



Science & Technology AUSTRALIA

Inquiry into Funding Australia's Research

29 June 2018

To the Standing Committee on Employment, Education and Training,

Thank you for the opportunity to respond to the Inquiry into Funding Australia's Research.

Science & Technology Australia (STA) is the peak representative body for more than 70,000+ scientists and technologists in Australia through our member organisations, including associations and societies, research institutes, and research strategy bodies such as councils of deans. A full list of our members is available [here](#). Our mission is to connect science and technology with governments, business, and the community, to enhance the role, reputation and impact of science.

Science & Technology Australia believes federal investment in research and the structures that support it is crucial to underpin and grow the thriving and effective scientific research that will ensure Australia's health, wealth, wellbeing and environmental sustainability – today, and into the future.

We commend continuity of support for enduring investment in research through the Australian Research Council (ARC) and the creation of recent schemes, such as the Medical Research Future Fund (MRFF) and the recent decision to implement long term-planning around research infrastructures, as important mechanisms to strengthen Australia's capacity to conduct leading scientific research, as well as to innovate and apply that research.

However, as the nature of science and the research sector evolves, it is important also to adapt the system. In recent years, the number of outstanding research proposals has flourished, yet the pool for public investment has remained steady – resulting in worrying declines in the success of worthy applications for federal research grants. At the same time, Australia continues to do itself a disservice by failing to rise to the challenge of ensuring diversity among successful grantees, and therefore failing to nurture new and important perspectives. Australia is also guilty of failing to protect that diversity that exists in the system by supporting marginalised populations through periods of vulnerability. Confusion and a lack of transparency around the process that determines allocation of public investment in research and infrastructure is also creating barriers to new entrants to the system.

In considering these issues, STA makes the following recommendations:

1. Improve the transparency of funding decisions and set clear and well communicated guidelines for the allocation of public funds through the Medical Research Future Fund
2. Create a consultative reform process to implement research grant funding recommendations outlined in this document and previous reviews
3. Prior to the next round of research infrastructure funding, develop clear guidelines for applying for and deciding on such funding
4. Adjust the funding process for research infrastructure by consulting with the sector on the most recent allocation of funding;

5. Consider applications for scoping projects at the 2-year review of research infrastructure funding;
6. Create a Research Future Fund to complement the ARC, in the same way as the MRFF compliments the National Health and Medical Research Council (NHMRC).

Please find our specific feedback below: thank you for considering our submission.



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Introduction

Federal investment in Australia's research underpins a system that produces innovative, successful and impactful outcomes. These outcomes improve the way people live and work in Australia and around the world.

This submission explores barriers and opportunities to world-class Australian research, including issues of transparency in decision-making, the burden of the application process, the allocation of funding for research and research infrastructure, and the establishment of a Research Future Fund based on the success of the Medical Research Future Fund (MRFF).

Some federal research investment mechanisms are highly successful in achieving the specified aims laid out for those programs. A recent example of this is the Cooperative Research Centres Projects (CRCP) grants, which successfully brings research and industry together to achieve innovative outcomes for Australia. While it is possible that the CRCP program may need to be reviewed in the future, STA considers the implementation of the CRCP to be effective and efficient.

Ensuring that research is adequately and efficiently funded will ensure a better return on investment of the public dollar: an efficient system will free up researchers to spend less time applying for grants and more time on what they do best: pushing the boundaries of knowledge and innovating and applying that knowledge.

The current federal system has to date successfully invested the necessary resources to support Australia to become a global leader in research. But as the world research sector changes, it is essential to ensure that Australia's approach to investing in research stays up to date.

From time to time it is important to review the way in which national research funding is administered and adjust processes to ensure they maintain the principles for grants administration of¹:

- excellence;
- equity;
- transparency;
- simplicity;
- support of the seven key principles of the *Commonwealth Grants Rules and Guidelines*²

While this inquiry may not constitute an exhaustive examination of all of the issues related to federal investment in research, Science & Technology Australia recommends a broader review of research funding as the next step towards supporting Australia's research to be internationally competitive. In lieu of such a review, STA requests consideration be given to the following important issues:

¹ [“The Changes”](#) National Health and Medical Research Council, 2017

² [“Commonwealth Grants Rules and Guidelines”](#) Department of Finance, 2017

Improving Funding Transparency

Competitive Grant Transparency

As the trend towards interdisciplinary research grows, the boundaries between the remits of funding and granting bodies become blurred. When considering the two major research funding bodies, the Australian Research Council (ARC) and the National Health and Medical Research Council (NHMRC), there appear to be clear differences in remit:

“The ARC supports the highest-quality fundamental and applied research and research training through national competition across all disciplines. Clinical and other medical research is primarily supported by the National Health and Medical Research Council. In addition, the ARC brokers partnerships between researchers and industry, government, community organisations and the international community.”³

However, these boundaries are challenged when health-related research falls just outside of the remit of NHMRC funding. STA’s members report that it can be difficult to distinguish the appropriate funder, and request clearer guidelines to ensure important research does not fall between the gaps.

Researchers from Medical Research Institutes are not eligible to apply for funding under the ARC as these institutes are not covered under A13 List of Eligible Organisations of the ARC funding rules⁴. This prevents researchers in areas such as stem cell biology, genetics/genomics and developmental biology that do not have direct clinical benefits from funding access.

STA recommends that the list of eligible organisations should be reconsidered to allow other eligible organisations to be included if they have researchers that fall under the necessary Fields of Research Codes. Both the NHMRC and ARC should regularly review the Fields of Research (FOR) codes and Socio-Economic Object-08 (SEO-08) codes used in all applications, to ensure that no area of research regularly falls through the gap between the bodies. With this regular consultation and collaboration between the two funding bodies, Australia will become more adaptive towards supporting emerging and important collaborative research projects.

Non-Competitive Grant Transparency

The recent national research infrastructure funding plan and recent decisions around the allocation of the MRFF, have raised concerns in the sector regarding the transparency of public investment decisions.

Feedback from the STA executive and policy committees which contains real scientists has been unanimous, with concerns raised about how allocations have been made and priorities set. There is broad support for the investment, but a

³ [“Australian Research Council Website”](#) accessed July 2018

⁴ [“Funding Rules for schemes under the Discovery Program \(2017\)”](#) Australian Research Council 2017

strong desire to better understand the vision behind these decisions, and how they might support a strong future for Australian science and technology.

While competitive grants provide clear outlines and transparent, contestable application processes, there appears to be a lack of such processes for these recent decisions around research infrastructure and the MRFF.

STA recommends transparency in funding decisions backed by clear and well communicated guidelines for the allocation of public investments in research infrastructure and through the Medical Research Future Fund, and any such future instruments.

A comprehensive review of the research grants process

The Issues

Feedback to STA suggests the research community has identified two areas of concern regarding the methodology for awarding research grants through a competitive process, such as administered by the ARC and other grants under the National Competitive Grants Program: ensuring diversity among successful applicants, and declining success rates for worthy applications.

The ARC has made specific plans to address imbalances in access and allocation of grants to women and Aboriginal and Torres Strait Islander researchers⁵. A review is also underway to review the provisions of parental leave under all National Competitive Grants⁶. However, work is still needed to ensure cultural diversity and access to grant support for researchers with disability.

Regarding declining success rates; this has resulted from a steep increase in the number of quality applications for federal support, while the quantum of funds available for disbursement has remained static (at CPI). The time burden associated with preparing, assessing and monitoring the increasing number of applications creates an untenable workload for researchers, institutions and the funding bodies themselves.

The recent review of the NHMRC was informed by a desire to increase success rates and minimise the burden of application times, however it is yet to be seen if these changes will have the desired effect.

STA has identified alternative processes by examining successful international methodologies (outlined below), which may help address issues of diversity and increase the success rates of worthy grant applications.

Recommended Changes to consider

A two-tiered process

One of the major administrative time costs for research grants is preparing the grant application. A single research grant proposal (80-120 pages in length) can

⁵ [“Gender equality in research statement”](#) Australian Research Council, 2018

⁶ [“Gender Equity Action Plan”](#) Australian Research Council, 2018

take on average 38 working days of a researcher's time per year⁷ – this equates to 550 working years of researchers' time across all proposals to the NHMRC alone.

With more applicants for a static pool leading to decreasing rates of success (less than 20% for ARC Discovery Grants⁸) this represents a significant cost in unproductive time for the vast majority of applicants.

The implementation of a two-tiered process, similar to that used by the Health Research Council of New Zealand, would minimise unproductive time for researchers whose proposals are least likely to succeed, and make best use of the time given by senior researchers to selection committees.

This approach involves a much less time-consuming phase, seeking expressions of interest, before a more comprehensive application is required.

Such an approach would decrease the total time spent on unsuccessful applications by applicants as well as assessors. The time requirements for applications and assessing applications were a key hurdle to considering multiple rounds or rolling funding similar to the ARC linkage grants and this process will allow such opportunities to be explored.

The process does potentially put more emphasis on the track record of the chief investigator of the application. However, this potential bias can be mitigated by limiting the number of publications allowed in this process.

Stage 1: Expression of Interest

- 5 top publications from the primary investigator
- A word limited summary of the project aims
- An outline of collaborators (no emeritus professors)
- A brief impact/engagement statement of the research

Stage 2: Invited Applications

- Invite only
- A more detailed outline of the project, budget and timeline
- No information about the researchers undertaking the work where possible
- Similar in information to the current ARC process

A focus on promoting diversity

Diversity issues extend to the age and experience of researchers receiving grants and awards; the type of research projects allocated funding; equal representation of women and men; and the representation of cultural and other minorities.

⁷ [“Funding: Australia’s grant system wastes time”](#) D. Herbert, *et Al*, 2013

⁸ [“Selection Report: Discovery Projects 2018”](#) Australian Research Council, 2018

To improve equity, diversity and inclusion we have proposed a number of models (outlined below). We urge that these be considered in any review of the grant process:

- **Diversity Quotas:** This can quickly and effectively address the issue of gender disparity where it exists. The ARC already monitors gender disparity among successful applications and it would be possible to address these concerns with a quota regarding each field of research. (With the suggested two-tiered system above it could be possible to apply quotas at either stage).
- **Gender Application Limits:** This approach places the burden of gender equity on research institutions by limiting the number of applications that will be accepted based on gender parity. For every 2 applications received from an institution, 1 of those applications must have a female chief investigator. This may prove difficult however as some fields may have proportionally low numbers of female applicants yet still provide a high success rate (such as in mathematics).
- **De-identifying applications:** With the two-tiered system outlined above, it would be possible to de-identify applications in the second round. This process not only negates the issue of gender bias, but other areas of diversity too (e.g. the bamboo ceiling⁹). While the first-round applications are based on research track record the second round can be based on the project itself which may eliminate unconscious bias.
- **Limiting publication records:** Diversity of experience is also an issue, and it's important that early carer researchers are empowered to participate. As the Chief Scientist recently stated, it is essential that researchers be encouraged to pursue high quality work over high numbers of publications¹⁰. A limit of 5 of the primary author's "self-chosen best" publications not only provides an incentive for researchers to strive for high quality research, but also removes some of the barriers in the system for people that have had interruptions in their research career due to family, illness or other reasons.

There are also concerns that Emeritus Professors who have extensive research careers skewer the process, being considered above and beyond other publications predominantly because of their high research output. As Emeritus Professors are researchers that are no longer employed by an institution, it should be considered that they be disallowed from being included in grant applications.

The important of brave and ambitious research

Another concern for the sector is the gradual move towards "safe research" over innovative and novel research. This is a phenomenon that is identified as a

⁹ "[Unconscious bias and the bamboo ceiling](#)" The Australian Human Rights Commission, 2014

¹⁰ "[Big questions, bright futures](#)" Chief Scientist Alan Finkle, 2018

concern in research funding systems worldwide¹¹. Some projects like the ARC Discovery Early Career Researcher Award have increased weightings to areas such as Project Quality and Innovation (now at 40%)¹². Concerns within the sector however indicate that weightings do not provide enough incentive to encourage “brave” research.

Recent changes to the NHMRC grants to create the Ideas Grants are a step forward to ensure specific funding for innovative ideas and should be considered for other grant bodies after the success of these changes are reviewed.

Multiple funding rounds

Under the current funding model for programs like the ARC there is significant time and cost required to assess applications. As previously mentioned there is also a considerable time burden for applicants. These burdens have meant that participation for both applicants and selection panellists is becoming more and more untenable.

The two-tiered expression of interest approach outlined above would reduce the number of applications that require assessment at the panel stage and could open the system up to two or three application rounds per year.

Multiple application rounds would empower researchers who are also teaching academics to participate in the research funding process, which will inevitably improve the output of our research sector.

Enhancing international collaborations

During our consultations with the STEM sector, one of the major issues raised regarding the competitive grants process was the information burden placed on researchers that are including international collaboration on grant proposals.

While some checks on international collaboration should be considered, there needs to be a balance struck between the integrity of public funding and the limiting effect that such requirements can have on international collaboration. Any review into the competitive grant process for research funding should ensure that international collaboration is encouraged and not hampered by unnecessary red tape.

STA recommends the creation of a consultative reform process to implement research grant funding recommendations outlined in this document and previous reviews

This process should include an analysis of the NHMCR changes and successful approaches overseas; explore the viability of a two-tier expression of interest

¹¹ [“Why the Medical Research Grant System Could Be Costing Us Great Ideas”](#) Aaron E. Carroll, 2018

¹² [“Selection Report: Discovery Early Career Researcher Award”](#) Australian Research Council, 2018

system; introduce improvements to address the diversity of grant recipients; and find ways to enhance collaboration with international researchers.

Research Infrastructure

Recent changes to the process

The recent introduction of long term research infrastructure planning has had a predominantly positive effect on the research community. Long term planning is essential, and especially so for large facilities, and ensuring long term investment as well as a clear plan for the future of this vital infrastructure will provide fertile ground for more successful research in Australia.

The inclusion of operational funding, as well as capital funding, also indicates an understanding of the ongoing funding requirements of our research infrastructure. After consultation with the sector, it is clear that the outline for future infrastructure is sound and effective and should be considered a cornerstone of long-term public investment in research.

STA's stakeholders have suggested refinements to improve this process for the future, which have been outlined below.

Ensuring strategic funding

Feedback received from the sector indicates that there is no clear articulation of the strategic decision-making behind the latest round of infrastructure funding.

While the National Research Infrastructure Roadmap reflected very specific priorities, some facilities were only partially funded or requested funding based the assumption that other complementary facilities would also be funded, allowing collaboration to occur. As a result, gaps may begin to appear before new investment is made in four years.

An independent board was recommended by the Clarke review into research infrastructure and can effectively oversee public investment in research infrastructure over the long-term. This board could ensure that funding is allocated in a strategic, transparent and consultative way, which better follows the priorities outlined in the Roadmap.

STA understands that there is a benefit to being able to access experts in priorities on an ad hoc basis, but this does not necessarily preclude the formation of an independent advisory board. This board should be flexible enough to allow experts to participate in the process between the roadmap stage and the investment plan stage.

STA recommends that an independent infrastructure strategic advisory board be formed and that this board have flexible membership positions for expert facility advisors.

Providing clear guidelines for applicants

Feedback provided by organisations in the STEM sector has indicated the need for more clarity and specific guidelines provided ahead of any allocation of funding in the future.

Some facilities indicated that prior to the most recent announcements they were given specific advice in preparing funding information and were regularly contacted by the Department. Other organisations indicated that they were unaware the information they were providing would be considered as part of official funding applications or business cases, and received little to no correspondence.

The sector greatly appreciated the work that was put into the funding process by the Department of Education and Training in collaboration with the Department of Industry, Innovation and Science, however every stakeholder we consulted said they considered it important to be clear about the process given the long-term nature of the decisions being made.

STA recommends that prior to the next round of research infrastructure funding, clear guidelines are developed for applying for and deciding on research infrastructure investment, based on feedback on the most recent allocation of funding.

Making it easier to start a NCRIS facility

Of all the funding that was provided in the recent research infrastructure announcements there was little for new NCRIS facilities. While the long-term plan is beneficial, there is a concern that any future facility is now locked out of funding for up to 4 years (until the next roadmap process). Other facilities that were provided support for scoping projects will not be funded until after the next research infrastructure roadmap.

STA recommends that applications for future infrastructure scoping projects should be considered at the 2-year funding review. This will allow for a scoping project to be completed in time for consideration at the subsequent national research infrastructure roadmap.

A Research Future Fund

The Medical Research Future Fund has demonstrated the importance of meaningful public-private investment in the translation of scientific research into real world applications. While there is some room for improvement (outlined above) the overall success of the program provides the government and the research sector with the evidence needed to create a similar fund in line with non-medical areas of research translation.

The success of the MRFF is based around industry co-investment; a similar such fund that encourages co-investment in other areas of translational research would increase business investment in research, and improve Australia's standing as an innovation nation.

The aim of a Research Future Fund would be to provide targeted funding for translational research in a similar fashion to the MRFF. Opportunities to co-invest from private sources will provide some of the resources required by the Research Future Fund. This co-investment will aid in offsetting some of the total investment required for this new research fund.

STA recommends the creation of a Research Future Fund to complement the ARC, built to mirror the way the MRFF complements the NHMRC.