MTPConnect

Australia's Life Sciences
Innovation Accelerator

Pulse Report

THE PATH TO GROWTH: WORKFORCE AND SKILLS GAPS IN AUSTRALIA'S COMPLEX THERAPEUTICS MANUFACTURING

April 2025

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PREFACE

Welcome to another MTPConnect Pulse Report, a regular series providing unique insights, information and thought leadership on Australia's medical technology, biotechnology and pharmaceutical sector, tailored for medical science clients of the Industry Growth Program.

The importance of life sciences to the Australian economy is well-established: the sector supports more than 80,000 Australian jobs and contributes more than $8 billion in Gross Value Added, growing at 6.3 per cent per annum since 2016 and rich potential for much more.

However, the future growth of the sector is dependent on the skills and capacity of its workforce.

The sector faces ongoing challenges in developing, attracting and retaining world-class talent, particularly people with experience in research translation, clinical applications, Good Manufacturing Practice (GMP) for advanced manufacturing and commercialisation.

This Pulse Report examines the current and future workforce requirements in the emerging complex therapeutics manufacturing sector.

The findings, derived from an extensive survey of views from key Australian employers investing in this sector, show that there is considerable work to be done if Australia is to deliver on its substantial investments in this critical sovereign manufacturing capability.

They also demonstrate that the challenge remains to ensure growing and scaling medical science SMEs can access the skilled staff they need, here in Australia, to get their products to market and ultimately to patients.

Meeting this challenge brings significant upside: investing to upskill our life sciences workforce is about creating more jobs, building resilient companies, increasing sovereign capability and more secure supply chains for vital medicines, and all the while moving Australia up the global innovation league table.

MTPCONNECT'S ROLE SUPPORTING WORKFORCE DEVELOPMENT

MTPConnect is Australia's life sciences innovation accelerator, an independent, not-for-profit organisation dedicated to supporting the growth of Australia's vibrant medical products sector.

In 2024, MTPConnect was selected as an Industry Partner Organisation under the Industry Growth Program (IGP). With Medical Science identified as one of seven priority areas in the IGP, MTPConnect provides sector-specific expertise to help support SMEs and start-ups in the program.

Since 2015, MTPConnect has been focusing its activities on improving management and workforce skills to support the growth of the life sciences sector.

From 2020–2023, MTPConnect delivered the $32 million Researcher Exchange and Development within Industry (REDI) program. This Medical Research Future Fund-backed initiative, delivered in-demand training, mentoring and industry placements to more than 8,400 participants across Australia. The impact of these activities delivered over three and a half years are summarised in the report *Improving workforce skills in Australia's medical products sector*.

Three comprehensive skills gap reports were published, identifying a total of 81 skills gaps, which were categorised into seven themes with the 24 most impactful opportunities comprehensively described. These represent a mixture of new and emerging gaps covering the full value chain from pre-production, production and post-production and focus on the most important skills for building a resilient and competitive medical products sector.

The third report, *Positioning the MTP workforce for post-pandemic prosperity*, examined skills gaps that have grown in importance because of the COVID-19 pandemic. This report focused on biosecurity, infectious disease resilience and advanced manufacturing. Collectively the four gaps highlighted below relate to the design and development of drug and vaccine design using a sovereign supply chain based predominantly within Australia.

1. Shortage of Good Manufacturing Practice (GMP) - trained staff for advanced manufacturing of high-value therapeutics
2. Lack of process design expertise
3. Lack of a commercialisation competency framework/resource for SMEs
4. Lack of in-silico (computational) skills for drug and vaccine development

As a result of the analysis, MTPConnect delivered the GMP Uplift Training Program around Australia, upskilling 400 individuals working in manufacturing roles. These activities concluded in 2024.

EXECUTIVE SUMMARY

Australia's investment in complex therapeutics requires a skilled workforce.

- There has been a significant investment (in excess of $5 billion) by government and industry in new and upgraded facilities for complex therapeutics manufacture in Australia.
- For the benefits of these investments to be realised, a corresponding investment in developing this specialised skilled workforce is required.
- There has long been an understanding that there is a shortage of suitably skilled workers, but the actual workforce requirement to support this emerging, sovereign manufacturing capability has not been identified.
- **MTPConnect's analysis shows that size of this skilled workforce at the end of 2024 was 1,389 and that by the end of 2027, an additional 1,490 people will be required.**
- There is an urgent requirement for this skilled workforce in all mainland states, across all job roles and all career stages.
- There is currently no national complex therapeutics manufacturing skills framework and training plan in place.
- A coordinated, national and industry-led approach to meeting the workforce challenge is best placed for success.

BACKGROUND

Since 2020, more than $5 billion[1] has been invested in the development and upgrading of facilities for manufacturing complex therapeutics around Australia. Local investment has been mirrored globally, with multinational contract and development organisations (CDMOs) undertaking significant expansion.

It has long been recognised that there is a significant shortage of suitably trained and competent people in the therapeutics manufacturing sector in Australia, a problem which will be further exacerbated in the coming years as new facilities around the country come online and demand for these new medical products grows.

To realise the return on the significant investment, an understanding of workforce requirements is required to inform development of a nationally coordinated workforce and skills plan.

In this report, we present results of a direct survey of major and emerging employers in the sector, providing an understanding of the current state of play, the expected demand, and requirements at the end of 2027.

COMPLEX THERAPEUTICS IN SCOPE

The Australian Government's Medical Science Co-Investment Plan highlights that Australia is best placed to compete globally in the area of "high value and advanced therapeutic products" and uses the term "complex therapeutics" to differentiate these therapies from traditional high-volume, low-value, small molecule medicines.

These "complex therapeutics" include nucleic acid-based therapies (including mRNA, siRNA et al.), antibody-based therapies (including antibody-drug conjugates, targeted radiotherapies, bispecific antibodies et al.), cell and gene therapies and protein-based therapies.

Skills needed to manufacture these complex therapeutics inevitably overlap with those needed to manufacture traditional small molecule drugs, complementary medicines and veterinary medicines. Similarly, the burgeoning field of synthetic biology also shares common skill requirements, particularly in process development.

However, for the purposes of this report, we have excluded workforce requirements for these sectors, focusing only on requirements for manufacture of complex therapeutics.

SURVEY APPROACH

The goal of the survey was to understand current workforce size across Production, Quality, Process Development and Maintenance (definitions for the purposes of the survey included in appendix) and at entry, mid and senior level.

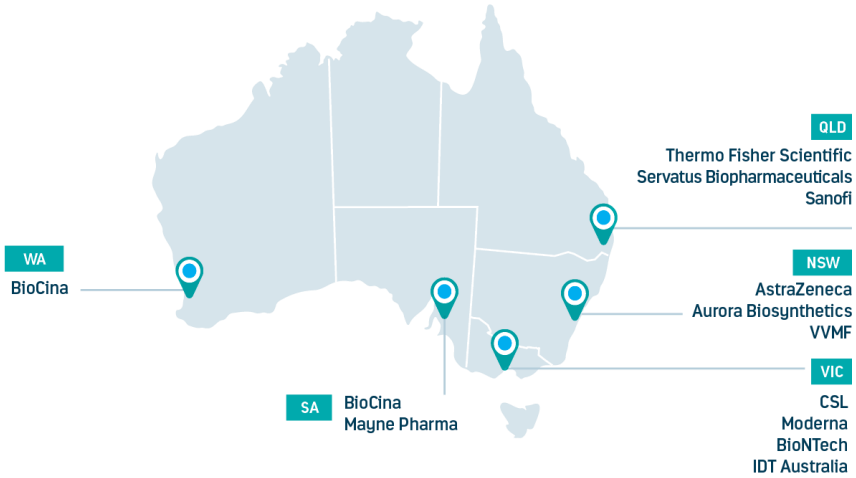
The survey also aimed to understand the extent to which the availability of suitably trained individuals is an issue now, and the extent to which it is likely to be an issue in the future. The approximate education level (Bachelor, PhD etc.) of the current workforce was also captured.

[1] MTPConnect analysis, data on file. March 2025

NATIONAL CONTEXT FOR WORKFORCE SHORTAGES

There is a significant workforce shortage in every mainland state. We do not present state level requirements in this report, as some organisations expressly requested this information remain commercial in confidence as a condition of responding. Echoing the findings of the Australia's RNA Blueprint Report, released in mid-2024, the industry expressed a strong need for an industry-led, nationally-coordinated approach.

Distribution of major companies undertaking facility investment



Through direct survey of the relevant companies in the sector, MTPConnect has identified that in order to maximise return on the investment in complex therapeutics manufacturing, the workforce needs to more than double by the end of 2027.

The size of the workforce at the end of 2024 was 1,389. To meet current and future demand, the workforce needs to be doubled by the end of 2027, with an additional 1,490 people required.

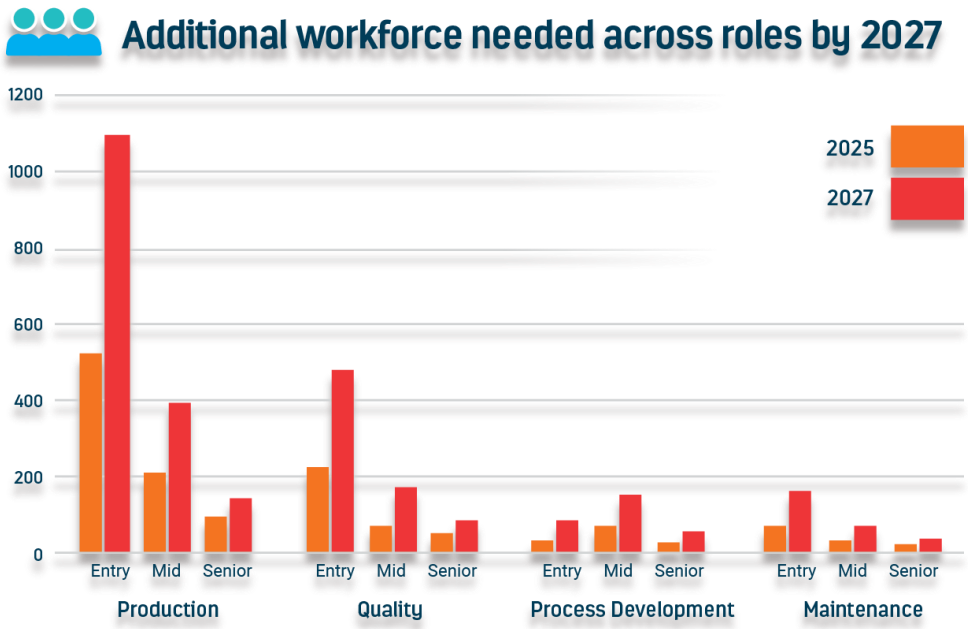


Figure 1 Overview of additional workforce required by the end of 2027 across role types and career stage (entry, mid and senior roles).

As summarised in Figure 1, the additional individuals are needed across all types of roles, and at all career stages. Production (97 percent increase), Quality (117 percent increase), Process Development (128 percent increase) and Maintenance (125 percent increase), with 'production' having the largest absolute requirement for new skilled workers.

While Production, Quality and Maintenance had the highest number of workers at entry level, individuals working in Process Development are predominantly in mid-level roles.

Responses to the question "What roles do PhD qualified workers generally undertake?" indicated that those working in Process Development tend to be PhD-trained. The rise of synthetic biology, including companies producing alternative proteins, will likely be a source of competition for individuals with these skills.

Figures 2 and 3 (below) show the extent to which companies feel recruitment of suitably qualified candidates is an issue now (Figure 2), and the extent to which they feel it will be an issue for their business in the future. Right now, 74 percent of respondents say recruitment is either a moderate or high concern.

This number increases to over 90 percent in the future. The survey did not address the ability for companies to retain talent, but free text responses suggest that this is also a major concern amongst respondents.

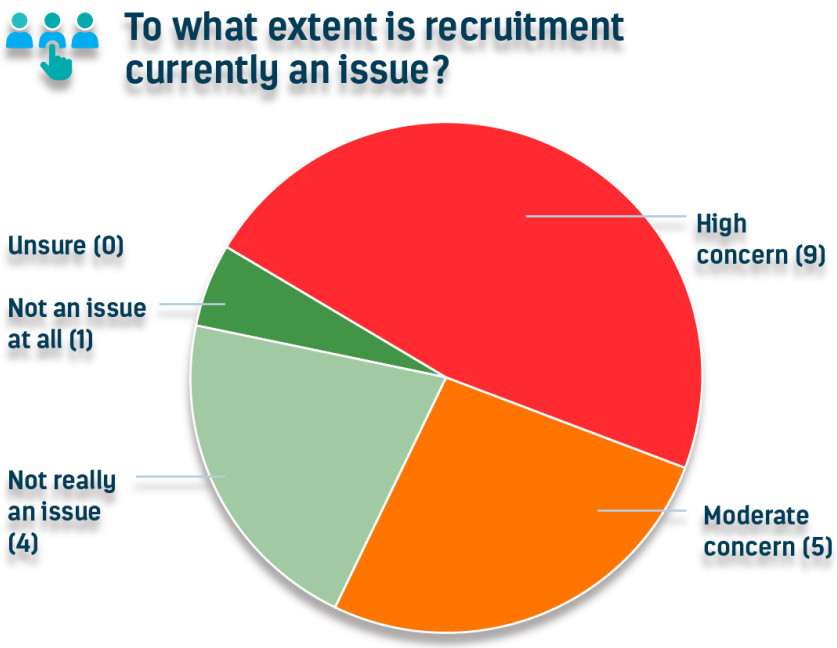


Figure 2 Extent to which recruitment of suitably qualified candidates is currently an issue.

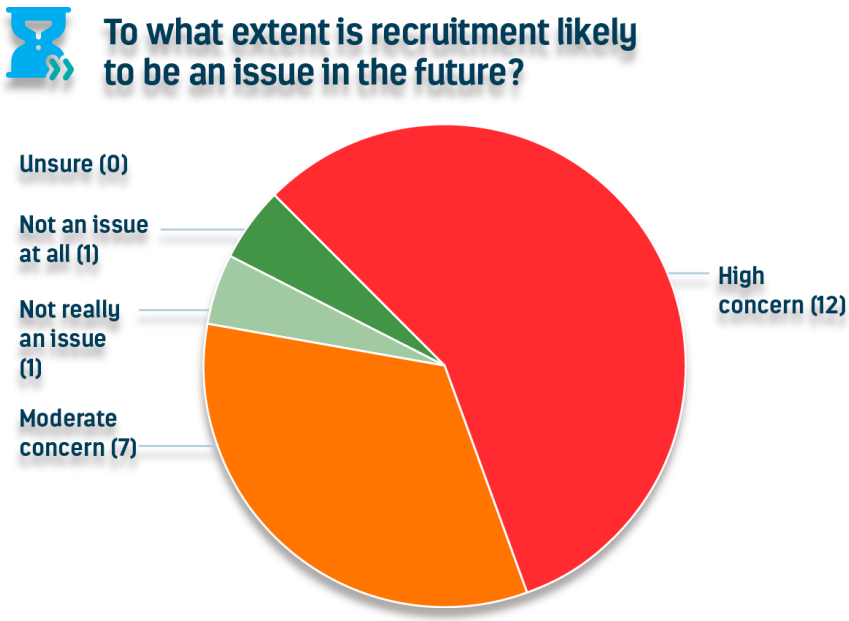


Figure 3 Extent to which recruitment of suitably qualified candidates is likely to be an issue in the future.

SOLUTIONS

The results of MTPConnect's survey show that there is a need for skilled workers in complex therapeutics manufacturing across all states, role types and career stages. A nationally coordinated and industry-led approach to- meeting the workforce challenge is best placed for success, with efforts requiring collaboration from government (migration), universities and the education sector, alongside industry and employers.

Development of a national complex therapeutics manufacturing skills framework would provide clarity about skills and knowledge required for each role to help companies with recruitment and professional development of staff as they progress with their career. It will also help with retention of staff who see this as a career, not just a job.

The framework will allow universities and training organisations to develop courses against standardised skillsets, greatly simplifying the process of developing new courses - not just for entry level roles, but for mid and senior level staff as well.

Development in consultation with all stakeholders, but especially industry, would confirm appropriately skilled workers were coming through the system.

At the entry level, industry has highlighted the need for hands-on experience providing work-integrated learning. Employer feedback suggests that internships should be at least six months in duration, as it takes this long for workers entering the sector to develop the skills to work independently. There is not necessarily a need for tertiary qualifications and TAFE and other registered training organisations (RTOs) are well placed to play an important role.

At a mid and senior career level, there is a role for carefully calibrated skilled migration programs to boost workforce supply. While Australia does have acknowledged advantages when it comes to quality of life, we are also competing in a global market where skilled individuals are in high demand.

For the purposes of the Skilled Occupation List and Classification of Occupations, a broader definition of "biotechnologist" to include people involved in manufacture, not just geneticists and biologists, would be beneficial for overall workforce development and capability.

The fellowship program, delivered under MTPConnect's REDI workforce program, is an example of an initiative that successfully facilitated movement of researchers between academia and industry with the ability to fill gaps in more senior roles.

CONCLUSION

Australia has the facilities and infrastructure to play a significant role in the development, manufacture and supply of complex therapeutics for the local market (including clinical trials), broader region and globally.

However, to realise a return on investment on the upgrade and development of new facilities, a corresponding investment into programs and initiatives that develop these specialised skilled workers is also required.

The survey results reveal a need to double the number of skilled workers in complex therapeutics manufacturing across Australia by the end of 2027.

They also highlight the potential for a coordinated national and industry-led approach to successfully meet the workforce challenge and set-up the sector for future success.

Approaches should include:

1. National Skills Framework: Developing a national complex therapeutics manufacturing skills framework would clarify role-specific skills and knowledge, aiding recruitment and helping training organizations create standardized courses. This would particularly benefit smaller companies lacking in-house training programs.
2. Entry-Level Solutions: There is a demand for hands-on experience, with employers suggesting internships of at least six months to develop independent working skills. Tertiary qualifications are not essential and TAFE and other RTOs could play a key role.
3. Mid and Senior Career-Level Solutions: Skilled migration programs can help address workforce shortages, particularly in senior roles.
4. Investment in Workforce Development: To maximise returns from upgrading facilities, implementing programs that develop specialised skilled workers in parallel with infrastructure improvements will help enable Australia to play a significant role in the global complex therapeutics market.

APPENDIX

Term	Definition for the purposes of this survey
Production	Staff in roles relating to operation and monitoring of manufacturing equipment on a production line.
Quality	Includes QA and QC functions. Staff who develop, validate, or apply processes to identify deviations and potential risks in manufacturing processes, or collect data in support of these activities.
Process development	Staff involved in roles relating to the development of processes for pharmaceutical manufacture.
Maintenance	Staff in roles relating to installation or maintenance of manufacturing equipment and systems.
Entry level	Staff predominantly involved in roles that require them to follow established SOPs. Minimal people management responsibilities.
Mid level	Also known as leading hand. Staff responsible for managing others and ensuring that SOPs are followed.
Management/senior	Staff with strategic oversight responsibilities. Responsible for major decisions.

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