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

N/A

Q22.

Food and Beverage

N/A

Q23.
Medical Products

MA requires upgrades and addition of cutting edge imaging platforms for visualization of disease processes at 60 nm resolution—a scale where many fundamental biological mechanisms operate but remain inaccessible to conventional imaging approaches—this platform addresses a critical limitation in translating molecular discoveries into clinical applications. These infrastructures' Measures of Success directly support the objectives through: 1. Establishment of Australia's first integrated super-resolution imaging facility accessible to researchers nationwide, filling a critical gap in national research capabilities 2. Development of a comprehensive Disease Cell Atlas revealing molecular mechanisms across cardiovascular disease, cancer, infectious disease, and neurological disorders 3. Identification of novel biomarkers for disease diagnosis, prognosis, and treatment response through detailed visualization of cellular changes associated with disease progression 4. Enhanced diagnostic capabilities through translation of imaging biomarkers into clinical applications 5. Building national capability in advanced biomedical imaging through comprehensive training programs and knowledge sharing networks

Q24.
Defence

N/A

Q25.
Recycling and Clean Energy

N/A

Q26.
Space

N/A

Q27.
Environment and Climate

N/A

Q28.

Frontier Technologies and Modern Manufacturing

N/A

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

N/A

Q31.

Supporting healthy and thriving communities

1. Creation of a sustainable national resource for super-resolution imaging through integration with Sydney Microscopy and Microanalysis (SMM), ensuring continued access for the Australian research community beyond the grant period. 2. Establishment of a standardized framework for correlating molecular imaging with clinical outcomes, supporting future translational research across multiple disease areas. 3. Building national expertise in advanced imaging technologies through comprehensive training programs and knowledge sharing networks, enhancing Australia's research capabilities in molecular medicine.

Q32.

Elevating Aboriginal and Torres Strait Islanders knowledge systems

N/A

Q33.

Protecting and restoring Australia’s environment

N/A

Q34.

Building a secure and resilient nation

N/A

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.

We have a specific need that builds upon foundational advances in super-resolution microscopy by establishing Australia's first Machine Intelligent Structured Illumination Microscope (MI-SIM) infrastructure for comprehensive Disease Cell Atlas development. Current approaches to cellular imaging in Australia cannot resolve structures below 200 nm, creating a critical blind spot in visualizing subcellular mechanisms that drive major diseases. The MI-SIM platform overcomes this limitation by enabling 60 nm resolution imaging, bridging the gap between molecular mechanisms and clinical outcomes across cardiovascular diseases, cancer, infectious diseases, and neurological disorders.

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.

Light Microscopy Australia contributes specialized workshops and standardized protocols to enable user access to the imaging facilities.

Q39.

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

- [ ] For expertise or advice
- [x] Access to research resources or products
- [x] Access to equipment for research
- [x] 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.

We anticipate this roadmap will ensure efficient implementation of the high-end microscopy infrastructure while building national capability in super-resolution imaging and maximizing scientific impact across all research themes. The comprehensive approach spans from infrastructure establishment to full-scale application across major disease areas, creating Australia's first integrated super-resolution Cell Atlas.