

# A commercial-scale viral vector manufacturing facility

## Benefits to research and education

The New South Wales Government has committed to expand and operate a world-leading viral vector manufacturing facility in the Westmead Health and Innovation District in western Sydney. Viral vectors are a key component of gene therapies and vaccines that save lives.

The first of its kind in Australia, the facility will enable both the development and manufacture of viral vectors to meet the growing demand in Australia and internationally for clinical-grade vectors. Led by Australian experts Professor Ian Alexander and Dr Leszek Lisowski, the manufacturing facility will ensure intellectual property for genetic therapies is retained in Australia to further boost innovation and investment. The facility will benefit research and education by attracting expertise from across Australia and the globe.

### World-class research

The viral vector manufacturing facility will build on Australia's reputation for world-class research, benefitting academic and clinical communities that have made significant contributions to cell and gene therapies.

NSW is the ideal location for Australia's viral vector manufacturing industry. It is at the forefront of international gene therapy research, with researchers paving the way by conducting Australia's first gene therapy clinical trial for a genetic disease back in 2002. The state is home to nationally and globally significant genomic medicine development programs, particularly in the fields of gene therapy, gene-modified cell therapy and RNA therapy. These therapies treat a wide range of conditions, including genetic diseases, cancer, infectious diseases and heart conditions. NSW is also home to two of Australia's top four highest-ranked research universities, and Sydney's population of five million includes a skilled and highly educated workforce.

Currently, Australian patients and researchers are waiting up to two years to source viral vectors from international suppliers needed for cell and gene therapy clinical trials. The NSW Government has invested in a viral vector manufacturing facility in response to this growing local demand. By securing an Australian local source of viral vectors, the facility will reduce treatment delays and accelerate local research.

“The NSW Government is investing in the next generation of researchers to ensure we have a skilled workforce and accelerate the local development and manufacture of cell and gene therapies. We're also nurturing a pipeline of talent, through targeted PhD scholarships and early-mid career fellowships, as well as international exchanges that will bring the best minds here to Australia.”

– Elizabeth Koff  
Secretary of NSW Health



## Benefits for higher education

The viral vector manufacturing facility will provide an important educational platform for researchers, attracting students and high-performance research teams. By increasing research capability, the facility will contribute to the education of the next generation of medical professionals. This will help further entrench NSW as a leader in cell and gene therapies.

As the demand for viral vectors grows, the NSW Government is investing in enhancing the expertise and developing a workforce in Australia to support this growth. This will benefit research and education by providing access to expertise, enabling students to learn from clinical experience and continuing to build the next generation of viral vector therapeutic experts.

Embedding research and education (including universities) within clinical areas (including hospitals) supports collaboration between medical professionals and the next generation of doctors, researchers, surgeons, nurses and clinicians.

“It’s important to develop this type of industry in Australia because when smart people graduate here in this area of research we need to make good use of their skills to generate economic impact.”

–Hugh Durrant-Whyte,  
NSW Chief Scientist  
and Engineer

## Case study

### Renowned research translating science to clinical trials

The new viral vector manufacturing facility draws on the skills of globally renowned experts Professor Ian Alexander and Dr Leszek Lisowski and their teams. Professor Alexander and Dr Lisowski are responsible for developing and then utilising, genetic therapies to help cure patients with disease. The manufacturing facility will leverage their expertise to develop locally owned intellectual property that can then be manufactured.

Professor Alexander and Dr Lisowski lead independent, but highly synergistic research teams. The teams have established expertise in viral vector development and manufacturing, and have proven track records in commercialisation and clinical development. In addition, they specialise in the development of new vectors optimised for clinical applications (for example, targeting organs such as the liver and eye), thus expanding the applications of these new technologies.

Professor Ian Alexander is Head of the Gene Therapy Research Unit at the Children’s Medical Research Institute, senior clinician at The Children’s Hospital at Westmead, and Professor of Paediatric and Molecular Medicine at the University of Sydney. Dr Leszek Lisowski heads the Translational Vectorology Group at the Children’s Medical Research Institute, and is Conjoint Senior Lecturer at the University of Sydney. Together, they have over 40 years of collective experience in viral vector research.

These researchers will play a key role in the new viral vector manufacturing facility by training staff and developing the manufacturing processes that will underpin operations.



Australia is internationally recognised for its world-class clinical trials, which attracts significant industry investment. At any one time, more than 10,000 clinical trials are being conducted in Australia. The industry is valued at \$1.4 billion to the Australian economy per year, including \$650 million of foreign investment. Thanks to its streamlined medical services, NSW is a highly sought after location for clinical trials. Researchers can access the entire NSW public health system and patient population with a single ethics application. Trials conducted in NSW also can access high-quality clinical data recognised by US and European regulators and other global institutions. The state’s existing infrastructure facilitates fast, efficient, high-quality clinical trials, with low-cost early phases and possible tax incentives.

Dr Leszek Lisowski (left) and Professor Ian Alexander

The Westmead Health and Innovation District is one of Australia's largest integrated health, education and research precincts. The viral vector manufacturing facility draws on the precinct's partner universities, medical research institutes, adult and paediatric hospitals, and training providers in manufacturing and vector technology. It provides a single point of entry to an ecosystem of globally recognised industry leaders, providing cell and gene therapy services from discovery through to clinical trials. This will support the research, development, patenting and production of high-value genetic therapies to capitalise on Australian Intellectual Property.

## Integrated expertise at the Westmead Health and Innovation District



Education

University of Sydney  
Western Sydney University



Health

Westmead Hospital  
Children's Hospital, Westmead  
Cumberland Hospital  
Westmead Dental Hospital  
Ramsay Private Hospital, Westmead  
Westmead Skin Hospital



Research

Children's Medical Research Institute  
Westmead Institute for Medical Research  
Crown Princess Mary Cancer Centre  
WSU Translational Health Research Institute  
Institute for Clinical Pathology and Medical Research  
Sydney Gene and Cell Therapies  
Kids Research Institute  
National Institute for Complementary Medicine  
The MARCS Institute for Brain, Behaviour and Development



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