

14 May 2008

NCRIS Secretariat
Department of Innovation, Industry, Science and Research
GPO Box 9839
CANBERRA ACT 2601

Email to: ncris@dest.gov.au

UNSW



PROFESSOR LES FIELD

DEPUTY VICE-CHANCELLOR
(RESEARCH)

Dear NCRIS Secretariat,

UNSW RESPONSE TO 2008 REVIEW OF THE NCRIS ROADMAP

The University of New South Wales welcomes the opportunity to comment on the 2008 Review of the NCRIS Roadmap. This is a response to the themes and issues covered in the **“2008 Review of the NCRIS Roadmap Discussion Paper”¹**.

1. INTRODUCTION

A real positive of the NCRIS Program is that it recognises the need to invest in research infrastructure to retain Australia’s research effort. Infrastructure funding needs to be a long-term program backed up by planning and coordination which sees major research infrastructure securely supported into the future.

NCRIS has been the first major scheme to recognise that human capital and the bank of technical and professional knowledge and expertise that underpins physical infrastructure is as important as the infrastructure itself. ***A key element of the future of these programs is people. Instruments funded through NCRIS will have typical lifetimes of 10-15 years; continual funding for staff beyond the current horizon is required.***

UNSW is a comprehensive, research-intensive institution and our research programs span a diverse range of innovative research initiatives from biomedical research, information technology and materials engineering through to economics, social policy, history and interactive cinema.

As a leading Australian research university, UNSW will continue to invest strongly in existing and new research infrastructure. UNSW already has a significant investment in major infrastructure supporting research programs in photovoltaics, quantum computing, photonics, astronomy, stem cell research, anti-cancer and HIV research, advanced computing, “e-research” and major data bases and library facilities underpinning research in Law and the Social Sciences.

UNSW is involved directly as a partner in 6 of the 1st round NCRIS capabilities and we will be the host for major new infrastructure in at least 4 of the capabilities and provide supporting infrastructure for some of the others.

Cutting-edge research relies on complex infrastructure. Such programs are not short-term – they take many years to establish and the benefits will flow over the space of decades rather than months. The infrastructure is typically expensive to purchase and install, and requires an on-going and long-term commitment to properly manage and maintain it. The management of critical research infrastructure requires long-term strategic planning at all levels of Government, industry, and within the organisations that host it.

¹ http://www.ncris.dest.gov.au/development_ffolder/roadmap_review_2008.htm#Discussion_Paper

The necessity for long-term planning permits the government to better position and coordinate activity. It is absolutely clear that major research initiatives must align strongly with national priorities. Such planning enhances research capacity, employment, and follow-on industry development in Australia, but do require the government to have an effective mechanism to engage proactively with institutions.

2. SUMMARY OF RECOMMENDATIONS

NCRIS Process

- While we note that the purpose of this review is not to examine the Program as a whole, there are none-the-less important points that need to be made regarding the process in reviewing the existing capabilities or examining new ones.
 - Governance arrangements must be straight-forward, concise and well focused on the purpose of managing the infrastructure.
 - Contracts would be much better organised through the development of standard templates which covered critical issues such as focussing the objectives, managing risk, liabilities, etc.
 - The pre-Investment Plan lobbying process needs to be more aggressively controlled to ensure that decisions are made on the basis of technical merit and need and not unduly influenced by political considerations.
 - In appointing Facilitators, NCRIS must be careful to ensure that those selected do not have a potential or real conflict of interest in that they (or the associated organisations from which they were selected) potentially derive benefit from the NCRIS process.
 - It would be helpful if the facilitators engaged fully with not only those researchers engaged in the facilities, but also the institutional decision makers (ie Deputy Vice-Chancellors (Research)) at each stage of the process.

Large Regional Facilities

- It would be logical for large regional centres (like the Analytical Centre at UNSW) which bring together a range of major facilities spanning many of the capabilities, to be recognised as regional infrastructure centres.

Mismatch with the LIEF Program

- A useful possibility, which UNSW has proposed to the National Innovation System Review would be to telescope the LIEF and NCRIS programs so that NCRIS becomes an extension of the LIEF Scheme such that a single program could cover the continuum of facilities from smaller to larger.

NCRIS Capabilities

An Environmentally Sustainable Australia

- UNSW supports “Remote Sensing and Spatial Information” as a key systemic infrastructure which underpins many major focus areas and Research Priorities.
- TERN - UNSW strongly agrees that the TERN is a priority but it cannot be just a terrestrial ecosystem capability - the interpretation of the ecosystem data has to be deeply coupled with the changes in climate.

- IMOS - A replacement blue-water national research vessel is desperately needed now, and plans need to be made as soon as possible to this end.
- Marine Observatory - the tools of molecular biology are increasingly a critical component of any broadly based environmental research program. NCRIS needs to take note of facilities required to support a Marine Observatory in Australia.
- Built Environment - UNSW agrees that there is a clear absence of capability related to understanding, managing, and planning built environments.

Frontier Technologies

- Fabrication - UNSW views Australian National Fabrication Facility (ANFF)² as one of the most successful capabilities of the first round of NCRIS and strongly supports its continuation beyond the current NCRIS funding round.
- Characterisation - Microscopy and microanalysis technologies in their broadest scope will continue to need strong support into the future.
- NMR facilities were missed in the first NCRIS Roadmap - NMR is a major infrastructure investment (of the order of \$20M) for most research-intensive institutions and underpins research in the life-sciences, the physical sciences, and engineering.
- Optical microscopy and related near-field spectroscopic imaging techniques are also very important aspects of microscopy which have not yet been properly captured in the Characterisation portfolio.
- Platforms for Collaboration - The Platforms for Collaboration Capability was not properly integrated with the other Capabilities. Most of the Capabilities were relying on Platforms for Collaboration to provide the IT and data storage infrastructure and this has failed to deliver. All of the Capabilities have a dimension which could be construed as IT systemic infrastructure. It may well be better distributed amongst the other existing and developing Capabilities to manage as appropriate to their individual needs. It is vital to the well being of many sciences that very large, cutting edge world class high-performance computers are maintained, linked with very fast networks, and associated with strong data serving capacity.

Humanities, Arts & Social Sciences

- UNSW supports the call for software, middleware and hardware solutions that connect and coordinate researchers with existing infrastructure such as grid technologies, visualisation facilities, and ultra-high speed broadband.
- The Australasian Legal Information Institute (AustLII), is an example of 'major existing digital databases and collections' which constitutes major systemic research infrastructure but which does not require a massive investment to sustain.
- Particularly for the Humanities and Social Sciences there needs to be a recognition that NCRIS should support smaller investments in critical research infrastructure - this may require NCRIS to review the definition of what constitutes a "Landmark Facility".

Promoting & Maintaining Good Health

- There is a need to establish a "virtual cell therapy facility" in Australia, with multiple distributed nodes and at least one real time facility in each major capital city.
- Metabolomics, and other emerging 'omics, although currently less mature, will grow in importance and should be kept under active consideration in the next iteration of the roadmap.
- UNSW believes it is important that the NCRIS investment in NIF be maintained.

² See www.anff.org.au for further information

3. NCRIS PROCESS

It is disappointing that, during this critical period of national reviews, this review is focussed on the capabilities funded under NCRIS and not the broader issue of the NCRIS process which has evolved, or on the Program itself. ***While we note that the purpose of this review is not to examine the Program as a whole, there are none-the-less important points that need to be made regarding the process in reviewing the existing capabilities or examining new ones.***

The NCRIS Roadmap process itself worked as a method of winnowing and defining the major infrastructure requirements for Australia. The overall management of the Program, however, was poor from an institutional management perspective. This has been one of the most difficult and complex research funding matters that institutions have had to deal with. Almost all of the major infrastructure is based around the University sector – they host much of the infrastructure, they contribute resources (staff, space, logistical support, facilities) and most of the users will be University based.

Governance

The governance arrangements around NCRIS projects have been overly complicated. ***Governance arrangements must be straight-forward, concise and well focused on the purpose of managing the infrastructure.*** Almost each different capability has evolved its own governance model and while it is important to recognise the need for flexibility, there should be clear guidelines of the fundamental governing principles.

Contracts would be much better organised through the development of standard templates which covered critical issues such as focussing the objectives, managing risk, liabilities etc. NCRIS Guidelines should have been more prescriptive with the governance structures or at least with clear overarching principles.

The most complex governance issue arose in some capabilities where the administering body clearly had many functions of which coordinating an NCRIS capability was only one. In these cases there must be a clear legal (and risk) segregation of NCRIS business from other activities. The governance around the NCRIS Capabilities needs to be absolutely focussed on managing the major facility, not distracted by other issues.

Matching Support

Institutions were initially advised that matching support would not be required. As NCRIS developed however, facilitators made it clear that if UNSW (or any institution) wished to engage in the process, they would be required to provide significant institutional cash (and in-kind) support. This additional unbudgeted support is a significant financial burden. It became clear that those who were able to demonstrate significant matching support, could effectively “buy” their way into the NCRIS Capabilities.

State Government Involvement

State Governments became a critical element in the NCRIS process. All State Governments were/are trying to coordinate and optimise their involvement in NCRIS Capabilities. Moreover, certain States were much more proactive in supporting infrastructure than others. State Government involvement unduly influenced the recommendations of the Facilitators and was an additional layer of complexity in pulling together NCRIS bids (based on political rather than scientific/technical merits).

The Victorian State Government was able to drive and influence the agenda during the application process but then withdrew support from some capabilities after the decisions regarding which capabilities were successful.

The pre-Investment Plan lobbying process needs to be more aggressively controlled to ensure that decisions are made on the basis of technical merit and need and not unduly influenced by political considerations.

Facilitators

In appointing Facilitators, NCRIS must be careful to ensure that those selected do not have a potential or real conflict of interest in that they (or the associated organisations from which they were selected) potentially derive benefit from the NCRIS process. In the first NCRIS round, this meant that the transparency and accountability of NCRIS processes was compromised (at least) by the perception that there was bias based on the selection of Facilitators and the infrastructure which was supported.

University Engagement

Engagement with key University decision makers was poor. The NCRIS process engaged primarily with individuals who were potential users of instrumentation. In addition, the process was selective and relied on informal networks so it missed many groups during the critical stages where the NCRIS framework was being developed. NCRIS failed to engage with the Universities at the highest levels (eg. with the Deputy Vice-Chancellors (Research)) where there is generally a reasonable knowledge of infrastructure needs and key contacts. There was no easy way of knowing what NCRIS proposals were being developed by staff at UNSW until the very last stage when there was a request for institutional support.

It would be helpful if the facilitators engaged fully with not only those researchers engaged in the facilities, but also the institutional decision makers (ie Deputy Vice-Chancellors (Research)) at each stage of the process - from developing the investment plans, to final sign-off.

4. LARGE REGIONAL FACILITIES

There are some facilities such as the UNSW Analytical Centre³ which serve as a regional focus for major infrastructure and bring together a range of major facilities spanning many of the capabilities. The Analytical Centre at UNSW is a facility established to co-locate major research instrumentation in a single, purpose built, high-level facility to service both UNSW and its collaborating institutions, as well as providing a service to industry/external partners.

It would be logical for large regional centres (like the Analytical Centre at UNSW) which bring together a range of major facilities spanning many of the capabilities, to be recognised as regional infrastructure centres. Some of the components of these Centres already get NCRIS support but the NCRIS program overall could benefit from wider national access to these facilities.

UNSW Analytical Centre

The UNSW Analytical Centre houses equipment valued in excess of \$35M including the most important major instruments used in the characterisation of biological, chemical and physical materials. The Analytical Centre also includes preparation laboratories, smaller instruments and computing facilities.

³ See <http://www.dvcresearch.unsw.edu.au/analytical.html> for further information

The Analytical Centre incorporates:

- Electron Microscope Unit (involved in NCRIS as a major node of AMMRF);
- Bioanalytical Mass Spectrometry Facility (involved in NCRIS through Evolving Biomolecular Platforms);
- Nuclear Magnetic Resonance Facility (NMR); and
- Solid State Facilities (including X-ray analysis, XRD, XRF, Raman Imaging etc).

The co-location of major research equipment permits the University to provide the appropriate infrastructure to support the instruments and provide a world-class research environment within which the instrumentation can be maintained and operate to specification. The UNSW Analytical Centre also provides the technical/professional support for the instruments and facilitates access by external researchers. The provision of major research infrastructure in a cross-disciplinary environment also has great potential to encourage collaboration and also provides an environment where a range of related techniques can be focused on any particular problem.

5. MISMATCH WITH THE LIEF PROGRAM

The Discussion Paper's Introduction says:

"NCRIS is specifically concerned with medium to large-scale infrastructure. A process for defining, identifying and assessing landmark² infrastructure requirements will be developed in the second half of 2008, and any landmark infrastructure requirements identified during the Review will be noted for reference during this process;

[FOOTNOTE 2 As a guide, the National Research Infrastructure Taskforce (NRIT) noted that Australian Landmark Facilities were typically large-scale, complex facilities that served large and diverse user communities, were generally regarded as part of the global research capability, typically involved an investment in excess of A\$100 million, and engage national and international collaborators in investment and in access protocols. (The Final Report of the NRIT 2004, p.63). The NCRIS Roadmap noted that capabilities likely to require funding above \$60 million are considered Landmark Infrastructure.]

On the other end of the scale, programs such as the Australian Research Council Linkage Infrastructure Equipment and Facilities (LIEF) and the National Health and Medical Research Council (NHMRC) Enabling Grants program provide funding for smaller scale infrastructure;"⁴

The ARC LIEF Program currently funds critical research infrastructure up to a maximum of \$1M-\$2M, whereas NCRIS funds critical research infrastructure above \$5M and generally as part of larger programs up to \$50M. Clearly there is a gap for supporting intermediate facilities in the \$1M to \$5M range. ***A useful possibility, which UNSW has proposed to the National Innovation System Review, would be to telescope the LIEF and NCRIS programs so that NCRIS becomes an extension of the LIEF Scheme such that a single program could cover the continuum of facilities from smaller to larger.*** This would address the NCRIS issue related to transparency and accountability of the NCRIS process. The LIEF Program could be expanded to incorporate personnel support costs which is a very positive attribute of the NCRIS Program.

⁴ Page 5, 2008 Review of the NCRIS Roadmap – Discussion Paper

6. NCRIS CAPABILITIES

Selective Coverage

There would be merit in supplementing the Roadmap process with an examination of those major facilities that are actually considered important (say at the multimillion dollar level) as investments by the major institutions to determine which aspects of major infrastructure have been missed in the first round of NCRIS road mapping process.

Some areas which rely on major infrastructure and which fit squarely within the NCRIS program, did not get coverage by the facilitators or by the focus of the Facilitators that were chosen. For example, major data bases underpinning research in the Social Sciences and Arts clearly represent systemic infrastructure which failed to achieve recognition in the first round of NCRIS. Major facilities in NMR spectroscopy, which support a broad range of research activities in the Biosciences, Physical Sciences and Engineering, also failed to be captured in the first round of NCRIS.

An Environmentally Sustainable Australia Expert Working Group

UNSW generally agrees with the views of the expert working group on the current NCRIS Roadmap capabilities and current investments supporting an Environmentally Sustainable Australia. *UNSW supports “Remote Sensing and Spatial Information” as a key systemic infrastructure which underpins many major focus areas and Research Priorities.*

TERN⁵

Whilst acknowledging the huge task associated with defining, planning and implementing a terrestrial ecosystem research network (TERN), this is an important NCRIS capability that should be pursued given its relevance to issues such as climate, biodiversity, soil conservation and water amongst others. *UNSW strongly agrees that the TERN is a priority but it cannot be just a terrestrial ecosystem capability - the interpretation of the ecosystem data has to be deeply coupled with the changes in climate.* There may be a disconnect here that should be avoided. In the same way as Geoscience notes the need to integrate the data with modelling, the TERN should do likewise - modelling must be developed to inform the data collection and the data must inform the modelling.

IMOS⁶

The Integrated Marine Observing System (IMOS) needs to be extended to northern waters, but also to coastal waters. A blue-water research vessel capability is absolutely essential. The past research vessel Franklin and the present vessel Southern Surveyor have together supported much of Australia’s significant marine research. The useful economic life of 2011 for the Southern Surveyor is extremely optimistic. Shipboard systems are in poor condition, and science schedules are increasingly adversely affected when these systems break down. *A replacement blue-water national research vessel is desperately needed now, and plans need to be made as soon as possible to this end.*

The coastal zone is not presently well addressed by IMOS due to the identified priority of understanding the larger scale ocean and atmospheric environmental systems. However, physical oceanography of the coastal zone naturally would fit into the IMOS system, in terms of commonality of equipment, data users and the use of the IMOS data bank and data distribution system.

⁵ See <http://www.ncris.dest.gov.au/capabilities/tern/> for further information

⁶ See <http://www.imos.org.au/> for further information

Marine Molecular Observatories are now well established in other countries, and *the tools of molecular biology are increasingly a critical component of any broadly based environmental research program. NCRIS needs to take note of facilities required to support a Marine Observatory in Australia.* This would focus on traditional physical and biological measurements (eg. currents, temperature, marine chemistry etc) as well as genomic sampling (eg. use of DNA sampling to characterise and genetically fingerprint marine life and diversity). One benefit of molecular observing platforms is the breadth of information they gather that is of direct physiological relevance to the organisms that are being impacted by environmental change.

Built Environments

UNSW agrees that there is a clear absence of capability related to understanding, managing, and planning built environments. Given Australia's concentration in urban areas, this clearly needs to be a priority.

Frontier Technologies Expert Working Group

UNSW generally agrees with the views of the expert working group on the current NCRIS Roadmap capabilities and current investments supporting Frontier Technologies. However, there are some aspects of these capabilities which require further elaboration.

Fabrication Capability

UNSW views Australian National Fabrication Facility (ANFF)⁷ as one of the most successful capabilities of the first round of NCRIS and strongly supports its continuation beyond the current NCRIS funding round. While the initial establishment of ANFF was complex and time-consuming it is now operating highly effectively, with an experienced, independent Board and CEO, and excellent communication processes between the nodes. There exists a close liaison between ANFF and the UNSW Node of the Australian Microscopy and Microanalysis Research Facility (NCRIS Characterisation capability).

Fabrication facilities such as those provided by ANFF require high levels of ongoing investment, to keep existing tooling and infrastructure operating effectively and to maintain international competitiveness through the procurement of new tooling as it becomes available. It is essential to maintain an on-going reliable base funding for the national capability. The micro- and nano-fabrication tooling also requires highly specified clean-room environments, with large initial establishment costs. As demand grows for fabrication facilities over the coming decade it will probably be necessary to make additional investments of a comparable magnitude to those made in the initial NCRIS round. Given the magnitude of such facilities, opportunities for joint investment between NCRIS and other schemes (such as LIEF) should be explored wherever possible.

Characterisation Capability

UNSW hosts a major node of the Australian Microscopy and Microanalysis Research Facility (AMMRF)⁸ and the installation of equipment is currently underway. Like the Fabrication Capability, this facility has been successfully and professionally initiated with an effective governance structure and will serve a wide cross section of the research community. This capability builds on the successful NANO Major National Research Facility and represents a long-term investment in cutting-edge equipment. The AMMRF is a nationally distributed capability with a very good travel-and-access program to facilitate users getting to any facility. This capability arguably supports thousands of projects nationally in any one year and is probably one of the best embodiments of what NCRIS should aspire to support.

⁷ See www.anff.org.au for further information

⁸ See <http://www.ammrf.org.au/> for further information

Microscopy and microanalysis technologies in their broadest scope will continue to need strong support into the future. This is because these facilities underpin research in so many of the National Research Priority areas, including future developments in areas such as biomaterials and nano-medicine, in addition to supporting future demands in nano-fabrication via ANFF.

UNSW strongly agrees with the statement “*that the capability focuses heavily on certain microscopy and spectroscopy-based techniques and overlooks other characterisation techniques.*”⁹ Areas such as NMR spectroscopy (in the physical sciences) which clearly involves major infrastructure but spans multiple disciplines was one such area which fell between the cracks.

NMR facilities were missed in the first NCRIS Roadmap –NMR is a major infrastructure investment (of the order of \$20M) for most research-intensive institutions and underpins research in the life-sciences, the physical sciences, and engineering. NMR facilities lend themselves to the successful AMMRF “node” model of flagship instrumentation and associated specialisation with access enabled and supported researchers across the network. Care should be taken to ensure that such major research infrastructure needs are properly captured as part of the NCRIS process.

UNSW agrees with the view that sub-diffraction ***optical microscopy and related near-field spectroscopic imaging techniques are also very important aspects of microscopy that have not yet been properly captured in the Characterisation portfolio.***

Platforms for Collaboration Capability

Platforms for Collaborations has a focus on infrastructure and supporting services to allow the research community to collect, share, analyse, store and retrieve information, and acknowledges the importance of this capability.

The Platforms for Collaboration Capability was not properly integrated with the other Capabilities. Most of the Capabilities were relying on Platforms for Collaboration to provide the IT and data storage infrastructure and this has failed to deliver. All of the Capabilities have a dimension which could be construed as IT systemic infrastructure. It may well be better distributed amongst the other existing and developing Capabilities to manage as appropriate to their individual needs.

High Performance Computing is also part of this Capability. ***It is vital to the well being of many sciences that very large, cutting edge world class high-performance computers are maintained, linked with very fast networks, and associated with strong data serving capacity.***

Humanities, Arts and Social Sciences Expert Working Group

UNSW is pleased to see that the NCRIS Discussion Paper recognises the importance of large-scale research infrastructure for the Humanities, Arts and Social Sciences, which were largely ignored in the initial Roadmap.

UNSW generally agrees with the views of the Expert Working Group on the need for national research information infrastructure and underlines the importance of facilitating access to open archives and open publishing formats.

In the area of creative arts and media, ***UNSW supports the call for software, middleware and hardware solutions that connect and coordinate researchers with existing infrastructure such as grid technologies, visualisation facilities, and ultra-high speed broadband.*** These include the provision of:

- Networked collaborative toolsets, web-based and integrated across web-standard platforms (W3C compliant);

⁹ See Page 15, 2008 Review of the NCRIC Roadmap – Discussion Paper

- Networked visualisation facilities utilising long distance interactive and immersive three dimensional environments to facilitate collaborative research in virtual spaces;
- Immersive environments comprised of high-performance computing settings to support research involving large sets of unstructured data (eg. historical newspapers, books, archaeological fragments, audio or video contents).

The Australasian Legal Information Institute¹⁰ (AustLII), is an example of ‘major existing digital databases and collections’ which constitutes major systemic research infrastructure but which does not require a massive investment to sustain. AustLII (including the other LIIs it operates, particularly the World Legal Information Institute¹¹ (WorldLII)) clearly comprises a ‘landmark facility’:

- it is large-scale and complex (probably more than any other free access law facility in the world);
- it ‘serve[s] large and diverse user communities’ (over 650,000 hits per day in Australia);
- it is ‘generally regarded as part of the global research capability’ (it is on two counts: WorldLII is the global portal, and AustLII is its largest single component);
- and it does ‘engage national and international collaborators in investment and in access protocols’ (via the Free Access to Law Movement and the collaborating LIIs).

Particularly for the Humanities and Social Sciences there needs to be a recognition that NCRIS should support smaller investments in critical research infrastructure - this may require NCRIS to review the definition of what constitutes a “Landmark Facility”.

Promoting and Maintaining Good Health Expert Working Group

UNSW generally agrees with the views of the Expert Working Group suggestions with respect to Promoting and Maintaining Good Health, but highlights one area which has been overlooked – Cell Therapies.

Cell Therapies

UNSW has identified one gap in the Capabilities relating to cell therapies. Cell Therapies represent an emerging area that is relevant to clinical practice and covers many areas of medical and biomedical research and needs to be supported by NCRIS. Emerging areas in which cell therapies are being developed include:

- Neurological Disorders including Parkinson’s Disease, strokes and blindness;
- Infectious Diseases;
- Liver Failure;
- Heart Disease;
- Burns and other skin conditions;
- Endocrinological disorders including Type 1 Diabetes;
- Bone fractures; and
- Infertility

Cells being grown for use in these conditions are stem cells, both adult and embryonic in nature, mature cells such as lymphocytes taken from peripheral blood and chondrocytes from bone or islets isolated from donor pancreases, and cell lines and animal cells.

¹⁰ See <http://www.austlii.edu.au/> for further information

¹¹ See <http://www.worldlii.org/> for further information

Growing cells for therapeutic purposes requires quality assurance and good manufacturing practice (GMP) under the guidelines being developed by the TGA. Manufacturing of the cells will need to be done in a Cell Facility, with every procedure licensed by the TGA. While there are a limited number of GMP cell therapy facilities, there are not enough to cater for the increasing needs of the Australian community and the emerging importance of research programs that depend upon a reliable source of cells.

There is a need to establish a “virtual cell therapy facility” in Australia, with multiple distributed nodes and at least one real time facility in each major capital city. The focus of the facility should be to concentrate on supporting emerging therapies, with links to facilities that support established therapies, namely bone marrow and cord blood transplantation. Australia now has the opportunity to co-ordinate and manage the expansion of cell production facilities in an effective national manner so that the cell therapeutic facilities can cater for the increasing needs of Australia.

Evolving Bioplatforms and Informatics

UNSW agrees with the need for ongoing support of proteomics. ***Metabolomics, and other emerging ‘omics, although currently less mature, will grow in importance and should be kept under active consideration in the next iteration of the roadmap.*** Co-locating proteomics and metabolomics capabilities offers optimal opportunities for both to progress.

National Imaging Facility

UNSW understands that the National Imaging Facility’s submission to the NCRIS Roadmap review highlights the need for translation from animal research to clinical trials and the vital role of imaging in this translation. ***UNSW believes it is important that the NCRIS investment in NIF be maintained.***

UNSW welcomes the opportunity to contribute further to the Review of the NCRIS Roadmap once the Exposure Draft of the updated NCRIS Roadmap has been released in mid-June.

Yours Sincerely,



Professor Les Field
Deputy Vice-Chancellor (Research)