

Please note: the substantive content of the 2026 NRI Roadmap Survey begins at Question 20 (with prior questions dealing with administrative and other information).

As such all submissions that are published include the responses submitted from Question 20 onwards only.

Q20.

Part 2: Research themes

2.1 NRI comprises the assets, facilities and associated expertise to support leading-edge research and innovation in Australia and is accessible to publicly and privately funded users across Australia and internationally. We are seeking your input on possible directions for future national-level investment - i.e., where the requirements are of such scale and importance that national-level collaboration and coordination are essential.

The [2021 Roadmap](#) used a challenge framework to support NRI planning and investment. With this in mind, consider likely future research trends in the next 5 - 10 years, and with respect to one or more of the 8 challenge areas identified in the 2021 Roadmap as listed below:

- describe emerging research directions and the associated critical research infrastructure requirements that are either not currently available at all, or not at sufficient scale and
- describe current national infrastructure requirements that you anticipate will no longer fit the definition of NRI in 5-10 years.

Do not limit your commentary to NCRIS funded capabilities.

Q21.

Resources Technology and Critical Minerals Processing

Q22.

Food and Beverage

Q23.
Medical Products

Q24.
Defence

Q25.
Recycling and Clean Energy

Q26.
Space

Q27.
Environment and Climate

Q28.
Frontier Technologies and Modern Manufacturing

There is not enough national capacity in high performance computing and data storage/archive to accommodate the amount of data being generated by researchers and national facilities in the synthetic biology and biotechnology space. These facilities and researchers are working with ever increasing data file sizes (scale of experiments and files generated by cutting-edge high-throughput equipment) which cannot be managed using desktop computing infrastructure and need large scale computing to process and store. For example, the Australian Genome Foundry requires computing resources for multiple types of analysis that are too large for local CPUs to process e.g. genome sequencing & sequencing data analysis, untargeted metabolomics, integration of multiple types of 'omics data, flow cytometry & cell sorting data, microscopy images. The rapid expansion of deep learning and artificial intelligence tools is already affecting our molecular biology work (e.g. AlphaFold, protein engineering) and is anticipated to exponentially increase in the next 5-10 years.

Q29.

2.2 The 2024 statement of National Science and Research Priorities (NSRPs) includes outcomes linked to each priority to assist in identifying critical research needed in the next 5 to 10 years.

Consider the priority statements and, with respect to one or more of the 5 priority areas as listed below:

- describe emerging research directions and the associated critical research infrastructure requirements that are either not currently available at all, or
- not at sufficient scale and describe current national infrastructure requirements that you anticipate will no longer fit the definition of NRI in 5-10 years.

Do not limit your commentary to NCRIS funded capabilities, and where relevant, refer to the underpinning outcomes and research identified in the NSRPs document.

Q30.

Transitioning to a net zero future

Synthetic biology and biotechnology will be essential technologies for building net zero solutions. These technologies will contribute to biomanufacturing and circular economy. Synthetic biology involves building and testing synthetic microbes and organisms. This includes high performance computing (for designing and analysing synthetic constructs) and high-throughput and automated equipment, and cutting edge equipment (for building and testing synthetic constructs/organisms). This will enable Australian researchers to conduct world class cutting-edge research.

Q31.

Supporting healthy and thriving communities

Synthetic biology and biotechnology will be essential technologies for solutions relating to healthy and thriving communities. These technologies will contribute to areas such as RNA vaccines and drug discovery. Synthetic biology involves building and testing synthetic microbes and organisms. This includes high performance computing (for designing and analysing synthetic constructs) and high-throughput and automated equipment, and cutting edge equipment (for building and testing synthetic constructs/organisms). This will enable Australian researchers to conduct world class cutting-edge research.

Q32.

Elevating Aboriginal and Torres Strait Islanders knowledge systems

Q33.

Protecting and restoring Australia's environment

Synthetic biology and biotechnology will be essential technologies for solutions relating to protecting and restoring the environment. These technologies will contribute to areas such as coral conservation and producing 'green' alternatives to products currently produced from fossil fuels. Synthetic biology involves building and testing synthetic microbes and organisms. This includes high performance computing (for designing and analysing synthetic constructs) and high-throughput and automated equipment, and cutting edge equipment (for building and testing synthetic constructs/organisms). This will enable Australian researchers to conduct world class cutting-edge research.

Q34.

Building a secure and resilient nation

Synthetic biology and biotechnology will be essential technologies for solutions relating to Australia remaining a secure and resilient nation. These technologies will contribute to Australia's sovereign capabilities in areas such as RNA research and defending Australia from biological threats. Synthetic biology involves building and testing synthetic microbes and organisms. This includes high performance computing (for designing and analysing synthetic constructs) and high-throughput and automated equipment, and cutting edge equipment (for building and testing synthetic constructs/organisms). This will enable Australian researchers to conduct world class cutting-edge research.

Q35.

2.3 The case for a new NRI capability, or enhancements to existing capabilities, typically emerges through advocacy from research communities clustering around rigorously identified needs and goals. Such a concept could respond to a requirement for novel or expanded capacity within a domain, or across domains, and must be such that it could only be made available with national-level investment.

If you have identified such a requirement, briefly describe the need, the proposed infrastructure capability, the medium-term goals, impacted research communities, and the timeframe over which you advocate its establishment. Your response can include links to relevant existing reports.

Building large scale fermentation infrastructure (1000L and upwards) is too risky for traditional funding sources, so requires government intervention to de-risk these infrastructure ventures. Synthetic biology and biotechnology startup progress will be hindered (or will move overseas) without access to these shared facilities or de-risked options for funding these facilities.

Q36.

Part 3: Industry perspectives

This section is seeking input specifically from industry-based respondents. Other respondents can skip this section.

Recommendation 6 of the [2021 Roadmap](#) related to improvements in industry engagement with NRI. To complement work on this topic that has occurred since then, we are seeking additional advice on NRI requirements as perceived by current or potential industry-based users.

Q37.

3.1 Have you (or your organisation) interreacted with or used Australia's NRI?

☐ Yes

☒ No

Q38.

3.2 If so, please briefly outline the NRI capabilities you (or your organisation) have interacted with or used. Do not limit your response to NCRIS capabilities.

This question was not displayed to the respondent.

Q39.

3.3 Please indicate your (one or more) primary reasons for interacting with NRI:

This question was not displayed to the respondent.

Q40.

3.4 If you answered no, please indicate your (one or more) primary reasons:

- ☐ I did not know about it
- ☐ Other facilities suit my needs better
- ☐ I would like to, but cannot get access due to geographical location
- ☐ I would like to, but believed that access was only available to academic researchers
- ☐ I am not aware of any capability that meets my needs
- ☒ Other (please specify)

I'm not representing an industry-based user

Q41.

Part 4: Other comments

4.1 Please elaborate on any of your above responses or add any other comments relevant to the development of the 2026 Roadmap. Your response can include reference or links to existing reports that you recommend be considered during the 2026 Roadmap development process.

Continuing NCRIS funding for existing capabilities and facilities is crucial to enable the acceleration of Australian research, in both academic and industry settings. Removal of NCRIS funding from existing NRI capabilities would lead to stagnation in Australian research and accelerate the 'brain drain' of Australian researchers to other countries.

Q49.

4.2 Optional Document Attachment.

Note: Our strong preference is that answers are provided against the relevant questions in the survey. However, this file upload option is available for submissions in file format, where needed. Please ensure the document includes your name or organisation.