

Future Pathways Short Independent Submission

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Short Introduction

My short submission is based on research experience of private and public sector science, internationally and in Aotearoa/NZ, working within multinational pharmaceutical companies in Europe, Manaaki Whenua Landcare Research, Lincoln University and SME's e.g., Connovation, Remediuss Bio, IRANZ, Cawthron, Wakatū-AuOra, and Bragato. I understand research leadership of R&D groups, within large and small companies, and leadership of NZ science organisations (Thomson Medal in 2017). I'm research active and have published approx. 400 refereed scientific papers, reports, technical dossiers, and book chapters, including many linked to new product development (medicines and pest control tools) in national and international markets.

This submission does not attempt to traverse all aspects of the Future Pathways review which will be well covered by many submitters. Instead, this submission focuses on the potential of private sector R&D and Māori led research to deliver impact, which are areas where there is some confusion and where the consequences of inaction will be substantial and long-term.

Reflections on the current system and Future Pathways discussions 2021/22

- There are many good elements to the current system including efforts to balance investment using different vehicles e.g., Marsden Fund and NSCs. As a nation our track record in publications/excellence is high. System changes should facilitate improved translation into real world impacts. There are very experienced Research Managers in MBIE who could readily facilitate change.
- Private sector expenditure has increased significantly in recent years. However, compared with overseas private sector, R&D entities are undervalued.
- Fledgling R&D capabilities within Private Sector and Māori organisations are not well supported or understood. The sphere of activity of values-based Māori business entities, which spans the public-private divide and includes significant investment in social, cultural, strategic and public good initiatives, is not recognised.
- Many attendees of the various Future Pathways workshops have extensive experience of R&D within Universities, CRIs or Government departments with a life-long reliance and dependence on research grants.
- Overseas the private sector attracts the smartest graduates and PhDs. Change is happening too slowly in NZ, and there is still a tendency to think of the research system consisting only of CRIs and Universities. This thinking condemns ECRs to life-long reliance on tax-payers, versus salaries that are funded from revenue generated by their own endeavours and innovation.
- There is a risk that over-dependence on CRIs in NZ could inadvertently stifle in-house private sector R&D capacity. CRIs are a great asset but private sector R&D capacity should be nurtured with targeted assistance, beyond tax incentives, to build distinctive R&D capability to deliver impact and new employment opportunities.
- Many discussions at Future Pathways workshops regarding Māori and R&D, referred to Māori as end-users of R&D. This is outdated language and does not align with Te Tiriti.

- There is a misconception that private industry R&D is short term problem solving. In mature and maturing companies, it will be long-term and strategic and focused on technical and scientific needs, addressing market requirements, which inform research activities.

Recommendations

Priorities, Te Tiriti and Funding

- Investment should be directed towards updating our NZ RSI Strategy Documents. These are important documents. There is an opportunity for a clearer National Science Strategy that embraces Te Tiriti, cross-Government alignment (including with MoH, MPI, MFAT), Māori and private sector thinking, as well as drawing on MBIE's expertise. The smartest private sector thinkers in science led organisations need to be involved, as well as those in CRIs, IROs and Universities.
- National research priorities need to be quite clear i.e. transition to zero carbon economy, nutritious food for everyone, transition to high value jobs etc.
- Our RSI is immature. We need a national research system that enables and supports sector focused research organisations and private companies, such as Bragato (emerging) or Fonterra (well-established) to deliver impact and offer a diversity of ECR opportunities. More social, economic and positive environmental impacts will be delivered by strengthened R&D capabilities within industry that drives private investment and solves industry challenges, whilst generating public benefit. Once established, distinctive R&D capability in private companies connects more effectively with research expertise in CRIs, overseas research groups and companies, and Universities in NZ and overseas, and creates value from fundamental and applied research and secondment opportunities for entrepreneurial researchers.
- A transformation is needed to deliver much greater impact for Māori. Value, impact, and ensuring taonga that are unique to Aotearoa NZ are protected would be achieved by a national priority that enables Māori led R&D, including by Māori for Māori, that is independent of crown entities. This moves well beyond viewing Māori as end-users or stakeholders and discussions regarding co-development and consultation. VMCF fails to deliver on its intended aspirations. The VMCF commitment of \$2.0m p.a should be increased substantially to enable larger and longer programmes of capability building, currently capped at \$250k per project. This should be reviewed with some urgency and viewed as just one mechanism to effect change and others will be needed.
- Base funding schemes for Māori led entities with R&D aspirations and sector focused R&D organisations and start-ups will achieve this transformation. A mechanism that fosters such entities, equivalent to SSIF (or an NSC or Core) investment for approx.10 yrs. to reach maturity and become self-sustaining financially, and deliver impact, is needed. For example, Cawthron acquired \$5.0m p.a SSIF for an extended period in 2011. This provided confidence and enabled transformation in capability and capacity e.g., 150 employees to > 300, \$15m to >\$50m p.a (revenue mostly private sector R&D investment), publications 10 to 110 p.a over a 9-year period.

- Base grant funding should be driven by NZ needs with a greater focus on impact.
- Career concerns are common for all researchers, as well as ECRs and will remain so until there is greater diversity of opportunity, and R&D capability is developed within a larger number of private and Māori entities. In this scenario more scientist salaries are funded from revenue generated by their own endeavours and innovation vs grant dependence. Supporting capability build in SMEs, including Māori entities and “start-ups” of < 20 people that are already starting on the journey of employing PhDs to lead new product development and commercialisation and are set to grow, will deliver impact and generate more employment opportunities nationally and regionally.

In summary, the need for Tiriti-led system change has potential to enable this reform opportunity to be truly aspirational and transformational. At the same time it will be important to retain effective schemes like MPI SFFF, NSCs like HVN, as well as Callaghan PhDs and post-docs, and include mechanisms to encourage secondment schemes from Universities and CRIs to the private sector, increase VCMF and provide capability building base funding support for emerging Māori led R&D entities. Reduce funding where impact is not being delivered. See diversity as strength, in a maturing research ecosystem, not portrayed as fragmentation.

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