



# Fund medical research with government-backed bonds says leading scientist



Why is it a problem to find money for medical research? It's a valuable investment and should be funded with debt.

by Alan Trounson

Just before Easter, the Industry and Science Minister, Ian Macfarlane, launched a report promoting the use of government-backed bonds to boost funding for research, in particular translational research which is targeted solely at getting treatments and therapies which come from medical research into the clinic.

In the US, a similar system was utilised to create a \$US 3 billion (\$3.9 billion) fund for the development of the very successful California Institute for Regenerative Medicine (CIRM), or the Stem Cell Agency as it later became.

In Australia, we are in a similar situation to what existed in California back in the early 2000s. The issue then was how to continue the state's world class record of research (remember California is home to universities such as Stanford, Berkeley and UCLA) in a climate of rapidly reducing funding – and a growing medical need for answers for the millions of people entering the 65-plus age group with their greater health needs.

According to the report, *Innovate and Prosper: Ensuring Australia's Future Prosperity Through University-Industry Collaboration*, there is a disconnect between the sorts of research that universities do and what industry needs. This, in part was recently addressed when the National Health and Medical Research Council announced the recognition of four Advanced Health Research and Translation Centres – hospitals and research institutes best placed to take science from the bench to the bedside. A consortium called Monash Partners, including Monash University, Monash Health, Alfred Health and others, is one of the four. And while the recognition comes with no funding, it clearly indicates the focus of the government is to increase the relevance of our funded research to the lives of Australians.

Globally, up to 75 per cent of all healthcare costs are consumed by chronic diseases such as arthritis, diabetes and dementia. In 2004, aware that the "aged care tsunami", as it was called, would deplete California's coffers within decades, a citizens' initiative termed Proposition 71 was proposed by almost a million voters and later passed by referendum with 59 per cent in favour.

The aim of Proposition 71 was to create an agency specifically focused on driving basic and applied stem cell research. The California Institute for Regenerative Medicine (CIRM) was formed, and I was appointed president of CIRM from January 2008 to June 2014.

The funding model for CIRM was similar to the one that is being proposed in the report. Essentially, Proposition 71 directed the Californian government to raise \$3 billion through the sale of general obligation 30 year bonds, up to a maximum of \$300 million a year for 10 years. Any debt associated with the bonds was capitalised by payment from the bond funds by CIRM over the first five years. Financial returns from intellectual property and commercialised products returned to the state.

During the time of my presidency, CIRM generated major contributions for the Californian economy through science and technology jobs, the building of 12 new stem cell institutes, private donor contributions of over \$800 million and support of a strong biotechnology industry. These returns far outstripped the debt of bond fundraising during my term.

The *Innovate and Prosper* report, authored by PricewaterhouseCoopers in partnership with the Australian Technology Network of Universities (ATN), warns that "the long term sustainability of innovation can best be ensured if private investment accounts for a growing proportion of its financing".

The premise behind finding \$3 billion through bonds to pay for stem cell research in California was that the cost of transformative, long-term research should be spread over the benefiting generations, five, 10 and 20 years hence, thereby better matching the timing of the cost with the timing of the associated benefit.

With an election cycle of three years or thereabouts, the long-term goal and commitment for medical research is rarely ever going to happen. Medical research – whose results, let's be clear, are unlikely to benefit the majority of the baby boomer generation – competes for the same monies allocated to hospitals, and the subsidies provided to the pharmaceutical companies to provide subsidised but necessary drugs to Australians.

Hospitals and the provision of medical services require acute financing. Preclinical and "first-in-human" research (the basis of what with luck becomes clinical trials and then available treatments) requires almost the opposite: substantial, long-term funding.

Using this template, medical research should be funded in a similar way that money is found for infrastructure or general debt. This model inspired the use of general obligation public bonds for the \$3 billion financing of CIRM. And remember this funding model was overwhelmingly supported by the Californian voters through a referendum.

This system drove an incredible program of basic research but also translational research to scientists in academia, research institutes and biotechnology companies. Importantly, benefits and inducements were made for collaborations between institutions and industry, a fault in the current system outlined by Philip Clark, the chair of the ATN's industry advisory group, who warned correctly that university-industry collaboration in Australia is currently "terrible".

Under the bond funding system, CIRM-funded research resulted in an extraordinary array of scientific discoveries being made, patented, published and turned into translation for regulatory approval (by the US Food and Drug Administration) for clinical trials. There is every reason to believe a similar system could work here.

Medical research should not be viewed as an operating cost of a country; rather it should be approached as an investment in intellectual capital and intellectual infrastructure that pays back over time. Just adding money to medical research is no longer an option, nor in fact does it seem to be working. A bond system, however, when used wisely and strategically and managed scrupulously, will be paying very substantial benefits back to the community within 10-15 years.

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