

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

Use of genomic data to support decision making around regeneration of land post mine closure.

Q22.

Food and Beverage

Use of genomics in plant, livestock and aquaculture breeding programs to accelerate trait selection for increased productivity and improved climate tolerance. Use of genomic data to test food safety (eg microbial testing for spoilage etc)

Q23.

Medical Products

Use of genomic data to assess diagnostic point of care devices efficacy. Use of genomics to fully characterise pathogens, bacterial treatments (bacteriophages), and patient response to treatments.

Q24.

Defence

Use of genomics to improve biosecurity screening in different contexts: - Protection of defence personnel in locations where potential pathogen risks exist (assessment of pathogens present where personnel might be deployed) - Characterisation of pathogens in imported goods (eg foods, or detection of microbes in wood/natural products) - Use of genomics to identify biological organisms in potential terrorism/biological attack

Q25.

Recycling and Clean Energy

Use of genomic tools in synthetic biology; to alter organisms to change enzymes in the development of biofuels.

Q26.

Space

Genomic data is critical to understanding how conditions in space can impact human health and mitigate risk in future space travel. Another critical area where genomics is applied is in understanding how we can sustainably grow plants in space for nutrition. Genomics can be utilised here for both discovery work (what happens to the physiology of plants in space) and in making modification to plants in order to increase the production of nutrients, and improve the plants' ability to grow in space.

Q27.

Environment and Climate

Genomics is a crucial tool in building a deeper understanding of our environment - from understanding diversity of plants, animals, and soils to being able to characterise the impact of climate change on human, animal and plant health. Only with this understanding can we start to adapt to changing climates and protect our environment.

Q28.

Frontier Technologies and Modern Manufacturing

Genomics (and other 'omic technologies) are driving the creation of massive amounts of data. The national infrastructure required to orchestrate the movement of that data, analyse it, and store it will be a huge undertaking in the coming 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

Q31.

Supporting healthy and thriving communities

Genomics has a massive role to play in supporting healthy and thriving communities. Genomics is increasingly being applied to diagnostic testing and personalising treatment plans to improve patient outcomes. It also hold value in preventative health screening in the population. Through the use of genomics, we can identify potential threats of disease early and mitigate risk through changes in lifestyle or early intervention. In order to be able to do this with equity and efficacy, large and diverse population studies will need to be supported. Ensuring the genomic infrastructure in Australia is maintained and updated will be critical to ensuring these types of studies are conducted in country and so can be regulated to ensure benefit to our communities. Maintaining and upgrading genomic research infrastructure is critical to this and making sure that infrastructure can operate under the appropriate levels of NATA accreditation is of equal importance. For this to happen there need to be a mechanism for funding that includes the software required for Laboratory Information Management Systems (LIMS) which tracks samples and data through laboratory and analytical workflows. Upgrading and maintaining LIMS to ensure appropriate NATA accreditation for population studies, clinical trials and translational research programs is a large cost for each research facility (~\$2M) and there is currently no path to funding for this. Without it, we will not have any dedicated research facilities with the capability to perform this critical work.

Q32.

Elevating Aboriginal and Torres Strait Islanders knowledge systems

Q33.

Protecting and restoring Australia's environment

Q34.

Building a secure and resilient nation

Ensuring we have the capability and capacity to perform genomic and other 'omic studies within Australia and to have the infrastructure and compute requirements for analysis and storage of Australian data is of critical importance to building a secure and resilient nation. Genomic data generated through research in Australia is a valuable asset to the nation. The level of population diversity we have in Australian communities also makes that data a valuable asset to other countries and to global industries (such as the pharmaceutical industry). It is important that we protect that data and properly regulate its use. This can only be assured if the samples and data remain sovereign to Australia, rather than sample being shipped overseas, and Australian research funds being used to pay overseas entities to generate the data.

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.

Australia is poised to be of global importance in ensuring there is good global diversity in genomic data sets utilised for clinical trials and drug discovery. We must ensure that we have the appropriate genomics capability and capacity to capitalise on those opportunities. This requires the genomic research infrastructure established using NCRIS funding to be set up to perform genomic testing under NATA 15189 regulatory conditions (clinical accreditation). Currently, there is only one such facility in Australia (AGRF), and the cost of maintaining the required clinical accreditation has been borne entirely by that facility. As the volume of research work requiring clinical accreditation grows (it has grown 100% in the past 3 years) funding support will be required. For example, a common issue for most laboratories with clinical accreditation (eg public and private pathology labs) is having a fit for purpose laboratory information management system (LIMS). LIMS is the infrastructure that orchestrates and tracks the movement of samples and data in and out of the laboratory and analysis processes and is critical to ensuring compliance with the regulatory requirement of processing clinical samples. To upgrade LIMS cost ~\$2M, and currently NCRIS does not recognise this as "infrastructure" and so does not provide support. Establishing dedicated infrastructure for clinical research will equip Australia to play a role in the global drive to utilise genomics to positively impact community health. It will attract global pharmaceutical companies to conduct their clinical trials and drug discovery work here, it will enhance opportunities for Australian researchers to be engaged in global health and research initiatives, and this in turn will provide life saving opportunities for Australian people to have access to clinical trials to improve health outcomes. With clinical accreditation, these research facilities can also support public and private pathology laboratories when required. By labs like AGRF providing more cost-effective genomic sequencing, with faster sample to data turnaround times, pathology labs can focus on the critical task of analysing and reporting of the data, and interpretation of those results to inform the patient's diagnosis and treatment plan. As clinical genomics becomes increasingly entrenched in our health systems, this model offers a path to provide equitable access to testing, at the lowest cost, with States providing the resources to ensure that data is effectively interpreted and

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.

AGRF is a n NCRIS facility: genomics, non-mass spectrometry proteomics, clinical genomic services, bioinformatics, DNA/RNA extraction services. As an organisation we also have close interactions with: BioCommons (bioinformatics), Metabolomics Australia, Monash Proteomics, Proteomics Australia, StemCore.

Q39.

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

☒ For expertise or advice

☐ Access to research resources or products

☒ Access to equipment for research

☒ Access to equipment for operational reasons

☒ Help in translating research

☐ Access to data

☒ Support for clinical trials

☐ Other (please specify)

Q40.

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

This question was not displayed to the respondent.

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.

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.

