

Mr Simon McKeon
Chairman,
Strategic Review on Health and Medical Research in Australia
The National Health and Medical Research Council

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Dr Dan Catchpoole
President, AMATA
Daniel.catchpoole@health.nsw.gov.au

Dear Mr. McKeon and Panel members,

The Australasian Genomic Technologies Association, Inc. (“AMATA”) represents a national community of research scientists with expertise in genomic ‘platform sciences’ (eg microarray technology, next generation sequencing etc). The McKeon review Terms of Reference rightly recognises that many of changes in the research landscape since the last NHMRC strategic review have occurred as a result of the sequencing of the human genome. The technology associated with genomic studies has brought biology into the centre of the information technology revolution. AMATA arose within this environment initially being comprised of a number of microarray facilities and users in each Australia capital city. The AMATA mission is to introduce and implement new platform technologies into the Australian research community through annual meetings, fostering communication & collaboration between research groups and to serve as a multi-disciplinary forum towards understanding and fully utilising these high-throughput technologies and the inherent data analysis demands.

AMATA provides an example of how strategic funding into ‘omics’ platforms can successfully generate a strong research capacity and associated community. It is largely through the success of this consortium that the wide variety of genomic technologies has been founded in research centres throughout the country. This network has served as a communication platform for genomics facilities and users from around Australia and New Zealand, and was incorporated in Victoria in 2004, with an Executive with representatives from each state. Hence, AMATA represents a sector of the research community well placed to suggest further strategic development to the McKeon review. The AMATA Executive Committee has reviewed the terms of reference of the McKeon Review of Medical Research and offers the following suggestions:

How might health and medical research be best managed and funded in Australia?

The strategic approach for the introduction, implementation, development and adoption of genomic technologies into health and medical research pathways across Australia involves sustained research infrastructure financial support.

Medical research in Australia increasingly relies on rapidly evolving platform technologies. For example, systems biology and functional genomics will drive much of the future molecular research in medicine and biotechnology. As a society based around understanding genomic technology, its development and application, AMATA has increasingly recognised that significant capability in

bioinformatics developed around these platform technologies is essential, and will form the basis of medical research in Australia going forward. Barriers to adoption of these technologies include the cost of equipment especially in a dynamic and constantly developing environment where major longitudinal studies can only be performed with major financial investment. Small scale studies rely on 'sequencing services' on a cost-per-sample basis which are often supplemented through grant funding. Many of these services are the result of ventures that came about initially by investigator-driven initiatives and hard earned grant funding but have become necessary and central research infrastructure.

AMATA believes that strategies are now needed to equitably bring in sustainable funding that underpin platform sciences and the rapid implementation of genomic technologies and associated expertise. These issues need to be addressed in a way that can support research in the many areas that require high throughput robotics and related technology and should not be left to ad-hoc, out of cycle initiatives that spend big, and then fail to provide long term support. AMATA believes that for sustained success for the translation of genomic technologies into medical research, we must invest in national networked facilities for genomic infrastructure, rather than single centres. "Multiple distributed nodes" are a good model for major facilities with strong coordination and networking between the facilities. AMATA members provide an effective example of such a distributed networking system, which provide advantages in making the facility available across a broader set of related disciplines, provide better capacity in research development at the local level as well as wider access to the researchers across Australia to professional expertise and technical assistance in genomic technologies.

What are the health and medical research strategic directions and priorities, and how might we meet them?

The strategy should be built on the basis that with the introduction of advanced and innovative technologies come the need to cultivate the integration of cross-disciplinary technical skills into our health and medical research priorities.

With the deluge of genomic sequencing data being generated, there is growing need to for bioinformatics and computational biology expertise to be applied to a full range of health and medical research paradigms. Targeted financial and infrastructure support, akin to the NECTaR initiative, will continue to be required to allow us to develop the computational tools required, allowing medical researchers to interact with experts in computational approaches including bioinformatics, data mining and machine learning. The NHMRC strategic directions should encourage innovation in cross-disciplinary research, including computational biology and bioinformatics that will underpin envisaged health priorities such as personalised medicine/theranostics.

An important aim of AMATA is to transform the plethora of genomic technologies into standard research tools. Currently our nation's research efforts in this area are being handicapped by a lack of general knowledge in the fields of genomics or bioinformatics. We seek to create a bridge between these areas that can be traversed by all researchers in Australia with their own biological expertise. What is desperately needed within a new NHMRC strategy is a coordinated practical and theoretical training underpinning technology innovations and enabling bioinformatics with a focus on translational medicine. Such 'innovations' may be high risk, but will be highly significant if successful.

How can we optimise translation of health & medical research into better health and well being?

A strategy which recognises genomic technologies requires unique expertise and where collaborations between multi-disciplinary teams are encouraged, with platform technology experts and/or computational biologist/bioinformaticians are integral to the team.

AMATA provide the foundation for several examples where integration of genomics plays across pathology and medical training, devices for diagnostics and delivery, and e-health. Our members recognise that there is a need to further develop an interface with health informatics. Enabling genomic medicine requires Australia-wide standards in the generation, storage and delivery of genomic data. It requires a network of clinicians cognisant in genomic medicine and genomic pathology. The distributed node arrangements of AMATA provide an excellent model for resourcing and community outreach to the medical genomics community. All this means genomics technologies will impact widely in medical research.

As a result capable, independent and well trained statisticians, bioinformaticians and systems biologists are absolutely vital for Australia to remain competitive and functional in all areas of health and medical research. Yet these positions are usually the least well supported and are generally based on short term contacts. These individuals are key to the success of any major research project and as such are usually put under a high degree of pressure, which is only exacerbated by the tenuous nature of their employment. As such, Australia continues to lose many skilled statisticians and bioinformaticians to overseas employment opportunities, and many Australian research groups are forced to outsource some of their analyses, rely on untrained PhD students or place increasing amounts of workload/pressure on the few skilled individuals who choose to remain. AMATA seeks to address some of these issues by providing access to and promoting advanced training and workshops in health and medical research relevant areas of bioinformatics and statistics, as well as providing those working within this area a portal to the wider Australian research community.

In summary, AMATA's recommendations to the McKeon strategic review are:

1. Consider genomic technologies as a fundamental component of the Australian medical research landscape.
2. Resource platform technologies in a distributed model that facilitates access to equipment and skilled technical staff for all research groups.
3. Building an expert workforce able to implement and apply these technologies within health and medical research initiatives, to allow truly innovative and collaborative efforts develop.
4. Recognise that the career structures of disciplines such as bioinformatics or genome biology require fostering within the medical research community.

Thank you for this opportunity to provide this input to this important review.

Yours sincerely



Dr Dan Catchpoole PhD, FFSc(RCPA)

President, AMATA

...on behalf of the AMATA Committee