

**AUT**

A FUTURE IN  
**CHEMISTRY**





## WHAT ARE CHEMISTRY CAREERS ABOUT?

Chemistry is at the core of human existence, from the development of new medicines, to the cleaning up of our environment and creation of food products with enhanced nutritional features. Careers in chemistry involve understanding the chemical properties of matter, learning more about how chemical reactions take place and using this knowledge to solve human problems.

Because the scope of chemistry encompasses all matter on the planet, career opportunities are as wide and diverse as the ever-changing world in which we live. Chemists apply their knowledge to analyse samples, make new chemical compounds, improve industrial processes and produce new materials. Chemical science is behind many of the advances of the modern age, such as OLED screens in TVs and mobile phones, plastics used by 3D printers, new specialised pharmaceuticals and catalysts for the production of hydrogen gas from water.

Are you an enquiring, observant and persistent person? Are you a problem-solver who wants to do something that will make a difference to the world and its peoples? If so, a career in chemistry could provide you with a great set of possibilities for your future.

## OUTLOOK AND TRENDS

In New Zealand, chemistry is a rapidly growing field. New technologies and products are being developed that have applications in the agricultural, food, pharmaceutical, mineral and cosmetics industries. Some areas are expanding very quickly, for example those related to new sources of energy and to the development of forestry and dairy resources. This expansion is further increasing the demand for qualified chemists.

Changes in environmental, occupational health and safety legislation have resulted in increased employment opportunities for the public sector and industry. There is corresponding growth in green chemistry, where the goal is to remove or at least reduce processes and products that harm people and the environment.

Opportunities are strongest in fields where more funding is available. For example, chemists or research chemists who work in research institutions to develop new products, and analytical chemists employed by industries, such as paint, food production or plastics.

However, finding work in pure research (often in a university) is more difficult, as funding is limited and competition is fierce.

Secondary teaching continues to be a very strong career option for chemists. Chemistry is one of the subjects for which Teach NZ study scholarships are often available.

Sources: [futureintech.org.nz](http://futureintech.org.nz) and Careers NZ

### Production and manufacturing industries

- Food and beverage production
- Chemical and related industries, such as pharmaceuticals, agrochemicals, petrochemicals, textiles, plastics, paint, metals and wood products

### Service (people) industries

- Health and medical organisations (hospital laboratories, biomedical/biochemical research, medical analysis and toxicology)
- Pollution monitoring, water purification and forensic work
- Education, teaching (secondary and tertiary)

### Research organisations and agencies

- Crown Research Institutes (CRIs): AgResearch, Institute of Environmental Science and Research (ESR), GNS Science (leading provider of Earth, geoscience and isotope research and consultancy), Manaaki Whenua Landcare Research, National Institute of Water and Atmospheric Research (NIWA), Plant & Food Research and Scion (forestry)
- Government departments, laboratories, regional councils and private research organisations

### Other roles

Although many chemists work in laboratories, an increasing number are employed in advisory roles, marketing, sales, management, or in government departments in key decision-making positions. A chemistry degree is also often an entry point into training as a patent attorney.

Chemists usually work a regular 40 hour week, although long running projects may require evening and weekend work. Some travel may be involved with projects or to attend conferences.

## CAREER ROLE EXAMPLES

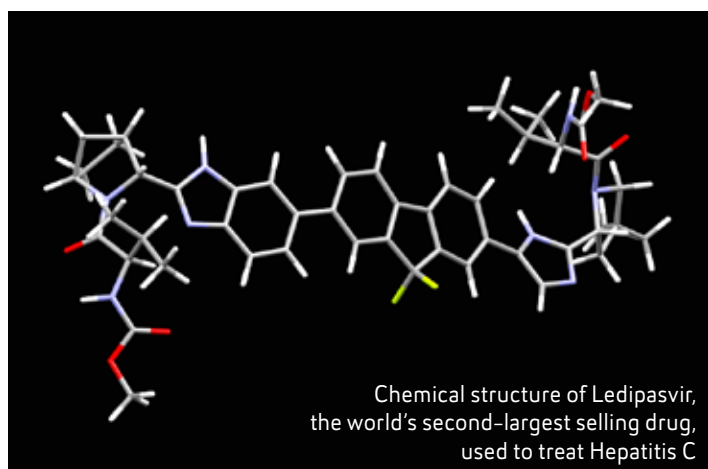
Roles at a technician level are achievable with a bachelor's degree. However, many research roles will require qualifications at master's or doctoral levels.

### Chemistry technician

Prepares equipment, materials, products and specimens for experiments and surveys. Carries out field and site surveys and tests. Performs experiments and evaluates results. Records processes, outcomes and the conclusions reached. Writes reports and papers on research results. Orders laboratory supplies and equipment and maintains databases.

### Senior research chemist:

Studies the synthesis, characterisation and properties of new chemical compounds, catalysts to aid in the industrial-scale synthesis of chemicals, and drugs for treatment of disease. Part of highly-skilled team in a chemical laboratory, may manage the team. Has a research background from



## WORK SETTINGS

In New Zealand, chemistry graduates find employment in private and public organisations, often in production, service and research sectors. They may be commercial enterprises, government department/agencies, research organisations or educational institutions.

Honours, Master's or PhD. Publishes research results in international scientific journals, presents papers at overseas conferences, obtains patents on new results.

### Raw material sampler

Carries out sampling of raw materials (ingredients and packaging) prior to use in a manufacturing plant. Ensures that materials are sampled on time, entered into the relevant systems and reach the laboratory on time. Performs sampling of finished products and staff training. May be involved in development, writing and implementation of procedures and setting up the work environment.

### Technical sales representative

Develops new business for the organisation, establishing new contacts and accounts. Supports the development of sales and marketing plans. Provides sales service and technical knowledge to customers. Works in a team to generate proposals, quotations, and tailored, innovative, commercially effective solutions. Contributes to continuous improvement of business performance. Ensures consistent quality service outcomes.

## SKILLS AND KNOWLEDGE

### Skills

- Apply analytical thinking to the solution of problems
- Analyse and interpret research results and other data
- Use practical technical skills for laboratory experiments and to operate equipment
- Possess strong written and verbal communication skills
- Participate effectively as a member of a team
- Accurately follow instructions and think independently
- Apply skills and knowledge in situations that may differ widely from what was encountered at university

### Knowledge

- Have a thorough understanding of chemistry and chemical compounds
- Competent at safely handling, storing and producing large quantities of chemicals
- Solid understanding of quality systems (e.g. NZS/ISO/IEC 17025)

## PERSONAL QUALITIES

- Accurate and observant with an eye for detail
- Patient and persistent, able to deal with setbacks in their research
- Enquiring, enthusiastic and motivated
- Able to think creatively about new research methods and new uses for chemicals
- Well organised, methodical and a good planner

## SALARY GUIDELINES

Pay rates depend on qualifications, experience and industry.

	Salary (per year)
Bachelor's degree graduate roles	\$35,000 - \$49,000
Research chemists with a master's degree	\$55,000 - \$75,000
Entry research roles for PhD graduates	\$60,000 - \$76,000
Research team leaders (permanent contracts)	\$130,000 or more
Analytical chemists working in industry	\$50,000 - \$60,000

Sources: futureintech.org.nz and , Careers NZ, payscale.com, Trade Me, Douglas Pharmaceuticals

Salary range is indicative of the New Zealand job market at the time of publication (mid 2017) and should only be used as a guideline.

## PROFESSIONAL REGISTRATION

Registration or professional membership is not a requirement in most areas; however it may be an expectation of some employers.

## THE AUT APPROACH

In addition to theoretical content, AUT Chemistry graduates benefit from a strong emphasis on practical skills, including the application of chemistry to real circumstances and the development of essential practical laboratory skills needed to be successful in scientific employment. The Bachelor of Science, including the Chemistry major, is taught only at the City Campus.

## CHEMISTRY STUDY OPTIONS

AUT offers the B.Sc in Chemistry at undergraduate level, and the Bachelor of Science (Honours), Master of Science and Doctor of Philosophy at Postgraduate level.

Staff research interests include co-ordination chemistry, bioinorganic chemistry, synthetic organic chemistry, biological chemistry, ionic liquids, analytical chemistry, and catalysis.

A man with short dark hair, glasses, and a black polo shirt with a small green logo on the chest stands with his arms crossed at a construction site. The background shows a clear blue sky with some clouds, trees, and construction equipment.

## KAPISH GOBINDLAL

Environmental Scientist, Geosciences Ltd

Bachelor of Science (Honours First Class) in Chemistry

“In my role, I consult on environmental issues related to soil and groundwater contamination. For example, if we find a site is contaminated we work with the client to remediate any hazardous material that could pose a threat to human health or the environment.

I conduct a variety of assessments dependent on the needs of the client. My role is extremely varied, including: desktop studies (determining the contamination risk of a site based on historic information), site inspections, sample collection of soil and water samples, critical analysis of laboratory results, preparing reports, presenting findings, research, and meeting with clients and council/regulatory bodies.

Communicating scientific information to the community/clients/stakeholders is extremely gratifying as I am able to utilise my theoretical knowledge of environmental processes in ‘real world’ situations.

This was my first position after completing my honours degree. Longer term, my aim is to pursue a PhD in Chemistry and straddle the line between academia and industry. I believe there is a market for environmentally friendly remedial technologies and high quality research: that’s where I’d like to be within 10 years.”

## EMPLOYER COMMENT

“The environmental consulting industry is dynamic and challenging. The wider community is now very aware of the anthropogenic impact on the environment. Consequently, our role as environmental scientists is constantly growing. In graduates, we look for a sound understanding of environmental processes and an eagerness to learn and develop skills related to environmental consultancy.

Out of a large number of applicants, Kapish stood out with his understanding of environmental chemistry, research capabilities and positive attitude. He demonstrated his initiative when he walked into our offices and presented his CV in person after we had advertised for the role. He has an amicable personality which we value in our working environment.

Work experience is always valued. It shows the applicant has the ability to cope effectively in a working environment. In our field, any postgraduate research is also a positive.”

**Johan Faurie**

Director, GeoSciences Ltd, Auckland

## USEFUL WEBSITES

### International Union of Pure and Applied Chemistry

[www.iupac.org](http://www.iupac.org)

### New Zealand Institute of Food Science and Technology (NZIFST)

[www.nzifst.org.nz](http://www.nzifst.org.nz)

### New Zealand Institute of Chemistry

[www.nzic.org.nz](http://www.nzic.org.nz)

### Royal Society of Chemistry

[www.rsc.org/careers](http://www.rsc.org/careers)

### American Chemical Society


[www.acs.org/content/acs/en/careers/college-to-career/chemistry-careers.html](http://www.acs.org/content/acs/en/careers/college-to-career/chemistry-careers.html)

## FURTHER INFORMATION

For the most up-to-date information on the study of chemistry and the Bachelor of Science, please visit our website: [www.aut.ac.nz/chemistry](http://www.aut.ac.nz/chemistry)


### FUTURE STUDENTS

Contact the Future Student Advisory team for more information: [www.aut.ac.nz/enquire](http://www.aut.ac.nz/enquire)  
[futurestudents@aut.ac.nz](mailto:futurestudents@aut.ac.nz)

 @AUTFutureStudents

### CURRENT AUT STUDENTS

Contact the Student Hub Advisors team for more information: 0800 AUT UNI (0800 288 864)  
[www.aut.ac.nz/enquire](http://www.aut.ac.nz/enquire) | [studenthub@aut.ac.nz](mailto:studenthub@aut.ac.nz)

 @AUTEmployabilityandCareers

### EMPLOYABILITY & CAREERS


For other Future Career Sheets visit:  
[www.aut.ac.nz/careersheets](http://www.aut.ac.nz/careersheets)


For employability and career support, AUT students can book an appointment through <https://elab.aut.ac.nz/>


### CITY CAMPUS


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.

