



Australian Academy of Science

**RESPONSE TO THE REVIEW TO
STRENGTHEN INDEPENDENT MEDICAL
RESEARCH INSTITUTES ISSUES PAPER
FROM THE AUSTRALIAN ACADEMY OF SCIENCE / DECEMBER 2014**

Australian Academy of Science Response to the Review to Strengthen Independent Medical Research Institutes Issues Paper

The Australian Academy of Science welcomes the opportunity to provide an initial response to the Issues Paper released by the Review to Strengthen Independent Medical Research Institutes (iMRIs). The Academy promotes scientific excellence, disseminates scientific knowledge, and provides independent scientific advice for the benefit of Australia and the world. The Academy is made up of over 470 of Australia's leading scientists, each elected for their outstanding contribution to science.

The Academy looks forward to further engagement with the Review Panel, and to providing a more detailed response to the foreshadowed discussion paper. The Academy would be pleased to provide further information or explanation on any of the points made in this submission.

1 Having regard for sources of medical research funding in Australia, current funding arrangements and other players in the sector...

1.1 ...identify and describe key elements of a best practice model for iMRIs. Suggestions may address organisational structure, and capital and asset models

Research productivity can be improved by ensuring that researchers have access to high quality research infrastructure and technical expertise through the more efficient sharing of high-cost equipment. For this to occur, appropriate funding models, sharing arrangements and access agreements need to be developed.

1.2 ...is there an optimally sized and structured model for an iMRI in Australia? For example, is there an optimal size for number of scientists, number of support staff?

There is unlikely to be an optimally-sized medical research institute across all areas of medical research—a one-size-fits-all policy is probably not appropriate.

- (i) However iMRIs must have a sustainable business model and smaller institutes cannot draw on the economies of scale and efficiencies as easily as the larger institutes. The question is not one of size but one of sustainability and providing there is a solid business model, size is not an issue.
- (ii) There is a question of critical mass of research activity. In general, smaller groups working in isolation do not have the benefits of the vibrant research environment that a larger number of researchers and research groups provide. Smaller MRIs do need to be part of an active research community, for example in association with other institutes or universities.

2 Identify and describe opportunities for how iMRIs might increase efficiency and avoid duplication in the health and medical research sector. Suggestions may address capital and asset models, corporate and research infrastructure, and organisational structure

There is an opportunity for iMRIs to increase efficiency through the sharing of expensive infrastructure and equipment, where this is feasible, and local capacity exists to make this possible. It should be noted that there are legal issues that prevent the transport of biological specimens and that this can restrict some areas sharing equipment.

Also there is the opportunity to avoid duplication of back-office functions (HR, reception, IT support, stores, loading docks, animal houses, technical support staff and so on). To take advantage of some

of these efficiencies colocation (or close location) is necessary, but for others such as services, remote sharing is also feasible.

There is also the opportunity to ensure that there is coordination of the research effort between like-minded institutes to avoid potential duplication (or strong overlap).

Almost all medical research is underpinned by expertise from cognate and also distant disciplines (for example informatics, basic biology, chemical synthesis and drug design, biophysics and mathematical modelling). Collaborative access to the range of different disciplines that underpin medical research is facilitated by close proximity and engagement with universities or other institutes.

In some particular instances mergers may be both feasible and desirable. For example, the establishment of the Brain Research Institute in Melbourne through the merger of four iMRIs to the benefit of all parties (<http://www.brain.org.au>)

3 Identify and describe opportunities for iMRIs to share resources and equipment with other health and medical research institutions (universities, other iMRIs, hospitals, healthcare providers). Suggestions may address sharing administrative services (e.g. HR, security, OHSE, research administration) or scientific facilities (e.g. equipment, staff, laboratories).

As discussed in point 2 above, there is opportunity to avoid duplicating facilities and services that lead to reductions in operational overheads.

The Grand Challenges Canada model of trans-disciplinary research and sharing of resources could be of interest in this context (www.granchallenges.ca).

4 Identify and describe possible opportunities for accessing more diverse funding sources.

Most iMRIs already seek to acquire funding from a diverse range of sources, and some iMRIs are very successful at raising philanthropic funding for research as well as bequests and donations. The fact that many iMRIs focus on a specific disease type, eg diabetes, cancers, the brain etc, serves to highlight the importance of the disease and to marshal an interest group for fund raising and also to source patients for clinical trials.

5 Identify opportunities for iMRIs to expand existing and develop new national and international strategic collaborations with other institutions (universities, MRIs, health sector and/or industry), including collaboration with those fields, disciplines and scientific resources needed for research growth and expansion over the next decade (e.g. mathematics and big data expertise, behavioural sciences, engineering).

5.1 International collaboration

Science is a collaborative endeavour where researchers need to frequently and routinely collaborate with expertise that lies outside their own institution. The increased need to collaborate and the benefits it can bring are well outlined by the US Office of Research Integrity¹. The need for Australia to collaborate internationally has been documented by the House of Representatives' inquiry into Australia's international research collaboration², amongst numerous other reports. International

¹ Office of Research Integrity (2014) *Need for collaboration*. Available at: http://ori.hhs.gov/education/products/niu_collabresearch/collabresearch/need/need.html

² House of Representatives Standing Committee on Industry, Science and Innovation (2010) *Inquiry into Australia's international research collaboration*. Available at:

collaboration is seen as a key benchmark of the strength of a nation's science system³. Australia has established strong collaborative ties to both traditional scientific powers in North America and Europe, and with newly emerging scientific leaders in the Asia region. While Australia is well placed to strengthen international links, especially with Asia, the opportunity to do so is diminishing as Australia has not had a strategic international science collaboration strategy since 2011, and would benefit from developing one⁴.

It is important to recognise that international strategic collaboration with other institutions and nations is a competitive endeavour, and the desire to increase such collaboration needs to be matched with strategic support. Providing strategic support for Australian researchers and institutions to gain access to and share resources, data, ideas and risks with the rest of the world is essential if Australia is to continue to be a partner of choice in international collaboration. Indeed, if Australia is not a competitive collaborator, our future capacity to address domestic and global problems will be greatly diminished⁵.

5.2 Multidisciplinary collaboration

As stated above, almost all medical research is underpinned by expertise from cognate and also distant disciplines (for example informatics, basic biology, chemical synthesis and drug design, biophysics, mathematical modelling and so on). The Academy has outlined in recent reports how developments in areas of computer science⁶ and nanotechnology⁷ have the potential to transform many areas of health and medical research and to improve health outcomes, and the same is true of other disciplines. Collaborative access to the range of different disciplines that underpin medical research is facilitated by close proximity and engagement with universities or other institutes. iMRIs will need to increase collaborations and engagement with other research organisations to provide good access to this expertise.

6 Identify and describe opportunities for iMRIs to implement policy, governance or other arrangements to more readily translate into health policy and, with this, positive health outcomes.

The opportunities and benefits of enhancing non-commercial pathways to impact (such as through research translation into policy) are well outlined in the McKeon report⁸. Appropriate incentives and recognition within the funding system for iMRIs needs to be in place to help facilitate such translation.

http://www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=isi/intresearch/report.htm

³ For example see Chapter Six, 'International Collaboration' in Office of the Chief Scientist (2014) *Benchmarking Australian Science, Technology, Engineering and Mathematics*. Available at:

<http://www.chiefscientist.gov.au/2014/12/benchmarking-australian-science-technology-engineering-mathematics/>

⁴ As outlined in Australian Academy of Science (2011) *Australian Science in a Changing World*. Available at: <https://www.science.org.au/node/36457>

⁵ Australian Academy of Science (2010) *Internationalisation of Australian Science*. Available at <http://www.science.org.au/publications/documents/Internationalisation-of-Australian-Science.pdf>

⁶ Australian Academy of Science (2013) *Future Science: Computer Science*. Available at: <https://www.science.org.au/node/36464>

⁷ Australian Academy of Science (2012) *National Nanotechnology Research Strategy*. Available at: <https://www.science.org.au/node/36462>

⁸ Department of Health and Ageing (2013) *Strategic Review of Health and Medical Research*. Available at: http://www.mckeonreview.org.au/downloads/Strategic_Review_of_Health_and_Medical_Research_Feb_2013-Final_Report.pdf

As the McKeon review states, most public health professionals work in state and territory health departments and investigate the evidence base around which to develop or change policy, and that it is through the state and territory health departments that research findings are usually most efficiently disseminated. It would be desirable to facilitate policies that enhance the relationship between state and territory health departments and research organisations, including iMRIs. Achieving this will require appropriately investing in public health and adequately resourcing research organisations to engage with public health professionals. The NHMRC proposal for Academic Health Centres is still a potentially powerful vehicle that could be used to help achieve critical mass of the medical research effort and translation of good medical research into tangible health outcomes. The Academic Health Centres need to be put into practice.

7 Identify ways iMRIs can actively build capacity of the health and medical research sector in Australia to respond to future challenges. Suggestions may address innovations in the areas of research methodology, workforce and training.

A number of the iMRIs form an effective bridge between universities, hospitals, industry and the community by providing a focus for collaboration and knowledge transfer, and they have an important role in research training.

However, career structure and workforce security issues are particularly acute in iMRIs, with the job security of many researchers within iMRIs really only guaranteed as long as a researcher is attached to an active research grant. We need to move away from the tendency to support research through short-term proposals to one where there is longer support available for good research projects. The short-term research contract reduces career desirability and forces many exceptionally talented researchers to leave the research system.

The Academy supports what has already been investigated and reported on numerous occasions^{9 10}, and is comprehensively explored within the McKeon Review. It should be noted that the imperative for non-tenured researchers to have to continuously pursue research funding to ensure short-term career viability reduces their ability to participate in more substantive research programs.

8 Outline strategies that could be implemented by iMRIs to boost their commercial and fiscal returns in the health and medical research sector.

To put commercialisation into perspective, the prospect of generating significant commercial returns from medical research is firstly quite low—the reality is that few great breakthroughs will ever become commercially successful. Even the most successful commercial outcomes are unlikely to make any substantial offset to the cost of running the medical research and health systems. Secondly, the commercial returns from medical research are likely to take a long time to come to fruition—the stages from laboratory to tangible health outcomes is typically years or decades.

⁹ Department of Innovation, Industry, Science and Research (2011) *Research skills for an innovative future*. Available at:

http://docs.education.gov.au/system/files/doc/other/research_skills_for_an_innovative_future.pdf

¹⁰ House Standing Committee on Industry, Science and Innovation (2008) Inquiry into research training and research workforce issues in Australian universities. Available at:

http://www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=isi/research/report.htm

The McKeon review outlines the substantial opportunities to enhance commercial pathways to impact from health and medical research¹¹, along with the barriers that need to be overcome to increase such commercialisation. One of the main reasons that Australia has lagged in research commercialisation has been the lack of government support for research translation into commercial products. The McKeon review found that targeted funding is required at the preclinical and early clinical stage of research commercialisation, and the suggestion of a Translation Biotech Fund is discussed in the report¹². At present there is very little funding available for researchers to pursue what are risky research commercialisation opportunities, and the financial incentives to continue to pursue new research opportunities are far higher.

The Academy supports the view, advanced in the McKeon review, that suggests that research organisations that have sub-scale or no business development offices (which might be the case at smaller iMRIs), should be encouraged to engage larger institutions/precincts for commercialisation requirements. The proposed Industry Growth Centre in Medical Technologies and Pharmaceuticals might be one such way to help encourage such an initiative.

9 Apart from publications and citations, what other impact criteria are used by your institution as indicators of individual or institutional success?

The Academy is not an employer of medical researchers so this question is not directly relevant. Research excellence is an overarching criterion for success and this is enhanced by the translation of good research into tangible health outcomes. The criteria that institutions apply in terms of individual or institutional success are influenced by the funding environment in which they exist. For organisations such as iMRIs to obtain competitive government research funding, they need to employ and reward researchers who can demonstrate research excellence, otherwise the iMRIs will be uncompetitive and unlikely to succeed within the current research funding environment.

¹¹ Department of Health and Ageing (2013) *Strategic Review of Health and Medical Research*. Available at: http://www.mckeonreview.org.au/downloads/Strategic_Review_of_Health_and_Medical_Research_Feb_2013-Final_Report.pdf

¹² Ibid