New South Wales, Australia
BIO International Convention 2022

Making opportunities happen in life sciences

NSW GOVERNMENT

Contents

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Health Minister's Foreword

New South Wales (NSW) is a global leader in developing and delivering transformational medical research and treatments and has Australia's largest economy and population. It is an honour to represent my home state at this year's highly esteemed BIO International Convention.

NSW Health is the largest and best health system in Australia and is responsible for more than 220 public hospitals and over 160,000 employees. To give you an idea of scale, NSW Health has more employees than General Motors does globally.

The state of NSW leads the nation with a thriving health system that provides care for more than a million overnight patients in public hospitals every day and cares for over 18 million patients a year in the community. NSW, and Australia more broadly, also benefits from partnerships within a sophisticated medical research environment with an extensive range of expertise found in the private hospital system, universities, industry and medical research institutes.

Our advanced and interconnected ecosystem is backed by sizeable strategic NSW Government investment in public infrastructure, precincts and human capital. In addition to an annual operating budget exceeding A$30.2 billion (US$21.2 billion), our capital investment in health is A$10.8 billion (US$7.6 billion) over four years to 2024–25, including A$25 million (US$17.5 million) in a viral vector manufacturing facility and A$96 million (US$67.3 million) in an RNA pilot manufacturing facility.

Our research and development capabilities are among the best in the world and our health and medical research pipeline spans discovery, translation, clinical trials, commercialisation, and advanced manufacturing.

NSW boasts globally renowned researchers and institutions in the areas of genomics and precision therapeutics, gene and cell-modified gene therapy, RNA and DNA diagnostics and therapeutics and bacteriophage (phage) therapy. These include:

- the Garvan Institute of Medical Research's Precision Oncology Screening Platform Enabling Clinical Trials (PrOSPeCT) program which will fast-track the development, manufacturing and use of precision, personalised cancer treatments;
- the Sydney Children's Hospitals Network (SCHN) which was the only Australian site in an international clinical trial for a new gene therapy for spinal muscular atrophy;
- the University of New South Wales (UNSW) RNA Research Institute which is leading state-wide collaborative initiatives in RNA diagnostics and therapeutics; and,
- the Westmead Institute of Medical Research and the University of Sydney which together conducted a world-first study demonstrating the safety of phage therapy in patients.

NSW enables fast, efficient, safe, robust, and highly cost-efficient clinical trials by virtue of the state's natural strengths of population size and diversity, and through centralised coordination, making it one of the top 10 global destinations for clinical trials.

This prospectus highlights NSW's strengths and capabilities in health and medical research, and opportunities for international investment and collaboration.

Our concierge services are ready to provide you with more information and connect you with the right partners in NSW and they can be contacted at medicalresearch.nsw.gov.au/contact-us.

The Hon. Brad Hazzard MP
Minister for Health

Trade, Tourism and Major Events Minister's Foreword

New South Wales (NSW) and our capital Sydney are leading the way to an even healthier future with rapidly growing medtech and pharmaceutical industries, a focus on biotech, and world-leading research and innovation ecosystems.

NSW is Australia's largest state and the engine room of the national economy. NSW is also the birthplace of global medtech leaders such as Cochlear and Resmed, with a long history of supporting health and life sciences businesses take breakthrough products and services to the world.

As the sector takes on a new global prominence due to the pandemic, we're especially proud to participate in the 2022 BIO International Convention in San Diego, California.

The United States is already a leading destination for NSW companies looking for international opportunities to expand their businesses – it is one of our top export markets. We hope to expand these relationships even further at BIO 2022, showcasing cutting-edge technology and innovative solutions to partners, buyers and distributors in the United States and across the world.

Over the four days, we will spotlight the incredible investment opportunities across NSW's biotechnology industry.

Sitting on the east coast of Australia, NSW offers investors a unique gateway to establish a footprint and expand in the Asia Pacific.

NSW has world-class universities and research organisations, Australia's strongest STEM workforce pipeline and a fast, high-quality and cost competitive clinical trials pathway supported by tailor-made infrastructure including at our new $3 billion Westmead Health and Innovation District.

This prospectus provides valuable information on this, and other investment and business opportunities located in NSW, Australia's largest health system. It also features the NSW companies who are representing our health and life sciences sector during the BIO Convention.

Our team look forward to working with you to support your company to grow and make opportunities happen.

The Hon. Stuart Ayres, MP
Minister for Enterprise, Investment and Trade
Minister for Tourism and Sport
Minister for Western Sydney

Make opportunities happen in New South Wales

With Australia's largest population, strongest economy, and innovative life sciences sector, New South Wales (NSW) is open for business for companies looking to expand in Australia and the Asia-Pacific region.

An economic powerhouse in the Asia-Pacific region

Australia's best-performing economy and home to Sydney, its financial centre.

NSW accounts for more than half of Australia's economic growth.

The state's economy is larger than the individual economies of Singapore, Hong Kong and Malaysia. Our economic and political landscape is stable and secure.

A highly skilled and diverse workforce

NSW has Australia's largest population with 8.2 million residents, more than two-thirds of whom hold post-school qualifications. More than a third of Sydney's workforce holds a bachelor's degree or higher.

The state's population is also among the most diverse in the world. While English is by far the most widely spoken language, almost a third of NSW residents speak a second language. In all, there are 275 languages spoken within the state.

Australia has the fourth-highest proportion of highly educated immigrants in the OECD and is ranked 11 out of 134 countries in the 2021 Global Talent Competitiveness Index.

Personalised government support for international investors

Investment NSW centralises the NSW Government's trade and investment attraction activities, providing a single point of accountability for the private sector.

Its role is to reinforce NSW as the most desirable place in the world to visit, study, invest and do business.

It acts as a concierge for business, universities, and other institutions, partnering with different parts of government and its international network to bring the best of what the NSW has to offer and create valuable partnerships.

Find out what Investment NSW can do for your business: www.investment.nsw.gov.au

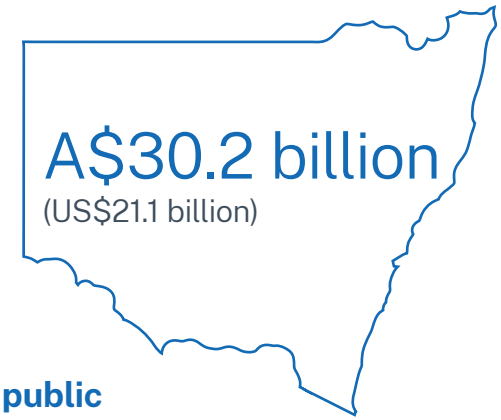
A sophisticated and highly networked health system

NSW has Australia's best-performing healthcare system, and a globally significant R&D ecosystem with strong government-backing.

NSW has an advanced and interconnected research and commercialisation ecosystem developing the next generation of therapies, supported by internationally recognised health and education sectors.

World-class healthcare is delivered to NSW's 8.2 million residents through a unique devolved structure of governance which includes 15 local health districts and 2 speciality health networks, supported by centralised policy and support pillars.

Precincts are a strength of NSW's health system. Across the state there are globally significant networked concentrations of health, research, and education facilities.



A$30.2 billion
(US$21.1 billion)

public health system annual budget

228 **public hospitals** serve over 8 million people

3rd ★★★★★ most efficient healthcare system **in the world**

(The Commonwealth Fund, 2021)

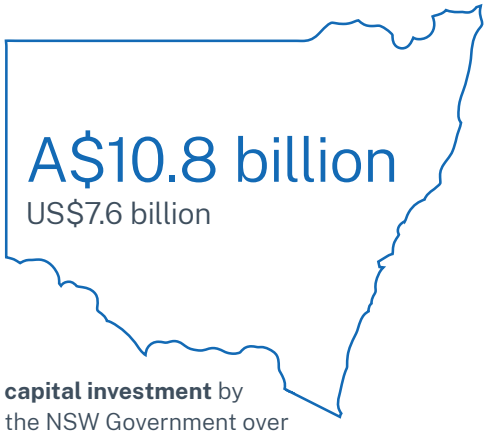
Over 127,000 **full-time equivalent** staff

Over 350,000 **surgeries** were performed during 2020–21

3 million **emergency department attendances** were triaged during 2020–21

Statewide public pathology service, and Australia's first and largest Statewide Biobank

NSW's Health and Medical Research Ecosystem



A$10.8 billion
US$7.6 billion

capital investment by the NSW Government over four years to 2024–25

NSW is home to **55%** of Australia's life sciences companies and **44%** of its start-ups

Two of the world's **top 50** universities

(QS 2022)

8th in the world for life sciences research

(Nature, 2020)

CASE STUDY

A world-class public health response to the COVID-19 pandemic

The management of COVID-19 in Australia is viewed by some international bodies as one of the best in the world. With a population of just over 25 million people, Australia recorded 7,373,942 million cases and 8,662 deaths to 3 June 2022. In 2020, Australia did not experience overall excess death, and in 2021 the annual excess death rate was 3.5%, a difference of around 5,000 deaths, or around 100 deaths above the expected statistical variation in the number of deaths each year. This effective management of the pandemic was the result of strong national collaboration and the rapid implementation of policy based on available evidence and pragmatism.

As NSW Health responded to the challenges of COVID-19, it also optimised its close relationships with culturally diverse and at-risk communities at a local health district level, engaging with community leaders to increase awareness of the risks of infection, encouraging testing and highlighting the benefits of vaccination.

The NSW Government has committed more than A$4 billion (US$2.88 billion) to the NSW health system to manage the impacts of the COVID-19 pandemic since March 2020. This includes an investment of A$458.5 million (US$ 330 million) by the NSW Government over 2020–21, with a further A$80 million (US$ 57.6 million) in the 2021–22 budget, to speed up access to surgery for patients who had their surgery delayed. This was made possible through increased collaboration between public hospitals and private providers.

NSW's Health and Medical Research Ecosystem

Significant financial investment by the NSW Government ensures internationally recognised research is translated into therapies and practice both locally and globally.

A dedicated Office for Health and Medical Research, part of NSW Health, supports research, translation, and commercialisation through a range of programs:

Translational Research Grants Scheme (TRGS) which builds research capability and accelerates evidence translation within the NSW public health system. Over **A$35.8 million** (US$25.2 million) has been funded over five rounds in TRGS.

Over **A$25 million** (US$17.6 million) in COVID-19 research to inform the NSW response to the COVID-19 pandemic, enhance **research ecosystem and infrastructure** and translate COVID-19 research.

Medical Devices Fund, a seed funding program for new-to-world medical devices. Since 2009, the Fund has awarded **A$70 million** (US$49.3 million) for 40 projects which has generated **A$870 million** (US$613 million) in capital, 70 regulatory product approvals and over 200 completed clinical trials.

Commercialisation Training Program which develops the commercialisation skills of innovators in medical devices, diagnostics, therapeutics, and digital health. Graduates of the program have raised more than **A$77 million** (US$54.2 million) in private equity and grants and founded 19 start-ups.

A$150 million (US$105.7 million) over 10 years to build **cardiovascular research capacity** in NSW and make NSW a global leader in cardiovascular research.

Next-generation clinical trials

NSW is a global premier destination for high-quality, efficient, and cost-effective clinical trials.

The state's natural strengths include a large, diverse, and talented population complemented by world class research institutions, universities, and a highly networked public health system.

In addition, capabilities, policies, and services including start-up support, resource-sharing, and streamlined ethics and governance processes, have earned NSW a reputation as a globally competitive destination for clinical trials; particularly in early-stage trials.

- NSW clinical trial start-up is highly efficient, with more than 90 percent of clinical trials approved within 60 days of application, and contracts signed within 30 days.
- NSW benefits from an ethnically and culturally diverse population, with 33 percent of its residents born overseas, and up to 47 percent with at least one overseas born parent.
- Clinical trials can access the entire NSW public health system and patient population with a single ethics application which is also recognised nationally.
- A large and competitive domestic contract research organisation (CRO) sector that is highly experienced with managing trials for overseas companies.
- Access to patient populations through high-quality clinical trial sites in regional and rural NSW, capable of delivering decentralised clinical trials, supported by a A$30.6 million (US$21.5 million) Commonwealth Medical Research Future Fund Grant.

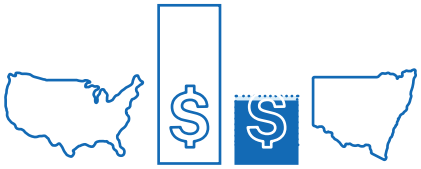
Specialist **expedited** ethics reviews of **early phase** clinical trials within

just 20 days

NSW has a large recruitable population, with

56%

of its **8.2 million residents** willing to participate in a clinical trial



Trials in NSW are

28%

less expensive than in the US

Increasing up to

60%

with federal R&D **tax incentives**

A personalised concierge service for clinical trials

clinicaltrialsNSW within NSW Health, enables capacity, capability, and collaboration across clinical trials.

Its **Clinical Trials Connect** service assists industry and researchers in establishing clinical trials in NSW in a range of ways including, by:

- finding trial investigators and engaging key opinion leaders
- identifying potential patient populations
- finding specialist trial support services including CROs, biostatistics, etc.

Contact

clinicaltrialsNSW@health.nsw.gov.au to run a high quality, fast, and cost competitive trial in NSW.

Next-generation clinical trials

CASE STUDY

NSW stands out in global trial of new gene therapy for spinal muscular atrophy

The Sydney Children's Hospitals Network (SCHN) was the only Australian site in an international clinical trial for a new gene therapy treating spinal muscular atrophy (SMA), the leading cause of infant death in Australia.

Australian participation in the trial was supported by a A$2 million (US$1.4 million) investment from the NSW Government to add SMA to the NSW and the Australian Capital Territory's (ACT) newborn screening program run by SCHN. The NSW newborn screening program has near universal population coverage, screening around 100,000 newborns per year, and is an important way to identify pre-symptomatic infants before the onset of irreversible nerve death.

As a result of the early identification of newborns with SMA, NSW patients were able to join the global SPR1NT trial at the Sydney Children's Hospital, Randwick (part of the SCHN) for the new gene therapy called Zolgensma®.

NSW was the equal leading recruitment site globally, and the first international site to recruit children outside of North America. The trial led to the first market-approved adeno-associated virus-based gene therapy drug for paediatric patients.

Genomic and precision medicine

NSW is a global leader in precision medicine for cancer diagnosis and management, cardiac disease, and cystic fibrosis.

NSW has internationally significant expertise in the investigation of proteomics, microbiomics for personalised medicine approaches, and genomic medicine.

Researchers across the state are expanding the use of precision medicine across diverse clinical areas, revolutionising the understanding and treatment of disease in Australia and worldwide.

Genomic and precision medicine is supported by complementary state government investments in clinical trials infrastructure, NSW Health Pathology (Australia's largest public pathology network), and the Statewide Biobank.

The Australian Cancer Research Foundation International Centre for the Proteome of Human Cancer (ProCan®)

ProCan®, which is part of the US Cancer Moonshot and European iPC consortiums, is analysing the proteomes of tens of thousands of cancers for which clinical outcomes are already known in order to create a database that will enable cancer clinicians to enhance the accuracy of their treatment decisions. ProCan® has developed robust, high-throughput techniques that include rapid preparative methodologies and liquid Chromatography/tandem Mass Spectrometry suitable for analysis of very small cancer samples.

The multidisciplinary ProCan® team, based at Children's Medical Research Institute in Westmead, Sydney, contains proteomicists, data scientists, software engineers, project managers, histopathology technicians, and clinically-qualified medical oncologists.

ProCan® collaborates with large numbers of cancer research groups located primarily in Australia, Europe and North America who supply cohorts of tumour samples and associated clinico-pathologic data as well as other 'omic' data. The ProCan® team uses advanced computational techniques to enable prediction of clinical outcomes from proteomic data.

Precision Oncology Screening Platform Enabling Clinical Trials (PrOSPeCT)

The PrOSPeCT national project is led by the NSW-based Australian Genomic Cancer Medicine Centre (Omico) and backed by A$185 (US$131 million) in funding from the Australian Government, not-for-profits, and industry. The project will fast-track the development, manufacturing, and use of precision, personalised cancer treatments. This national genomic and proteomic platform that will screen more than 20,000 trial-eligible cancer patients between 2022 and 2025. It is designed to support industry-sponsored biomarker-dependent drug development and welcomes industry partners.

The Microbiome Research Centre (MRC)

The MRC at the University of New South Wales is a comprehensive world-class microbiome-focused research centre solely dedicated to studying the microbiota in health and disease; supported by grants totalling A$2.5 million (US$1.8 million) from the NSW Government. Its researchers integrate basic science and translational medicine, and harness powerful multi-omic approaches such as genomics, epigenomics, transcriptomics, proteomics, metabolomics, as well as bioinformatics; to answer pertinent questions about the microbiome that are relevant to human health.

Genomic and precision medicine

> “Through PrOSPeCT, we will fast-track the development, manufacturing and use of precision, personalised cancer treatments, changing lives, creating jobs and building Australia’s sovereign capability in drug development.”

Professor David Thomas
Head of Genomic Cancer Medicine at the Garvan Institute and CEO of the Australian Genomic Cancer Medicine Centre (Omico)

CASE STUDY

NSW leads national platform strengthening precision medicine in oncology

Omico is an NSW-led national precision oncology platform which accelerates biomarker-dependent clinical trials. The platform brings together 23 of Australia’s major cancer centres, leading research institutes, Australian and state governments, industry partners and patients. It is led from The Kinghorn Cancer Centre, a joint facility of the Garvan Institute of Medical Research and St Vincent’s Hospital, in Sydney, NSW.

Omico is developing an innovative suite of clinical trials that match therapies to individuals based on the genomic information of their tumour. This is offered to patients with advanced cancers who have exhausted other treatment options. Of the more than 3000 patients who have undergone screening to date, 62 percent have had new treatment options identified.

Partnerships with industry have been critical to Omico’s success. It has connected with more than 35 partners across pharma and biotech who have provided proprietary anti-cancer therapies for trial participants. As a result, clinicians leading each trial have access to a wide range of treatment options for patients based on their tumour’s genomic information.

Genomic and precision medicine

CASE STUDY

Personalised treatment improves outcomes for children with cancer

The Zero Childhood Cancer Program (ZERO) is a world-leading personalised medicine program led by the Children's Cancer Institute and Kids Cancer Centre at Sydney Children's Hospital, Randwick. ZERO established a framework for recommending precision and personalised therapy for all Australian children diagnosed with high-risk malignancies (less than 30 percent chance of survival) or who relapse on standard therapy or have rare or undiagnosable tumours.

To date, ZERO has enrolled close to 800 children with high-risk cancers on its national clinical trial. For almost all children, the genomic basis of the disease has been identified, and personalised treatment recommendations have been made for over 70% of these children. Of the first 250 children enrolled on ZERO who received their recommended personalised treatment, 70 percent had a complete remission, a partial remission, or their tumour was stabilised. Over the next three years, ZERO will expand more than six-fold to be available to all children in Australian diagnosed with cancer, connecting them to a global network of information/data sharing and knowledge transfer.

ZERO is generating comprehensive, internationally unique datasets and tumour tissue resources that may hold the key to improving long-term health outcomes for children with cancer. The program has developed cutting-edge advanced capabilities in child cancer preclinical modelling, liquid biopsy, computational biology, and drug discovery and development. Industry partnership is welcomed at many stages to effectively and efficiently find new drug targets, develop new therapeutics and repurpose existing medications, test efficacy of new agents in paediatric cancer models and improve disease detection and monitoring.

Gene and gene-modified cell therapy

NSW is a global centre of excellence for viral vector development and for gene and cell therapy research and clinical delivery.

The state has a complete gene therapy pipeline spanning design, construction, and testing of gene therapies through to commercial-scale production and patient treatment. Research teams work collaboratively to exploit synergies across different technologies, including gene editing technology that combines viral vector and RNA capabilities. There is also shared translational support, such as the statewide NSW Health Pathology genomics service which is Australia's largest public pathology provider.

NSW has sponsored research and licensing agreements with European and US leading biopharma companies. NSW is also driving the use of new therapeutic tools by taking advantage of existing advanced manufacturing infrastructure and health system readiness.

The NSW Government has established a research and clinical delivery program in cell therapies, including CAR T-cell therapies and antigen-specific immune effector cells for pathogens and cancer.

CASE STUDY

Multi-million-dollar government investment in the region's first Viral Vector Manufacturing Facility

This project is the first GMP-grade clinical and commercial viral vector manufacturing facility in the Southeast Asia–Pacific region. The new facility at the Westmead Health and Innovation District will ensure a reliable and reasonably priced domestic viral vector supply for use in cell and gene therapy development and delivery. This will remove the bottleneck in taking these therapies from bench to bedside due to a global shortage in manufacturing capacity and exponentially increasing demand.

The Stage 1 'pilot' facility is manufacturing clinical-grade viral vectors on site and working towards GMP accreditation in 2022. It currently supports a small number of local clinical trials for advanced therapeutics. Stage 2 of the project, currently in planning, will see the 25L viral vector pilot facility expanded to a commercial-scale viral vector manufacturing facility with a 550L capacity.

The viral vector manufacturing facility is a unique opportunity for industry to co-invest with the NSW Government in world-leading technology. There are partnership opportunities at all stages of the viral vector manufacturing process, including logistics, raw material supplies and manufacturing, process development, health data sciences and software engineering.

Gene and gene-modified cell therapy

"The rapidly advancing gene therapy revolution offers tremendous opportunities for Australia and the world. NSW is at the global forefront in some areas and is ready to use its expertise to bring health benefits to society."

Professor Ian Alexander
Head of the Gene Therapy Research Unit, Sydney Children's Hospitals Network and Children's Medical Research Institute

CASE STUDY

NSW Ocular Gene and Cell Therapies Australia team among first in the world to administer revolutionary gene replacement therapy

LUXTERNA® is the world's first approved gene replacement therapy for an inherited blinding eye condition, and one of the first gene replacements for any human disease. Two Sydney siblings diagnosed with *Leber congenital amaurosis*, a severe form of retinal dystrophy, were among the first in the world to receive the gene therapy in late 2020 and early 2021.

LUXTERNA® is injected under the retina and carries a functioning RPE65 gene to replace the patient's faulty one (which causes a range of symptoms including total blindness), relieving some of the devastating symptoms. Since receiving this gene replacement therapy, the siblings had profound improvements in their vision which mirrored clinical trial results.

The therapy was delivered through Ocular Gene and Cell Therapies Australia; a collaboration involving the Genetic Eye Clinic and other teams at Sydney Children's Hospitals Network, the Eye Genetics Research Unit and Stem Cell Medicine Group at CMRI, and the Save Sight Institute at Sydney Eye Hospital and University of Sydney.

RNA therapeutics and diagnostics

NSW is a global centre of excellence for RNA therapeutics and diagnostics.

As a result of the NSW Government's multi-million-dollar investments, NSW is an international leader in RNA therapeutics and diagnostics, with capability to research, develop, and manufacture RNA-based treatments locally.

The state's world-class RNA ecosystem consists of specialised research facilities and a collaborative network across universities and medical research institutes. The NSW Government, in partnership with the NSW RNA Bioscience Alliance, is investing A$96 million (US$67.3 million) to develop an RNA pilot manufacturing facility.

With capabilities in RNA therapeutics including siRNA, circRNA, CRISPR gene editing and other mRNA – and strengths in cancer treatment, immunotherapy, genetic disorders, diagnostics, and drug delivery systems – NSW is at the forefront of the RNA revolution.

NSW RNA Bioscience Alliance

A collaborative alliance of all universities in NSW and the ACT working with the NSW Government to boost the development of RNA research. The Alliance coordinates and leverages science, engineering and medical research, creating a central point for expertise and training.

The University of New South Wales RNA Institute

Australia's leading RNA-focussed research, development and translational Institute was established with a A$25 million (US$17.5 million) investment to grow Australia's RNA-based therapeutics industry. Leveraging world class research in Chemistry, Engineering, Biology and Medicine, combined with a certified pre-clinical production facility and leading capabilities in targeted delivery and analytics, the Institute aims to overcome key challenges in the field of RNA therapeutics from fundamental science to new manufacturing methods.

NSW RNA Production Research Network

Launched with a A$15 million (US$10.5 million) investment by the NSW Government, this collaborative network of five universities and seven medical research institutes is conducting three pilot research projects to develop RNA-based therapeutic solutions that will assist the COVID-19 response and treatment of other diseases:

1. Nasal & lung delivery
2. siRNA for viral infections
3. mRNA and viral vectors.

RNA therapeutics and diagnostics

> Through a combination of talented researchers, world-class research institutions, and significant state government capital investment, NSW's domestic RNA therapeutics pipeline, from bench to bedside, is truly world-class."

Professor Pall Thordarson
Director of the UNSW RNA Institute

CASE STUDY

RNA pilot manufacturing facility

This GMP-grade facility will be a significant foundational milestone for the strong RNA R&D ecosystem in NSW that supports the translation of fundamental research through clinical trials to commercial outcomes.

The NSW Government has invested A$96 million (US$67.3 million) to build this first-of-its-kind facility that will allow industry and researchers to develop RNA diagnostics, therapeutics and vaccines. Whilst initially facilitating the development of sRNA and mRNA, the facility will have adaptability as a central tenant, allowing it to pivot to new RNA-based therapeutic advances.

The pilot facility will include laboratories and pre-clinical trial spaces available for industry and researchers to translate successful pre-clinical projects into therapeutic formulations for clinical trials. The activities of the NSW RNA pilot manufacturing facility will be supported by the robust clinical trial framework in NSW and world-leading universities and medical research institutes.

Phage therapy

Phages are viruses that kill bacteria and, unlike antibiotics, are unaffected by resistance. Phage therapy has potential applications across health, agriculture, and biodefence.

The recently established Phage Australia network, of which NSW Health is a partner, is focused on the rapid translation of phage therapeutics into clinical practice including being first in the world to establish a national open label clinical trial with standardised treatment protocols and data collection.

This network of phage researchers and clinician scientists led out of NSW will establish phage therapy as the third major intervention for infectious diseases, after vaccines and antibiotics. This collaboration will build a national industry ecosystem of genomics and informatics, diagnostics, clinical trials, manufacturing, and internationally networked biobanks.

"Phage therapy is both our last resort for dealing with antibiotic resistance now, and our best hope for the future. Phage Australia, with the support of NSW Health as a valuable partner, is playing a leading international role in developing safe phage treatments for serious infections."

Professor Jon Iredell
Director, Phage Australia

CASE STUDY

NSW Hospital successfully treats girl using intravenous phage therapy

In an Australian-first, clinical teams across The Children's Hospital at Westmead, in collaboration with colleagues from the Westmead Institute for Medical Research (WIMR), successfully treated a seven-year-old girl using intravenous phage therapy for a longstanding bone and joint infection. The patient suffered from a severe bone infection in the leg and foot, and the initial treatment with antibiotics failed to treat the aggressive and highly resistant bacterial infection. With limited antibiotic options left, amputation was the only remaining treatment option if the infection did not resolve.

NSW researchers acquired a suitable phage on compassionate grounds and administered the therapy to the patient. After a two-week dosing regime in conjunction with long-term antibiotic treatment, the young girl's infection resolved. She did not require limb amputation, and long-term follow-up has demonstrated radiological and mobility improvement.

Phage therapy

CASE STUDY

NSW researchers demonstrate safety of phage therapy in patient

An NSW research collaboration between WIMR, and the University of Sydney led by Professor Jon Iredell administered adjunctive phage therapy to 13 patients with severe *Staphylococcus aureus* infections. The phages were produced under GMP conditions to ensure their quality as therapeutic products. The patients tolerated the therapy well and did not show any signs of adverse reaction from the phage therapy. This was the first time that research had demonstrated the safety and tolerability of GMP-quality IV-administered phage therapy in people with severe *Staphylococcus aureus* infections.

BIO 2022 NSW Delegation

ARIA Research

ariaresearch.com.au

ARIA Research Pty Ltd is a Sydney-based start-up developing technologies that enable blind and vision-impaired people to see through sound. ARIA delivers technologically-enhanced human echolocation that enables blind users to perceive their surroundings in precise detail.

The system provides users an immersive and detailed real-time perception of their immediate environment, enabling a new level of agency and autonomy, to meet the world on their own terms. Over the past two years, ARIA has been developed in collaboration with University of Sydney, University of Technology Sydney, Blind Citizens Australia and World Access for the Blind Australia.

Aus Medical Orthotics

ausmedicalorthotics.com.au

Aus Medical Orthotics is an Australian made, TGA approved non custom orthotics (shoe inserts). The orthotics uses light synthetic rubber material, which is predominantly used in custom made orthoses, to re-establish the arch of the foot and allow the individual to walk longer distance without placing excessive weight on the joints, as research illustrates orthoses allows people to walk and exercise, subsequently reduces the prevalence of diabetes, arthritis and heart disease among the population.

AuTech Center

autechcenter.com

Based in Maryland, the AuTech Center has the capital, expertise, and relationships to simplify establishment in America. It has never been cheaper or easier to go global.

Biointelect

biointelect.com

Strategic planning and commercialisation for the biopharmaceutical and medical device sector including commercial, government and not-for-profit; helping clients develop and drive strategy; identify and evaluate new business opportunities; engage the right partners; plus, therapeutic development advice from start-up to post launch, with Australian and Global health technology policy thought leadership.

BIO 2022 NSW Delegation

Captix Bio

captixbio.com.au

Captix Biomedical Pty Ltd is a pioneering Australian company developing innovative, implantable, medical technologies to optimise the therapeutic outcomes of cell therapies. Captixbio's IMITA® device is a cell protection and delivery technology intended to transform the current cell therapy paradigm for the treatment of Type 1 diabetes.

Cartago BioTech

cartago-biotech.com

Cartago Biotech proposes an innovative therapy to cure chronic back pain by regenerating the degenerate intervertebral disc (IVD) by a direct spinal disc injection of its patented recombinant human protein. The product is a biological disc "regenerator" molecule first discovered by Cartago Biotech team.

Children's Medical Research Institute

cmrijeansforgenes.org.au

Children's Medical Research Institute conducts world-leading research in the areas of oncology, gene therapy, proteogenomics, inherited retinal diseases, stem cell biology, neurobiology and embryology. ProCan®, our flagship program studying the proteomics of cancer seeks to revolutionise the way in which cancer is diagnosed and treated.

Global Health Neurology Lab

globalhealthneurolab.org

Global Health Neurology Lab is a for-profit social enterprise dedicated to promoting health and preventing diseases. We develop low-cost innovations to address pressing global health challenges. Our mission is to humanize and transform healthcare through cutting-edge neuroscience and engineering.

BIO 2022 NSW Delegation

Greenlight Clinical

greenlightclinical.com

Specializing in Ophthalmology and Oncology, and Rare Disease, this boutique and responsive end-to-end full-service research organization has offices in the US and Australia, and a World Class Central Laboratory in Sydney.

HA Tech

ha-tech-ltd.com

HA TECH is an Australian based Company, Developing & Delivering innovative Diagnostic products includes RT PCR and Antigen/ Antibody test kits. Currently over 30 products in the pipeline, HA TECH has a focus on the diagnosis of serious infectious diseases that affect hundreds of millions of people worldwide and are among the most urgent global health.

HA tech is supplying its TGA approved COVID-19 RT-PCR kit in over 20 countries. A production facility at Sydney has capacity of 40 Million RT PCR kits and 10 Million Antigen/Antibody test kits per month.

Inventia Life Science

inventia.life

Inventia Life Science is an Australian biotechnology company that's developed a revolutionary 3D cell culture technology to enhance the way preclinical biomedical research and drug discovery is conducted. Inventia's flagship product, RASTRUM™ 3D cell culture platform, is a gamechanger in creating realistic 3D cell cultures that mimic human tissue and diseases.

Minomic

minomic.com

Minomic is a cancer focused diagnostics company aiming to commercialise their next generation detection and characterisation of solid tumours, including those in the prostate, bladder and pancreas. The technology works through the implementation of a liquid biopsy, involving a blood test that can identify cancerous tumours but also differentiate them from aggressive and non-aggressive.

MiCheck reduces the number of unnecessary biopsies required in men by up to 60%. It is suggested as the middle step between PSA tests and biopsies. Biopsies are currently used to detect aggressive prostate cancer in men however they are not ideal as they are costly, traumatic and potentially infectious.

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Mobius

mobiusmedical.com.au

Mobius Medical is an Australian Contract Research Organization founded in 2008. We are a new generation Clinical Research Partner dedicated to delivering high quality clinical trials in the most efficient and affordable way. Mobius Medical is a full service CRO with expertise in medical device first-in human, multi-centre pivotal, post market registry trials and Phase I-IV pharmaceutical trials.

My Medic Watch

mymedicwatch.com

My Medic Watch's vision is to provide users with the best alert and prevention mechanisms that technology can offer, to ultimately increase user independence, quality of life and peace of mind.

Our apps provide alerts & SMS, location, a coordination of response from nominated caregivers, monitoring of data and the option to share historical data with caregivers & medical personnel.

To increase detection accuracy, our apps are the only ones of their kind with adjustable parameters to best fit each user. Our technology is clinically tested, patent-protected and readily available commercially-available smartwatches. We are currently working with machine learning algorithms to add preventative warnings for potential falls and seizures using data collected from previous episodes.

PainChek

painchek.com

PainChek® enables best-practice pain management for all people, everywhere.

PainChek is a universal solution enabling best-practice pain management for all people everywhere. The smartphone app uses AI technology to identify the presence of pain even when it is not immediately obvious which analyses micro facial expressions. This gives a voice to those who cannot verbalise their pain.

Paratus Clinical

paratusclinical.com

Paratus Clinical is a clinical site network supported by appropriately centralised core functions, operating in 5 wholly owned sites across Australia, conducted in over 70 clinical trials in many disease areas, and is part of the Pacific Clinical Research Network, a group which has dedicated research sites across ANZ.

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Perx Health

perxhealth.com

Perx Health is a digital care company building the world's highest-engagement health programs. Perx patients proactively engage with their digital program 4–5 times daily, which leads to 95%+ treatment plan adherence. Perx has proven positive clinical outcomes in peer-reviewed research, managed 25+ chronic conditions and generated 6x ROI for customers.

Pharmaxis

pharmaxis.com.au

Pharmaxis is a clinical stage drug development company that has built a pipeline of small molecule drugs from its own research team in the fields of cancer, fibrosis and inflammation. Phase 2 studies are currently recruiting for myelofibrosis, liver cancer and skin scarring. Pharmaxis has also developed two respiratory products which are approved and supplied in global markets, generating ongoing revenue.

PolygenRX

polygenrx.com

PolygenRx uses genetically informed drug discovery and precision medicine to improve treatment of complex disorders. Our universal companion diagnostics de-risks drug development and add value to existing portfolios. Our clients are pharmaceutical companies, clinicians and consumers looking to improve drug targeting, optimise selection of existing medications and facilitate patient-oriented treatments.

Rapair Medical Devices

rapair.com.au

Rapair Medical Devices heals wounds in days rather than weeks without stitches, staples or glue and with minimal scars. Rapair Medical Devices has developed the Rapid Repair Wound Dressing, a major innovation in wound repair. In a human clinical trial of our dressing on excision wounds, we were able to remove stitches within 24 hours.

Normally these stitches would need to stay in for at least 10 to 14 days. Our team successfully completed the CSIRO On Program to accelerate commercialisation of our technology.

In 2020 our team won the NASA iTech competition beating over 70 of the best emerging technologies from around the globe. Rapair Medical Devices delivers faster, better healing.

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Scientia Clinical Research

scientiaclinicalresearch.com.au

Scientia Clinical Research (SCR) is an FDA audited not-for-profit early phase clinical trial company. SCR conducts ~30–35 clinical trials per year (healthy volunteers & patients), including First Time In Human (FTIH) single and multiple dose studies, food effect studies, drug interaction studies, ethnopharmacology studies (Japanese, Chinese, Korean), biosimilar studies, formulation studies and specialty studies incorporating a range of pharmacodynamic markers.

SCR can manufacture finished product (investigational product) from active pharmaceutical ingredients and manage investigational product importation, receipt and labelling. These services have provided significant time and cost savings to our Sponsors.

Southern Star Research

southernstarresearch.com

Southern Star Research is a leading Australian, privately owned, full-service Contract Research Organisation. We specialise in providing early phase clinical research support to biotech, device and pharmaceutical sponsors looking to accelerate their clinical program. Headquartered in Sydney we actively support PhI/II studies in Australia and New Zealand.