

*Why is it in Australia's interest to have a viable, internationally competitive health and medical research sector?*  
(Terms of Reference 1 and 6)

There are several aspects to this question. 1) Tertiary education is the third biggest export sector in the Australian Economy and relies heavily on income made through international student fees. The choice of Universities made by international students is influenced by a variety of factors, but the reputation of Australian Universities is one of the key factors. The higher a University is ranked the more international students it will attract. The ranking of Universities mainly relies on research indicators, such as publications in Nature and Science, Citations of research output, Nobel laureates etc. A significant part of this reputation depends on biomedical research. Currently, the G8 universities are found among the top 100 universities in the world. Dropping below the top 100 would decrease the number of international students coming to Australia, resulting in significant loss of income for the tertiary education sector. 2) Training of medical students and future GPs requires medical researchers and practitioners who are at the forefront of their field. Only researchers who actively contribute to research will ensure continued high-level education. 3) Fostering of Biotech industry. Although small, Australia has a growing Biotechnology industry. Biotechnology industry emanates from research output generated by universities and research organizations. Reliable long-term research funding is required to generate ideas and concepts that can be translated into medical practice. 4) Attracting top researchers from around the world to come to Australia requires competitive research in the biomedical sciences.

Strategies: Long-term reliable funding for biomedical research in Australia. The success rate of current NHMRC project and program grant funding is very low. Grants are underfunded due to large salary gaps. Changing these conditions will make medical research a more attractive career.

*How might health and medical research be best managed and funded in Australia?*  
(Terms of Reference 2, 3 and 7)

Currently health and medical research is funded by both NHMRC and ARC. Significant improvements could be made by combining the two funding agencies. The redefinition of biomedical research by the ARC and the move of the NHMRC away from basic research threaten basic biomedical research, which is vital for Australia (see above). Long-term funding for established researchers should be available based largely on track record. Program grants should be increased, but not at the expense of project grants. Two grant management systems exist in Australia (RMS and RGMS). RGMS implemented by the NHMRC is a poorly developed system that is extremely tedious to use by both researchers and assessors. RMS is user friendly and provides a clean layout of each grant proposal. RGMS should be abandoned and replaced by RMS.

In general research projects are significantly underfunded by international standards. NHMRC grants have huge salary gaps that severely impact on project outcomes. Grants that are shared between different institutions do not have higher funding than individual grants. As a result collaborations are difficult to manage. Success rates are significantly higher in some European countries. Success rates are similar in the US, but the average funding per grant is much higher. On a per capita basis other research intensive countries spend 2-4 times more money on project funding (e.g. NIH, DFG etc.). State funding often provides significant support to employ university lecturers and research assistants in European countries. NHMRC and ARC provide the bulk of project funding in Australia. Other countries have significant more funding through other sources (Philanthropy, investments etc.). Project and seed funding is extremely important to commercialize academic ideas and to attract sponsored research from the industry. Project grants should not be overregulated. Research by definition is risky and its outcomes are uncertain. Overemphasis of feasibility and achievement of predicted aims will stifle research and creativity.

- *What are the health and medical research strategic directions and priorities and how might we meet them?*  
(Terms of Reference 5, 12 and 13)

The pharmaceutical industry is increasingly looking into collaborative projects with Universities. R&D in the industry is expensive, while research at Universities is cheaper. This is an opportunity to train PhD students in projects where co-funding through industry exists. Due to the ageing population it appears likely that health priorities will remain similar in the next few years (obesity, diabetes, degenerative diseases, cancer, preventive medicine). However, treatments will change significantly. Cancer treatment will be tailored depending on molecular diagnostics. While personalized medicine will not become a reality in the near future for a variety of reasons, molecular understanding of diseases such as cancer and diabetes, will classify patients into subgroups that will receive tailored treatments. Preventive medicine could become a very important factor with our increased understanding of degenerative diseases and ageing. Thus research to understand the biomedical basis of these processes will remain extremely important.

- *How can we optimise translation of health and medical research into better health and wellbeing?*  
(Terms of Reference 4, 8, 9, 10 and 11)

Development of drugs and new treatments is a long-term process. Seed funding needs to be made available at different stages of translation. Currently there are difficulties to maintain intellectual property and to have long-term support for development of drugs and new treatments. Infrastructure is available but often not the people to run it. Regulations are often too restrictive without being based on evidence that they improve research safety. Administrative hurdles need to be significantly reduced. This applies to research of aboriginal health where lots of research opportunity is wasted due to administrative hurdles. It also applies to use of animals in research where costs have risen to the point that researchers give up this line of research, which is crucial for testing new drugs and treatments.