



# Medical Laboratory Science

## The backbone of medical decision making

"If you're interested in healthcare and diagnostics this is definitely the course for you. The topics covered are wide-ranging and forward-thinking."

Lisa Stevens  
Medical Laboratory Science graduate

Does this tissue sample contain cancer? What can this woman's blood tell us about her health? Is this unborn child developing normally? Is this drug effectively stopping the infection? Did this man die of COVID-19?

Medical laboratory scientists are part of a highly-skilled team that works to solve the mysteries, put the pieces of the puzzle together and answer the critical questions of medicine. They play a crucial role in health care by providing laboratory tests and interpreting results to enable accurate diagnosis and treatment of patients. It's a life-saving profession.

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## What is a medical laboratory scientist?

Medical laboratory scientists are skilled health professionals who provide the laboratory-based tests and assays necessary for the diagnosis and treatment of patients. Seventy per cent of diagnoses made by clinical staff (such as doctors) depend on laboratory tests. In fact, the practice of modern medicine would not be possible without medical laboratory scientists.

In addition to working in hospital and community diagnostic laboratories, medical laboratory scientists play important roles in other areas such as medical research, forensic science and biotechnology.

Medical Laboratory Science covers a wide range of subjects. As a medical laboratory scientist, you can choose to become a specialist in one particular area after you graduate:

**Haematology** – Detection of diseases related to blood such as leukaemia and bleeding disorders.

**Chemical pathology** – Changes in blood chemistry relating to illnesses like diabetes, cancer, drug dependency and heart disease.

**Histology and cytology** – Microscopic analysis of tissues and cells to identify abnormalities observed in cancer biopsies and cervical smears.

**Immunology** – Tests for changes in the immune response indicating infection, gluten and other allergies, and autoimmune diseases.

**Microbiology and virology** – Detection of harmful bacteria, fungi, viruses, and parasites causing diseases such as meningitis, pneumonia and skin infections.

**Transfusion science** – The use of blood products and blood group identification is essential for organ transplantation, blood transfusion and clotting factor deficiencies.

**Molecular diagnostics** – Nucleic acid testing as a wide range of applications. The ability to detect gene abnormalities has significantly advanced diagnosis and treatment of many diseases.

## Why study Medical Laboratory Science?

The Bachelor of Medical Laboratory Science (BMLSc) is the only degree that enables you to enter the pathway to register as a medical laboratory scientist.

In the diagnostic medical laboratory, theoretical knowledge is combined with cutting edge technologies and sophisticated instrumentation to provide rapid, accurate and reliable results that are used by clinicians for the correct diagnosis and treatment of patients. The test results that medical laboratory scientists provide have an immediate impact on the care of patients, especially those who are critically ill. The knowledge you acquire in the BMLSc degree will be directly applicable to your work as a medical laboratory scientist.

Demand for faster testing and constant monitoring of patients has taken some tests out of the laboratory to patients' bedsides. This is called "point-of-care" testing. Another new role is that of the clinical scientist, a position of responsibility achieved through time in the medical laboratory workforce and further training.

### Background required

There are no subject requirements for entry into the Health Sciences First Year (HSFY) programme, but we recommend you take Biology, Chemistry and Physics in Year 13.

If considering tertiary study before enrolling in HSFY, you are strongly advised to contact the Health Sciences Admissions Office beforehand.

### Admission to the programme

The BMLSc is a four-year degree, including Health Sciences First Year (HSFY). All applicants seeking admission under the HSFY category must have passed all seven HSFY papers with at least a B- grade (65%) overall average. UMAT (the Undergraduate Medicine and Health Sciences Admissions Test) is not required. The Admissions Committee will firstly select from those applicants who are applying under Single Programme Preference. Thereafter, if places are still available, the Committee will select from the applicants

that have applied to multiple Health Sciences restricted entry programmes. There are other routes of admission for students who have completed two or more years of university study, or who are university graduates. International students should apply under the International category for admissions.

For more information about applying for admission to the programme, see [otago.ac.nz/healthsciences](http://otago.ac.nz/healthsciences)

If scientific research is your passion, a postgraduate degree provides an opportunity to further your education. If you gain your BMLSc with credit or distinction, you are eligible to apply for the Postgraduate Diploma in Medical Laboratory Science (PGDipMLS). This is a one-year programme which can be undertaken in most areas of medical laboratory science. If you then gain your PGDipMLS with credit or distinction, you can undertake a further year of research and study to gain a Master of Medical Laboratory Science (MMLSc). There are opportunities for high-achieving students to progress to a PhD through a further three-year programme of research and study.

## Careers in Medical Laboratory Science

The University of Otago BMLSc is an internationally-recognised qualification, enabling you to work around the world in:

- hospital and community diagnostic laboratories
- health research groups in universities, Crown Institutes, and the private sector
- companies supplying scientific instrumentation (research and development, sales, technical support)
- biotechnology companies
- forensic science
- diagnostic and clinical education
- laboratory management
- veterinary pathology laboratories
- hospital mortuaries.

Career diversity is something we value. In addition to working in hospital and community diagnostic laboratories, medical laboratory science graduates often pursue other roles in medical science in the public and private sectors.



## PROFILE

### Lisa Stevens

Medical Laboratory Science graduate

Where can a bachelor's degree in Medical Laboratory Science take you? Lisa Stevens found it can take you a long way.

After graduation, Lisa was offered immediate employment in the laboratory where she undertook one of her fourth-year placements. She was able to gain full registration as a medical laboratory scientist while pursuing her passion for infectious diseases and molecular diagnostics.

Lisa's overseas experience began in Singapore, working for the world's largest clinical research organisation. She then moved to the Philippines to work for the Pandoo Foundation, and wrote a master's thesis on the burden of disease in school-aged children in the Philippines and other developing countries.

Here's what Lisa has to say about studying Medical Laboratory Science at Otago:

"It was great getting such a broad-spectrum look at many aspects of human pathologies, like haematology, biochemistry, microbiology. But it was also good to be able to specialise in areas that were particularly interesting to me."

"Working and studying overseas, has been an exceptionally challenging experience for me – both personally and culturally. However, the education and skills gained from the medical laboratory science course at Otago has meant that my technical capabilities in the field were so well developed I was able to be competitive and capable on the world stage of laboratory science."

"I believe that my beginnings in the BMLSc at Otago set me up for a long and exciting career in infection sciences."

Lisa now works at the World Health Organization at its headquarters in Europe.

For questions about  
Medical Laboratory Science  
[otago.ac.nz/medlabsci](http://otago.ac.nz/medlabsci)

