

## **MBIE Te Ara Paerangi - Future Pathways**

### **Response from the Department of Anatomy, University of Otago.**

Assembled by the Departmental Research Committee with input from senior academic staff members.

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## **1. NGĀ WHAKAAROTAU RANGAHAU, RESEARCH PRIORITIES**

**KEY QUESTION 1: What principles could be used to determine the scope and focus of research Priorities?**

**KEY QUESTION 2:**

**A) What principles should guide a national research Priority-setting process?**

**B) How can this process best give effect to Te Tiriti?**

**KEY QUESTION 3: How should the strategy for each research Priority be set and how do we operationalise and implement them?**

We accept that the setting of priorities in a broad sense is necessary to guide funding for major challenges of today, such as the impact of - and the response to - climate change. Specific funding rounds may be set aside for such research. If research priorities are set, there should be a broad representation of stakeholders involved in these decisions. For example, there should be appropriate room for Māori aspirations. This is essential for prioritisation to give effect to Te Tiriti. Similarly, research priorities need to incentivise domestically important research which may not always yield high impact outputs on an international level.

Also, if research priorities are set, they should reach into the school curriculum. The schooling system trains the people that will eventually be addressing the research priorities.

However, it is important to consider that prioritisation comes with an inherent risk of trying to align all research with pre-defined priorities. This can for example increase the risk of de-funding basic, blue skies research. As we don't know what tomorrow's challenges will be, this is problematic. Today's blue skies research may well address tomorrow's major challenges. For example, our department contributed in various ways to the detection of COVID19 across the country and overseas. Among these contributions were at least two molecular tools, developed with contributions from Anatomy researchers, that found their use in COVID detection in NZ and overseas but were never designed for this application. Both tools originated from blue skies research, one with the aim to extract DNA from very old subfossil remains, the other addressing a need for high-throughput purification of genetic material. Neither tool would exist without the fundamental research they were originally designed for. Would "high-throughput molecular detection and sequencing of viral pathogens" have been a research priority at the start of 2019? We think perhaps not.

**One of the key arguments of our response is that we would prefer people rather than specific research to be prioritised.** We will outline suggestions and reasoning in the appropriate sections below.

## 2. TE TIRITI, MĀTAURANGA MĀORI ME NGĀ WAWATA O TE MĀORI TE TIRITI, MĀTAURANGA MĀORI AND MĀORI ASPIRATIONS.

KEY QUESTION 4: How would you like to be engaged?

KEY QUESTION 5: What are your thoughts on how to enable and protect mātauranga Māori in the research system?

KEY QUESTION 6: What are your thoughts on regionally based Māori knowledge hubs?

Enabling and protecting mātauranga Māori and facilitating a broader engagement of research with Te Tiriti is best achieved by bringing more Māori researchers into the science workforce. That requires targeted career support and it requires that science is an attractive career path. It is challenging to convince talented Māori students and scholars to aim for a career in research when for example professional programmes offer more stability and security. This is a general problem in NZ research. Providing more stable funding for researchers between PhD and faculty positions would benefit research in NZ generally, and should include targeted funding for Māori researchers (see point 5).

Mātauranga Māori research needs to be primarily Māori-led and self-determining. In order to achieve and maintain this, we have to be careful to incentivise genuine linkages between Māori and Pākehā researchers rather than describing token linkages with Māori to support research and grant applications. The latter is not only disingenuous, but can also overburden established Māori researchers and consultation groups.

**Māori knowledge hubs:** Such hubs would be an excellent way to connect iwi and research institutions. Currently, co-designed research often grows out of long-term relationships between individual researchers and iwi representatives. That is an ideal situation, and increasing the number and scope of such relationships should be our long-term aspiration. If Māori knowledge hubs could contribute to facilitate and accelerate the establishment of new relationships, that could indeed help including mātauranga Māori more broadly in our science system.

Such co-location also uplifts local mātauranga, and ensures that students do not need to make the choice of being with their hapori or pursuing a higher education. Embedding researchers in the community will help with whakawhanaungatanga and ensuring research is both relevant to local communities, and led/co-led by them.

## 3. TE TUKU PŪTEA FUNDING

KEY QUESTION 7: How should we determine what constitutes a core function and how should core functions be funded?

KEY QUESTION 8: Do you think a base grant funding model will improve stability and resilience for research organisations, and how should we go about designing and implementing such a funding model?

This section acknowledges a number of key limitations of the current funding system. As a result of high overheads on staff positions, fully qualified researchers such as postdoctoral fellows or technical staff are very expensive. Consequently, a lot of research is conducted by postgraduate students. Limited postdoctoral and technical support can limit student

supervision, in particular if the academic staff member leading the research is tied up in finding the funding for the research in a very competitive and limited funding environment.

When technical or postdoctoral support is available, it is usually temporary and tied to a specific research grant. When the grant expires, the knowledge and expertise associated with these positions is often forced to leave the group, without the research group and subsequent students being able to profit from this gained expertise. Furthermore, students trained as part of the research projects are also often forced to move overseas due to very limited postdoctoral support in New Zealand, causing further loss of expertise that was built using New Zealand funding.

The postdoctoral funding gap also raises equity concerns. This period of uncertainty tends to overlap with peak fertility for women, which causes some hard conversations. However, the extension to eligibility for Marsden Fast Starts and Rutherford Discovery Fellowships is really excellent. Potentially this grace period should be extended to PhD students. Parental leave should also be extended to PhD students, as is the case in other countries such as for example Norway.

Short term contracts also limit productivity for postdoctoral and technical staff, who might have to spend a significant amount of their time securing their next position.

Thus “**core functions**” in our view are academic positions that fill the void between PhD student and faculty positions (postdoc, research fellow) as well as technical positions. These roles can secure continuity of research and efficient multiplication of gained experience.

How could these be better funded?

- We do not wish just to demand “more money”, but at the same time research funding at a similar level of other OECD countries would certainly help tackle at least some of these problems. The proposed **increase of Research and Development funding to 2% GDP** will be a step in the right direction.
- Other options may include a **review of the overheads system**. Currently, a PhD student at the University of Otago would cost less than \$45,000 p.a including tuition fees, while a fully costed postdoctoral fellow costs more than \$160,000 p.a. This is an extreme disincentive to including a postdoctoral fellowship into a research grant. Grant overheads instead should be charged as a percentage of the whole project rather than staff positions, as is done in major international funding rounds. What is also required is a government review of overhead funding to ensure that there is equality between institutions in rates that are charged and in how the funding is used.
- A **simplification of the funding environment** may reduce administrative costs and increase available research funding. So, for example, do we need NSCs, and CoREs and MBIE Endeavour projects and so on, or would it be more efficient to concatenate different funding streams? The above funding tools are great for enhancing collaboration, but this might be achieved by other means, such as not disincentivising large research teams through extensive overheads on personnel (see point 4.)

**Base funding:** Transparent, base funding with clearly defined purposes would be an excellent idea to support long-term continuity of technical staff who are often the heart of a research

group and whose experience is invaluable to successful student and postdoctoral projects. It could be challenging to administer, but see point 5.

#### **4. NGĀ HINONGA INSTITUTIONS**

**KEY QUESTION 9: How do we design collaborative, adaptive and agile research institutions that will serve our current and future needs?**

**KEY QUESTION 10: How can institutions be designed to better support capability, skills and workforce development?**

**KEY QUESTION 11: How should we make decisions on large property and capital investments under a more coordinated approach?**

**KEY QUESTION 12: How do we design Te Tiriti enabled institutions?**

**KEY QUESTION 13: How do we better support knowledge exchange and impact generation? What should be the role of research institutions in transferring knowledge into operational environments and technologies?**

This feels like a point that refers most strongly to CRIs. However, it is relevant for the entire NZ science environment.

A major problem is that intense competition for limited funding inhibits inter-institutional collaboration and knowledge exchange. While funding may remain limited, barriers to collaboration can be removed.

For example, charging overheads on personnel rather than projects is one factor that discourages collaboration. Adding New Zealand collaborators to research grants such as Marsden, HRC or various MBIE grants is expensive. For cost intensive research, such as most work involving genomic research, it can be challenging to fit a project of suitable scale into a standard \$1 million grant. The cost of adding domestic collaborators can be prohibitive. While re-structuring overheads may not reduce the overall overhead costs, it would remove a disincentive to add collaborators to projects. Such collaborations may then yield further benefits, such as cost-efficient equipment sharing between institutions.

#### **5. TE HUNGA MAHI RANGAHAU RESEARCH WORKFORCE**

**KEY QUESTION 14: How should we include workforce considerations in the design of research Priorities?**

**KEY QUESTION 15: What impact would a base grant have on the research workforce?**

**KEY QUESTION 16: How do we design new funding mechanisms that strongly focus on workforce outcomes?**

Overall, we propose a shift to a more people-focussed funding system that puts an emphasis on stable, secure and clearly structured career paths in science.

Notwithstanding the provision of targeted support for major global and national science challenges, we consider “research priorities” as secondary behind better environments for the workforce. Researchers compete in an international environment for high impact publications. High impact publications come with highly relevant research. This in itself is a driving force

that guarantees impactful research. An important role of research priorities could be to incentivise research that may not be internationally impactful, but domestically important.

Arguably, this super-competitiveness is not a healthy research environment in itself, but this is an international problem that is hard to solve by one country. What New Zealand can do is to provide researchers with an environment where they can deliver this research.

In order to provide a supportive research environment, we suggest the following:

- Provide **better continuity for key roles such as technical support and research fellows**, through long term funding, specific for these roles rather than a specific project. This can be base funding, although perhaps hard to administer. Alternatively, it can be through competitive funding, but based on overall lab performance rather than for a specific project. For example, research groups that are sustainably producing a certain number and quality of (broadly defined) outputs each year or departments that demonstrably contributed successfully to researcher development, might qualify to apply for research fellow and technical positions based on a long-term research programme rather than a specific project. This could be provided through a tiered system, with allowances made for groups led by early and mid-career researchers. Again, the system is suitable to target and support Māori researchers.
- **Make “researcher development” a stronger criterion for funding applications.** For example, include an explicit statement on how a project will contribute to developing ECR leadership as part of the evaluation criteria.
- **Increase the number of individual rather than project-based early career scholarships** such as Rutherford Postdocs and Discovery Fellowships, and the Hercus Fellowships. Importantly also, the full salary costs should be provided for recipients of these prestigious awards.
- **Provide an infrastructure that allows early career researchers to develop leadership experience** on a broader basis than the above high-profile scholarships, for example through Marsden Fast-Start grants, that cover the full salary of ECRs.
- The proposed **increase in R&D spending to 2% GDP** may allow to increase the number of long-term research projects (for example 5 years), which would also provide increased stability for directly funded staff.

## 6. TE HANGANGA RANGAHAU RESEARCH INFRASTRUCTURE

**KEY QUESTION 17:** How do we support sustainable, efficient and enabling investment in research infrastructure?

- **Incentivise collaborative research** and resource sharing to avoid doubling up on shareable infrastructure (see above).
- **Base funding centralised infrastructure** may be a solution, as long as equitable and easy access can be guaranteed.
- **Simplified reporting mechanisms** would allow for researchers to spend more time on research. Many of the portal-based systems are cumbersome and extremely time consuming. Reporting on research progress and outcomes is critical, but it should not be as difficult as many of the current systems have become.