

**Evaluation of Knowledge and Innovation Reforms:
Reviewing Australia's Block research Funding Schemes**

Submission by



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August 27 2003

BACKGROUND

The Walter and Eliza Hall Institute commends the Commonwealth Government's commitment to SET investment, manifest in recent increases in both NHMRC and ARC funding and in other reforms introduced through the Backing Australia's Ability policy.

We are grateful for the opportunity to contribute to discussions about research infrastructure within the academic sector. We have commented here on the IGS, RIBG and RTS schemes and have made a separate submission to the Major National Research Facilities Taskforce.

Before commenting in more detail on the funding mechanisms currently supporting infrastructure for academic research and research training, it is informative to present some background on The Walter and Eliza Hall Institute and other medical research institutes (MRIs) and their relationship with the university sector.

1. The Walter and Eliza Hall Institute

The Walter and Eliza Hall Institute is a world leader in medical research. Founded in 1915, WEHI is an independent not-for-profit research organization. It currently employs over 600 staff and has an annual operating budget of around \$50 million. Together with The University of Melbourne and Melbourne Health, WEHI is a Founding Member of Bio 21, the Parkville bioscience cluster. It co-founded the Australian Genome Research Facility (in partnership with the University of Queensland) and is a member of three CRCs.

The Institute is not involved in undergraduate teaching but provides advanced research training to postgraduate students (75 in 2003), postdoctoral fellows (113 in 2003) and research technicians. It also actively enhances science teaching in schools, primarily by developing the Gene Technology Access Centre (GTAC) program, in which the other partners are University High School, the Department of Immunology and Microbiology, University of Melbourne, and the Victorian Department of Education Science in Schools Strategy.

The central mission of the Institute is to help develop a deeper understanding of fundamental biological mechanisms and the causes of ill-health and disease. The long-term goal is to translate new knowledge into improved health, by fostering clinical application and developing better diagnostics, therapeutics and preventative measures. Thus the Institute's core business is discovery research, accompanied by a strong commitment to clinical translation and biotechnology development.

The Institute first came to international prominence for virology and immunology under the leadership of Sir Macfarlane Burnet, who shared the Nobel Prize for Physiology or Medicine in 1960. Under his successor, Sir Gustav Nossal, the Institute greatly expanded and diversified to encompass immunology, haematology, parasitology, molecular biology

and neural development. Today, led by Professor Suzanne Cory, the Institute has added strong new programs in bioinformatics, genetics of disease susceptibility, structural biology and medicinal chemistry.

2. Biomedical Research within the National Innovation System

Recent surveys collated by the Taskforce charged with Mapping Australian Science and Innovation indicate that biomedical research is one of the strongest sectors of the national innovation system. Around one third of Australia's scientific publications are in the field of medical and health sciences and, apart from those in astronomy, they have the highest citation index. The nation's strength in the life sciences has led to the recent push by the Commonwealth and State governments to promote an internationally significant biotechnology industry within Australia.

Much of the best biological research in Australia takes place in Medical Research Institutes (MRIs). Most MRIs operate as independent entities and are not directly accountable to another organization such as a University or hospital, although they have strong affiliations with these sectors. Each is headed by a Director who is directly accountable to an independent Board, and the staff are directly employed by the institute. Some MRIs are incorporated not-for-profit companies, others have been established under an Act of Parliament.

The 1999 bibliometric study performed by Bourke, Butler and Biglia indicated that the 'position of the MRI sector was pre-eminent', followed by that of ARC Centres. (Table 21 in P Bourke et al 'A Bibliometric Analysis of Biological Sciences Research in Australia'). A recent study by Butler has confirmed that the strong performance of NHMRC-funded research has continued. In particular, it notes the very high impact of publications coming from the former block-funded medical research institutes (which include WEHI).

A recent audit of 28 medical research institutes by the Association of Australian Medical Research Institutes (AAMRI) indicates that they had an aggregate research income in 2002 of around \$165 million, of which \$84.6 million was derived from NHMRC grants/fellowships, \$23 million from other Australian competitive grants and more than \$29 million from competitive grants awarded by international research funding agencies. The MRIs employ over 3900 research scientists and support staff, and train more than 1100 Honours, Masters and PhD students.

It is clear from this brief summary that the MRIs form a very important part of the national innovation system.

Ironically, however, despite their importance for catalysing biotechnology development, MRIs are not eligible for Commonwealth pre-seed funds under current Commonwealth policy.

Furthermore, *research and research training infrastructure support to the MRI sector is inconsistent, complex and totally inadequate*. More specifically:

2.1 MRIs are not eligible to receive RIBG funding from the Commonwealth, even though ~ 50% of their funding is derived from the NHMRC. In contrast, NHMRC grants to University researchers do attract RIBG support.

2.2 Some MRIs (about one third) receive some RIBG funding by putting their grants through a University, but only a proportion of the DEST funds are apportioned back to the MRI by the University, and the level transferred by different universities is highly variable (20 to 60%).

2.3 Most MRIs receive some infrastructure support from State governments but the methods and levels of funding are variable across the states and, with few exceptions, fall well short of actual indirect costs. Moreover, at least in some states, these funds are calculated from a past 3-year rolling average, and therefore always lagging behind expenditure.

2.4 MRIs provide research training for a large number of PhD and other graduate students but are not eligible to receive any RTS funding directly from the Commonwealth. Some universities provide a proportion of their RTS funds to MRIs, but the level is highly variable and often minimal.

IMPROVING KNOWLEDGE AND INNOVATION SUPPORT IN AUSTRALIA

1. Direct Research Grants

Diversity of funding sources (eg ARC, NHMRC) for direct research costs is an international norm, of proven benefit, and should be retained. Excellence should continue to be the principal criterion for awarding grants. Review should continue to be by expert peer review.

Recommendations:

1.1 Small partially funded grants should be largely replaced by larger fully-funded longer-term grants, as recommended in the Wills Review on Health and Medical Research. This policy should reduce the review load (which already occupies an enormous amount of the time of academics and researchers) and increase individual productivity (by reducing the need to write grants so often).

1.2 All competitive research grants should provide full direct costs and also attract full indirect costs (see below).

2. Indirect research costs

The Health and Medical Research Strategic Review 1999, which was endorsed by Cabinet, recommended that Australia develop a coherent approach to research infrastructure funding. The report suggested a co-operative approach involving DEST, DHA, NHMRC, ARC and the States/Territories.

Overseas and national surveys indicate that the indirect costs of supporting research amount to *at least* 60 cents per dollar of direct research costs. (*RM May and SC Sarson Nature 398 457-459 1999; Boston Consulting Group review to the National Board of Employment, Education and Training in 1992*)

Indirect research costs encompass both project-specific and more general infrastructure support, which overlap. They include:

- Non-capital aspects of research facilities such as libraries, data bases, laboratories, animal houses, herbaria, experimental farms
- Information and communication technology (ICT) support and service
- Salaries of general research support staff ie a staff member servicing a number of research projects via a centralised facility
- Shared equipment purchase, installation, maintenance, depreciation, hire and lease
- Research administration and management (finance, human resources, occupational health and safety compliance, purchasing)
- Intellectual property protection and management

- Maintenance and engineering associated with general research fabric
- Basic utilities (eg security, heating, lighting, cleaning, rubbish removal)

The current system of performance-based block funding to Universities for research infrastructure and research training via the RIBG scheme is non-transparent, overly complex and too low (24 cents in the dollar for 2002)

Furthermore, the failure of the Commonwealth to provide *any* infrastructure support to independent medical research institutes is imposing severe strain on a highly significant sector within the national innovation system.

Recommendations:

2.1 To promote research excellence and encourage research funding partnerships, the Commonwealth should move to a policy of ensuring full indirect costs for every *competitive* research grant awarded by all major funding agencies, both national and international.

2.2 The policy could be introduced in a stepwise fashion, starting with agreement by the Commonwealth government to provide full indirect costs for all *Commonwealth-funded* research grants (ARC and NHMRC grants/fellowships), irrespective of whether the host organization is a University or an independent MRI.

2.3 The indirect costs should be provided directly to the relevant responsible host research organization.

2.4 The relatively small amount of additional funding required to provide indirect costs to MRIs should be drawn from central revenue, not from DEST funding to Universities.

3. Core Research Support

Sustaining excellence requires continued investment. To maximise their potential, research organizations need access to *flexible and discretionary core funding* to further develop their research fabric, technology platforms and development capabilities, in accordance with their own strategies.

A reasonable goal would be that organizations of demonstrated research excellence should be awarded a core grant commensurate with at least 20% of the annual research revenue of the institute.

The Universities have access to core funding via the competitive **Institutional Grants Scheme (IGS)**. This policy should be continued but improved by simplifying the funding formula.

Independent MRIs (viz, those operating totally independently of Universities) should also have access to comparable core grants.

Recommendations

3.1 The Commonwealth IGS grant to universities should be based on a simple formula that is driven solely by success in gaining research funds. The formula should be driven by *total* grants (viz competitive grants, industrial grants, CRC grant shares; development grants etc). The loading for *number* of publications should be removed, since this criterion has had the unfortunate effect of driving a trend to publication in lower impact journals. The research student loading should also be removed because this criterion is addressed through the Research Training Support Scheme.

3.2 To ensure that a comparable core infrastructure grant is available to independent MRIs, agreement should be struck with the States/Territories that they continue to meet at least their current overall funding levels and obligations to MRIs. The provision of indirect costs with all Commonwealth grants (see 2.1 above) would provide the Commonwealth with leverage to ensure satisfactory agreement.

4. Research Training Support

The Commonwealth should continue to foster research training by providing PhD scholarships to students (eg APRAs) and training support costs to the host research organization (RTS).

The primary purpose of the RTS should be to cover administration, training and bench fees for graduate students. The current funding formula seems imperfect and unnecessarily complex. The factor for research income should be removed because it is more appropriately applied to the RIBG and IGS scheme as described above. The factor for *number* of publications should also be removed as it is a driver for low impact publications, as discussed above. The driver for successful completions, while relevant, drives quantity rather than quality of PhDs; therefore there should be no penalty for a somewhat longer training period (up to, say, 5 years). Finally, there should be a driver for excellence eg percentage points for success in competitive scholarships.

The Universities assume certain responsibilities for *all* higher degree research students; these include thesis examination, health service and Workcover. They do not, however, assume the primary research advisory and supervisory responsibility for all research students, many of whom – very appropriately – receive most or all of their training in

other research organizations. For example over 1100 graduate students train in MRIs and over 600 train at CSIRO. For administrative purposes, such students are usually nominally attached to a University department.

Currently, however, there is no transparent formula for RTS funding to flow to the external research organization and Universities vary greatly in the proportion of funds transferred.

Recommendations

4.1 The funding formula should be simplified and focussed solely on student research training and excellence, as discussed above.

4.2 A fair and transparent formula should be agreed upon by the Commonwealth for provision of *a proportion* of RTS funds to non-University research organizations and applied nationally by all Universities.

5. Development and Innovation

Governments are requiring the academic sector to actively engage in IP protection and development and a range of funding schemes have been developed to foster such activity. At present, the MRI sector is not eligible for the pre-seed funding made available to other sectors in Backing Australia's Ability and this is hindering biotechnology development.

Recommendation

5.1 MRIs should be made eligible for Pre-Seed funding.

CONCLUDING REMARKS

While the goals of the IGS, RIBG and RTS schemes are highly appropriate, the funding level is currently too low to sustain internationally competitive research activity.

In addition, the funding formula for each scheme should be tailored to match the specific purpose of each investment instead of overlapping with the other schemes, as at present.

Finally, there is an urgent need to enhance research infrastructure funding in the medical research institutes, which contribute a significant proportion of the nation's IP in the life sciences and the growing Australian biotechnology industry.

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August 27 2003