BSc) can provide entry into any career where employers are looking for tertiary-level education. We also find it can be a platform for entrepreneurs who go on to set up their own businesses – from setting up vineyards and wine making, to running sporting goods shops.

A degree in Physiology is also a perfect platform for entry to further study towards qualifications in health-related professions that lead to specific careers, such as audiology, dentistry, medical technology, medicine, pharmacy, and physiotherapy.

If you find human biology interesting and want to know more about how the human body works – or why it sometimes fails to work properly – then Physiology is for you.

Background required

There are no specific secondary school subject requirements. However, Year 13 Biology, Chemistry and Physics are strongly recommended because they underpin Physiology principles. In fact if you have not done Chemistry to Year 13, we strongly advise you consider first taking a bridging course such as the Summer School paper CHEM 150 Concepts in Chemistry (see otago.ac.nz/summerschool). Calculus and Statistics are also useful.

Structure of the degree

Physiology is offered as a three-year Bachelor of Science (BSc) degree. In first year, you need to study two core papers:

- HUBS 191 Human Body Systems I
- HUBS 192 Human Body Systems II

You also need to take at least two of:

- CELS 191 Cell and Molecular Biology
- CHEM 191 The Chemical Basis of Biology and Human Health
- PHSI 191 Biological Physics
- BIOC 192 Foundations of Biochemistry

Note there are no papers actually called 'Physiology' in first year.

In second year you take all three Physiology papers (PHSL 231, 232 and 233), which respectively cover the brain and nervous system; the heart, blood circulation, lungs and breathing; and the movement of substances in and out of our bodies and cells through the digestive system and kidneys. These build on the background provided in first year to provide a high level of knowledge across all body systems.

During third year you can choose from five papers (PHSL 341, 342, 343, 344 and 345). These focus at an advanced level on the above topics, but now taking you to the edge of current knowledge and the latest research related to both understanding the healthy body, and the changes that occur in disease.

Instead of enrolling in a BSc majoring in Physiology, you might choose to undertake a Bachelor of Biomedical Science (BBIomedSc) degree. This degree programme offers a major called Functional Human Biology which includes many of the above papers. See otago.ac.nz/biomedsci for more detail.

Teaching style

Physiology papers are taught via lectures, labs, group tutorials, computer-assisted and self-directed study, and regular assessments. The labs are very hands-on. They are organised into small groups, each with a personal tutor, offering a high level of support if needed.

Postgraduate and career opportunities

Studying Physiology gives you the opportunity to develop the skills and life-long learning strategies crucial for careers that require tertiary science qualifications. Physiologists work in a variety of environments including:

- Allied health professions such as optometry and audiology
- Aviation and space industries
- Education and research institutes
- Government agencies
- Hospital labs and rehabilitation centres
- Military
- Pharmaceutical and biotechnology companies
- Sports institutes and academies

Got a thirst for more? Further study could take you into a Postgraduate Diploma in Science (PGDipSci), a Bachelor of Science with Honours (BSc(Hons)), or research-based master's degree, or a PhD.

Physiology research at Otago

Our staff undertake internationally-recognised research focused on different thematic areas, for example:

- Membrane and Ion Transport
- Cellular and Molecular Neuroscience
- Cardiovascular and Respiratory Physiology

The types of medical and scientific problems that this research addresses include:

- Ageing and loss of muscle mass and strength
- Diabetes and obesity
- Fertility and neural control of hormones
- Heart and lung function and dysfunction, including atherosclerosis, diabetes, cardiac stem cells, arrhythmias, and hypertension
- Intestinal physiology and probiotics
- Ion channel physiology
- Kidney and blood vessel function
- Movement disorders such as ataxia, motor neurone disease, and Parkinson's disease
- Neurological disorders such as bipolar disorder, depression, and epilepsy
- Neurophysiology of smell
- Stress and the brain

PROFILE

Darshna Govind

Bachelor of Science (Physiology)

Darshna Govind decided to study Physiology because she was fascinated with learning about the human body and how it works. "It just seemed like a science that made sense to me."

She decided Otago was the place for her because of the wide range of science papers available, as well as Dunedin's awesome student culture.

"The physiology lecturers are great and it's obvious how passionate they are about the subject. My favourite paper was PHSL 345 Physiological Aspects of Health and Disease. It made me realise how physiology can be applied to many diseases."

Throughout her time at Otago, Darshna played hockey for the Otago University Hockey Club.

"This was so much fun and I made lots of great friends through hockey. I also enjoyed running and took the opportunity to explore the many beautiful running trails in Dunedin."

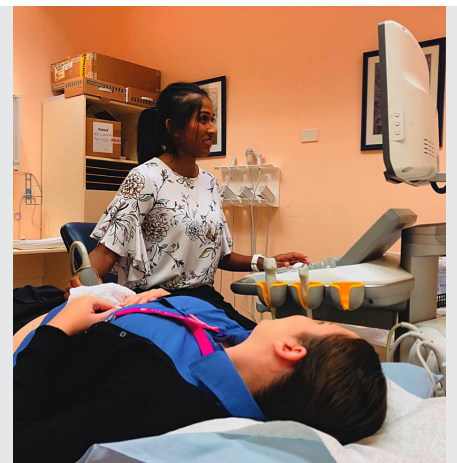
Currently working in Christchurch as a Vascular Sonographer at a public and private hospital,

Darshna facilitates ultrasound scans of patients with a wide range of vascular diseases, including atherosclerotic disease, deep vein thrombosis and varicose veins.

"There is a wide variety of work and it all involves a lot of physiology and understanding the haemodynamics of blood flow."

"After I graduated, I worked as a clinical respiratory physiologist in Auckland. It was great to put my physiology skills into practice with patients in a hospital. It taught me a lot about the hospital environment, and through this job I realised I wanted to work in ultrasound. The physiological principles behind respiratory and breathing are similar to haemodynamics and blood flow, so physiology has been a massive help."

"There is currently a shortage of sonographers, so we are in high demand. I have recently accepted a position in Edinburgh and intend to travel around the UK and Europe while I'm over there working. As if my job wasn't exciting enough!"



For questions about
Physiology
otago.ac.nz/physiology

