Medical Laboratory Science
Unravelling medical mysteries

"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? Why did this man die?

Medical laboratory scientists are part of a highly-skilled team which 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 healthcare 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. 70% 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 has 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’ bedside. This is called ‘point-of-care testing’. Another new role is that of the clinical scientist, who acquires 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 Pattern. 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

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 (PGDipMLSc). This is a one-year programme which can be undertaken in most areas of medical laboratory science. If you then gain your PGDipMLSc 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 mortuary technicians

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. During her employment, Lisa 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 when she travelled to Singapore to work on blood-borne infections for the world’s largest clinical research organisation.

She then moved on to Cebu City in the Philippines to work for the Pandoo Foundation, which is focussed on children’s education programs. Through the University of Edinburgh, she undertook a master’s degree and writing 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 the University of Otago:

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

“Working and studying overseas, especially in an Asian country, 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 have set me up for a long-lived and exciting career in infection sciences. I look forward to seeing all the great opportunities that will come my way in the near future.”

For questions about Medical Laboratory Science otago.ac.nz/medlabsce