NFMRI Speech – October 18, 2016

Innovation and Science 2030 – opportunities and challenges for the HMR sector

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(Check against delivery)

Thank you John. There's clearly a navigation theme in your conferences, from the inaugural 'Putting rubber on the road' last year to 'Getting innovations on the right track' this year. While we should all be moving faster, I have to say that I think we **are** on the right track. I guess the real question is where are heading and how do we get there?

You might ask – Where is the roadmap? That is what we – as Innovation and Science Australia (ISA) – have been tasked to develop. Our work is already well under way with an audit of our existing innovation systems that will be provided to government in December 2016. We intend this to be a transparent public document and its mapping will provide the starting point from which our strategic plan will subsequently be developed, with recommendations to government by October 2017.

ISA was announced by the Prime Minister as part of the National Innovation and Science Agenda – the NISA - last year. It was established as an independent and reinvigorated statutory board comprised primarily of members drawn from industry with extensive experience in innovation and entrepreneurship. Some are from the health and medical research (HMR) field and all have demonstrated success and influence in their sectors. Dr Alan Finkel, Australia's chief scientist, is deputy chair and Dr Chris Roberts, who will be known to many of you previously of Cochlear and on the Board of Resmed, is also a member.

We have just appointed two new members who will bring an international perspective to the group and provide us with access to international best practice: Beth Comstock, Vice Chair of General Electric who is based in New York city, and Israeli author Saul Singer who co-wrote Start-up Nation: The Story of Israel's economic miracle.

In December 2015, the Prime Minister launched NISA with 24 measures aimed at propelling the nation's innovation performance. ISA was tasked with assisting the delivery of these measures and advising a newly created Cabinet committee of innovation and science on the Government's
$10 billion annual investment in innovation and science and what else it could be doing differently or better.

I am pleased to say most of the 24 NISA measures have already been delivered or are in train. And I will begin by discussing a few of these.

In the NISA the government committed to undertaking a review of the $3.2 billion R&D tax incentive programme, which is a very substantial part (roughly 30%) of the government's total annual $10 billion investment in research, science and innovation. The R&D Tax Incentive provides an important incentive for private sector research and development and helps with cash flow for start-ups and pre-revenue biotechs. Indeed, the RDTI accounts for 90 per cent of all Government support for business R&D. The government invited Alan Finkel, John Fraser and me to conduct what is colloquially known as the '3Fs review.' I am pleased that what I regard as an extremely important report will now enjoy some sunshine. The report is publicly available with time still for consultation and submissions to government for another couple of weeks - until October 28, 2016. I would urge you to be pro-active in this regard.

The six recommendations in the review seek to improve the integrity and effectiveness of the programme and maximise its benefit to the nation. Three of the six recommendations deal with additionality i.e. encouraging research that would otherwise not take place. These recommendations also include providing extra incentives for businesses to hire PhD graduates and to collaborate with Australia's world-class research institutions. If we are to build a strong innovation ecosystem it will be one with far greater collaboration between industry and publicly funded research organisations. Only 30% of Australian researchers are employed in business compared to something like 60% in many of our OECD competitors, like Germany.

New financial initiatives include:

A. A new tax-based incentive for angel investors from July 2016 with a 20 per cent non-refundable tax offset for those investing up to $1m per annum in start-ups, and a 10 year capital gains tax exemption for investments held at least 12 months. This is a big incentive by any international measure.

B. New and less restrictive arrangements for venture capital limited partnerships (VCLPs) and early stage venture capital limited partnerships (ESVLCPs). Partners in new ESVCLPs will receive a 10 per cent non-refundable tax offset on capital invested during the year. The maximum fund size has increased from $100m to $200m.

C. I'm sure you are all across the new $500m Biomedical Translation Fund (BTF) launched on August 3. The BTF is a for-profit venture capital fund targeting investments in companies with projects at advanced pre-clinical, phase I, and phase II stages of development. This is a bold co-investment initiative led by Government. It's specifically designed to assist biotechs and medtechs with the second 'valley of death'

funding problems that presently hold back the commercialisation effort in the health and medical research sector. These investments are expected to require in the range of $5 million to $20 million per project. The aim is to match our research excellence with commercialisation firepower.

The BTF has already been set up with $250 million in government capital committed. This will be matched by at least $250 million from private and institutional investors. Competitively selected life sciences fund managers will manage the money and make the investment decisions … their applications are currently under review. The plan is for the funds to be made available for HMR investment early in the new year.

I see this as being complementary to the initiatives and ambitions of groups like the NFMRI and others, who are concentrated on adding value to academic-initiated translational research and IP - making it more attractive to the appropriate future collaborators and investors such as the BTF mangers.

Separately and lead by Ian Frazer as Chair, the Medical Research Future Fund (MRFF) is working on a strategy and priorities document to guide government where MRFF funds should focus – that is due to be handed to government this month (October 2016).

Also delivered as part of the NISA measures, is funding of $23 million for incubators and accelerators to strengthen the entrepreneurial ecosystem and $11m for five international landing pads (Berlin, Shanghai Singapore, San Francisco, Tel Aviv) to help Australian entrepreneurs test their ideas in key ecosystems and markets offshore. So a lot if happening, and these initiatives aren't the end of the story. The Minister for Industry, Innovation and Science, Greg Hunt, is already flagging NISA 2.0 focussing on ideas for additional investment in innovation, followed by NISA 3.0, which will focus on business simplification and the implementation of ISA's 2030 strategic plan.

Another form of essential strategic support is through infrastructure funding. Many high-priority, medium-scale research facilities are too large or complex to be supported by any single research institution, but are nevertheless necessary for leading-edge research. It makes sense to fund these centralised facilities at a national level and aim for continuous operation by domestic researchers and international collaborators to ensure maximum return on investment.

There are important examples of national infrastructure of direct relevance to health and medical research. These include the Monoclonal Antibody Technology Facility (MATF) - one of the nineteen facilities providing research services under Bioplatforms Australia. The technology is being used by Queensland University of Technology's (QUT) Janet Davies to develop grass pollen vaccines that will improve the quality of life of people with hay fever and asthma. I was intrigued to hear that most immunotherapy vaccines are based on temperate grasses rather than the subtropical grasses found in Australia – so there's potential for this work

to have significant local as well as global impact. I understand that, as an NFMRI grant recipient, Janet is entitled to activity-based credits at Bioplatforms Australia, a demonstration of how parts of our ecosystem integrate effectively.

Like Bioplatforms Australia, the Australian National Fabrication Facility (ANFF), is also supported under the National Collaborative Research Infrastructure Strategy (NCRIS). It provides micro and nano fabrication facilities that have been used in the development of a needle-free vaccine delivery platform that is a safe and cost effective alternative to traditional vaccinations. It can eliminate the need for refrigeration and is a potential game changer for disease control in developing countries.

I'm referring here to the Nanopatch™, which came out of Professor Mark Kendall's lab at the University of Queensland. Advanced instruments were used to fabricate the microneedle arrays used in the technology. The spin off company Vaxxas was established in 2011 with $15 million in venture capital funding – one of Australia's largest series A investments in a start-up. The Nanopatch™ technology is licensed to US-based pharmaceutical company Merck (MSD) with Vaxxas continuing to be involved in the R&D. Milestone payments and royalties are part of the agreement.

Government support of key national research infrastructure, like that supported under the NCRIS, is currently being assessed by an expert working group led by my colleague and chief scientist Alan Finkel. They are developing the 2016 national research infrastructure roadmap to strategically guide government investment in research facilities over the next ten years. This roadmap, along with ISA's audit, will feed into our 'National strategic plan for science and innovation to 2030' – the topographic roadmap, if we continue the metaphor.

State and territory governments, publically funded research organisations and others are all key players in strengthening our innovation system. There are great examples across the states, including Queensland, but in the interests of time… I now want to talk about philanthropy.

Alongside government funding, industry investment, venture capital and private equity; in my view philanthropic endeavor will provide an increasingly key financial component of a thriving health and medical research system.

We often hear fund managers complain about the uncertainties associated with investing in biotech and medtech firms; the complexity of value propositions, the considerable influence and delays of regulators and unpredictability of clinical trial outcomes.

Philanthropists are in a special position to address the knowledge and funding gaps that inhibit the rate at which medical innovations are translated, commercialized and used by people around the country and the world in improving quality of life.

At a time when the NHMRC is funding less than 14% project grants, entities such as the NFMRI play an increasingly important research-funding role in reviewing and supporting the development and advancement of scientific innovations that would otherwise never see the light of day, particularly if we were just to rely on peer review grants process or a later stage analysis by venture capitalists. The NFMRI material for this conference talks about its role in getting money to places where others fear to tread. NFMRI's support of specific disease-based research, such as new drugs for asthma and a rheumatic heart disease vaccine, as well as technologies that are cross sector specific, like Stephen Haswell's diagnostic lab-on-a-chip – all are testament to this.

While Australia does not yet have a culture of philanthropic contribution as deep, and intense, as that found in the US, Australian philanthropists have made extraordinary contributions to health and research, including funding state-of-the-art research that promise to be of significant benefit into the future.

Some recent examples include:

- More than $30 million from the Kinghorn Family Foundation for the Kinghorn Cancer Centre in partnership with the Garvan Institute and St Vincent's Hospital in Sydney;
- Star Track Express founder Greg Poche's support of $40 million for the Melanoma Cancer Centre at the Mater Hospital;
- Multiple Private Ancillary Funds (PAF) and private family endowment support for MRIs like the Walter and Eliza Hall Institute (WEHI) of Medical Research in Melbourne;
- And the $50 million generosity and leadership of my fellow presenter at this conference, Clive Berghofer AM, OAM, in funding the QIMR Berghofer Medical Research Institute in Brisbane.

I believe there will be an increasing need and role for philanthropy to support knowledge creation in all parts of the HMR sector, essential for improved delivery of health services and outcomes. But as we know knowledge creation alone is not enough, it is also about mobilising the knowledge generated by our best and brightest in meaningful and impactful ways that improve people's lives.

The fundamental challenge of our time is – and for this sector – is how to match research excellence with commercialisation excellence?

We have all heard the statistics about where we rank for collaboration and publication and citation on a world scale.

The next steps are to turn much more of this excellent research and knowledge into products, services or processes that fulfil a market need. Certainly the Translational Research Institute, as a joint venture between several Queensland universities, hospitals and the government, is a unique Australian first – its 'concept to commercialisation structure' is driven by patient need.

And, in delivering on the promise of medical research, it is also possible to further support and expand HMR. For example, there have been undoubted economic benefits over the last ten years for the University of Queensland and the Diamantina Institute from the licensing of the HPV vaccine Gardasil for cervical cancer. There are many more examples of successful spinoffs through UQ, and Hatchtech and Spinifex – all of which are fantastic. They are causing great excitement and providing examples of what is possible.

Research translation and commercialisation can also be driven through entrepreneurial activities or through industry partnerships – like those supported by the Cooperative Research Centres (CRCs) - some of which I will be visiting in Brisbane later today. They include the Wound Management Innovation (WMI) CRC and the CRC for living with autism. The WMI CRC recently announced the development of a new product: a foot insole with a pressure-sensing fabric that sends a message to a smartphone warning of potential damage to a diabetic's feet. The technology has the potential to reduce the incidence of ulcer recurrence among people living with diabetes. 3M, an American company, joined as one of several international partners just a few months ago.

These are all encouraging examples but much more needs to be done to reduce the vertical barriers between industry and academia if we are to become of the top 10 innovative nations of the world by 2030.

I am happy to discuss this challenge in the Q&A session however let me conclude with some thoughts about how we can leverage philanthropy.

It seems to me, we have undercooked the exciting role philanthropy could play in meeting these challenges - notably when it comes to funding fresh innovative ideas. How can philanthropy leverage more support?

Maybe our future would benefit from disease-based challenge grants lead by government - maybe the MRFF - and matched with naming rights by philanthropy? This could be along the lines of the Yulgilbar Alzheimer's research programme that is overseen by another of my fellow presenters - Bob Williamson.

Or, perhaps additional incentives for private ancillary funds - estimated to be over $4 billion in aggregate - is the way to go. Driving greater investment in Australian research and innovation will certainly be a key area of focus as we develop ISA's 2030 strategic plan.

Or like the US' National Institutes of Health New Innovator Awards, supporting young researchers with $300,000 per year for five years with no preliminary data required.

I strongly encourage you all to provide us with your unique perspectives and invaluable ideas to guide our thinking throughout this process. To finish on the metaphor - you know the terrain, help us plot the best course.

Thank you.