**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**

Research in RNA-based therapeutics is rapidly evolving, driven by advancements in technology and the increasing recognition of RNA's potential to treat a wide range of diseases including mRNA vaccines and siRNA antivirals for infectious diseases, siRNA and RNAi to treat cancer and neurodegenerative disorders, gRNA and mRNA for CRISPR and gene editing applications to treat genetic diseases, and others on the horizon. While substantial investment has been made in sovereign GMP manufacturing of RNA therapeutics within Australia, investment in the research and development pipeline, and the pre-clinical translational infrastructure to support that pipeline, has been limited. Australia's RNA Blueprint outlines a vision to build a national RNA ecosystem by connecting academia, industry, and government to promote collaboration and resource sharing. Building a healthy national RNA ecosystem will require ~10-20 years of sustained support for all aspects of the ecosystem, from discovery research through to GMP manufacturing and commercialisation. Research, development and manufacturing facilities that support pipeline development, like the UNSW RNA Institute's RNA Accelerator, produce high-quality RNA and nanoparticle formulations for researchers, helping to translate research programs along the technology readiness level toward GMP manufacturing and clinical trials. These facilities provide key capability access to researchers and industry alike, as well as training the future workforce. The successful clinical translation of therapeutics hinges on access to specialized expertise and facilities capable of navigating the "valley of death", a critical phase in translational research, particularly at Technology Readiness Levels (TRL) 2-5. Core funding for translational research and development facilities is essential, as it mitigates the risks associated with the "valley of death" by providing researchers and industry access to high quality, small to pilot-scale production for pre-clinical studies, regulatory guidance, and technical support leading into clinical 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

RNA therapeutics hold immense potential to support government priorities of promoting healthy lives, including through breakthroughs in precision medicine and the treatment of rare diseases. By leveraging RNA technologies, researchers can develop highly targeted therapies that address the underlying genetic causes of diseases, offering more effective and personalized treatment options. mRNA vaccines have already demonstrated their ability to rapidly respond to infectious diseases, and similar approaches are being explored for cancer and genetic disorders. These advancements align with Australia's National Science and Research Priorities, which emphasize the importance of supporting healthy and thriving communities. One of the most promising aspects of RNA therapeutics is their potential to revolutionize the treatment of rare diseases. Many rare diseases are caused by specific genetic mutations, making them ideal candidates for RNA-based interventions. RNA therapeutics, such as antisense oligonucleotides and small interfering RNAs (siRNAs), can precisely target and modulate the expression of disease-causing genes. This precision medicine approach not only improves treatment efficacy but also reduces the risk of off-target effects, providing hope for patients with previously untreatable conditions. Supporting the development and commercialization of these therapies is crucial for addressing the unmet medical needs of rare disease patients and enhancing overall public health. To realize the full potential of RNA therapeutics, access to robust translational infrastructure is essential. This includes facilities for pilot-scale production, advanced analytical platforms, and regulatory support to navigate the complex path from research to clinical application. Bridging the "valley of death" in translational research, particularly at Technology Readiness Levels (TRL) 2-5, is critical to ensure that innovative RNA therapies can progress from the lab to the clinic. Investments in such infrastructure will not only accelerate the development of RNA-based treatments but also foster a self-sustaining ecosystem that supports continuous innovation and economic growth. Australia's National Science and Research Priorities highlight the need for a secure and resilient nation, which includes building sovereign capabilities in critical areas like RNA therapeutics. By investing in translational infrastructure and fostering collaborations between academia, industry, and government, Australia can position itself as a global leader in RNA research and development.

*Q32.*

## Elevating Aboriginal and Torres Strait Islanders knowledge systems

*Q33.*

## Protecting and restoring Australia’s environment

*Q34.*

## Building a secure and resilient nation

*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.

*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.

*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.

Supporting the translational development of RNA therapeutics through the 'valley of death' is crucial to ensure that Australia's investments in sovereign manufacturing capability will ultimately lead to a thriving, self-sustaining ecosystem. This phase of development is fraught with challenges such as high costs, regulatory hurdles, and technical uncertainties. Long term support that provides the ecosystem with ongoing access to research, development and pre-clinical production facilities, regulatory guidance, and funding for pre-clinical studies, will lead to more locally discovered therapeutic candidates bridging this critical gap. Targeted support, such as core funding for translational facilities/capabilities and voucher schemes to subsidise research and industry access to those facilities is critical. This not only accelerates the development and translation of RNA-based therapies but also ensures that innovations reach the market, fostering a self-sustaining ecosystem. Such support will enable local researchers and companies to translate their discoveries into viable clinical therapeutics, ultimately enhancing national health security and economic growth.

*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.