

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

Biobanks have been persistently neglected in successive roadmaps, and the deferral of the collections step-change opportunity as part of the 2021 Roadmap response suggests they will once again miss out on meaningful support. Biobanks are critical infrastructure for Australia's medical research efforts, curating millions of unique and irreplaceable biological and clinical samples. When discoverable and reusable, these samples provide individual and population-level health insights to improve healthcare and disease prevention nationwide. International examples such as the UK Biobank showcase the potential impact of large-scale, nationally coordinated biobanking initiatives. The critical issue for Australian biobanking landscape is the fragmentation and lack of national coordination. At least 200 biobanks in Australia operate independently, leading to inefficiencies and duplication of effort. Large research initiatives (e.g. ProCan which generated the world largest proteomic dataset from more than 23,000 cancer samples, which we contributed about 1,500) often require human samples at scale to generate meaningful insights for research discoveries but often expressed significant challenges to obtain sufficient samples. The issue has led to several gaps that require immediate solutions, including:

- Specimen and data Visibility and Accessibility Issues: Limited national frameworks for sharing and integrating biobank data hinder research opportunities, particularly the linkage of samples with multiple datasets.
- Sustainability Concerns: Funding structures remain inconsistent, with many biobanks relying on short-term grants or project-based funding.
- Regulatory and Ethical Hurdles: Differences in governance frameworks across institutions limit the ability to establish a harmonised system for sample and data sharing.
- Limited Scale for National Research Needs: Most biobanks operate at the state or institutional level, lacking the capacity to support large-scale research addressing national unmet needs such as low-survival cancers (e.g., MRFF Low Survival Cancer Mission).
- Lack of AI-Powered Data Utilisation: Current biobanks do not leverage AI for efficient sample management, data integration, and predictive analytics.
- Absence of ISO Accreditation Capabilities: There is a lack of national standardisation infrastructure to ensure the quality and reliability of biobanked samples.

These were discussed and supported by biobanking and research infrastructure leaders (including Phenomics Australia) in a panel discussion hosted by the Victorian Cancer Biobank. The solutions proposed in the New Capability within this survey. Those existing biobanks operating in silos, where sample and data access is restricted and not visible for large-scale research projects, will no longer be fit-for-purpose in the next 5-10 years. Without national coordination and integration, these fragmented biobanks will continue to be underutilised, limiting their potentials.

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

Biobanking infrastructure is foundational to supporting the national research priorities of Supporting Healthy and Thriving Communities and Building a Secure and Resilient Nation. At scale, biobanking would enable: • Precision Medicine: Advancing personalised treatments by integrating biobank data with genomic and clinical information. • Public Health Research: Generating evidence for policy-making in disease prevention and healthcare interventions. • Clinical Research and Trials: Providing well-characterised samples for medical research and drug development. • One Health Approach: Integrating human, animal, plant, and environmental health data to ensure a healthier living environment. • Disease Preparedness: Facilitating rapid response to pandemics and emerging health threats. The gaps of current biobanking landscape in Australia had been raised in the previous section which include: • Specimen and data Visibility and Accessibility • Financial Sustainability Concerns • Regulatory and Ethical Hurdles • Limited Scale for National Research Needs • Lack of AI-Powered Data Utilisation • Absence of national ISO Accreditation Capabilities Individualised biobanks with limited national coordination will no longer be adequate. Without a national strategy, fragmented biobank operations will fail to meet emerging national and global research demands.

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.

Proposal: Establishing a National Agency for Biobanking Coordination A national agency is essential to facilitate standardisation, visibility, and cross-institutional collaboration for biobanking infrastructure. This initiative should focus on: 1. Digital Infrastructure with AI Integration: AI-driven tools for data integration, metadata cataloguing, and sample accessibility will enhance research efficiency and scalability. 2. Expanding Public and Private Partnerships: Engagement with industry, government agencies, and biobanking networks can provide sustainable funding and research expansion opportunities. This would also include further leveraging with other NCRIS initiatives (e.g. biodiversity collections). 3. Developing a Unified Biobanking Governance Strategy: National policies for ethical, legal, and social frameworks will ensure standardised/harmonised access and compliance across biobanks. 4. Enhancing Researcher and Public Awareness: Visibility campaigns and educational outreach will promote the significance of biobanking and encourage broader utilisation. 5. Creating National Health Collections at Scale: Leveraging existing biobanking infrastructure (e.g. Victorian Cancer Biobank) to build comprehensive national specimen collections addressing key health priorities. For example, UK Biobank showcase the great impact of samples and data generated from 500,000 donors recruited across the country. Internationally, model like BBMRI-ERIC in Europe has demonstrated the benefits of coordinated national biobank infrastructure. The impacted research communities include those who conduct research in (but not limited to): • Rare diseases (e.g. rare and low survival cancers) research – collective resources of human samples is critical for research in this area to achieve equality in health outcomes • Precision medicine and translational research • Clinical research and trials • Public health and infectious disease research • Life science and biotechnology companies Economic and Health Benefits: Recently, the Victorian Cancer Biobank (VCB) demonstrates the economic value of biobanks, with an estimated Return of Investment (ROI) of \$1.59 for every dollar invested. Establishing a national biobanking infrastructure will unlock greater potential for research impact and economic return.

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)

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.

A nationally coordinated biobanking strategy is essential to maximise Australia's research potential. By learning from international models (e.g., UK Biobank, BBMRI-ERIC), Australia can establish a leading-edge biobanking infrastructure that supports precision medicine, public health, and national research priorities. To ensure delivery of biobanking infrastructure, building capable workforces is essential. The skillset would include, legal, ethics, automation, biospecimen sciences, data and IT. About Us – The Victorian Cancer Biobank is a consortium with partners consists of 5 major hospitals in Melbourne and Cancer Council Victoria as the lead agency. The collaborative infrastructure provides high quality samples to support cancer research in an open access manner. As a critical research infrastructure, Victorian Cancer Biobank have been a cornerstone to many groundbreaking research and innovation in Australia, such as: • Blood test for early detection of colorectal cancer developed by CSIRO and Rhythm Biosciences. • Development of Melaseq™ by Geneseq Biosciences and Australian Clinical Labs (ACL)