

BIOMEDICAL, CLINICAL, MEDICAL LABORATORY, MOLECULAR and CELL BIOLOGY SCIENCES CAREER SNAPSHOT

Applied life sciences such as **biomedical or molecular and cell biology** are concerned with understanding the life processes leading to development of diagnostic devices and novel clinical treatments to extend healthy life, combat ageing, afflictions such as dementia or depression and inheritable and acquired disease.

Industry Snapshot

Applied life sciences are the stage for transformative multidisciplinary projects e.g. [Virtual Human](#) and [in silico medicine](#), as well as new approaches such as patient centricism leading to [predictive](#) and [personalised](#) medicine. Governments and insurers pressing for **results** such as cure, prevention and early intervention, over ongoing treatment, pose a range of challenges and exciting opportunities for the industry. Many new jobs will combine biomedical or molecular and cell biology knowledge with insights derived from data science.¹

Many job opportunities in Queensland can be located in the primary health care diagnostics and clinical measurements (e.g. Queensland Health including 35 laboratories of Queensland Pathology, Mater Hospital, several private pathology and clinical measurements companies) - for example Townsville HHS employs over 6200 people⁶, some of them being biomedical sciences graduates.

Australia, being home to over 480 biotech companies, has one of the largest biotech industries in the world², and work opportunities in health R&D (research and development) will be available for

the years to come due to the increasing global sales of prescription drugs for the most common diseases and genetic treatments for orphan (rare) conditions (expected to grow by 2022 by up to 110%¹).

Out of nearly 900 life sciences industry companies in Australia about two thirds are based in NSW and Victoria followed by Queensland (approx. 11%). About 84% of those companies are SMEs (Small to Medium sized Enterprises)³ including startups that carry the bulk of discoveries¹ and can be set up in regional centres.

Research institutes are another large employer group in the life sciences sector, where 69% of the research activities are in health and biomedical research, and 66% of the research organisations are based in New South Wales and Victoria while about 14% are in QLD³.

Queensland's life sciences sector boasts more than 250 companies, 85 core biotech companies and 80+ biotech-related research facilities employing more than 6600 researchers⁴. The biomedical jobs numbers in the state are predicted to grow from 9,440 in 2016 to 10,783 in 2021 to 12,420 in 2026⁵.

1. [Global life sciences outlook: Deloitte 2018.](#)
2. [Australian Life Sciences and Biotech – Key themes and Trends.](#)
3. [Australia's Life Sciences Sector Snapshot 2017.](#)
4. [Queensland Life Sciences Globally Competitive 2018](#)
5. [Queensland Biomedical 10-Year Roadmap and Action Plan 2017.](#)
6. [Townsville Hospital and Health Service Annual Report 2018](#)

* All links in this snapshot were accessed in November 2018.

Careers

While some individuals study biomedicine and science (molecular and cell biology) as a preparation for study of medicine, many construct exciting careers in:

- **Clinical sciences** working as part of a hospital team to conduct **clinical measurements** on patients such as sleep analysis, respiratory function, or ECG (Bachelor of Clinical Sciences Honours) – for more information view this [video](#)
- **Pathology or other medical laboratory science** providing diagnostic analyses and reports on tissues, bodily fluids or blood through operating laboratory machinery (Bachelor of Medical Laboratory Science) – for more information view this [video](#)
- Fundamental [research](#) (requires further study) that uncovers the mechanisms of life and informs medicine
- Academic research and teaching
- Commercial R&D within established, usually large to very large pharmaceutical or medical devices companies
- Innovation, R&D entrepreneurship within the start-up ecosystem
- Contract research organisations (CRO) e.g. clinical trials
- Specialised [allied health professions](#) (with further specialised training where your bachelor degree is a prerequisite) e.g. sonography, perfusion, renal dialysis or genetic counselling
- [Biomedical manufacturing](#), technical support, distribution, procurement or sales of medical devices or pharmaceutical products
- Industry bodies and professional organisations
- [Regulatory affairs](#)
- [Management consulting](#) or policy
- Science communication, medical writing or [secondary teaching](#) (with further training)

Gain Skills and Experience While You Study



BOOST YOUR PROSPECTS



Explore your options and career goals



Build your networks



Gain experience



Fine tune your job search skills



Show initiative and stand out

For further ideas access the [JCU Career Action Plan](#)

Your course will prompt you to develop professional and laboratory skills so it is essential that you keep a systematic record of your skills development including descriptions of projects in which you used them and to what effect e.g. collecting, preparing & testing of samples, design of experiments, use of laboratory manuals and records, WHS etc.

Given the great variety of career options available, we recommend that you pursue an extracurricular activity each semester with a clear developmental goal. Those experiences will help you define your interests and preferences in relation to the purpose, the industry type, work environment and organisational culture you may want to aim for in the future. You will also develop professional networks, transferable skills that make you effective in the workplace, and stories to tell in your job applications that will set you apart.

For example, if you are thinking of working directly with patients, you could join the ranks of [volunteers at Townsville Hospital](#) where you can learn to communicate confidently with diverse audiences, calm and comfort patients, extract relevant information from them and give effective instructions.

If you are considering science communications or teaching you could join the university's [student mentor program](#) to practice conveying complex information in simple terms. Further, you could participate in British Council's [Famelab](#) – a renowned science communication competition.

To impress future employers with your initiative and ability to make things happen, your entrepreneurship networks, confidence in identifying problems and developing smart solutions in multidisciplinary collaborations, you could start an entrepreneurship club with [JCUSA](#)'s support, participate in [iNQ](#) Socials such as "Pizza & Brews" or "Lunch'n'Learn", tap into the [WiRE \(Women in Rural Regional and Remote Enterprises\) Program](#) or try [EY's Survive The Panel competition](#). For more information on Life Sciences entrepreneurship access the [MedTech and Pharma Growth Centre's \(MTPConnect\)](#) website.

To learn more about innovation and entrepreneurship, you might like to check the online self-paced courses that JCU has enabled access to: [Developing an Enterprising Mindset](#) or [Lynda.com](#) – for example: *Guy Kawasaki on Entrepreneurship*; *Design Thinking: Venture Design* and apply the learning to making a business plan for commercialisation of your own research. You may access help from [JCU Innovation and Commercialisation Team](#) for commercialisation of your research.

For further skill development opportunities keep an eye on the JCU job board [CareerHub](#) and also the [Volunteering, competitions and challenges](#) page.

Identifying Opportunities and Graduate Job Search

To further complement your skills developed in your course and your extra-curricular activities, you may like to engage in biomedical laboratory placements.

While the four year Clinical and Medical Laboratory Science streams offer mandatory specialised clinical placements in the last year, the three year Bachelor of Biomedical Sciences offers an observational placement in year one and also a non-mandatory placement available throughout, recommended for year three. The more diverse lab experiences you complete, the better.

The departmental annual biomedical careers expo is a great source of information on the opportunities within the local health care, as is the career forum in the first semester of the first

year that may lead to a placement in the second semester of year one.

If you are more interested in a R&D career, take advantage of the third year research capstone subject and summer research scholarships with JCU laboratories in Townsville and AITHM in Cairns that may be available subject to funding.

For further opportunities and graduate jobs contact startups/SMEs and life science research institutes listed below. They often welcome passionate students with a "can do attitude". If they are not actively advertising, you can still send an "expression of interest" summarising how this particular organisation is a great match with your career goals, values, interests, knowledge, experience and skills, focusing on your enthusiasm and the contribution you can make.

- [Life Sciences QLD Directory](#)
- [QLD Science Capability Directory](#)
- [MedTech & Pharma Sector Directory](#)
- [AusBiotech Directories](#)
- [BioMelbourne Network Directory](#)
- [BioPharmGuy: Directory](#)
- [MedicalStartups: Directory](#)
- [AngelList: Healthcare Startups](#)

Jobs, placements and internships may be posted on websites of large pharmaceutical firms listed here:

- [Medicines Australia Directory](#).

For local healthcare laboratory jobs check: [Queensland Health](#), [Medlab](#), [Sullivan Nicolaidis](#), [QML](#)

Professional Associations

Membership in a professional organisation is a clear signal to employers about your commitment to the profession and professional development as well as a great way to expand your professional network. Join relevant student clubs at [JCUSA](#). Consider student memberships in the following professional associations.

- [Australian Institute of Med. Scientists](#)
- [AU Assoc. of Clinical Biochemists](#)
- [AU Society for Microbiology](#)
- [AU Soc. For Biochemistry and Molecular Biology](#)
- [ANZ Society for Cell and Developmental Biology](#)
- [AU Assoc. of Clinical Biochemists](#)
- [ARCS Australia](#)