

Running on empty

Daniel Pejic outlines how stringent pandemic measures hurt Melbourne's scientific prowess.

Melbourne has an international reputation for food, culture, sport and as a great place to live. The Australian city was ranked 10th in the Economist Intelligence Unit's Global Liveability Index 2022, a list it topped between 2011 and 2017. But perhaps less recognized is its position as one of Asia-Pacific's leading science cities. According to an analysis of author affiliations in Nature Index, which measures output in 82 high-quality natural-science journals, it has retained its spot as Australia's highest ranked city for scientific research, ahead of Sydney and Brisbane.

However, this success as a science hub has been tested in the past two-and-a-half years. Australia's border closures during the pandemic denied the city what is most needed for international science: a steady flow of the best students and researchers from overseas. The loss of international students also restricted a core income stream for universities, making it even harder to fund and attract research talent.

These developments could be the greatest challenge faced by Melbourne since its establishment as a science hub, something that can be traced back more than a century. It was the birthplace of the Commonwealth Scientific and Industrial Research Organisation (CSIRO), the Australian government's scientific research agency, which started life as the Advisory Council of Science and Industry in 1916. CSL, the biotechnology giant which is now one of Australia's most valuable companies, was also founded in the city in 1916 as Commonwealth Serum Laboratories, originally a public body working closely at the time with the Royal Melbourne Hospital, and the Walter and Eliza Hall medical research institute. The University of Melbourne was founded even further back, in 1853, a few years after Australia's oldest university, the University of Sydney.

Scientific investment in Melbourne continued throughout the twentieth and early twenty-first centuries. Since the 2000s, both state and federal governments have funded renowned scientific infrastructure in the city, including the Parkville biomedical precinct, where more than 10,000 medical researchers are based, and the Clayton area, surrounding Monash University. The former is home to the Aus\$1 billion (US\$630 million) Victorian Comprehensive Cancer Centre, the Bio21 Institute of Molecular Science and Biotechnology, and the Peter Doherty Institute for Infection and Immunity, which has received international



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attention for its work on COVID-19. The Clayton precinct surrounding Monash has a diverse range of academic and commercial research entities, including CSIRO and the Melbourne Centre for Nanofabrication, and is also home to 40% of Victoria's manufacturing companies. It is also the site of the Australian Synchrotron, the largest particle accelerator in the Southern Hemisphere.

Pandemic challenges

However, despite this wealth of scientific infrastructure, pandemic border closures and lengthy lockdowns have revealed the precarity of Melbourne's, and Australia's, research sector. Declining government funding for universities before the COVID-19 crisis had already led Australian academic institutions to increasingly rely on income from international students to subsidize research. The state of Victoria alone welcomed more than 200,000 international students each year before the pandemic struck, the vast majority of whom would have studied in Melbourne. But border closures in 2020 and 2021 led to the almost complete cessation of international student arrivals, and, amid falling revenue projections, universities across the country cut thousands of jobs. At the same time, the online migration of academic seminars and conferences has been a challenge for Australian-based researchers seeking international collaboration, with events tailored to audiences in Europe and America often taking place in the middle of the Australian night.

Melbourne still has many advantages over competitors for attracting and retaining scientific talent such as a high standard of living, a multicultural society, a strong track record of engagement with Asian scientific institutions, and competitive salaries. However, waning opportunities for research at the early and mid-career levels is driving some newly qualified scientists to leave Australia, a 'brain drain' that threatens to hinder the sector for a generation.

Australian federal government policy has also played a role in weakening universities. The conservative Liberal-National coalition government that led the country from 2013 until the election in May 2022 advanced a research agenda prioritizing commercialization and industry collaboration. At the same time, basic research funding has been neglected. Australia spends only 1.8% of GDP on research and development, according to 2019 figures from the Organisation for Economic Co-operation and Development (OECD), ranking 21st among OECD countries and well below the 2.5% average for the group. The previous federal government also angered universities by intervening in the competitive grants process, most recently with then acting education minister, Stuart Robert, vetoing six humanities applications on national interest grounds.

The new Australian Labor government has promised a renewed focus on scientific investment, but it is still too early to see how this translates into funding and policy priorities. As an attractive place to work and study with top-tier scientific facilities and strong international partnerships, Melbourne is well positioned to grow its reputation as a global city of science if it receives renewed attention. This, however, will demand a quick recovery from the impacts of the pandemic and strengthening of the university sector, especially in terms of support for the next generation of internationally engaged Australian scientists.