

# Te Ara Paerangi - Future Pathways submission

## Selected Early Career Researchers (ECRs) at the University of Canterbury

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### Context

We welcome the opportunity to provide feedback to MBIE on the New Zealand science and innovation system. As a group of Early Career Researchers (ECRs), we gathered on two occasions to discuss our responses to the Te Ara Paerangi - Future Pathways green paper. We reflected on issues directly relevant to ECRs. Thus, rather than responding to the full list of questions, we focused on a selection of questions relevant to the ECR workforce and tailored our responses towards ECR needs/issues. These responses do not reflect the entirety of the University of Canterbury ECRs, but the opportunity was given to all ECRs to attend these workshops and contribute to this document. Nonetheless, the responses in this document reflect the thoughts of those named here and our responses have only focused on areas that we feel we are qualified to focus on and that are specifically relevant to ECRs.

A clear priority area for the future of science in New Zealand is increasing representation of Māori, Pasifika, and other historically under-represented groups. A reflection of this focus for the future is the fact that the group of ECRs contributing to this document are primarily immigrants or Tangata Tiriti New Zealanders.

ECRs are at a labour intensive period of their career, in which time sensitive research opportunities, high teaching and admin loads at their institutions, and family responsibilities often collide. ECRs are at the cutting edge of research developments, and a research system that reflects and adapts to specific ECR circumstances is essential to realise the full potential of ECR research capability.

## **NGĀ WHAKAAROTAU RANGAHAU RESEARCH PRIORITIES**

*1. How we design these priorities. For example, what should be the size, scope and focus of the priorities?*

Regardless of the approach to designing priorities, we urge that ECRs should be part of the decision making process. It goes without saying that decision making should be underpinned by the principles of Te Tiriti o Waitangi, and thus in partnership with Māori. Furthermore, priorities should reflect MBIE's commitment to Māori and Pasifika.

*2. How we decide what these priorities are. What process should we use for determining these priorities and who should be involved in the decision-making process?*

Defining impact should be performed on a global scale: we need a better consideration of global issues in funding priorities, rather than focusing solely on New Zealand specific issues. For instance, globally significant research such as climate change will benefit from a more international lens and will help position New Zealand on the global stage. Mechanisms behind this might include the use of internationally diverse review panels. In order to achieve more future-focused research priorities benefiting New Zealand's future ECRs, the science system needs to incorporate more ECRs in governance, management and decision making panels to strengthen their voice in development of funding mechanisms and develop experience as future leaders. Finally, decision making should be performed with a specific focus on equity and on outcomes for underrepresented groups.

*3. How we operationalise and implement these priorities. We need to determine who will be involved in determining the strategy for each priority, how they will be governed and how the priorities will operate on a day-to-day basis?*

Operationalising and implementing research priorities requires a science system that incorporates ECRs in governance, management and decision making panels to strengthen their voice in development of funding mechanisms and develop experience as future leaders.

## **TE TUKU PŪTEA FUNDING**

*8. Do you think a base grant funding model will improve stability and resilience for organisations? How should we go about designing and implementing such a funding model?*

The stability of a base grant clearly presents the opportunity for research organisations to be more resilient to the nuances of the funding system. Not only that, but base grants will provide organisational stability across the entirety of the New Zealand research and

innovation sector by providing capacity to absorb shocks, whether COVID-19, climate change impacts, or major earthquakes, for instance. More stability of research organisations in terms of funding for the core functions of the organisation should theoretically translate to more stability for ECRs. This stability of organisational-level funding will also help to promote longer-term research agendas that could sustain career pathways for ECRs, as opposed to highly competitive short-term funding cycles. Base grants could also potentially help to relieve ECRs of comparatively high teaching/admin loads so that they can focus on building relationships and consolidating research outputs.

We also feel the lack of transparency associated with overheads leaves room for researchers in different organisations or disciplines receiving different quantities for the same budgeted figure in grants (note, a partial solution could come from a discipline-specific overhead structure). A base funding model should largely overcome this issue. Nevertheless, if this is a zero sum game (in that introducing a base grant is merely shifting the overheads around), then there remains a general lack of research funding. The greater issue is providing more funding to researchers, in many cases ECRs, across the board and overcoming underfunding system wide. Finally, base grants may reduce unhealthy competition between institutions and therefore foster greater collaboration.

ECRs should be involved in the decision making process from design through to implementation. This reflects our wider recommendation that the science system needs to incorporate more ECRs in governance, management and decision making panels to strengthen their voice in development of funding mechanisms and develop experience as future leaders.

Associated with the general idea of base grant funding, we believe there are currently not enough sources of funding for postdoctoral researchers in the New Zealand science system and the general funds are extremely competitive, producing bias against ECR researchers. It is recommended that the MBIE Whitinga fellowships, a one-off funding round be continued as it provides a useful mechanism for very early career researchers to gain experience with reduced competition. The method of selection (setting a bar then using a lottery for all that met the requirements, with attention to population representation) was extremely successful in terms of diversity, quality and efficiency. Other postdoctoral funding mechanisms need to be expanded to support a greater number of postdoctoral positions. Assessment in general funding mechanisms needs to incorporate more capability development especially in larger research programmes to incentivise incorporating more postdoctoral and early career researchers. Finally, base grants could be used strategically to support early graduate ECRs in the period immediately following PhD graduation and prior to receiving competitive fellowships.

Independent from the idea of a base grant, but in line with the general premise of reducing competitiveness of grants and reducing bias in the allocation of funding, we recommend a diversification of funding across the national research and innovation sector. Currently, there is a tendency towards high risk, high reward funding pots, where success rates are

extremely low (below 10% in both full and Fast-start Marsdens). A less than 10% success rate for an ECR-specific grant, given the amount of time required to write it, and the very limited return (which cannot support a postdoctoral researcher given the \$300k cap), we believe is inadequate. We reflect, for instance, on the NSERC Discovery Grant in Canada, where success rate has varied between 57% and 75% over the past five years depending on whether ECRs or established researchers are considered, but the amount is sufficient to support a researcher, potentially for the duration of their career, if successful on a regular basis. These are considered “grants in aid” of research rather than full grants *per se* in the sense that they are not meant to support the full costs of a research programme. Instead, they can provide long-term operating expenses and access to other funding.

There are no bridging grants available for ECRs between grants relevant to both the host institution and national science system. In the United States, the National Science Foundation has an annual budget of ~\$8 billion, with grants ranging from ~\$50,000 to upwards of >\$5 million usually across 3-5 years. (And, notably, unsuccessful bids are provided reviewer and panel feedback regarding reasons for not funding and ways to improve the bid in the future). In this system, there are multiple mechanisms that allow for creativity, exploration and continuation of research projects. Language is provided in the proposal guidelines [here](#), and in particular there is a mechanism of Supplemental Funding which allows for up to six months of additional support to conduct the original scope of work. Other modes of adding extra time to research within NSF grants include No-Cost Extensions and Two Year Extensions for Special Creativity. This latter mechanism allows, “... *the most creative investigators an extended opportunity to attack adventurous, "high-risk" opportunities in the same general research area, but not necessarily covered by the original/current award.*” Such mechanisms within the New Zealand context would allow for greater latitude and autonomy for ECRs, who are arguably at their most creative within a few years of graduation, and would give NZ science a leg up in competing on the world stage in conducting cutting-edge research.

## **NGĀ HINONGA INSTITUTIONS**

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

Firstly, this is as much about cultural shifts as it is about designing for change. However, investment into ECRs is a fundamental requirement for any future-focused institution. As noted in our response to other questions, we need greater consideration of ECRs through availability of positions in the immediately post-PhD period. Currently there is a paucity of ECR opportunities following completion of PhD, and this issue is more problematic in some disciplines than others. This is a major disadvantage for New Zealand's scientific workforce when gaps at this career stage can propagate through later stages in scientific careers. Thus, employment bottlenecks at this stage represent a clear inequity. How this is achieved

is less important than the fact that it is achieved. We note several possibilities for increasing ECR opportunities at this career stage:

- a. A strategic reduction in overheads on ECR positions. Overheads over 100% make positions too expensive to include in many of our major funding mechanisms (those with capped awards). Given the cost of postdoctoral positions, many researchers include PhD students as the main mechanism for achieving deliverables/milestones, which is at odds with what a PhD should be about.
- b. We call for a government funded Postdoctoral Fellowship similar to the successful MBIE Whitinga Fellowship released in 2021. The number of applications for these positions indicates the level of demand, and reflects the number of PhD students coming out of universities.
- c. Increasing the caps on current mechanisms will more readily enable the inclusion of overheaded postdoctoral positions.
- d. Introducing criteria to incentivise inclusion of postdoctoral researchers on grants may increase the availability of positions.
- e. Funding postdoctoral overheads through other mechanisms (base grant funding) will reduce the strain on capped grants.
- f. Postdoctoral researchers in larger teams often struggle to develop independence so it would be useful if these overheads could be reinvested for developing independent lines of enquiry.

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

Property and capital investments benefit some disciplines more than others. There needs to be a balance between providing funding for labour/time (often more what is needed in the social sciences and humanities) and providing funding for infrastructure (often more needed in natural sciences and engineering). Having base grants supporting these types of research infrastructures should be balanced with base grants for basic research in social sciences that ECRs can access as they prepare themselves to apply for larger, competitive grants.

*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?*

Community, iwi, and industry partnerships are currently seen favourably in MBIE funded research. This is positive for impact and encourages researchers to set up partnerships in advance. However, there needs to be awareness that community groups, iwi, and other groups with limited paid staff have time eaten up in preparing for grants that may not eventuate. The communities can then feel 'ghosted' by researchers when the project doesn't go ahead. Even a small base allowance for koha for funding such partnership building opportunities might be a good idea, so such organisations are recognised for their time contributing to grant applications.

## TE HUNGA MAHI RANGAHAU WORKFORCE

### *14. How should we include workforce considerations in the design of research Priorities?*

New Zealand should be investing in ECRs. Research priorities should include building a research workforce that can address the key problems of our time (often identified by government and lead researchers), as well as a research workforce that is creative and innovative beyond the politically identified priorities of government.

### *15. What impact would a base grant have on the research workforce?*

We have elaborated on this point in response to question 8. However, we believe a base grant presents opportunities for a more healthy and resilient workforce. The stress associated with lack of job security is disproportionately felt at ECR stages, particularly in an environment where competition for funding is extremely high. Better retention of the workforce at this ECR bottleneck stage is fundamental to a more resilient workforce, reducing inequities that propagate throughout later career stages.

### *16. How do we design new funding mechanisms that strongly focus on workforce outcomes?*

As outlined in response to question nine, we believe there needs to be greater support for researchers in the early postdoctoral stage of their careers. Currently there are extremely limited opportunities available relative to the number of PhD students that are emerging from New Zealand universities. This career stage bottleneck propagates inequities throughout the New Zealand science workforce with certain demographics much more vulnerable to lack of opportunities at this career stage. Not all ECRs have the opportunity to travel overseas to take up a postdoctoral position for a wide variety of well-known reasons. Furthermore, losing these graduates to overseas hamstrings New Zealand in general as a player on the world research stage. Early graduates and ECRs are arguably some of the most creative people and in spaces where they are more likely to adopt new and emerging technologies, all of which would drive the research and technology engine that New Zealand wants to move toward. We note two potential solutions among many others, but also note that the methods for achieving these means are less important than the outcomes:

- a. A strategic reduction in overheads on early career positions (e.g. Postdoctoral Fellowships, particularly those at the immediately post-PhD stage).
- b. A new or expanded government funded Postdoctoral Fellowship scheme. This might be through the continuation of the MBIE Whitinga Fellowship, which proved highly popular.

Finally, for the wellbeing of students, a national scholarship scale is needed across government, benchmarked to the cost of living in each region to ensure postgraduate students are able to afford to complete their degrees.