AUT

A FUTURE IN **BIOMEDICAL SCIENCE**

WHAT IS BIOMEDICAL SCIENCE?

The fields of biomedical science and biotechnology have merged and flourished over the past decade, moving from what were initially medical applications to a wide range of industries including agriculture, pharmaceuticals, plant and veterinary science.

The fundamental basis of biomedical science research is investigating how the human body works at the molecular level, in order to find and evaluate new medical treatments for diseases and genetic disorders as well as manufacturing diagnostic tests. This research has expanded into areas such as drug delivery, medical devices and dosage form design. As an example, clinical epidemiology and biomedical engineering now come under the biomedical sciences umbrella.

Biotechnology is about using scientific knowledge of biological systems and living organisms to create new products and solve problems. Recent developments include bioremediation, which is the use of genetically engineered bacteria to synthesise human insulin for people with diabetes, the creation of transgenic plants that can produce their own pesticides, and industrial fermentation to produce biofuels, such as ethanol, from waste materials.

Are you inspired by the potential of science to improve people's health and wellbeing? Are you a problem-solver who likes hands-on practical work? Can you see yourself turning your passion for science and technology into a profession that is expanding into massively evolving industries? Then a career in biomedical science may be for you.

OUTLOOK AND TRENDS

Increasing crossover between biomedical and food sciences – As legislation concerning health and safety measures around food production becomes more stringent, an understanding of biomedical science will become increasingly beneficial. The Food Act of 2014 promotes food safety by focusing on the processes of food production, bringing in food control plans (FCPs) for high risk food production activities. FCPs must detail hazards such as germs, bacteria and chemicals in ingredients, and other contaminants that could be harmful to humans.

Most biotechnology opportunities are in human wellness and animal-based bioscience – Biotechnologists work in many different areas, including the development of health-promoting foods, or in animal-based bioscience, such as developing veterinary medicines. Although biotechnology organisations are spread across New Zealand, almost a quarter of the opportunities are based in the Auckland and Northland regions.
Source: NZ Bio

Investment in tech – The forecast for New Zealand technology companies continues to look bright, driven by investor appetite from Australia, New Zealand and further afield. While software startups attract the largest share of investment, Healthtech and Cleantech investments are also growing strongly. According to TIN's head of research Alex Dickson, so long as capital continues to meet our world-class engineering talent, and those success stories are exported, there's no reason New Zealand can't compete and win at the cutting edge of tech.
Source: The Technology Investment Network (TIN) 2023 report.

Science technician roles – The number of science technicians in NZ is expected to stay stable over the next three years, depending on research funding priorities. Currently the areas prioritised by government include food research, biological industries, health, environment and high value manufacturing and services (eg specialised medical equipment).

Ribonucleic Acid (RNA) Development Platform – In June 2023 the NZ Government invested $69.5 million over seven years in a Strategic Science Investment Fund (SSIF) Platform for Ribonucleic Acid (RNA) development to ensure NZ has world-class research capability to strengthen the use and commercialisation of RNA technology. The RNA Platform will be a catalyst for progress, innovation, and self-reliance in RNA-based therapies, empowering New Zealand to contribute to global health efforts while safeguarding its own population and the broader Pacific community.
Source: MBIE

WORK SETTINGS

Biomedical science is an area of rapidly expanding opportunities with roles in laboratories and in the field. Professionals usually work regular hours, with some evening and weekend work if involved in long-running projects or experiments. Typical workplaces include:

- Crown Research Institutes (CRIs) such as Environmental Science and Research (ESR), and Plant and Food Research (PFR)
- Private research institutes
- Universities and other tertiary institutions
- Pharmaceutical and biotechnology companies
- Health product and food-for-health product companies
- Government organisations like the Health Research Council (HRC) or Ministry for Primary Industries (MPI)

CAREER ROLE EXAMPLES

Biomedical scientists – help solve health care problems such as cancer, diabetes or obesity through studying how living organisms work. Conduct research and undertake testing of different treatments for dealing with diseases of humans and plants.*

Biotechnologists – study living organisms such as animals, plants, fungi, bacteria and viruses. Use this research to develop medical, industrial and agricultural products.

Research technicians – carry out research, testing and experiments in life sciences. Set up, operate and maintain laboratories for teaching and research, maintain databases and write reports/papers on research results.

*Biomedical scientists differ from medical laboratory scientists who have a specialist Medical Laboratory Science qualification and test blood and tissue samples taken from patients.

SKILLS AND KNOWLEDGE

Technical skills

- Excellent biomedical technology and biomedical laboratory skills
- Sound application of biomedical knowledge in industry
- Strong experimental design and statistical computer skills
- Excellent writing skills
- Acquisition, analysis and evaluation of research results and other information
- Good knowledge of biochemistry, microbiology, molecular biology and biotechnology
- Understanding of industrial processes
- Knowledge of safety procedures relating to hazardous substances
- Understanding of statutory and ethical responsibilities

General skill requirements

- Ability to work in a team
- Excellent communicator, able to explain complex ideas and technical terms to clients or co-workers
- Strong project management and research skills
- Competent time management and prioritising skills
- Capable problem-solver

PERSONAL QUALITIES

- Lateral thinker, objective, enquiring
- Logical, methodical and precise
- Flexible and adaptable

AUT BIOMEDICAL RESEARCH FACILITIES

AUT is home to three significant biomedical research facilities. The AUT-Roche Diagnostics Laboratory is a university and commercial laboratory collaboration. The multidisciplinary Institute of Biomedical Technologies (BTec) includes the Centre for Respiratory Therapies, Centre for Cardivascular Diagnostics and Centre for Biomedical Material. The Microbiology Suite is the third research facility.

SALARY GUIDE

Biomedical science graduates usually start their career in technician roles or equivalent, eg clinical trial assistant.

	Salary
Biomedical science graduate starting salary range Note: salaries may be slightly higher for master's graduates.	$55,000-$65,000
After 5+ years' experience	$85,000-$130,000, depending on role, employer and specialty

This information was accurate at time of publication (early 2024) and should only be used as a guideline.

Keep up to date with salary data by visiting websites, including:

Prosple Graduate Salary Guide
nz.prosple.com/on-the-job/whats-the-average-graduate-salary-in-new-zealand

Salaryexpert
salaryexpert.com/salary/job/biomedical-scientist/new-zealand

Payscale.com
payscale.com/research/NZ/Job=Biomedical_Scientist/Salary

Careers NZ
careers.govt.nz/jobs-database/science/science/biochemist

THE AUT APPROACH

You also complete a research or industry project in an area related to biomedical science. Companies or research organisations involved include Plant and Food Research, Manaaki Whenua – Landcare Research, AgResearch, Institute of Environmental Science and Research (ESR), SCION (Rotorua), MBIE, Environmental Protection Authority, and the Ministry for Primary Industries.

FURTHER STUDY OPTIONS

Biomedical postgraduate options range from graduate diploma to PhD levels.

Recent research in the school includes topics in aquaculture, aquatic biogeochemistry, fisheries and mangrove diversity.

ROSEMARY HEATHER

Food Science Analyst, AsureQuality

Bachelor of Science in Biomedical Science

"I started working in 2020 at AsureQuality as a laboratory technician and worked up to my current food analyst supervisory role on the protein laboratory bench.

AsureQuality is a food assurance service, offering quality management and assurance systems, laboratory testing and inspection. I really enjoy working in a food testing laboratory and using skills from my biomedical degree, particularly technical and laboratory skills and the understanding of standard procedures. I'm also drawing on elective courses I did around food safety as well.

I work on both the protein and foreign matter benches testing a range of food and dairy samples, including infant formulas and milk and cream samples. We are responsible for analysing and quantifying the protein content in samples through analytical testing.

We also conduct tests to identify potential foreign matter in customer samples and strive to deliver results within the specified timeframe for our customers. I feel it's an important role and I enjoy continuing to learn and grow.

There are 13 of us in our team working across the two benches. I really like the diversity of our team and how we support and learn from each other.

TIPS – I advise graduates to look for work experience before graduating. Through the AUT Edge Award I volunteered as a Blue Coat (on site ambassador) at Greenlane Hospital where I developed my communication skills and interpersonal skills. I also fundraised for cancer organisations.

Have a goal but don't just think about one pathway. Instead, be open to all opportunities and find enjoyment in anything you do."

EMPLOYER COMMENT

"We value qualities that create a positive work environment. I seek individuals who embody fairness, transparency and collaboration. To me, to be treated the way one likes to be treated forms the foundation of a thriving team.

When considering candidates in my team, I look for a seamless team fit, flexibility, and a willingness to share ideas. Honesty, integrity, and transferable work skills are essential traits that contribute to success in the role.

I advise graduates to be open to diverse roles, as demonstrated by my own journey from technical assistant to team leader in the dynamic field of food testing."

Adrienne Poihega

AsureQuality Team Leader – Chemistry Department

BIOMEDICAL SCIENCE

USEFUL WEBSITES

Careers NZ
careers.govt.nz/searchresults?q=biomedical

Institute of Biomedical Technologies (IBTec)
ibtec.aut.ac.nz

Institute of Environmental Science and Research Ltd (ESR)
esr.cri.nz

NZ Biotechnology Industry Organisation (NZBio)
biotechnz.org.nz

Science NZ
careers.sciencenewzealand.org

FURTHER INFORMATION

For more information on biomedical science and the Bachelor of Science, visit
aut.ac.nz/biomedical

For other Future Career Sheets visit
aut.ac.nz/careersheets

EMPLOYABILITY & CAREERS
For employability and career support, AUT students can book an appointment through elab.
aut.ac.nz
@AUTEmployabilityandCareers

FUTURE STUDENTS
Contact the Future Student Advisory team for more information: aut.ac.nz/enquire
futurestudents@aut.ac.nz
@FutureStudentsofAUT

CURRENT AUT STUDENTS
Contact the Student Hub Advisors team for more information: 0800 AUT UNI (0800 288 864)
aut.ac.nz/enquire | studenthub@aut.ac.nz

CITY CAMPUS
55 Wellesley Street East, Auckland Central

Connect with us now:

The information contained in this career sheet is correct at time of printing, early 2024.