

AUT

A FUTURE IN
**MEDICAL LABORATORY
SCIENCE**



WHAT IS MEDICAL LABORATORY SCIENCE ABOUT?

When your doctor sends you off to a diagnostic laboratory for blood or urine tests, they're calling on the skills of the disease or health detective, aka the medical laboratory scientist.

Medical laboratory scientists (MLS) are the health professionals that test and analyse blood, urine, tissue and other bodily fluids and specimens. These can come from any part of the body, such as part of a colon or piece of mole, or blood samples and urine samples.

The tests are typically requested by general practitioners (GPs) or medical specialists for the diagnosis and treatment of everything from high blood pressure and iron deficiency to cancers and infectious diseases. Laboratory results produced by medical laboratory scientists are used in the diagnosis of 70-80% of all patient disorders. Source: NZ Institute of Medical Laboratory Science (NZIMLS)

Medical laboratory scientists work in diagnostic laboratories, usually specialising in one or two of the following: clinical chemistry, haematology, histology, transfusion science, clinical immunology, medical cytogenetics, medical microbiology and the increasingly dominant field of molecular diagnostics. AUT graduates specialise in any two of those areas.

Do you enjoy problem-solving? Do you want to further your interests in biology and chemistry? Do you find it easy to handle multiple tasks at once? Are you interested in how advances in science can improve people's health? Would you like to be a health professional with great communication skills but not work directly with people? Then medical laboratory science may be a great career for you.

OUTLOOK AND TRENDS

Demand for new advanced diagnostics –

Employment of medical laboratory scientists is projected to grow 13 percent between 2018 and 2022, according to Ministry of Health. A greater understanding of biological processes is driving demand for new advanced diagnostics, generating new career prospects for medical laboratory scientists. In addition to these exciting developments, an aging population will lead to increasing reliance on pathology services, increasing demand for medical scientists who are involved in the improvement of human health.

Increase in automation – the upgrade from manual techniques to automation using sophisticated machinery continues across all aspects of medical laboratory work. Medical laboratory scientists need to maintain and operate machinery, troubleshoot and repair minor faults, and liaise with diagnostic company representatives when more sophisticated issues arise.

Complexity of knowledge – DNA technologies are advancing knowledge of both health and disease at a very rapid rate. Growth in molecular methodology, and the move towards whole genome sequencing for diagnosis, particularly of inherited genetic disorders, requires theoretical knowledge and practical skills. Graduate medical laboratory scientists need to be aware of advancing trends and keep their theoretical knowledge up to date as much as their practical skills.

High level analysis – Due to technological advances in diagnostic laboratory testing and analytical instrumentation, medical laboratory scientists are having to deliver increasingly complex analysis and reports that require high level skills across a variety of IT systems. Sources: University of Kansas/ Auckland District Health Board (ADHB).

Non-lab options

Graduates also find careers in public health agencies, biotechnology companies, the pharmaceutical industry, and diagnostic instrumentation and health informatics firms. There are also opportunities to work on science public policy in government departments.

Some find employment as specialist sales representatives and support staff for biochemical or instrument companies such as Roche Diagnostics, Beckmann Coulter or Stago. Others follow their interest in public health and find employment with public health agencies.

With extensive experience and further training, some medical laboratory scientists progress into specialist scientist roles.

CAREER ROLE EXAMPLES

Medical laboratory scientist (MLS) – tests, analyses and produces reports on bodily fluids and specimens, depending on the diagnostic laboratory's specialisation. Sorts and registers incoming specimens. Maintains as well as operates the technology and provides quality control. Hospital-based medical laboratory scientists will be involved in more specialised testing than community lab medical laboratory scientists.

Medical laboratory technician – assists medical laboratory scientists by taking samples, preparing slides, running tests etc. Performs tests on tissue, blood and other body fluids. (A degree isn't always required for this role however, a technician role can help degree graduates get into a lab).

Sales/technical support representative – work for biochemical/therapeutics companies either selling products to laboratory scientists, providing technical support for the equipment and diagnostic kits after purchase.

Health informatics practitioner – stores, retrieves, shares and optimises use of data that relates to human health. Uses information to assess the effect of health innovations on health policy and advance the field of informatics.

SPECIALISATIONS

Medical laboratory scientists may work within any of the following specialisation in a diagnostic lab:

Clinical chemistry – analysis of blood, urine, faeces and tissues, typically testing for diabetes, renal failure, heart disease and hepatitis.

Haematology – study of the development and disorders of blood and bone marrow, typically investigating for anaemia, cancer, bleeding, thrombosis.

Histology – prep, processing and staining of tissues obtained during surgery, biopsy or necropsy, typically looking at diseases such as cancer.

Transfusion science – prepare blood products from donor

WORK SETTINGS

The BMLS degree is recognised by Medical Sciences Council New Zealand for registration as a medical laboratory scientist. This typically opens up opportunities for MLS graduates to enter medical laboratory scientist roles in community or hospital diagnostic laboratories.

Large community medical diagnostic laboratories are located in main centres. Smaller communities are serviced by laboratories that provide basic testing with supplemental testing referred to bigger centres.

Once medical laboratory scientists have gained some experience they may move into research positions in specialist laboratories within organisations such as universities and pharmaceutical companies.

blood for patients, match patient and donor blood for safe transfusions and transplants.

Immunology – study of body’s response to disease, typically to diagnose HIV infection, rheumatoid arthritis, allergies etc

Medical cytology – analysis of cells from a variety of body sites, for example cervix, lungs or breasts. Typically looking for presence of cancer cells, eg cervical cancer tests. (this specialisation not offered at AUT)

Medical Microbiology – examining specimens from anywhere around the body, typically looking at bacteria, fungi, parasites and viruses.

Molecular diagnostics – analysis of chromosomes, DNA, RNA or protein for diagnosis of conditions with a genetic cause.

Source: New Zealand Institute of Medical Laboratory Science (NZIMIS), AUT medical science laboratory lecturers

SKILLS AND KNOWLEDGE

- In-depth knowledge of at least two specialties (see above)
- Acute observation, collection and recording of test results
- Confidence and competence in the use and maintenance of specialist laboratory equipment
- Logical thought processes that facilitate problem solving
- Strong oral and written communication skills
- Ability to follow directions, react appropriately and maintain poise and control under stressful conditions
- Excellence in manual dexterity
- Professional attitude, understanding the importance of patient confidentiality

PERSONAL QUALITIES

- Dependable, responsible, patient
- Mature and able to take the initiative
- Reliable team member
- Highly self-motivated
- Resilient, curious and persistent
- Good time management and planning skills

FURTHER STUDY OPTIONS

There are a range of postgraduate study and research areas in MLS, including the Master of Medical Laboratory Science, which has a specialist scientist or management pathway. A PhD can be also be done in this area.

Research topics include immunology, molecular diagnostics, microbiology, transfusion research, clinical chemistry and pharmacology.

SALARY GUIDE

Salaries for medical laboratory scientists vary based on experience and job location. Progression is by automatic annual increment for 3–5 years, then dependent on performance, skill shortages and responsibilities.

	Salary (per year)
Medical laboratory scientist graduate (depending on region and employer)	Starting salary: \$47,500 – provisional registration After 6 months \$52,000 (full registration) 5 to 7 years: approx. \$64,200–\$70,200 (annual increments) Senior level – \$73,000 – \$97,000 depending on responsibility, experience and quals.
Medical Laboratory Technician	Starting salary: \$42,800–(depending on region and employer) Up to 3 years: approx. \$49,500–\$54,000
Senior scientists/specialist experience	\$90,000–\$110,000+
Research officer	\$57,000–\$73,400+ (depending on organisation and experience)
Sales representative	\$42,000–\$87,000 + (depending on company and expertise)

Sources: Medical Laboratory Workers Union (MLWU), various collective agreements, including DHBs 2017 –2018/ Career Services, Hays Salary Guide 2018

Salary range is indicative of the New Zealand job market at the time of publication (Aug 2019) and should only be used as a guideline.

PROFESSIONAL REGISTRATION

MLS graduates must apply to the Medical Sciences Council (MSC) for registration and an annual practising certificate (APC) to practice. Registration is initially provisional and a minimum of 6–months.

THE AUT APPROACH

AUT’s Bachelor of Medical Laboratory Science offers one of two pathways; a four-year degree in medical laboratory science or a science degree with a Graduate Diploma in Medical Laboratory Science. (Check with MSCNZ for further information on the most appropriate qualification for you). Fourth year students do two 15–week work placements of 30 hours a week in New Zealand and/or Australia.

NB: Massey University (Palmerston North) and Otago University (Dunedin) also offer MLS degrees.



MEGAN WHITELEY

Medical Laboratory Scientist, Canterbury Health

Bachelor of Medical Laboratory Science

"I currently work at Canterbury Southern Community Laboratories in biochemistry, a job I'm really enjoying.

In this role I carry out a wide range of tests on blood and other samples to help doctors to diagnose and monitor all sorts of conditions from diabetes to cancer and pregnancy. I work as part of a team and individually, and no two days are the same.

Since I graduated over three years ago I've worked in five different laboratories! My first job was at Hill Laboratories as an environmental chemistry technician. I was there for four months until I got my first medical laboratory scientist job at Waikato Hospital- a maternity cover position in biochemistry that lasted five months. After that, I went to Canterbury Health Laboratories for another nine month maternity position in biochemistry.

I got my first permanent scientist job at Hawkes Bay DHB. I worked there for 13 months. It was great experience. It is a smaller multidisciplinary laboratory and I worked in a blood bank, haematology, biochemistry and microbiology on a 24/7 shift roster."

EMPLOYER COMMENT

"If you are having difficulty getting your dream job, take what is offered (in a different department, city, fixed term, nights or as a technician). You will learn a lot and the experience will never be wasted. Once you are in the laboratory system it is easier to transfer to the job you really want when it becomes available.

Remember it is a very small profession and potential employers may know each other so put as much professionalism and enthusiasm into the job you have as you would into your dream job.

I would recommend students do at least one of their fourth-year placements in New Zealand – if that is where they wish to work – so they learn how New Zealand labs run, work on equipment available in New Zealand labs and most importantly, become known to New Zealand employers."

Heather Murray

HOD Immunochemistry, Canterbury Southern Community Laboratories

USEFUL WEBSITES

The New Zealand Institute of Medical Laboratory Science

www.nzimls.org.nz

Medical Laboratory Workers Union (MLWU)

www.nzmlwu.org.nz

Medical Sciences Council of NZ


www.msccouncil.org.nz

FURTHER INFORMATION

For further information about medical laboratory science or the Bachelor of Science please visit: www.aut.ac.nz/mls

FUTURE STUDENTS

Contact the Future Student Advisory team for more information: www.aut.ac.nz/enquire
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55 Wellesley Street East, Auckland Central

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The information contained in this career sheet is correct at time of printing, August 2019.

