

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

Emerging Research Directions and Critical Infrastructure Requirements The growing complexity of health and disease research demands access to high-quality biological samples and models. In particular, there is a pressing need to advance personalized medicine and precision healthcare, both of which rely heavily on well-curated, diverse biobanks that can provide insights into genetic and environmental factors influencing health outcomes. Genomic research, immunotherapy, and rare disease studies will all require large-scale, diverse biological collections that are deeply integrated into the research landscape. The digital science revolution, including advancements in data integration, machine learning, and artificial intelligence (AI), will underpin much of this research and require biological models and samples to be digitized, standardized, and accessible for analysis at an unprecedented scale. Currently, biobanks and physical collections are insufficiently supported, with infrastructure not scaled to meet these emerging demands. The lack of investment has resulted in underdeveloped national resources, and uncoordinated management of these resources limits their potential. If Australia is to stay at the forefront of biomedical research, concerted national leadership is essential for the strategic development of biobanks as research infrastructure, fostering collaboration between sectors and advancing data-driven approaches to biological research. The deferral of the collections step-change opportunity in the 2021 roadmap response highlights the missed opportunity to meaningfully support biobanks and biological collections at a national level. This deferral indicates a trend where biobanks once again risk being overlooked despite their fundamental role in advancing research.

Future National Infrastructure Requirements Looking ahead, it is anticipated that the current national infrastructure for biobanks and physical collections will not fit the definition of NRI in the next 5-10 years unless significant investment is made. The increasing complexity of biological research, including the integration of high-throughput sequencing, phenotypic data, and environmental factors, will demand that biobanks are equipped with enhanced capabilities. These capabilities must include not only the physical storage of biological samples but also sophisticated systems for data management, linkage, and analysis. Without these advancements, biobanks will fall behind in terms of both quality and scale, making them ineffective as a tool for cutting-edge research.

Q24.

Defence

Building a Secure and Resilient Nation • Disease preparedness, particularly in the context of pandemics, national biosecurity, and bioterrorism threats, requires the preservation of both human and non-human microbial samples for future research and response efforts. Biobanks play a critical role in supporting national biosecurity preparedness by storing valuable biological samples that can be used to understand and respond to emerging infectious diseases, environmental threats, zoonotic outbreaks, and potential bioterrorism events. Ensuring the integrity and availability of these samples is crucial in mitigating the impact of such threats and strengthening global health security. • As rapid advances in genomic sequencing, data storage, and AI continue, biobanks will be tasked with managing increasingly larger and more complex datasets. This underscores the need for robust systems not only for the physical storage of biological samples but also for the cybersecurity of sensitive genetic data. To address these challenges, biobanks must integrate next-generation technologies, such as blockchain, to enable secure and transparent data sharing while ensuring the integrity of the data. In light of growing concerns over data breaches and privacy violations, it is imperative to establish a future-proof security framework to safeguard both biological and genetic information.

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

Critical Infrastructure Needs: • National biobanks that comprehensively store diverse genetic, phenotypic, and environmental data are essential for advancing precision medicine. Such biobanks will be instrumental in enhancing drug discovery processes and facilitating the development of targeted clinical trials, thereby fostering significant advancements in personalized healthcare. Emerging Research Directions: • Biobanks will be integral in collecting biospecimens and data from diverse populations, thereby enabling the discovery of disease biomarkers and enhancing the effectiveness of personalized treatment strategies. • The integration of genomic data with other health information will accelerate precision health approaches, facilitating more targeted drug discovery, including the development of novel gene and cell therapies, while also enhancing capabilities for disease prevention.

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.

Given the national interest in advancing medical products, defence research, and public health, there is a clear need for a new NRI capability dedicated to the strategic development and expansion of biobanks and biological models. The proposed capability should include: 1. National Biobank Approach – An integrated, scalable system to collect, store, and manage biological samples from diverse populations across Australia is essential. This infrastructure should be designed to accommodate the growing needs of precision medicine, genomic research, and public health surveillance. A unified national approach, with clear guidelines on ethics and governance, would significantly enhance this effort. Specifically, a coordinated framework for how ethics committees address biobanks across Australia is needed to ensure consistency, transparency, and trust in the handling of sensitive biological data. Establishing these ethical and governance guidelines would foster collaboration, streamline processes, and ensure that biobanks are managed in accordance with the highest standards of integrity and public accountability. 2. Enhanced Data Infrastructure – Biobanks must be integrated with advanced data management platforms that allow for big data analysis, genomic sequencing, and longitudinal data tracking. These platforms should enable researchers to efficiently access and query large datasets to drive discovery. 3. Research Capacity Expansion – The development of biological models, including organoids, cell lines, and animal models, will be crucial in facilitating therapeutic development and clinical trials. National investment is needed to scale the production and distribution of these models to meet future research demands. 4. Support for Interdisciplinary Research – Biobanks should be integrated with other critical research infrastructure to support interdisciplinary collaborations across fields such as environmental science, neuroscience, and infectious disease research. 5. Workforce Development for Biobankers - Investment in training programs, career pathways, and upskilling initiatives to ensure a skilled workforce capable of managing high-throughput automation, implementing novel technologies/techniques, data science, and regulatory compliance in biobanking. The timeframe for establishing this capability is urgent—within the next 3-5 years, given the rapidly evolving landscape of biomedical research. This infrastructure will serve not only as a foundation for advancing Australian research excellence but also as a key contributor to global health innovation.

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.

The role of biobanks and physical collections in advancing medical, environmental, and biological research is critical, yet these infrastructures have long been underprioritized in successive national roadmaps. Biobanks have faced persistent neglect in responses to previous roadmaps, including the 2021 roadmap, and the absence of concerted national leadership has hindered their strategic development. As we look ahead to the next 5-10 years, the urgent need for the development and delivery of biological models as research infrastructure remains one of the most significant unmet needs in the field. In summary, biobanks and biological models are at the heart of future research directions across multiple disciplines. Their strategic development and integration into a national research infrastructure are long-term unmet needs that must be addressed through concerted national leadership. It is essential that biobanks are given the support and investment they require to become a world-class resource capable of underpinning the digital science revolution and driving forward research in areas critical to Australia's health and security. Failure to act now will risk once again sidelining biobanks, missing the opportunity for a significant step change in infrastructure that could transform the research landscape for years to come.

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.

[ABNA responses to 2026-NRI-roadmap-survey-FINAL.pdf](#)

92.2KB

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