

# Industry snapshot: What do we know about the work of biological sciences?

The 2013 Australian Graduate Survey collected data from 4,227 graduates from Biological Sciences degrees. Data was collected between four and six months after graduation.

## Population

Data was collected from graduates with the following characteristics:

Characteristic	Number	Percentage
Male	1,595	37.7
Female	2,632	62.3
Median age	23	-
First language English	3,112	74.6
First language Other	1,059	25.4
Graduate from undergraduate degree	3,461	81.9
Graduate from postgraduate degree	755	17.9

## Overall outcomes

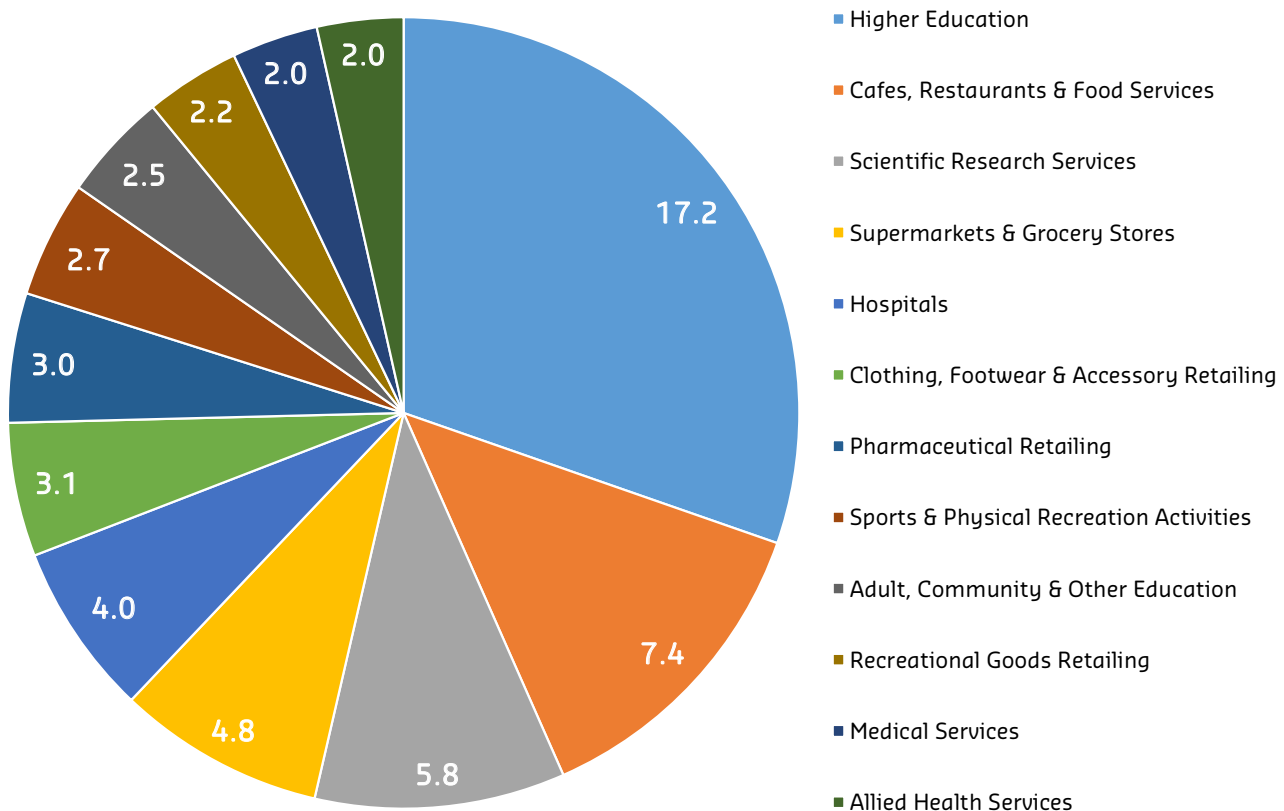
Overall, 40.3 per cent of graduates were working part-time, 23 per cent were working full-time and 3.2 per cent were self-employed. In relation to studying, 42.3 per cent were studying full-time and 3.5 per cent were studying part-time.

Status	Number	Percentage
Full-time work	958	23
Part-time work	1,679	40.3
Self-employed	83	3.2
Studying full-time	1,750	42.3
Studying part-time	146	3.5

## Employment outcomes

Of the 2,638 graduates who were working, whether part-time, full-time or self-employed, the largest area of employment was higher education, accounting for 17.2 per cent of graduates. Other graduates were distributed across multiple employment areas.

The chart below illustrates just those areas in which at least 2 per cent of graduates were employed.



## Further study

Of the 1,897 graduates who were undertaking further study, 51.3 per cent were studying in the field of natural and physical sciences (including biological sciences) and 32.3 per cent were in the field of health.

## More information

For more information on the outcomes of graduates from Biological Sciences degrees, degrees, please visit [www.graduatecareers.com.au](http://www.graduatecareers.com.au).

## What is the broader employment context?

The life sciences cover a broad range of disciplines involving the scientific study of living things. These include parts of the environmental sciences focusing on biology in ecological systems through to the "molecular" disciplines such as biochemistry. The life sciences can be studied in a variety of contexts including relating to the environment, or in support of clinical disciplines such as nursing, physiotherapy or paramedicine.

The life sciences are addressed through both degrees with a professional focus and through general science degrees. Thus the degree to which employability is addressed varies greatly. Often life sciences are studied in a general degree, such as biomedical science, as preparation for graduate professional studies. This strategy is becoming more common with the adoption of the "Melbourne Model" of a general degree followed by graduate professional study.

Another consideration with the life sciences is that, outside the clinical professions, a substantial proportion of employment is directly related to higher education and research. This is borne out by the graduate outcomes for the life sciences where the single largest area of employment is higher education (17%). Beyond this, graduates go into a multitude of industry areas - retailing and medical services being two examples.

## Employability for life sciences in general degrees

The life sciences are characterised by poor levels of graduate full-time employment, high levels of continuing full-time study and below average levels of relevance of their degree to the jobs they secure after graduation (Graduate Careers Australia, 2013). The apparent poor employment outcomes for life science graduates are not new. McInnis, Hartley and Anderson (2000) reported the life sciences then had the lowest full-time employment rates.

In the same survey, McInnis et al (2000) also found that almost half of science graduates obtained professional or managerial jobs within one year of graduation. Another 20% had jobs at a technical level. And around 80% thought their job was an appropriate part of their career path. The majority of graduates remained within the general area of science: 70% of those employed were working for an organisation with a scientific focus.

However, more recent data from the 2011 Census shows that people with a degree in the life sciences did not enjoy as good an employment outcome as those in technology, engineering, and mathematics as they were least likely of all science disciplines to be in professional or managerial employment (less than 60%) (Norton, 2013).

Despite the poor employment outcomes in the sciences there has been an increase in enrolments, which, according to Norton (2013) has been a result of government policy encouraging students to take up STEM disciplines. Advocates for science education have argued graduate employment rates, as measured by the Australian Graduate Survey, are not adequate in judging generalist degrees where career outcomes are less clear than professionally oriented degrees (Ross and Hare, 2014).

There have been attempts to place the life sciences in a more industry-relevant context: several Australian universities, such as the University of Queensland, the University of New South Wales, Flinders University and Monash University, have run degrees with a vocational emphasis in the area of biotechnology (see Brack, Schmidt & MacKinnon, 2010). Anecdotal evidence has shown that these degrees have not enjoyed the popularity that degrees in biomedical sciences have. This probably reflects the relatively few positions in the biotechnology industry, together with the insufficiency of an undergraduate degree for the few industry positions that exist.

In another project conducted by Monash University, all biotechnology employers consulted stated that they preferred to appoint science graduates with an Honours degree (MacKinnon, personal communication). This was because the Honours degree involves a substantial research project, developing the research and other skills required in the scientific workplace. In the sciences, undergraduate research projects take the form of an “apprenticeship” in which a student is attached to a research laboratory and receives training from experienced members of the laboratory.

The intensive nature of the project is one of its limitations. According to Brew and Jewell (2012) only up to 2,000 students across all disciplines engage in such activities annually. This represents a tiny proportion of the total enrolments in the life sciences. It is unlikely that there is capacity in the life science research sector to greatly increase this number. This means that a less intensive form of research activity would be necessary if it were to be more widely implemented.

## Things to think about

1. When considering undertaking a life science degree, be aware that the majority of life science graduates continue into further study. This can be graduate professional study, or it can be a research degree (usually preceded by an Honours year). According to the Graduate Destination Survey data, there is no single clear professional track for life science graduates.
2. An undergraduate degree alone is unlikely to lead to a career in science. A qualification including experience in scientific research may be required. At the minimum an Honours year is required, but a higher degree by research (PhD) is not uncommon.
3. Most direct employment in the life sciences is associated with higher education and research. Again the Graduate Destination Survey data shows no single large employment group outside of this sector.
4. General life science degrees will expose students to scientific research. At the end of a degree graduates will have sound scientific knowledge and a good understanding of research, but will have limited experience at doing scientific research. It is most likely that industry exposure will be limited to the scientific research laboratory.
5. According to our case studies, general employability skills are not prominent in general life science degrees. Our case studies suggest that extra-curricular activities including part-time employment and volunteering are important for employability skills development.

## References

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- Prepared by Dawn Bennett (Curtin University) and Sarah Richardson (Australian Council for Educational Research).
- Access to data from the 2013 Australian Graduate Survey provided by the Australian Government Department of Education.

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