

Impact Report

2021 – 2025



Table of contents

1	About mRNA Victoria	3
2	mRNA Victoria's research programs	11
3	Clinical scale mRNA manufacturing	21
4	Population scale mRNA manufacturing	2
5	The mRNA workforce of the future	33
6	International partnerships	41
7	The future of the mRNA sector for Australia	49

Ministerial foreword



The Victorian Government established mRNA Victoria in May 2021 with a clear mandate: to build a leading mRNA and RNA industry in the Asia-Pacific region and to place Victoria at the forefront of one of the most promising frontiers in modern medical science.

This report captures what five years of focused effort, strategic investment and genuine collaboration can achieve.

The mRNA Victoria Impact Report 2021 – 2025 tells the story of what is possible when government, researchers, universities and industry work together with a shared purpose. It is a story of bold investments and brilliant minds – from Moderna’s Technology Centre in Melbourne, the Southern Hemisphere’s first commercial-scale mRNA facility, to BioNTech’s state-of-the-art clinical and research and development manufacturing facility in Bundoora.

Our investment in this sector has always been about more than single milestones. It has been about building an enduring ecosystem – one that positions Victoria as the Asia-Pacific hub for mRNA research, manufacturing, clinical trials and workforce training for decades to come.

Through more than \$30.6 million in research grants across 63 projects, we have supported scientists working on treatments for cancer, HIV, Alzheimer’s disease and rare childhood diseases. Our investment is also expanding into agricultural applications of RNA, with \$4.3 million towards research to help safeguard our vital agricultural sector.

Through our partnerships with Moderna and BioNTech – the two most advanced mRNA companies globally – we have attracted world-class expertise, infrastructure, research and clinical trial programs to Victoria.

Our investment in the Monash mRNA Workforce Training Centre and the Australian Centre for AI in Medical Innovation at La Trobe University is ensuring Victoria has the skilled workforce and cutting-edge capabilities to sustain this advantage into the future.

None of this happened by accident. It required vision, sustained commitment and the courage to invest in science and innovation, and I am proud that Victoria has led that charge.

The benefits extend well beyond our state. Victoria’s mRNA ecosystem strengthens Australia’s pandemic preparedness, supports health equity across the Asia-Pacific, and contributes to the global pipeline of medicines that could change – and save – countless lives.

I want to thank the dedicated team at mRNA Victoria, our Scientific Advisory Group, and every researcher, clinician, industry partner and university that has been part of this journey.

Victoria can be proud of what has been achieved and we are looking forward with confidence to the next chapter.

The Hon. Anthony Carbines MP
Minister for Economic Development
Minister for Medical Research



1

About mRNA Victoria

About mRNA Victoria



WHAT IS mRNA VICTORIA?

Established in May 2021, mRNA Victoria is a Victorian Government agency responsible for building a leading mRNA and RNA industry in the Asia-Pacific region. Through strategic investments and partnerships, we position Victoria at the forefront of mRNA innovation and advance the next generation of RNA-based therapies.



OUR MULTI-PRONGED APPROACH

We deliver the Victorian Government's commitment to establish Victoria as the leading Asia-Pacific hub through:

- ◉ **Research & Development:** Supporting researchers to develop new mRNA medicines, from early stage to clinical research
- ◉ **Translation & Commercialisation:** Partnering with industry to create an end-to-end RNA ecosystem that commercialises medical research innovations
- ◉ **Manufacturing:** Investing in research-grade, clinical-scale and commercial-scale manufacturing
- ◉ **Global Partnerships:** Working with international mRNA companies, organisations and agencies to build capability and capacity in Victoria
- ◉ **Clinical Trials:** Supporting the development and testing of next-generation mRNA vaccines and medicines

- ◉ **Workforce Training:** Developing skilled talent for the growing mRNA sector
- ◉ **Supply Chain Development:** Building the local supply chain to support the ecosystem
- ◉ **AI Initiatives:** Leveraging artificial intelligence to accelerate medical innovation

OUR ROLE

We identify key capabilities, gaps and opportunities to lead the Victorian Government's engagement, investment and partnerships in growing the mRNA ecosystem. Leveraging Victoria's deep scientific and medical research expertise, mRNA Victoria partners with universities, research institutes, organisations, agencies and industry across the globe to accelerate mRNA innovation, building Victoria's position as the premier destination for mRNA research, manufacturing, clinical trials, and workforce training in the Asia-Pacific region.

BUILDING VICTORIA'S mRNA ECOSYSTEM

Melbourne is the centre of Australia's biotechnology and medical research ecosystem, with deep research and manufacturing capability.

Nearly 60% of Australia's pharmaceutical exports come from Victoria, where many of the leading medical technology and pharmaceutical companies are based. CSL, the second largest influenza vaccine manufacturer in the world, has opened the only cell-based influenza manufacturing facility in the Southern Hemisphere in Victoria¹.

Victoria is Australia's leading hub for clinical trials. Accelerated development is driven by the co-location of medical research facilities with hospitals, enabling researchers to gain insights from early-stage clinical testing.

The Victorian Government has committed up to \$400 million to establish the Australian Institute for Infectious Diseases (AIID). The AIID brings together the University of Melbourne, the Burnet Institute and the Doherty Institute to enhance Australia's capability in infectious disease and public health research to drive greater speed, innovation, equity and sovereign capability in our response to emerging infectious diseases. This builds on Victoria's existing capability in the Australian Government's Australian Centre for Disease Preparedness, operated by the CSIRO.

Most of Australia's life sciences professionals are based in Victoria, the leading state in Australia for mRNA research.

The addition of mRNA manufacturing and research programs to Victoria's world-class biotech precinct establishes Melbourne, and Victoria, at the frontier of medical research.

mRNA – THE NEW ADVANCED MANUFACTURING INDUSTRY

The establishment of Moderna's new mRNA manufacturing facility is a game changer for Victoria and Australia's biomedical manufacturing capability. Opened in 2024, the facility at Monash University's Clayton campus is the first of its kind in the Southern Hemisphere.

This new facility is capable of producing 100 million doses per year, enabling Australian manufacturing of COVID-19 booster shots and mRNA vaccines for respiratory viruses such as influenza and respiratory syncytial virus (RSV).

The facility marks a significant milestone for Australia's capacity to safeguard the community against future pandemics. For the first time, Victoria will be able to manufacture mRNA vaccines at population scale.

A partnership with ground-breaking German biotechnology company BioNTech will also see a clinical scale mRNA manufacturing facility established in Melbourne. The priority will be next-generation mRNA therapeutics and vaccines for research and clinical trials. These trials will focus on infectious diseases, cancer medicines, rare diseases and personalised cancer treatments.



1. <https://newsroom.csl.com/2025-12-02-World-class-1bn-vaccine-and-antivenom-manufacturing-facility-opens-in-Melbourne>

Who we are

mRNA VICTORIA'S SCIENTIFIC ADVISORY GROUP

Leading global vaccine experts are members of mRNA Victoria's Scientific Advisory Group. The Scientific Advisory Group's role is to provide advice on developing the mRNA ecosystem in Victoria.

The members of the group at December 2025 are:

mRNA Victoria acknowledges the contributions of previous members of the Scientific Advisory Group:

- **Professor Doug Hilton** – Chief Executive Officer, CSIRO and former Director, Walter and Eliza Hall Institute of Medical Research
- **Dr Barney Graham** – Former Deputy Director, Vaccine Research Center, US National Institutes of Health
- **Professor William Charman** – Sir John Monash Distinguished Professor, Faculty of Pharmacy and Pharmaceutical Sciences, Monash University

We would also like to acknowledge the contribution of mRNA Victoria's inaugural Chief Executive Officer, Mr Michael Kapel.



Dr Amanda Caples
Victoria's Lead Scientist and Chair of the Group



Professor Brendan Crabb
Director, Burnet Institute



Professor Sharon Lewin
Director, Doherty Institute



Professor Terry Nolan
Head of Vaccine and Immunisation Research Group, Doherty Institute at University of Melbourne



Professor John Carroll
Director, Monash Biomedicine Discovery Institute



Professor Andrew Steer
Director, Infection and Immunity, Murdoch Children's Research Institute



**Professor
Ricky Johnstone**
Executive Director
Cancer Research,
Head of the
Gene Regulation
Laboratory at
Peter MacCallum
Cancer Centre



**Professor
Wai-Hong Tham**
Laboratory Head,
WEHI



Dr Minna-Liisa Änkö
Honorary Research
Associate, Hudson
Institute of Medical
Research



**Professor
Charlotte Conn**
Professor
of Biophysical
Chemistry,
RMIT University



**Professor
Barton Haynes**
Director of the
Human Vaccine
Institute, Duke
University School
of Medicine

mRNA VICTORIA'S EXECUTIVE LEADERSHIP



Phoebe Dunn
Chief Executive
Officer



Jaffa McKenzie
Director,
mRNA Projects
and Strategy



Rebecca Skinner
Director, Research
and Industry
Development

The key steps to building an mRNA ecosystem

1



INVEST IN RESEARCH AND DEVELOPMENT

- Establish mRNA Victoria as a dedicated agency tasked with building a new industry and capability
- Establish the Scientific Advisory Group
- Accelerate mRNA Research
- Establish the mRNA Workforce Training Centre
- Establish the Australian Centre for Artificial Intelligence in Medical Innovation (ACAMI)



2



CLINICAL MANUFACTURING

- Establish translational, commercialisation and clinical manufacturing capability





3



COMMERCIAL MANUFACTURING

- Establish the Moderna Technology Centre – Melbourne

4



SUPPLY CHAIN

- Support supply chain partners



INTERNATIONAL PARTNERSHIPS

- Develop international partnerships and collaborations to combat disease
- Global ecosystem engagement and leadership

5



mRNA Victoria's research programs



Bold ideas, a strong research program and innovation drive the future of mRNA commercialisation and manufacturing in Victoria.

mRNA Victoria's grant programs support talented researchers across the sector to build a strong pipeline of mRNA therapeutic candidates and accelerate potential breakthroughs.





mRNA VICTORIA ACTIVATION PROGRAM (mAP)

The mAP grant program supports bold new ideas that contribute to Victoria's development as a leader in RNA research, development and manufacturing.

New research and innovations are supported by the program, contributing to the development of a viable and self-sustaining mRNA sector in Victoria. These grants are available to businesses, universities and medical research institutes, with local and overseas partnerships encouraged.



mRNA VICTORIA RESEARCH ACCELERATION FUND (mVRAF)

These grants fast-track translational research breakthroughs towards clinical trials, and support early-stage innovative research.

Grants of up to \$500,000 have supported translational research and grants up to \$100,000 have supported early-stage innovative research.

Building an mRNA R&D pipeline and new advanced manufacturing industry



A strong pipeline of mRNA research and development (R&D) will drive the development of medical breakthroughs and new technologies.

mRNA Victoria has provided more than \$30.6 million in funding for 63 research projects to develop mRNA research candidates across therapeutics, drug discovery and new mRNA technologies.

Scientists globally agree that RNA is the next frontier of medical research. Clinical trials are currently underway applying mRNA technology to the treatment of HIV, cancer and other rare diseases, creating the medicines of the future.

In 2021, mRNA Victoria funded the development of Australia's first local mRNA COVID-19 vaccine candidate. In a crucial step towards building expertise in the development of new vaccines and medicines, the Peter Doherty Institute for Infection and Immunity and Monash Institute of Pharmaceutical Sciences (MIPS) created two Victorian-made COVID-19 vaccine candidates, the first side-by-side study of protein and mRNA-based candidates.

ROUND 1 mRNA VICTORIA RESEARCH ACCELERATION FUND RECIPIENTS

The Victoria Government has supported projects to develop novel treatments for a range of diseases, next generation manufacturing, and alternative vaccine delivery methods (needle-free technology), through the mRNA Victoria Research Acceleration Fund (mVRAF) and mRNA Victoria Activation Program (mAP).

Funded projects include:

- a research partnership between Monash University and Alfred Health to develop a lipotide-based nanoparticle (LBPN) RNA delivery technology for muscular dystrophy, a disease that affects 1 in 20,000 children.
- a study to develop an mRNA vaccine for the treatment of Alzheimer's disease, through a partnership between The Florey Institute of Neuroscience and Mental Health and Monash University.

Leading Institution	Project Partner	Project Title
Monash University	Alfred Health	Development of a lipopeptide-based nanoparticle RNA delivery system for the treatment of muscular dystrophy or acquired musculoskeletal conditions.
The Florey Institute of Neuroscience and Mental Health	Swinburne University of Technology	A new mRNA-exosome gene therapy for Niemann-Pick Disease Type C1.
University of Melbourne	Peter MacCallum Cancer Institute	mRNA-based antiviral therapeutics for SARS-CoV-2 using Cas13.
RAGE Biotech	Monash University	Accelerating the development of an inhaled RNA therapeutic for the management of chronic lung disease.
The Florey Institute of Neuroscience and Mental Health	Monash University	Developing an mRNA vaccine for the treatment of Alzheimer's disease.
Baker Heart and Diabetes Institute	Monash University	Anti-inflammatory and anti-thrombotic mRNA therapeutics: Potential game-changers for the therapy of cardiovascular diseases.
St Vincent's Institute	Monash University	Reversing autoimmune diabetes with mRNA therapy.
Hudson Institute	Pharmorage Pty Limited	Development of RNA based therapeutics for the management of TLR7-driven autoimmunity.
RMIT University	Austin Hospital	Novel mRNA therapeutic strategies for reprogramming tumour associated macrophages in lung cancer.
RMIT University	Royal Melbourne Hospital	Developing novel mRNA vaccines for high-risk groups.
Monash University	Ensign (CHINA) Medical Teck. Co Ltd.	A novel mRNA-based therapy for chronic kidney injury treatment.
Monash University	Children's Medical Research Institute	Combining mRNA delivery with viral gene delivery to treat metabolic liver disease in infants and children using in vivo gene editing.

ROUND 2 mRNA VICTORIA RESEARCH ACCELERATION FUND RECIPIENTS

The Fund provides one-off grants of up to \$500,000 to support research into treatments for a range of diseases and health conditions, including cancer, tuberculosis, malaria, and Parkinson's Disease.

Leading Institution	Project Partner	Project Title
The Walter and Eliza Hall Institute of Medical Research	The Peter Doherty Institute for Infection and Immunity	Using lipid nanoparticles to deliver novel combination RNA therapeutics for pulmonary bacterial infections.
University of Melbourne	Children's Cancer Institute Australia	Building predictive power to fast-track the evaluation and prioritisation of nanocarriers for therapeutic RNA delivery in brain cancer.
University of Melbourne	Denteric Pty Ltd	Development of an mRNA vaccine for a human bacterial pathogen <i>Porphyromonas gingivalis</i> involved in Periodontitis and Alzheimer's Disease.
St. Vincent's Institute of Medical Research	Monash University	The use of mRNA therapy for blood cell cancers.
The Walter and Eliza Hall Institute of Medical Research	Monash University	mRNA-encoded nanobody therapy against COVID-19.
University of Melbourne	Victoria University of Wellington, New Zealand	An mRNA vaccine for preventing liver-stage malaria.
St. Vincent's Institute of Medical Research	The Royal Children's Hospital	RNA delivery of therapeutic gene editing to blood stem cells.
Monash University	Cancer Epigenetics Laboratory, Trinity College Dublin	A modular platform for the development of mRNA-based epigenetic drugs: a pilot.
Peter MacCallum Cancer Institute	The Walter and Eliza Hall Institute of Medical Research	Development of nuclear mRNA targeting therapeutics to treat cancer.
Peter MacCallum Cancer Institute	Storm Therapeutics Ltd	Therapeutically targeting mRNA methylation to enhance anti-tumour immunity.
Murdoch Children's Research Institute	Korea Advanced Institute of Science and Technology (KAIST)	Development of a novel ASO-based therapeutic for TRAPPC4-related disorder.
The Walter and Eliza Hall Institute of Medical Research	Mermaid Bio Pty Ltd	Harnessing mRNA delivery for intracellular antibody therapies.
Hudson Institute of Medical Research	Hudson Institute of Medical Research	ASO against SRY as a potential therapeutic for Male Parkinson's Disease.
Hudson Institute of Medical Research	Silence Therapeutics	Modulation of Iron Overload in the Myelodysplastic Syndromes using siRNA therapy.
Monash University	PTNG Biologicals	Structure-based antigen design as a novel strategy for precision mRNA vaccines.
Monash University	Ensign (CHINA) Medical Teck. Co Ltd.	Cardiac-homing Lipid Nanoparticles for Relaxin-2 mRNA Delivery.

ROUND 3 mRNA VICTORIA RESEARCH ACCELERATION FUND RECIPIENTS

Leading Institution	Project Partner	Project Title
Messenger Bio Pty Ltd	BioCurate Pty Ltd	Development of mRNA Therapeutics for Genetic Brain Diseases.
The Macfarlane Burnet Institute for Medical Research and Public Health Ltd	Monash Institute of Pharmaceutical Sciences	Developing potent and lifelong mRNA vaccines to combat global health threats.
The Macfarlane Burnet Institute for Medical Research and Public Health Ltd	Moderna, Inc	Novel mRNA-based antibody technologies for mucosal pathogens.
Peter MacCallum Cancer Institute	GenScript Biotech (Singapore) PTE. Ltd.	mRNA-based chimeric antigen receptor (CAR) T cell therapy for the treatment of cancer.
Peter MacCallum Cancer Institute	Monash University	Combining mRNA vaccines with Flt3L-secreting CAR-T cells for the effective treatment of solid tumours.
RMIT University	Monash University	Reprogramming T Cells In situ for Lupus Nephritis Treatment using Novel mRNA-Loaded Lipid Nanoparticles.
RMIT University	The Walter and Eliza Hall Institute of Medical Research	Development of mRNA-encoded intrabody therapy to treat cancer.
St Vincent's Institute of Medical Research	Stanford University	A new mRNA therapy to combat Victoria's spiralling liver disease crisis.
The Walter and Eliza Hall Institute of Medical Research	Monash University	Antisense oligonucleotide therapy for neurodevelopmental disorder Prader Willi syndrome.
The Walter and Eliza Hall Institute of Medical Research	Centenary Institute of Cancer Medicine & Cell Biology	Lipid nanoparticle (LNP) delivery of gene therapy in inflammatory disease.
The Walter and Eliza Hall Institute of Medical Research	Murdoch Children's Research Institute	Supporting brain development in neurodevelopmental disorders through increasing healthy mRNA transcript levels.
The Walter and Eliza Hall Institute of Medical Research	Monash Institute of Pharmaceutical Sciences	Formulating therapeutic cancer mRNA-LNP vaccines to elicit potent CD8 T cell responses.
University of Melbourne	The University of Wollongong	Restoring frataxin in Friedreich's ataxia by nanoparticle-mediated delivery of frataxin mRNA.
University of Melbourne	Monash University	Development of novel LNP-mRNA formulations for the treatment of liver fibrosis.
University of Melbourne	Monash University	Leveraging mRNA and lipid nanoparticle technology to develop a cure for HIV.

ROUND 4 mRNA VICTORIA RESEARCH ACCELERATION FUND RECIPIENTS

Leading institution	Project Partner	Project Title
University of Melbourne	Monash University	Harnessing the power of innate immunity using mRNA
RMIT University	Khalifa University (Abu Dhabi)	Smart monocyte backpacks for targeted gene-therapy of atherosclerosis
The Florey Institute of Neuroscience and Mental Health	University of Melbourne	Development of a mRNA vaccine for the prevention of Alzheimer's disease
Zittra Medicines	MediciBio (Korea)	A Best-In-Class Combined mRNA Therapy for Sandhoff Disease and Tay-Sachs Disease
Hudson Institute of Medical Research	BASE mRNA facility	Development of a novel mRNA-based therapeutic to tackle autoinflammatory disease
The Florey Institute of Neuroscience and Mental Health	GenScript Biotech	Development of apolipoprotein E-targeted mRNA therapeutics for the treatment of Alzheimer's disease

mRNA VICTORIA ACTIVATION PROGRAM RECIPIENTS

The mRNA Victoria Activation Program (mAP) is the largest dedicated mRNA research grant program in Australia. The grant program supports bold new ideas to grow Victoria's mRNA research, development, and manufacturing capability.

The mAP grants support clinical research and projects to develop technology such as combination mRNA and viral gene delivery, advanced high-throughput and automated mRNA manufacturing and a purification platform for reduced production time of mRNA vaccines.

Institution	Project Title
Burnet Institute	Burnet Institute Vaccine Initiative: mRNA vaccines to tackle global pandemic pathogens that provide broad immunity.
Hudson Institute	Re-defining the RNA that activates innate immune sensors to produce safer and more effective RNA therapies.
Messenger Bio Pty Ltd	High-throughput Automation and Scale-up of Preclinical mRNA Manufacturing and Expansion of the RNA Engineering Toolbox.
Monash University	RaRtech: a novel and rapid mRNA manufacturing technology for pandemics preparedness and therapeutics.
Monash University	A universal platform for affinity purification of RNA.
Monash University	Novel enzymes to transform the manufacturing of mRNA in Victoria.
University of Melbourne	mRNA BEATs technology to enhance CAR T cell therapy of cancer.
University of Melbourne	Developing a novel RNA therapeutic for chronic hepatitis B.
University of Melbourne	Leveraging mRNA technology to improve adoptive cell therapy for cancer.
University of Melbourne, The Sir Peter MacCallum Department of Oncology	Sequence-Specific Silencing of Oncogenic Drivers with Personalised Cas13 RNA Therapeutics.
Victorian mRNA Innovation Hub (VMIH)	Announced in August 2022, VMIH is a world-first collaboration between Monash University, the University of Melbourne, Doherty Institute and Monash Institute of Pharmaceutical Sciences to develop next-generation vaccines and therapeutics to treat a range of diseases.



3

Clinical scale mRNA manufacturing

Clinical scale mRNA manufacturing



BioNTech is establishing a state-of-the-art clinical-scale mRNA manufacturing facility and R&D grade facility at La Trobe University's Bundoora campus, in partnership with the Victorian Government. Once operational, the clinical-scale facility is designed to deliver next-generation mRNA vaccines and treatments for clinical trials conducted by BioNTech and third parties.

BioNTech's facility will support medical research institutes, biotech and life science companies to develop early-stage and clinical vaccines and therapies, as well as producing BioNTech's own investigational drugs. A key driver for this project was the recognition that there was a critical gap in the local production of research and clinical-grade materials, which hindered the development of mRNA-based therapies.

The R&D facility has begun producing research-grade RNA materials to support research and development in the context of various diseases, including infectious diseases, rare diseases and cancer, supporting the translation of research into medical breakthroughs.

Construction of the clinical-scale mRNA facility is well advanced and is set to be completed by the end of 2026. On 17 November 2025, the Minister for Economic Growth and Jobs Danny Pearson attended a topping out ceremony alongside BioNTech Chief Operating Officer Dr Sierk Poetting, La Trobe University Chancellor John Brumby and Vice-Chancellor Professor Theo Farrell and mRNA Victoria CEO Phoebe Dunn, to mark the construction achievement.

On the same day, Minister Pearson also officially opened the new R&D grade facility. The R&D facility is operating from La Trobe University's Bio Innovation Hub and will produce research-grade RNA. The R&D facility will ultimately be located within the state-of-the-art clinical-scale mRNA manufacturing facility once it is open and operational.

BioNTech Innovation Centre

Under the multi-layered strategic partnership between BioNTech and mRNA Victoria, BioNTech has also established a team of local experts at its Melbourne Innovation Centre.

The BioNTech Innovation Centre aims to accelerate advances in Australia's RNA research projects by assessing and identifying mRNA-focused research projects from academia or the biotech industry to help facilitate their transition into clinical-stage development as potential product candidates.

"BioNTech's vision is to translate science into survival. The State of Victoria is one of the leading life sciences hubs in the Asia-Pacific region, and we are looking forward to strengthening its cutting-edge research and development," said Prof. Ugur Sahin, M.D., Chief Executive Officer and Co-Founder of BioNTech. "It is important that innovation does not stop at the lab bench, but that it reaches patients quickly. We already conduct a number of clinical studies in Australia and are evaluating ways to contribute with more to come."

The BioNTech Innovation Centre aims to support researchers throughout the drug development cycle with technical and scientific expertise. The Centre will also provide specialised advice on the research, development and manufacturing of new mRNA-based investigational vaccines and therapeutics.

BioNTech's expertise, alongside new research and clinical-scale cGMP mRNA manufacturing services, aims to support researchers in Australia and the Asia-Pacific region to translate their discoveries into the clinic.

"BioNTech's vision is to translate science into survival. The State of Victoria is one of the leading life sciences hubs in the Asia-Pacific region, and we are looking forward to strengthening its cutting-edge research and development."



BioNTech Clinical Trial Program

As part of the strategic partnership with mRNA Victoria, BioNTech is also delivering the BioNTech Clinical Trial Program to deliver next generation investigational oncology treatments to up to 4,000 cancer patients in Australia and New Zealand over the next 10 years.

Led by the Peter MacCallum Cancer Centre as coordinating delivery partner with Monash Health, Alfred Health and Austin Health, the program will work with local hospitals and health providers to deliver clinical trials for investigational treatment approaches for hard-to-treat cancers.

CLINICAL TRIAL ONCOLOGY PLATFORM

To support the delivery of the program, BioNTech has entered into an agreement with the Peter MacCallum Cancer Centre to establish the Clinical Trial Oncology Platform, creating a network of key delivery partners including Austin Health, Alfred Health and Monash Health.

The platform is designed to streamline clinical trials through efficient data collection, planning and patient access. Its objective is to improve access for cancer patients to BioNTech's innovative clinical trials across Australia, giving them more investigational treatment options.

BioNTech is working with internationally renowned principal investigators and clinical trial teams from hospitals across Melbourne, regional Victoria and Australia to offer investigational targeted treatments for lung, breast, melanoma, head and neck cancers and other common cancers, with more to come.

The program builds on BioNTech's existing clinical footprint and collaboration partnerships across Australia.

The program is working with local hospitals and health providers to improve access for cancer patients to innovative clinical trials.



Australian Centre for AI in Medical Innovation

La Trobe University has established the Australian Centre for Artificial Intelligence in Medical Innovation (ACAMI), as part of its partnership with the Victorian Government. This initiative is addressing an urgent need for AI expertise within the medical research sector and will help keep Victoria at the forefront of this field.

Artificial Intelligence is revolutionising medical research, including through the rapid analysis of genetic mutations for vaccine development, improved patient screening and enhanced clinical trial design. The current lack of skilled AI talent is a key barrier to adopting AI in drug discovery, design and development.

ACAMI is supporting the next generation of drug discovery and other medical innovation by developing a skilled AI workforce, clinical research and an academic research program.

With a home at La Trobe University, ACAMI is focused on industry-oriented research and developing employment-ready graduates.



In May 2025, ACAMI's new NVIDIA DGX H200 AI supercomputer, funded by mRNA Victoria, was switched on. The supercomputer is one of the fastest in Australia and positions Victoria as a national hub for AI in medical innovation.

The first deployment of its kind at a university in Australia, the supercomputer will use AI to accelerate the translation of research into clinical trials and personalised therapies to improve health outcomes for patients.

This groundbreaking technology will support our world-leading researchers to accelerate medical innovations in the state – cementing Victoria's reputation as a global leader in this field.

As part of the BioNTech partnership with the Victorian Government, BioNTech is bringing representatives from InstaDeep to its Australian head office in Melbourne.

BioNTech acquired InstaDeep in July 2023, integrating a team of almost 290 AI, machine learning, and bioengineering professionals located across Europe, Africa and the Middle East.

Bringing InstaDeep to Melbourne will give Victorian and Australian researchers direct access to world-class AI and machine learning expertise, tools and co-development opportunities.



4

Population scale mRNA manufacturing

Population scale mRNA manufacturing

Building sovereign mRNA manufacturing capability in Australia is critical to strengthening our resilience to future pandemics. Population scale manufacturing capacity supports national protection against emerging health threats, and establishing this capability in Victoria delivers ecosystem and economic benefits while significantly enhancing our pandemic preparedness.

As part of the Victorian Government's partnership with Moderna, mRNA Victoria is leading the delivery of Moderna's population-scale mRNA manufacturing facility at Clayton, with capacity to produce up to 100 million vaccine doses per year in the event of a pandemic for diseases including COVID-19 and influenza.

The Moderna Technology Centre – Melbourne (MTC-M), located at Monash University's Clayton campus, was officially opened by the Premier of Victoria and the federal Minister for Health and Aged Care in December 2024.

The MTC-M is the first commercial-scale mRNA manufacturing facility in the Southern Hemisphere. It is also the only Moderna manufacturing site in the world to have end-to-end mRNA manufacturing capabilities – from making vaccines through to packaging the finished drug product onsite, ready to ship across Australia and around the globe.

The facility was completed on schedule and was granted its Good Manufacturing Practice (GMP) licence from the Therapeutic Goods Administration in August 2025.

Respiratory viruses will be a focus for production at the Moderna facility. It will provide Australians with access to locally made mRNA vaccines against COVID-19, seasonal influenza, RSV, and other respiratory viruses (subject to regulatory approval).

The MTC-M is the first commercial-scale mRNA manufacturing facility in the Southern Hemisphere.



The Victorian Government's partnership with Moderna involves a range of initiatives to build the local mRNA ecosystem, including:

- Moderna's Regional Research Centre for Respiratory Medicines and Tropical Diseases, launched in 2023. The Centre drives collaboration with local research institutes to develop next generation mRNA vaccines and medicines. The first partnership through the Centre is the Monash-Moderna Quantitative Pharmacology Accelerator (MMQPA), which uses advanced computer models to make the development of new mRNA medicines safer and more efficient.
- Moderna's Headquarters for Australia, New Zealand, South-East Asia, and Oceania in Melbourne, opened in August 2023. The headquarters is a significant commitment by Moderna to Victoria's goal of becoming the leading Asia-Pacific hub for mRNA research, manufacturing, clinical trials, and workforce training.

It is also the only Moderna manufacturing site in the world to have end-to-end mRNA manufacturing capabilities – from making vaccines through to packaging the finished drug product onsite, ready to ship across Australia and around the globe.

Moderna's investment into Victoria builds on Moderna's research collaborations through the mRNA Platform Incubator Network (mPIN) to advance mRNA medicine, foster scientific excellence in clinical translation in Australia and further the therapeutic potential of the mRNA platform. The Incubator Network has agreements with Victorian and national medical research institutes.

An independent Oxford Economics report published in September 2025, highlights the economic and health benefits flowing from the Victorian Government's strategic partnership with Moderna.

The report showcases the benefits of the MTC-M, including injecting \$220 million into the economy each year and supporting nearly 1,000 jobs per year through ongoing operations.



The report, *Australia's mRNA Advantage – Jobs, Health and Economic Resilience*², reveals that during the two-year construction period, the facility contributed \$493 million to national GDP and supported 1,830 jobs each year.

Moderna's partnership with mRNA Victoria also strengthens Australia's capacity to respond to future pandemics by enabling faster access to locally produced vaccines.

Moderna is investing an estimated \$266 million directly in national mRNA research and development between 2023 and 2033,

supporting research partnerships, clinical trials and workforce development. These activities are expected to generate an additional \$267 million in national economic value over ten years, including \$117 million in Victoria.

The report highlights that over a 30-year period, the facility is expected to deliver \$4.8 billion in pandemic preparedness and health benefits. This includes \$1.33 billion in avoided lockdown costs and \$3.47 billion in health related benefits, including reductions in health risks and improvements in population wellbeing.

2. Oxford Economics, *Australia's mRNA Advantage: Jobs, Health and Economic Resilience* report

Moderna Regional HQ

Melbourne is now home to Moderna's regional headquarters for Australia, New Zealand, South-East Asia and Oceania. Along with Moderna's Regional Research Centre for Respiratory Medicines and Tropical Diseases, this confirms the biotech leader's strong support for Australia's mRNA research, development, and industry ecosystem.

The establishment of the Moderna facility positions Victoria as a world leader at the new frontier of mRNA research and development.

The creation of the Monash mRNA Workforce Training Centre at Monash University further establishes Victoria as the mRNA workforce training hub in Australia.

Moderna Regional Research Centre for Respiratory Medicines and Tropical Diseases

The Moderna Regional Research Centre for Respiratory Medicines and Tropical Diseases provides essential support for researchers to work on the medicines of the future.

By drawing on innovative work from around Australia and the Asia-Pacific, the Regional Research Centre is bringing together talented researchers to work at the frontier of medical advances.

The Regional Research Centre is providing opportunities for researchers to partner with globally renowned scientists and to accelerate the development of new mRNA medicines.

Centre Director Dr Felicia Pradera said “As a pioneer of mRNA science, Moderna is thrilled to partner with world-class Australian scientists, enabling the advancement of what is becoming an exciting new age in approaches to medicines.”

The Regional Research Centre provides opportunities for researchers to partner with globally renowned scientists and to accelerate the development of new mRNA medicines.



MMQP Accelerator



The Monash Institute of Pharmaceutical Sciences (MIPS) has established a Quantitative Pharmacology Accelerator, through a collaboration between Moderna and Monash University.

The Monash-Moderna Quantitative Pharmacology Accelerator (MMQPA) is a five-year program that aims to drive advancements in mRNA medicines, including therapeutics and vaccines. This has been made possible through a \$3 million investment by Moderna, and substantial in-kind contributions from Moderna and Monash.

This partnership is a great example of world-leading researchers and industry coming together to create a critical capability which will advance mRNA medicines to patients and strengthen Australia's resilience to a range of diseases and future health emergencies.

Quantitative pharmacology uses mathematical computer models to predict how medicines will work in the human body. This science has improved the efficiency and safety of the drug development process.

Quantitative pharmacology is hugely impactful across the entire drug discovery pipeline – from the early stages right through to regulatory submission and even analysis of real-world performance of medicines. This collaboration offers the potential to create a world-class and globally rare mRNA quantitative pharmacology capability based right here in Melbourne.

MIPS is located in Parkville's biomedical precinct and is home to some of Australia's leading quantitative pharmacology experts, with model development expertise across a range of diseases, specialising in infectious and tropical diseases. The Monash-Moderna collaboration has enabled the MIPS team to access pre-clinical and clinical data from Moderna programs across the world to develop important in silico models that will support the development of new, safe and effective medicines.



5

The mRNA workforce of the future

mRNA Victoria is working with the biotechnology sector to create a skilled workforce ready to take Melbourne and Victoria to new medical frontiers.

mRNA Victoria supported the establishment of the Monash mRNA Workforce Training Centre with a \$10 million grant to Monash University. The centre is supporting industry and national and international students by building a future mRNA R&D and manufacturing workforce for Australia and the Asia-Pacific.

This new centre is providing training to build critical skills and knowledge to meet the increasing demand for a highly skilled mRNA workforce.

Monash mRNA Workforce Training Centre



The Victorian Government has invested \$10 million to establish a new centre for specialised training for workers across all aspects of the mRNA manufacturing life cycle.

The Monash mRNA Workforce Training Centre is supporting the development of a highly skilled workforce needed to produce the next generation of medicines and vaccines.

“The Monash mRNA Training Centre will draw on Monash’s exceptional pool of biomedical talent to deliver best-practice education and training programs, and ultimately facilitate the development of life-saving vaccines and therapeutic treatments” said Professor Sharon Pickering, Monash University Vice-Chancellor and President.

An Industry Advisory Group will ensure that students have the advanced skills needed by the biotechnology industry. The advisory group includes members from the biomedical industry, CSIRO and the Therapeutic Goods Administration.

“The Monash mRNA Training Centre will draw on Monash’s exceptional pool of biomedical talent to deliver best-practice education and training programs...”





Moderna Fellowships available for local researchers

The announcement of an Australian Fellowship program to support scientists in advancing mRNA innovation demonstrates Moderna's commitment to the next generation of Australian scientists.

"When we confirmed our partnership with the Australian and Victorian Governments to secure our nation's first large-scale mRNA manufacturing facility last year, we also committed to help advancing mRNA scientific endeavours within the country's biomedical community. We hope this program helps to accelerate Australia's contribution to the transformational power of mRNA science," said Michael Azrak, former General Manager of Moderna Australia & New Zealand.

The Australian Fellowship is open to researchers working across a range of disciplines, including

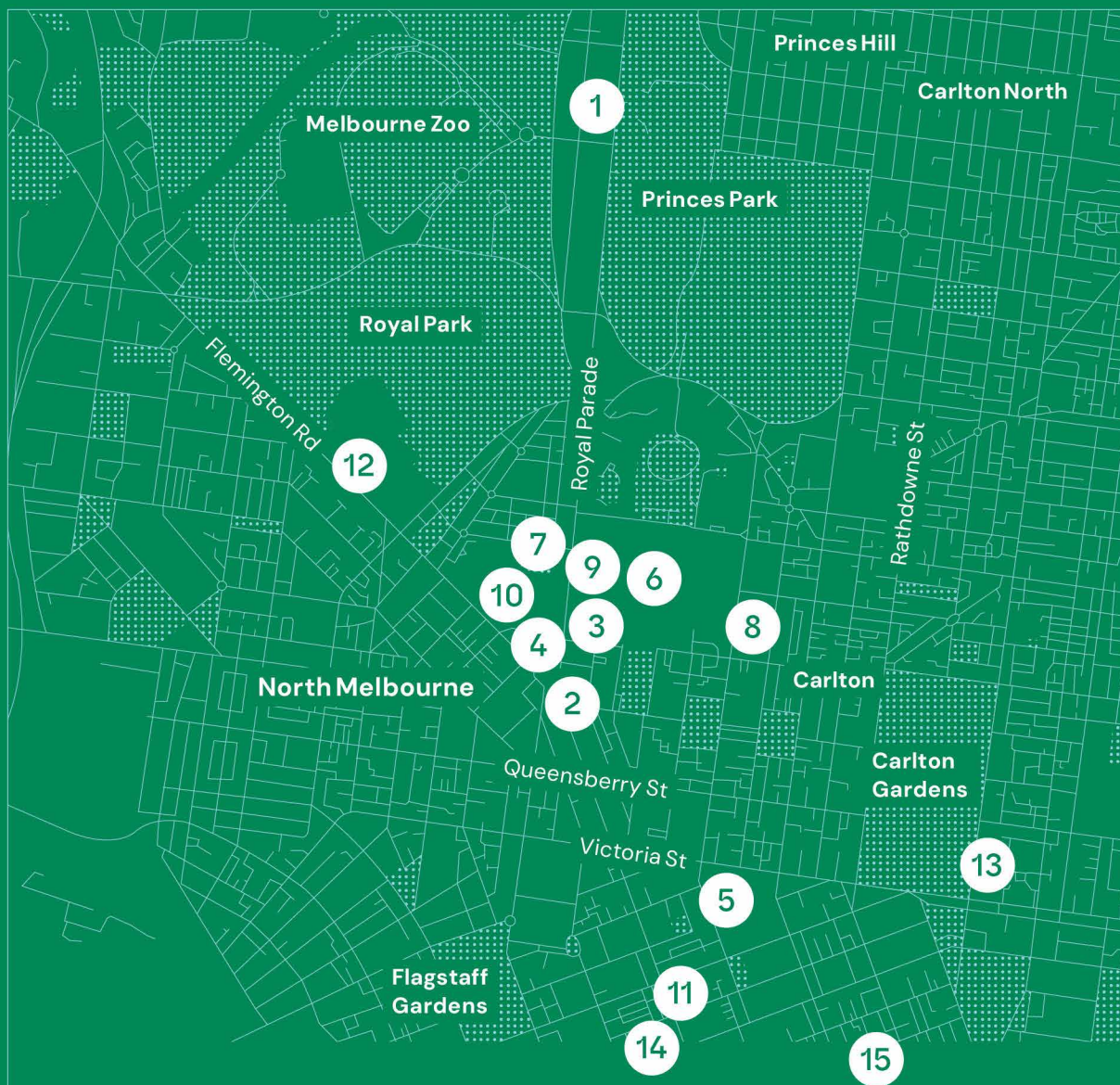
early discovery and clinical development of new mRNA products, as well as research and development in infectious diseases and immunology.

Successful applicants benefit from scientific training and education, and a professional development learning program that draws on Moderna's in-house expertise, in addition to salary and expenses support. The learning program includes on-the-job training, online learning, and meetings at the Moderna Regional Research Centre in Melbourne.

"We hope this program helps to accelerate Australia's contribution to the transformational power of mRNA science."

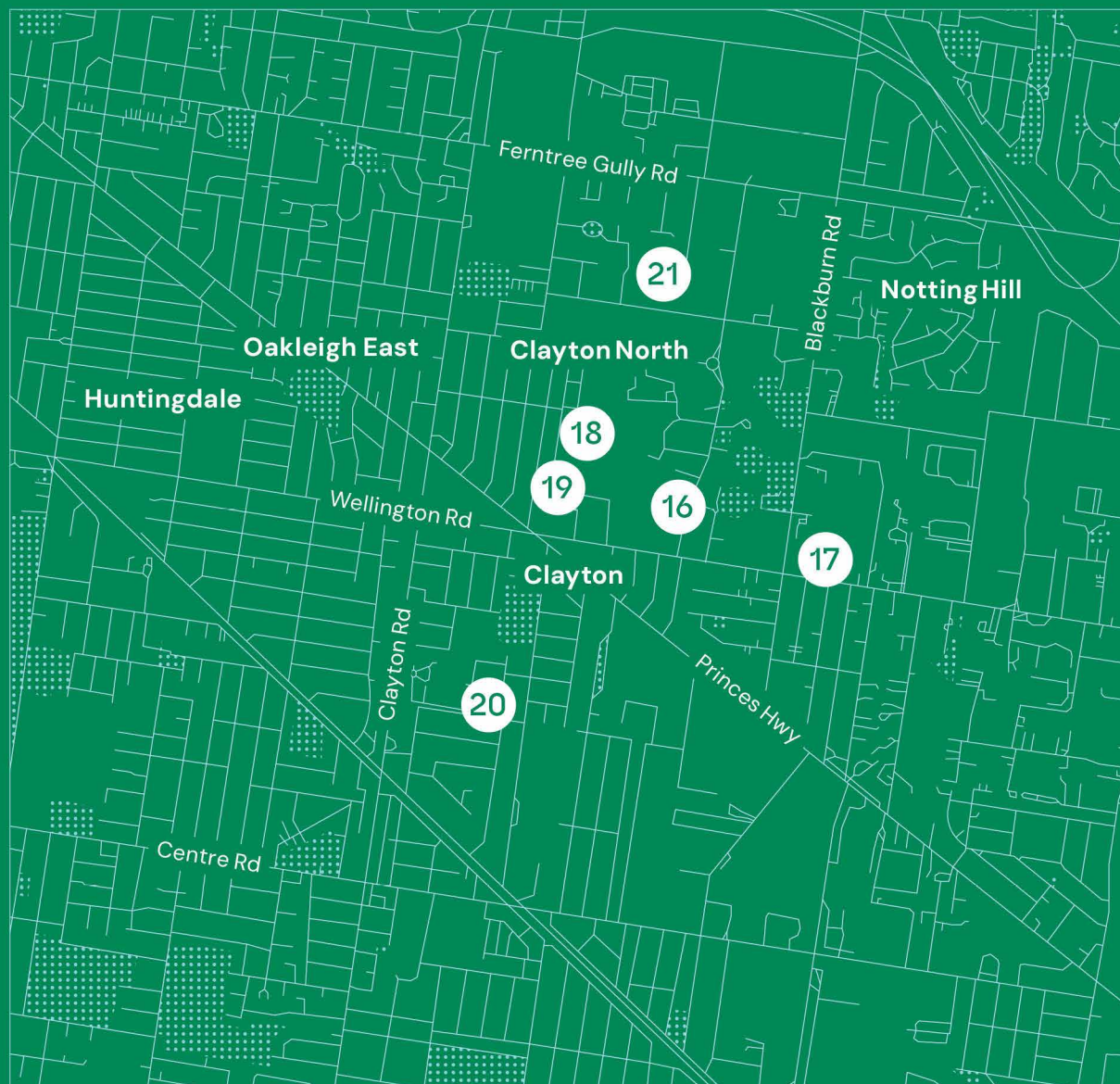


PARKVILLE / CBD



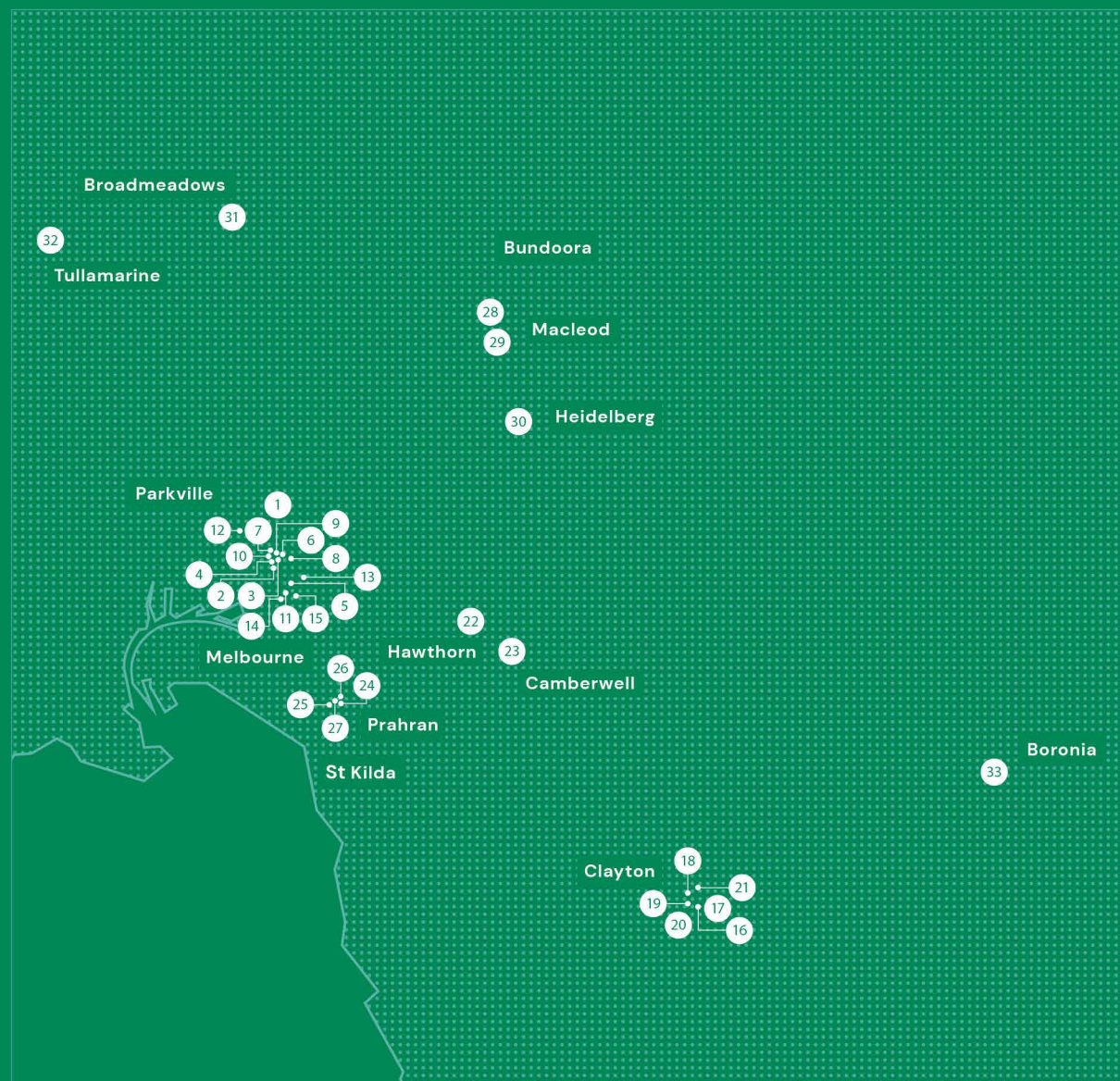
1. Monash Institute of Pharmaceutical Sciences
2. CSL Headquarters and Research Centre
3. Peter Doherty Institute of Infection and Immunity
4. Peter MacCallum Cancer Centre
5. Royal Melbourne Institute of Technology
6. University of Melbourne
7. Walter and Eliza Hall Institute
8. Messenger BIO
9. Florey Institute of Neuroscience and Mental Health
10. Royal Melbourne Hospital
11. RAGE Biotech
12. Murdoch Children's Research Institute
13. St. Vincent's Institute of Medical Research
14. BioNTech Innovation Centre
15. Moderna Australia Headquarters and Regional Research Centre

CLAYTON



- 16. Monash University
- 17. Moderna Technology Centre – Melbourne
- 18. Monash Biomedicine Discovery Institute
- 19. Monash mRNA Workforce Training Centre
- 20. Hudson Institute of Medical Research
- 21. CSIRO

MELBOURNE



1. Monash Institute of Pharmaceutical Sciences
2. CSL Headquarters and Research Centre
3. Peter Doherty Institute of Infection and Immunity
4. Peter MacCallum Cancer Centre
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18. Monash Biomedicine Discovery Institute
19. Monash mRNA Workforce Training Centre
20. Hudson Institute of Medical Research
21. CSIRO
22. Swinburne University
23. Pharmorage
24. Baker Heart and Diabetes Institute
25. Monash Public Health and Preventive Medicine
26. Burnet Institute
27. Alfred Hospital
28. La Trobe University and ACAMI
29. BioNTech Clinical Scale manufacturing BioTainer site
30. Austin Hospital and Olivia Newton John Cancer Centre
31. CSL Broadmeadows
32. CSL Tullamarine
33. IDT Australia



International partnerships

mRNA Victoria is establishing global partnerships to support the development of RNA ecosystems across the Asia-Pacific region and internationally.

These partnerships accelerate collaboration across all aspects of the mRNA lifecycle, including research, manufacturing, clinical trials, and workforce training.

The agreements give researchers within Victoria and in partner jurisdictions the opportunity to collaborate on shared projects, including joint research projects and clinical trials of new mRNA vaccines and therapies.

A goal for these partnerships is to provide a pathway for the development of RNA research in the region. mRNA Victoria works with international agencies, organisations and governments to support this work.

6

mRNA Victoria Australia Information Session in Seoul

mRNA ecosystem and collaboration

International Partnerships



On 12 March 2022, the Victorian Government formalised a collaboration with Korea on mRNA vaccine research and development, clinical trials and manufacturing under a new MoU between mRNA Victoria and the Korean Health, Industry Development Institute (KHIDI). Under the partnership, Victoria and Korea have committed to exchange information and facilitate linkages between industry, research and government organisations.

Through the signing of this agreement, mRNA Victoria is establishing regional alliances in the Asia-Pacific region to build opportunities.

“The partnership will bring together Victoria’s biotechnology research expertise with South Korea’s biomanufacturing specialisation, strengthening the capability in both Victoria and South Korea.”



On 7 March 2022, mRNA Victoria signed an MoU with the Department of Health – Abu Dhabi to progress joint RNA research and facilitate investment in building manufacturing capability and is the first step in a partnership to support the development of the RNA ecosystems in Victoria and the UAE.

mRNA Victoria is building global alliances to facilitate the exchange of information on RNA industry development strategies, drive the joint development of COVID-19 and other RNA related therapeutics, through building organisation-to-organisation links and progressing opportunities for academic collaborations in early-stage research.

“With the signing of this, we look forward to seeing advancements in mRNA-based therapeutics research and strengthening the capabilities of the international healthcare system so that we are better prepared for future pandemics and health crises.”

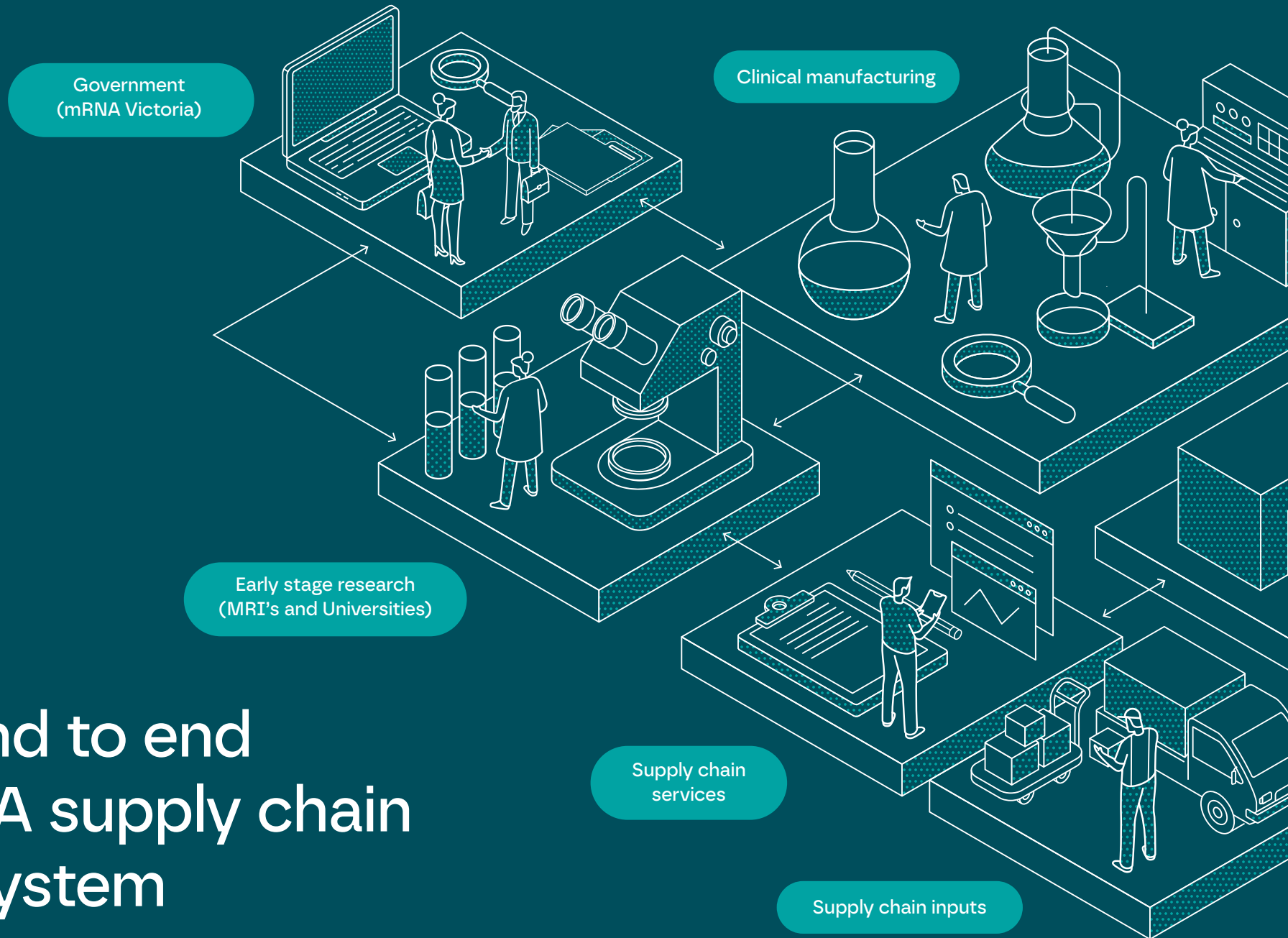


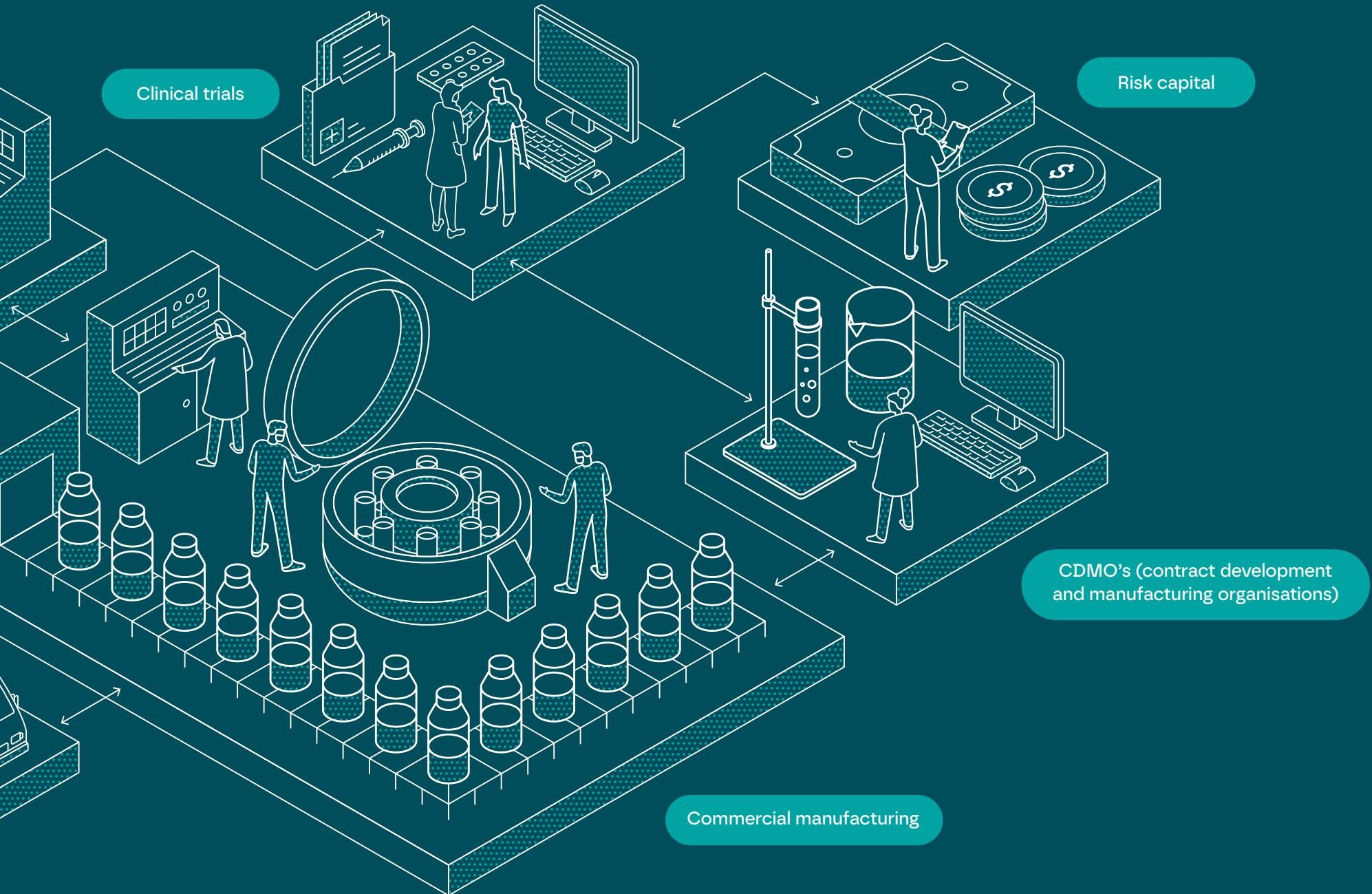
On 26 April 2023, the Victorian Government signed an MoU with the South African Medical Research Council (SAMRC) and Afrigen Biologics and Vaccines (Afrigen) to fast-track international collaboration in the following areas:

- ⦿ R&D in encapsulation and delivery technology to reduce the cost of manufacturing RNA
- ⦿ Information sharing for development of the Victorian and South African RNA ecosystems
- ⦿ Workforce training exchange programs
- ⦿ R&D into novel RNA vaccines and therapies for diseases of interest

“The partnership will seek to improve production capacity for low- and middle-income countries worldwide.”

An end to end mRNA supply chain ecosystem





Global engagement and leadership

To build the mRNA industry in Victoria, mRNA Victoria collaborates with partners across the ecosystem including research institutes, start-ups, venture capitalists, industry bodies and established industry players.

mRNA Victoria takes an active role in industry events, conferences and meetings locally and internationally, and collaborates with organisations including:

- AusBiotech
- Advances in mRNA Science (AIMS)
- Australian Vaccine Value Chain Conference
- Alliance for mRNA Medicines
- BIO International Conventions (USA, Europe, Asia)
- AUScelerate (formerly MTPConnect)
- BioMelbourne Network
- World Vaccine Congress

mRNA Victoria has also been recognised globally for its efforts, receiving the prestigious Excellence in Economic Development Gold Award in 2022 by the International Economic Development Council, and the RNA Excellence in Australia award at IMAPAC's Asia-Pacific RNA Excellence Awards.

Case Study

BioMelbourne Network Events

mRNA Victoria collaborated with the BioMelbourne Network to deliver nine lectures for the Victorian mRNA community during 2023 and 2024. The lectures were an opportunity for specialists to share their knowledge, and to foster connections between researchers, industry and government.

There were 33 speakers across the nine lectures, which were well attended by representatives of 266 unique organisations, including large multinational corporations, ASX listed and non-listed public and private companies, start-ups, R&D partners, medical research institutes, hospitals, not-for-profits and industry support services.

The lectures covered the following topics:

- Introduction to the Intellectual Property landscape, the product development pathway and leveraging existing capabilities in the development of new RNA therapeutics
- Fireside Chat with Professor Robert Langer (pictured left), co-founder of Moderna, Institute Professor at MIT
- Exploring the Clinical Trials Landscape

- Enabling RNA Technology
- The RNA Platform: Breadth of possibility beyond mRNA
- mRNA Clinical Trials: Enhancing Research–Clinician Collaboration to accelerate outcomes for patients
- Preparing for Disease X
- Regulation of the mRNA platform, opportunities and challenges
- BioNTech: From concept to clinical trials



Grant Symposium

On Friday, 29 November 2024, mRNA Victoria held its inaugural Grant Recipient Symposium (GrantCon) in Melbourne.

GrantCon brought together recipients of mRNA Victoria's grant program for RNA research and ecosystem development for a full day of knowledge exchange and networking. The symposium aimed to foster collaboration, facilitate resource sharing, and identify synergies among researchers working toward similar goals.

mRNA Victoria CEO Phoebe Dunn opened the event with an overview of the grant program including the mRNA Victoria Research Acceleration Fund (mVRAF) and mRNA Victoria Activation Program (mAP) and other initiatives designed to strengthen Victoria's RNA ecosystem.

The morning sessions showcased funded projects, including the Victorian mRNA Innovation Hub (VMIH) at the Monash Institute of Pharmaceutical Sciences, and platform application projects from the Monash Biomedicine Discovery Institute (Novel Enzymes), the Hudson Institute (RNAte platform), Messenger Bio (Preclinical mRNA manufacturing), and the Monash Institute of Pharmaceutical Sciences (RNA engineering toolbox).

A highlight of the morning program was an industry panel on navigating pathways to translation, featuring Kathy Nielsen (BioCurate Pty Ltd), John Power (BioNTech SE), Steve Rockman (then CSL), and Claire Borg (Moderna), facilitated by mRNA Victoria Scientific Advisory Group member Dr Wai-Hong Tham.

The afternoon featured curated breakout sessions where grant recipients discussed their projects in small groups, exploring opportunities for collaboration and collective problem-solving. Attendee feedback was overwhelmingly positive, exceeding expectations for the event.



Messenger BIO case study

Denzil Furtado's early PhD research, looking at mRNA to treat single gene diseases of the brain, inspired the Messenger Bio start-up. Co-founded with Professor Frank Caruso, the goal for Messenger Bio is to make it easy and affordable for researchers to access high-throughput customised mRNA and Lipid Nanoparticle technology for preclinical projects.

mRNA Victoria provided funding to the start-up, to automate and expand the capacity of their RNA Engineering Toolbox. This is a crucial piece of accessible infrastructure that will help researchers translate their mRNA breakthroughs into potential new vaccines and products.

Messenger Bio was part of the 2022 TRAM Air Program, the University of Melbourne's accelerator program. The TRAM Air program supports the University's research community to develop ventures that will attract investment. Messenger Bio won the top prize of \$10,000 at the November 2022 Showcase Competition.

"By partnering with scientists early on, we hope to accelerate the discovery and development of new products, from vaccines to gene editing medicines," said Denzil.



The future of the mRNA sector for Australia



7

Agricultural applications of RNA technology

The Victorian Government is investing \$4.3 million to explore how RNA technology can assist our agriculture sector.

An initiative funded through the Victorian Government's Economic Growth Statement, mRNA Victoria is investigating agricultural applications of RNA technology and manufacturing feasibility, in collaboration with Agriculture Victoria and Agriculture Victoria Services.

For example, RNA technology could increase the yield from broadacre and horticultural crops, reduce the need for insecticides by targeting Australian-specific pests, and reduce methane emissions from cattle.

Working closely with leaders from across the RNA research, manufacturing and agriculture sector, this investment will deliver benefits to farmers, while leveraging Victoria's position as a leader in mRNA technology.

The future of mRNA

mRNA technologies are projected to deliver an advanced manufacturing industry of up to \$7 billion in Victoria. This will create the opportunity for Australia to develop a significant global market for mRNA therapeutics.

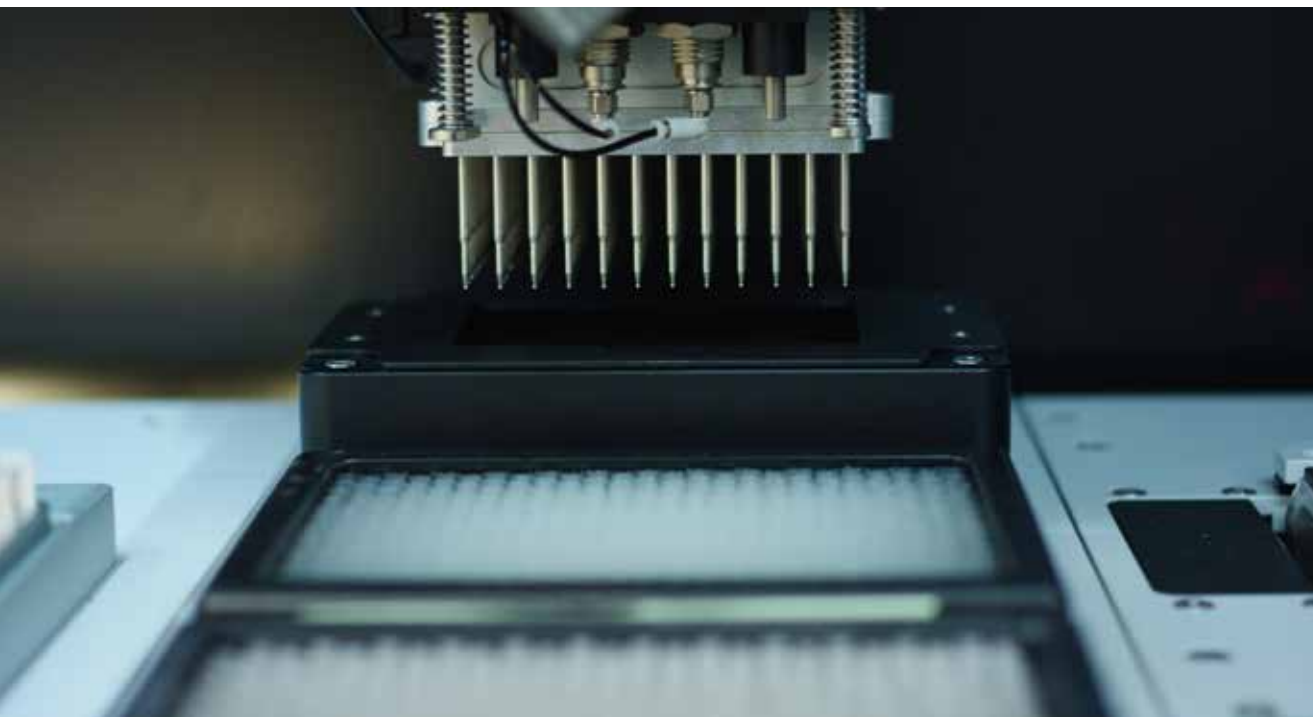
Analysis estimates that the market for RNA vaccines and therapeutics will range from \$AUD71 billion to \$AUD189 billion by 2030.

Following the advances made in using mRNA vaccines for COVID-19, researchers are exploring the potential for mRNA vaccines to treat diseases such as malaria, HIV, tuberculosis, monkey pox, bird flu and Zika. This could have enormous global benefits with around 10 million new tuberculosis cases every year and about 230 million malaria cases reported in the Africa region in 2020 alone. Significant progress has been made in adopting novel mRNA vaccine approaches to prevent HIV and malaria.

Several mRNA-based HIV vaccines are undergoing clinical trials to evaluate their safety and efficacy³. In preclinical studies, a next generation mRNA vaccine for malaria triggered high levels of antibodies that recognised the parasite and blocked transmission in mosquitoes by up to 99.7%⁴.

3. [mRNA-based vaccine technology for HIV – PMC](#)

4. [Revealed: new vaccine target to block malaria transmission | WEHI](#)





Personalised cancer vaccine clinical trials

“It may be the penicillin moment in cancer therapy,” said Professor Georgina Long of the Melanoma Institute of Australia, when describing critical advances in the use of mRNA vaccine technology to treat melanoma.

Long before mRNA vaccines were developed to combat the COVID-19 pandemic, researchers had been working to find ways to use mRNA to treat cancer, with the mRNA working as a ‘vaccine therapeutic’.

Results of trials conducted by Moderna are positive. The personalised cancer treatment performs well, reducing the recurrence of melanoma in participants. “It is possible to see that (patients) may have cancer as a long-term disease rather than a death sentence,” Professor Long explained in a recent interview.

This world-first trial to use personalised vaccines in cancer treatment shows that combining mRNA technology with Merck’s immunotherapy drug, Keytruda produces better results for melanoma patients.

Researchers are confident that mRNA technology could be used to treat many types of cancer. This could be an alternative to broad and non-specific cancer treatments.

Results of trials conducted by Moderna are positive. The personalised cancer treatment performs well, reducing the recurrence of melanoma in participants.



Victorian mRNA Innovation Hub



Next generation mRNA vaccines and therapeutics are the focus for the Victorian mRNA Innovation Hub, where mRNA researchers learn from some of the world's best scientists.

The Victorian Government provided \$5.4 million to establish the Hub, which brings together a team from the Peter Doherty Institute for Infection and Immunity (Doherty Institute), Monash Institute of Pharmaceutical Sciences (MIPS), the Monash Biomedicine Discovery Institute (BDI) and the University of Melbourne's Faculty of Engineering and Information Technology. Headquarters for the Hub are at the Monash Institute of Pharmaceutical Sciences and Monash RNA.

"The major aim of the Victorian mRNA Innovation Hub is to increase the efficiency of mRNA manufacture and delivery, to develop unencumbered IP to support the development of Australian mRNA products and to train and upskill a community of mRNA scientists to drive Victorian mRNA innovation and create a skilled workforce," explains Professor Chris Porter, Director of MIPS and Chair of the Victorian mRNA Innovation Hub Management Committee.



Research Case Study

The Hub is made up of four nodes:

1



Led by Professor Traude Beilharz, Monash Biomedicine Discovery Institute (BDI). The scientists at the BDI have significant experience in mRNA stability, in vitro synthesis and purification of RNA, transcription regulation and complex RNA design. Their research will lead to the generation of new molecular RNA tools and novel approaches to develop improved mRNA therapeutics.

2



Led by Professor Damian Purcell, Doherty Institute. Professor Purcell has more than 30 years' experience with RNA research. The Node brings together expertise in high containment, in vitro cultivation (SARS-CoV-2, influenza and other), animal infection models, analysis of viral RNA elements, testing of antiviral efficacy and assessment of innate and adaptive antibody and cellular immune responses.

3



Led by Professor Colin Pouton, Monash Institute of Pharmaceutical Sciences (MIPS). Professor Pouton has more than 30 years' experience in drug and nucleic acid delivery and has the most well-developed mRNA vaccine program in Australia. The MIPS Node brings together broad experience in parenteral and mucosal drug delivery, targeting to immune cells within the lymph and immune system, pharmacokinetics and drug disposition and expertise in vaccine and drug development.

4



Led by Professor Frank Caruso, Engineering and Information Technology, University of Melbourne. This group is exceptionally well resourced to evaluate the critical interactions that occur at the nano-bio interface between nanoparticles and target cells. The Node combines expertise in delivery engineering with experience in nanomaterial assembly, nanoengineering and gene delivery, along with the development of prototype technologies to investigate novel mRNA delivery systems.

Australia's first locally produced COVID-19 vaccine

In a medical and manufacturing breakthrough Victoria has developed and created Australia's first local mRNA COVID-19 vaccine to reach Phase 1 clinical trials. The Victoria Government invested \$5 million to support Monash Institute of Pharmaceutical Sciences (MIPS) to manufacture doses of the mRNA COVID-19 vaccine.

Researchers at the Peter Doherty Institute for Infection and Immunity (Doherty Institute) and MIPS created the two vaccine candidates, which are distinct from existing vaccines.

The two candidates are:

- ① the Doherty receptor-binding domain (RBD) protein vaccine which uses part of the virus protein, rather than genetic material or another virus, to elicit an immune response.
- ① the MIPS RBD mRNA vaccine which represents the virus genetic sequence that codes for the tip of the spike, which will lead to production of the RBD protein.

Preclinical results from the MIPS RBS mRNA vaccine were published in October 2023, which showed the vaccine induced a strong immune response and helped overcome the issue of "immune imprinting".



Burnet Institute

mRNA VICTORIA
ACTIVATION PROGRAM
RECIPIENT

mRNA Victoria's Activation Program has provided a \$3 million grant to the Burnet Vaccine Initiative to accelerate the development of next generation mRNA vaccines. The Burnet Institute is a world leader in malaria research, and the funding will support the application of mRNA technology to fight diseases such as malaria and hepatitis C.

The Burnet Institute has a long history of leading medical research in the Asia-Pacific and Africa. This new initiative combines the expertise of key Burnet investigators, Professors Heidi Drummer and James Beeson and Dr Andy Pournourios, with Moderna's mRNA vaccine technology.

The funding from mRNA Victoria is expanding the program, enabling collaboration with the Monash Institute for Pharmaceutical Sciences (MIPS). The Burnet team is collaborating with Professor Colin Pouton at MIPS to develop multi-antigen vaccines with the potential to produce more effective and long-lasting immune responses and greater protection.

This project is another step towards establishing Australia as a leader in vaccine production in the Asia-Pacific region, with the capability to rapidly develop and produce vaccines.



Research Case Study

Finding a cure for HIV

University of Melbourne / Monash University

mRNA VICTORIA
ACTIVATION PROGRAM
RECIPIENT

Melbourne researchers have made a breakthrough in HIV research by leveraging mRNA and lipid nanoparticle technology to force the HIV virus out of hiding within cells, opening the way to eradicate the virus from the body.

In 2024, the research team was awarded \$100,000 towards the project through the mRNA Victoria Research Acceleration Fund.

mRNA Victoria's Scientific Advisory Group member, the Peter Doherty Institute for Infection and Immunity Director and University of Melbourne's Laureate Professor Sharon Lewin said the research provides an important proof-of-concept they hope could be a turning point in the field.

"Back in 2020, my lab started looking at mRNA to deliver a new treatment for COVID-19. That work sparked a lot of new ideas for HIV, despite the two being

very different viruses," said Professor Lewin.

"Over the last five years, we've built this whole new program of work to use mRNA and designed lipid nanoparticles to get to the HIV reservoir and eliminate persistent virus.

Our work has changed dramatically, and this study is an incredibly exciting milestone."



Peter MacCallum Cancer Institute

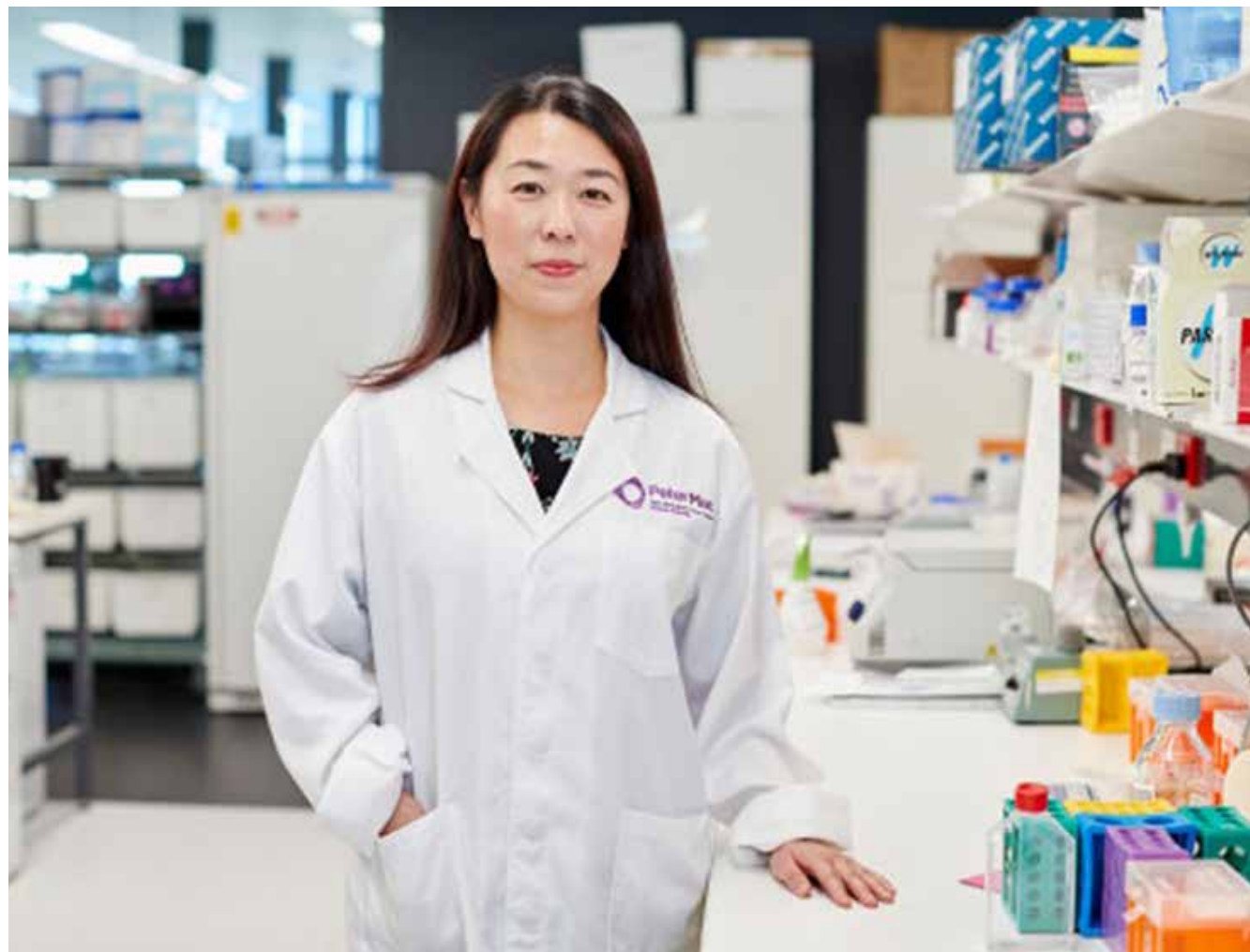
mRNA VICTORIA
ACTIVATION PROGRAM
RECIPIENT

Dr Clare Slaney is using mRNA technology to find new ways to use the body's own immune response to fight cancer.

Some blood cancers are currently being treated by taking a patient's own immune T-cells and genetically engineering them to fight cancer. Dr Slaney is using novel mRNA vaccine technology as a platform to make these T-cells work in difficult solid cancers, including pancreatic cancer.

Dr Slaney's work is supported by an mRNA Victoria Activation Program grant. The grant program boosts bold new ideas to develop Victoria's mRNA research, development and manufacturing capability.

The mRNA Victoria Activation Program (mAP) is the largest dedicated mRNA research grant program in Australia, providing \$21 million to advance new mRNA research.



Hudson Institute of Medical Research

Noxopharm

mRNA VICTORIA
RESEARCH
ACCELERATION
FUND

A team led by Professor Michael Gantier at the Hudson Institute of Medical Research has developed a new RNA drug designed to limit the damaging effects of the autoimmune disease lupus.

SOF-SKN™, an innovative RNA-based therapeutic mimics naturally occurring anti-inflammatory molecules produced by the human body, and is applied as a topical cream directly to affected skin. The drug has just completed its clinical phase in a groundbreaking, world-first clinical trial conducted by Australian biotech company Noxopharm.

Lupus is a chronic autoimmune illness where the body's immune system attacks its normal cells. It can affect different parts of the body, leading to skin problems, joint pain, fatigue and inflammation of major organs.

Although lupus can affect anybody, 90 per cent of patients are women.

For women, the condition often develops during their reproductive years, impacting fertility and increasing risks during pregnancy and childbirth.

Professor Gantier's team made a fundamental discovery about how extremely short RNA fragments act as a natural anti-inflammatory system that is blocked in patients with lupus.

"Treatments for autoimmune disease such as lupus are often associated with multiple side-effects and poor patient response" Professor Gantier said.

"My research is harnessing the potential of RNA therapeutics, like those used in mRNA vaccines, to revolutionise autoimmune disease treatments, blocking disease at its source."

The research team was awarded \$100,000 in 2022 towards the development of the treatment through the mRNA Victoria Research Acceleration Fund.



Niemann-Pick Disease

Florey Institute / Swinburne University

mRNA VICTORIA
RESEARCH
ACCELERATION
FUND

Niemann-Pick Disease Type C (NP-C), sometimes called “Childhood Alzheimer’s” is a rare genetic disease which causes patients to suffer motor and cognitive disabilities. There is no cure for this fatal disease and patients usually do not survive past their teenage years.

The mRNA Victoria Research Acceleration Fund (mVRAF) is supporting a project to develop an effective mRNA gene therapy to improve the health outcomes for NP-C patients.

mRNA is an emerging gene therapy designed to restore functional genes in NP-C patients. This project will investigate different mRNA therapeutic formulations in NP-C cell and animal models to identify clinically useful candidates. Gene therapy is the most effective approach to treating NP-C as it targets the underlying genetic defect.



St Vincent's Institute of Medical Research

Maddie Riewoldt's Vision

mRNA VICTORIA
RESEARCH
ACCELERATION
FUND

Melbourne researchers have discovered a groundbreaking RNA treatment targeting rare childhood diseases, including bone marrow failure syndrome.

Associate Professor Andrew Deans from St Vincent's Institute of Medical Research (SVI) said the innovative RNA therapy could transform the lives of children with rare blood disorders.

The cutting-edge RNA Prime Editing technology corrects the genetic defect that causes life-threatening blood disorders such as Fanconi anemia (FA).

"Prime Editing allows us to correct the FA mutation with exceptional accuracy," Associate Professor Deans said.

"If we can deliver this safely into patients, we could avoid the need for risky and expensive bone marrow transplants altogether."

Fanconi anemia is a rare, genetic disorder that causes bone marrow failure and affects children from a very young age. About 190 young Australians are currently diagnosed with the syndrome. Sadly, more than half will die from the disease and its related conditions.

This important project is being delivered in partnership with Maddie Riewoldt's Vision (MRV) – the only organisation in Australia dedicated to bone marrow failure syndrome research, education, advocacy and support for patients and their families.

Through this collaboration, SVI and MRV will work closely with patients and families to incorporate lived experience, build understanding of the therapy, and ensure it is designed to meet their needs as it advances towards a world-first clinical trial.

The research team was awarded \$100,000 in 2023 towards the development of this RNA-based gene editing technology through the mRNA Victoria Research Acceleration Fund.



Professor Mark Dawson, Peter MacCallum Cancer Centre

An mRNA Victoria grant has supported the discovery of a new type of immunotherapy in solid tumours. The ground-breaking research uses a world-first drug that tricks cancer cells into alerting our immune system to destroy them. Professor Mark Dawson, Associate Director of Research at Peter MacCallum Cancer Centre, led the research team.

The research – performed in collaboration with Storm Therapeutics and published in Cancer Discovery – identifies how the drug modifies cancer cells, making them behave as though they have been infected by a virus. This causes the cancer cells to trigger an immune response to destroy the cancer cells. This exciting development is a new way to treat cancer cells that may evade other immunotherapies.

Professor Dawson is the first Australian to be awarded the Memorial Sloan Kettering (MSK) Cancer Center's prestigious Paul Marks Prize for cancer research. The prize recognises global leaders in cancer research who are making a significant contribution to the understanding of cancer, or improving treatment through research.

Peter Mac Executive Director Cancer Research, Professor Ricky Johnstone, said "We are thrilled for Mark to be recognised for his tremendous impact on fundamental, translational and clinical cancer research and become the first Australian to win this highly regarded prize. Professor Dawson and his team should feel extremely proud for the significant difference they've made, and will continue to make, to the lives of people living with cancer."



Research Case Study

RNAtc Platform, Hudson Institute of Medical Research

mRNA Victoria in partnership with Invest Victoria has supported the Hudson Institute of Medical Research to develop the RNAtc platform. This novel technology tests mRNA/RNA candidate therapeutics and vaccines in pre-clinical and clinical stages of development.

The RNAtc platform predicts their efficacy and potential inflammatory side-effects, enabling researchers to fast-track treatments for emerging and existing diseases. The platform uses robotic automation in testing services for library screening or testing of different conditions. Induced pluripotent stem cell (iPSC) models are used to reduce the risk of clinical trial failure and accelerate the development of new RNA and mRNA products.

The RNAtc platform establishes a critical link in Victoria's mRNA industry and consolidates

Victoria's place as a key player in the global mRNA ecosystem. The investment by mRNA Victoria reflects a commitment to creating the research infrastructure needed for innovation in the development of mRNA therapeutics.

A government spokesperson said "Our investment will see effective vaccines developed faster and manufactured right here in Victoria. It's part of our drive to innovate and grow high-value industries and jobs."



mRNA VICTORIA IMPACT REPORT, SOURCES

mRNA Victoria, www.djsir.vic.gov.au/priorities-and-initiatives/mrna

Premier of Victoria, www.premier.vic.gov.au

Prime Minister of Australia, www.pm.gov.au

BioNTech, www.investors.biontech.de

Burnet Institute, www.burnet.edu.au

CSL, www.newsroom.csl.com

Department of Health, Abu Dhabi, www.doh.gov.ae

Doherty Institute, www.doherty.edu.au

Hudson Institute of Medical Research, www.hudson.org.au

Moderna, www.investors.modernatx.com

Monash University, www.monash.edu

Oxford Economics, Australia's mRNA Advantage: Jobs, Health and Economic Resilience report

Peter Mac, www.petermac.org

St Vincent's Institute, www.svi.edu.au

The Florey, www.florey.edu.au

ABC News, www.abc.net.au

Biotech Dispatch, www.biotechdispatch.com.au

Fortune, www.fortune.com

MIT Technology Review, www.technologyreview.com

Sydney Morning Herald, www.smh.com.au

The Age, www.theage.com.au

The National News, www.thenationalnews.com/uae

The Telegraph, www.telegraph.co.uk

Wired, www.wired.com

mRNAV^C

