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Jonathan West: A healthy regard for tomorrow

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DURING the next 20 years, biotechnology must become a fundamental contributor to Australia's productivity, both directly through increases in export income and indirectly through the maintenance of the population's health.

Initial investment in biotechnology is expensive for any nation, in intellectual and capital terms. Australia has limited investment in these resources at present, but has the opportunity to redress the situation.
The quality of Australian science and the nation's stable political structure provide a good foundation for building a biotech industry.

The question is whether the Australian people want to make the investment. This question cannot be properly faced until biotechnology is viewed by the people as a real national resource, rather than the somewhat eclectic creation of scientists who are removed from the daily lives of most people.

It may well be asked whether Australia can afford not to make the investment. Present predictions are that healthcare costs for Australians will reach trillions of dollars during the next two decades as the population ages and existing health trends continue.

If Australians are to avoid a catastrophic burden, then we must invest now in biotechnology and we must invest heavily. Investment of $1 billion now will probably save $100million in 20 years' time.

Investment must be meaningful in sum and duration. Grants of a few million dollars seem generous to the recipients, but make little strategic impact. Recurrent funding is required because the science and technology is evolving so rapidly. The magnitude of funding needed exceeds traditional resource supply for biomedical and bioscience research in Australia, but not in other countries.

Investment must be managed with national priorities in mind. It may be argued that management of biotechnology funding through individual grants is fragmented and risks wasting vital resources. For government, in particular, it is highly desirable that a coherent and strategic biotech investment program can be developed.

Investment must support partnerships between governments, industry and research groups. Partnerships should include consideration of policy direction, co-ordinated research programs and infrastructure support. The partnerships should maximise synergy between groups and seek a co-ordinated approach to infrastructure support.

Investment must be strategic, as Australia does not have the resources to address all aspects of the biotechnology revolution.

Investment priority should be directed towards those initiatives likely to be of greatest benefit to the health of the population and national productivity.

Investment must be made in education. The biotechnology revolution will require us to develop a completely new national skills base. We will need new tissue engineers, new nano-technologists, molecular nutritionists and organic architects. We will need to develop training programs and educational support for the new workforce.

Investment must be immediate. The lead time of assembling research groups and manufacturing teams can be considerable. We also have the lead time of training the new workforce. If we are to meet the challenges of the next 20 years, we must invest now.

At the same time, our advances in bioscience and biomedicine will open important ethical debates. Already, we face community debate over the growing of genetically modified crops. While most genetic modification so far has been directed at improving the "natural" properties of food, the creation of foodstuffs with additional or enhanced properties is a new phenomenon. To what extent is it desirable that we create "designer" foods, which can deliver drugs or nutrition supplements in our daily diet?

Humans are remarkably adaptable to medical devices and prostheses. It has been predicted that by 2020, most people over the age of 60 will have some sort of implanted medical device.

Such devices are, however, expensive. How will we ensure equity of access to the new technology and avoid a two-tier society of those who can afford the new medicine and those who cannot? This is particularly important for those most likely to need new devices -- older members of society.

If we are to embrace organ replacement and tissue repair as means of maintaining a healthy and productive population, we shall have to ask how much of our bodies are we willing to replace?

At what point would this process of repair alter the individual concept of self? Indeed, if the next 50 years see us consuming predominantly modified foodstuffs and undergoing continuing renewal of our bodies, and pushing our physical capacity through use of biomachinery, we might well ask what a human being really is.

The question is not whether biotechnology will have a future in Australia, but what sort of future it will have and how it will contribute to the benefit of the nation.

It might be asked what choice Australia has about future investment in biotechnology. It appears certain that modern biotechnology will fundamentally change the world as we know it. Indeed, given the demographic and economic challenges before us, biotechnology will lead us to change ourselves.

On present trends, we must harness biotechnology to sustain national productivity and support the standard of living of our children and their children. The message is clear.

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