

Te Ara Paerangi Future Pathways Green Paper

On Behalf of the HRC Sir Charles Hercus Health Research Fellows

We are responding to Te Ara Paerangi Future Pathways on behalf of the HRC Sir Charles Hercus Fellows. We represent a group of 30+ PhD-qualified mid-career researchers who are current and previous Hercus Fellows in Aotearoa New Zealand and whose excellence has been recognised by receipt of this prestigious fellowship. We are based throughout Aotearoa New Zealand, however the vast majority of fellows are employees of the University of Auckland or University of Otago. As a consequence, our arguments are largely relevant to tertiary education organisations. We are involved in a wide range of health-related research spanning clinical, translational, basic biomedical, public health, and engineering specialities. Many fellows completed the early stages of their research careers in New Zealand, although a proportion have had significant overseas research experience, and some, usually 1-2 / year, use the fellowship as a mechanism to return to Aotearoa New Zealand.

For context, the Hercus Fellowship is awarded to 5-8 fellows annually to researchers who have 6-10 years post-PhD research experience (this was 4-8 years for fellows starting earlier than 2020). More recently, the conditions of being awarded a Hercus included only applicants in non-permanent positions (ie: soft-funded researchers). As a result, the Hercus is very effective in supporting fellows in precarious careers and provides us with several years of relative stability. The Hercus Fellowship has allowed many researchers to advance their careers, and, broadly, each Fellow now supports their own group. This support is acknowledged and appreciated by the current Fellows.

For some Fellows, the receipt of this award facilitates getting a permanent university position at the start or during their tenure. However, this is by no means a universal experience and there are Fellows who have left Aotearoa New Zealand at the conclusion of their awards, or continue to struggle with unstable employment, or partial salary coverage at the conclusion of their fellowship. This is despite successful, productive fellowships with prolific dissemination of findings (an average of 13 peer-reviewed publications per Fellow – equivalent to the average output from a 5-year HRC programme grant).

In 2017, the active Hercus Fellows met for the first time to share their research and have a round-table discussion regarding ongoing career issues. During the 2nd Hercus Fellow meeting in 2019, there was a consensus view on the paucity of mid-career fellowships within the NZ science funding system, particularly for biomedical researchers (90% of the previously surveyed Hercus fellows were biomedical researchers).

In response to discussions regarding this with Dr Vernon Choy, the then HRC's director of research investment and contracts, the HRC subsequently established the Consolidator grant funding round in 2020. This grant was designed to provide research funds (\$600K over 2 years) to support mid-career researchers who had made progress towards being a principal investigator in health research and who had previously held a Hercus fellowship or similar fellowship from another funder. These were open to both soft-funded researchers and those with fully-funded positions. Five were awarded in 2020, of which two recipients were Hercus Fellows, one of whom was in a permanent position and one soft-funded.

At the time, the HRC's chief executive, Professor Sunny Collings, stated that "It's essential to support the work of New Zealand's health researchers at all stages of their careers" and "awarding these [Consolidator] grants and ensuring continuity in health research funding was especially important during the unprecedented experience of COVID-19." Surprisingly, the Consolidator grant ran for only one round and was not offered again in 2021. This was a huge blow to the Fellows who were planning to apply to try and maintain ongoing research funding.

In this context, most early and mid-career researchers find it challenging to map out a sustainable career trajectory.

Because the Hercus Fellows are in a similar position as all early/mid career researchers in New Zealand, this feedback is inspired by the response submitted by the Faculty of Medical and Health Sciences Postdoctoral Society, University of Auckland:

<https://zenodo.org/record/6345545#.YirDyehByMo>

Te Hunga Mahi Rangahau Research Workforce

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

We feel that institution of a base grant system would have considerable positive impacts on the research workforce. Under the current model, overheads on fully costed grants comprise 100%+ of the salary paid. For soft-funded researchers, this represents an unsustainable position, as most of the grant is absorbed by their own salary costs. As a result, grant funding is frequently budgeted to cover PhD stipends, which cost less and are exempt from overheads, rather than experienced researchers/postdocs, with the latter being unaffordable. Further, the massive bottleneck for competent PhD graduates to mature to early-career positions undermines the ability to promote research as a viable career pathway. This imbalance is only exacerbated as careers progress and salary costs become higher. The introduction of a base grant or restructuring of how overheads are charged on grants has the potential to provide greater flexibility for the PI, with respect to recruitment of research staff vs. students. Importantly, this may provide a more visible and realistic career path from PhD to full-time researcher. The ability to hire more research staff also increases the likelihood of project delivery in a timely manner, offering greater value to funders; whereas with students, because their work is also a training exercise, failure in project delivery is more likely.

It must be considered that the net effect of the current over-headed grant system is that many can only allocate a very small portion of their FTE to a research project funded by the most prestigious grants. While the prestige of winning an early-career grant, like a Marsden Fast-Start or a mid-career grant like Rutherford Discovery Fellowship, is high, the monetary value is less significant due to overheads and budget rules. Indeed, a Marsden Fast-Start can only cover approximately half of the salary of a Research Fellow, limiting their ability to become independent. Overcoming this enormous limitation is perhaps the most compelling argument for transitioning to a base grant concept. In effect, the playing field would be levelled as variable institutional salary costs become decoupled from the research budget.

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

As recipients of one of the few long-term fellowships available in Aotearoa New Zealand, we are strongly supportive of changes to funding mechanisms. In 2015, a survey was carried out of the Sir Charles Hercus Health Research Fellows who had completed their tenure during the period of 2009 to 2015. This survey identified significant stumbling blocks to their future career progression,

including lack of permanent lectureship positions and an over-subscription for these positions, and limited research funding in a highly competitive environment.

Mid-career was identified by Hercus fellows as where the biggest gap in career support appeared, with the mid-career researcher no longer eligible for postdoctoral and early-career funding, but without the longer-term track record of the more experienced, senior researcher with whom they must compete for funding. The lack of appropriate mid-career funding contributes to world-class researchers having to leave research careers to pursue other professions, or to pursue their research careers overseas, resulting in loss of experience and expertise from the NZ health research sector.

We have compiled the following suggestions that we urge MBIE to consider when designing new funding mechanisms:

1. Establish a sustainable early/mid career pathway. An essential aspect of the new Aotearoa New Zealand funding system is to address the unsustainable precarity in early/mid career employment. Currently, we theoretically mirror international models where early-career researchers are on fixed-term contracts until they transition into a permanent position. However, in New Zealand there are comparatively few permanent positions available at academic institutions, and this results in a cycle of endless grant writing to support personal salary costs at the expense of research. In some overseas universities, there are a maximum number of postdoctoral positions one can be employed in before being offered a tenured position. For example, in the USA, temporary postdoctoral appointments are limited to five years in NIH-funded extramural or intramural programs, in a context where there is much greater scope for non-postdoctoral research positions (e.g Staff Scientists). There is no safeguard here for early/mid career researchers to prevent perpetual employment on fixed-term contracts (“the endless postdoc”). In reality, many researchers progress their careers well into the mid-career stage on fixed-term funding, then leave the field seeking stability. While the Hercus Fellows are better positioned, once the Fellowship is complete many Fellows return to applying for grants to fund 100% of their salaries.

2. Development of a new research career pathway in academic institutions. For the early/mid career researchers who do not want or cannot access the 40:40:20 teaching:research:service model (currently the predominant way to get a permanent 1.0 FTE at an academic institution), there needs to be a newly defined, accessible, and accepted pathway to securing permanent research positions. This will allow NZ researchers to focus solely on maximising research productivity, which requires establishing funding for permanent Staff Scientist / Permanent Researcher roles. We envisage that a successful Staff Scientist would partially be funded as a permanent service role, offering expert advice and technical services, whilst maintaining a portion of their FTE allocated to managing their own research projects and groups. This position could be part of a larger group, such as an established laboratory, or act as a major service to their respective department or school. This will create a win-win scenario as it allows job stability and high research standards, which in turn enhances the quality of service delivery.

In reality, most successful research is collaborative, whether within a supportive research group, or through national and/or international networks. The current emphasis on career “independence”, which encourages researchers to carve-off a particular research niche, often does not result in higher-quality research outputs. Supporting research scientists that sit within successful research groups/institutions/collaborations and providing funding for these wider research structures will also be key to workforce development and stability.

3. Increasing people-centred funding. Provide funding for researchers (e.g. through Fellowships) as

opposed to funding of projects. This could work alongside the Staff Scientist position, and will allow for flexible funding where the research direction of the individual is not tied to projects or specific project outcomes. Furthermore, funding individuals allows flexibility in both projects, and choice of institution. If the funding follows the researcher, this allows one to transition between universities, CRIs and industry, maximising the value provided by harnessing the environment that best allows the research to be conducted, while upskilling the researcher for future positions. Indeed, this would enhance the connectivity of researchers. There is compelling evidence that researchers are at their most creative and innovative early in their career. The long-term precarious employment that is occurring in the research sector at present ensures that early/mid career researchers may miss opportunities to conceptualise and execute their best and most creative ideas, which is a major loss to the New Zealand research ecosystem.

4. Providing alternative non-academic career path options. Currently the impact of biotechnology and other spin-outs arising from university research is limited, and most opportunities in the New Zealand research sector are university or CRI-based. Unlike other countries, New Zealand significantly lags behind in the incentivising and development of substantial research hubs that exist in other countries such as the UK, USA, Canada, Switzerland, Germany, the Netherlands and Belgium. Not only can these companies create immense value for the government (eg: new employment and taxes), they create an environment for value creation and innovation at top levels. Establishment and maturation of biotechnology hubs will ultimately answer the major challenge of stalled early/mid researcher career progression, as these biotech companies will need a constant supply of highly skilled PhD level scientists to carry out their high calibre research in a timely manner. We believe a government-driven approach to foster innovation and commercialisation, particularly in the biotechnology sector, is a challenging but promising pathway that is being erroneously overlooked in the current green paper.

In summary, we have included suggestions that highlight some of the features that will support a new funding model. These features will protect against future workforce instability, and allow New Zealand to retain highly-skilled and highly-trained researchers. The concept of base-funding contains many attractive features, however we realise that implementation may be contentious. We also worry about 'administrative creep' by the parent organisations absorbing much of the base-funding, which needs to be controlled. However, many of our suggestions as response to Question 16 can be implemented independent of the overarching base-funded or over-headed model. A focus on providing viable career options is the best avenue for advancing a stable early/mid career research workforce, including the Hercus Fellows.

Ngā Whakaarotau Rangahau Research Priorities

KEY QUESTIONS 1, 2: What principles could be used to determine the scope and focus of research Priorities? What principles should guide a national research Priority-setting process?

As a cohort of early/mid career researchers, we think the development of Research Priorities could form an excellent basis of research in NZ. However, a danger in setting high-level research Priorities is that while they may address key outcomes, they may lead to neglect of the fundamental research that underpins eventual impact. Depending on how pervasive these Priorities are, this could unintentionally divert funding from other research that may lead to fundamental discoveries. Impact is not always immediately obvious when it comes to basic and fundamental research, and as a small but relatively affluent country, New Zealand must not shirk responsibility to contribute to fundamental research in order to focus on the current priorities. If broad Research Priorities are

instigated, there needs to be a separation of funding between Research Priorities and fundamental research.

The advantages of ensuring adequate funding for fundamental research are clearly highlighted in the pace of the development of the COVID-19 vaccine, which was built on the backbone of research into mRNA vaccines and a SARS-CoV-1 vaccine. A home-grown example is the work of the Malaghan Institute for Medical Research, which through decades of stable funding for fundamental research and senior staff scientists positions, enabled them to develop cutting-edge nanoparticle technology for manufacturing our own mRNA-based COVID-19 vaccines. Ensuring that fundamental research continues to be funded, and is adequately funded, allows continuation of research that does not meet a current Priority.

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

To us it is critical that part of the scope and focus of Research Priorities is on developing and/or adapting the training of the research workforce. While Research Priorities are a significant investment to address pressing current concerns, their instigation must be coupled with appropriate training of the workforce. Consideration must be given to the current strengths of our research workforce—the make-up of our current workforce may not align to future priorities, and considerations of training should be made in parallel with development of the current and future Research Priorities. This development should be set up to enhance the strengths of our research workforce while directing incoming trainees to specialise in skills that align with these Research Priorities.

Priorities should be set so as to maximise use of our current workforce, while also building the future workforce. Training of early/mid career staff to work towards Research Priorities must be done with both long- and short-term goals in mind. A worry is that there may become more early/mid career researchers trained to work in a very niche area, and their expertise and knowledge in this area may not be easily translatable outside the Priority.

Summary

As government-funded HRC Hercus Fellows, we comprise an important cohort of early/mid career researchers and are grateful to HRC and MBIE for the unprecedented opportunity to advance our research, build our groups, and become an important voice for research in Aotearoa New Zealand. We appreciate that our position provides us with a unique perspective on the shape of New Zealand research to come. Our response to Te Ara Paerangi Future Pathways Green Paper does not address the entirety of the Green Paper, but instead largely focuses on Te Hunga Mahi Rangahau Research Workforce. Our objective is to allow Aotearoa New Zealand to enhance its ability to provide more viable career options for a number of highly trained yet underemployed people holding PhDs. The current system threatens to compromise the development of our institutional knowledge, specialist subject knowledge, and the good-will of investors and researchers alike. A revamping of the research system can alleviate these issues through a focus on supporting qualified people during their early to mid career, and that this investment will be returned through development of an equitable, imaginative, dedicated, and happy workforce. We hope that the principles and values that underpin these suggestions are clear and can be applied beyond the areas we have fed back on.