

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

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

Q32.

Elevating Aboriginal and Torres Strait Islanders knowledge systems

Q33.

Protecting and restoring Australia's environment

Q34.

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.

I propose enhancements to existing capabilities in the field of Glycobiology. I am a Senior Research Scientist at the Australian Proteome Analysis Facility (APAF) situated in Macquarie University, Sydney, NSW. APAF is a NCRIS funded analytical facility functioning under Bioplatforms Australia. I take care of Glycomics and Glycoproteomics in APAF and I work with Prof. Nicole Packer who is one of the founding members and currently is its Academic Lead. I graduated my PhD in 2023 from the Institute for Biomedicine and Glycomics, Griffith University, QLD. Glycobiology is the study of complex carbohydrates which exist as glycoproteins, glycolipids, proteoglycans, free oligosaccharides found in human and other mammalian milk, etc. Glycosylation is involved in almost every cellular activity such as communication, pathogen adhesion, cell death, replication etc. There is strong evidence of dysregulated glycosylation during healthy and diseases conditions. The field has gained extraordinary momentum over the last decade especially in the analytical domain with famous mass spectrometry-based "Proteomics" researcher inclining towards studying glycoproteins. Top pharma companies have invested in the glycan analysis since at least 50% of the drugs available today are glycosylated and these sugars play an important role in drug potency. The Noble Prize for Chemistry (2022) was awarded to Prof. Carolyn Bertozzi from Stanford University for her work on visualising glycans in living cells using click chemistry. The importance of glycobiology has been recognised worldwide both in industrial and academic space due to its tremendous scope for transitional science. According to the Canadian Glycomics Network (GlycoNet <https://canadianglycomics.ca/>), 5 out of the top 10 selling drugs in the world are glycosylated and have generated a combined revenue of USD \$58 billion in 2020 alone. By 2028, the global market for glycosylated drugs is set to reach USD \$257 billion. Europe, Canada and Japan (http://www.jcgg.jp/index_e.html) have already started investing heavily on the glycobiology market. The recent report published by CarboMet (European Carbohydrate Network) outlines a roadmap for glycoscience in Europe for 2030 (https://glycopedia.eu/IMG/pdf/glyco_2030_a_roadmap_for_glycoscience_in_europe.pdf). Medium term goal: A strong limitation in glycobiology is the complexity of studying glycoconjugates and lack of trained personal to handle costly analytical instruments such as mass spectrometers, downstream data analysis etc. There is a strong need for establishing a state-of-the-art "Australian Glycomics Research and Translation Network" to galvanise extraordinary talents in glycobiology spread across different states of our country. Glycobiologists in Australia are spread out as plant glycobiologists, bacterial glycobiologists and researchers focussing on glycans in humans and other mammalian model organisms. However, the analytical techniques used by different groups of researchers are the same and is slightly modified according to their samples. There is a strong need for knowledge transfer among the researchers as a first step to break free of the prevalent notion that "studying sugars is difficult". Easy access of analytical techniques could make way for larger community of researchers to include glycobiology in their research especially in multi-omics projects. Impacted research communities: Investing in glycobiology based infrastructure is highly valuable in research focussing on diagnostics, therapeutics, quality control in drug manufacturing, cancer research, precision medicine for allergy such as red-meat allergy, rheumatoid arthritis, plant biotechnology, sea weeds-based therapeutics, to name a few. Establishing this network could bring together analytical experts provide a one stop solution for training emerging scientists and technical experts. This network could bridge the gap between industry and academia by providing expert advice to industries. A Glycomics foundry can be included for easing the research needs of glycobiology based startups.

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:

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.