



ANNUAL REPORT 2021



HARRY PERKINS INSTITUTE
OF MEDICAL RESEARCH



Chair's Report

Welcome to the Annual Impact Report for the Harry Perkins Institute of Medical Research, showcasing your achievements and the contributions of our communities in 2021.

Like the diseases we work to combat, which can evolve and adapt as a method of protection, the team at the Perkins has adapted and innovated in 2021 to ensure that we can continue to work with you to find new and better treatments.

Despite the cloud of COVID that restricted access to the buildings, we were still able to make significant new discoveries in the labs and raise considerable funds for the causes you believe in.

I am equally proud of our scientific achievements as I am of your generosity and commitment to keeping the research going – no matter what.

It's because of that willingness to do things differently, that the Perkins Community Engagement team were awarded the FIA National Award for Excellence in the Best Supporter Engagement category for transforming the MACA Cancer 200 experience for our riders.

You joined us in-person and online to hear about "Australia's cancer" during our Community Q&A on melanoma. That discussion highlighted just how far we've come thanks to medical research – with an extremely deadly disease becoming far more survivable thanks to advancements in immunotherapy.

Perkins researchers continued to prove that they are some of the best and brightest in the world – winning numerous major awards for their unwavering work towards uncovering the secrets of health and disease.

Dr Gina Ravenscroft was recognised with a Business News 40under40 award for her contributions to genetic disease research.

Perkins Head of Molecular Endocrinology and Pharmacology, Professor Kevin Pflieger, was appointed President of the Australasian Society of Clinical and Experimental Pharmacologists and Toxicologists – coincidentally on the same day that he was announced as a Fellow of the British Pharmacological Society. Both very prestigious positions and a testament to the research talent we have here in WA.

Leading melanoma expert, Professor Jonas Nilsson, won a Business Events Perth Aspire Award, to take his breakthrough Western Australian research to an international stage.

Professor Nigel Laing was a finalist in the WA Senior Australian of the Year award for his long and illustrious career dedicated to improving the lives of people affected by genetic disease.

The Lotterywest BioDiscovery Centre at the Perkins was a finalist in the WA Premier's 2021 Science Awards for inspiring thousands of local students with hands-on science lessons.

The awards continued for Perkins start-up companies, including a WA Innovator of the Year 2021 Award for the team behind Apricot, an advanced coronary artery assessment technology.

The Perkins biomedical engineering spinout company VeinTech also won a WA Innovator of the Year Award, as well as a prestigious prize at the MedTech Actuator Origin Pitch competition. Perkins researcher, Dr Nikhilesh Bappoo, who co-founded VeinTech, is also part of the management team at another start-up company VitalTrace, which won the Wesfarmers Wellbeing Platinum Award for their technology.

Medical device company OncoRes was also awarded a Manufacturing Voucher to test the clinical feasibility of an interoperative imaging tool developed by Perkins bioengineers.

And, importantly, our community of supporters proved yet again that they are the best, raising a record-breaking \$7 million for cancer research in the MACA Cancer 200 Ride for Research.

Likewise, participants in our Walk for Women's Cancer raised more than \$1 million to help fund groundbreaking breast and ovarian cancer research here at the Perkins.

It's because of these fundraisers, donors, walkers and riders that our vital work can continue. With support from people like you, I know that our teams of researchers will overcome any barrier to bring new and better treatments to the people who need them most.

Thank you for your support in 2021.



John Barrington AM
Chair, Harry Perkins Institute of Medical Research



Director's Report

After the challenging and unpredictable year that was 2020, I am pleased to say that despite the continuing threat of COVID your support has ensured that 2021 was an exceptionally productive year for the Harry Perkins Institute of Medical Research.

Our research teams provided answers for families by leading the \$20 million pre-pregnancy screening study and testing volunteer couples for shared genetic mutations that can cause devastating diseases in children. The program, known as Mackenzie's Mission, was co-led by Professor Nigel Laing AO and tested 1300 local couples. The study found that one in 25 couples had a faulty gene that increased their risk of having a baby with a severe or fatal condition - vital information for those planning to start a family.

Perkins cancer researchers turned their expertise to a childhood condition that causes weak muscles, obesity, and intellectual disability for those affected. The researchers are using targeted epigenetic editing to address the underlying cause of this disease, known as Prader-Willi Syndrome.

We established a Women's Cancer Senior Fellow and a new laboratory led by Dr Ankur Sharma. Dr Sharma's research is focussed on liver cancer, a major health threat and the only top ten cancer with rising incidence. We know that Dr Sharma's research will have a considerable impact on those facing liver cancer.

One of our Walk for Women's Cancer supported research teams, led by Associate Professor Pilar Blancafort, discovered a new cancer-causing gene and protein which creates highly aggressive and hard to treat breast cancers. This major discovery opens the door to new drugs which could block the pathways the protein creates, stopping the deadly cancer in its tracks.

With your support and with backing from the WA Government, we launched a biobank here in Perth. The biobank will store biological samples that can be used for future research and saved for analysis using future technologies. This will be an invaluable resource for health and medical research and could unlock new answers to important questions around health and disease.

A new treatment for inflammatory kidney and respiratory diseases, co-invented by Perkins research leader Professor Kevin Pflieger, received funding to progress into Phase 3 trials. The treatment could help adults and children affected by a type of kidney disease that can lead to permanent kidney damage and eventual organ failure.

Perth bioengineers from the Perkins developed an improved micro-filter for dialysis machines to reduce the risk of complications in patients. The filters play a critical role in trapping tiny air bubbles and blood clots, preventing them from entering the patient's blood stream when cleaned blood is returned to the body after dialysis.

And thanks to support from donors, the Perkins Melanoma Discovery team have uncovered a new epigenetic treatment that is showing great promise against an often fatal form of eye melanoma.

As you know, our research teams are passionate and relentless when it comes to fighting the major diseases that affect our community.

We have made more breakthrough discoveries than I could hope to fit in my Director's report, so we have created a handy graphic that illustrates some of our research outcomes for 2021 and how they might help people like you. You can find it on pages 8-9.

Lastly, on a personal note, I was recognised with an Order of Australia in 2021. I am humbled and honoured by this award and am immensely grateful to you, our generous supporters, who have contributed to the ongoing success of medical research in Western Australia. Your support has allowed people like myself to dedicate their career to improving the outcomes for people facing disease right here in Perth.

So thank you for your support in 2021. Together, we're helping people lead longer, healthier lives.

A handwritten signature in black ink, appearing to read 'P. Leedman', written in a cursive style.

Professor Peter Leedman AO
Director, Harry Perkins Institute of Medical Research

2021 Highlights

OUR COMMUNITY



283 medical researchers
Including **121** students
125 services staff
10 volunteers



775 walkers
36,353km walked in one day
182 volunteers
10,193 donors
\$1,032,155 raised



500 riders
274,602km ridden
207 volunteers
27,016 donors
\$7,067,865 raised



3843 visitors
80 schools
3 Teacher PD sessions
5 immersion programs
5 community activities
11 community talks
23 Tour and Talks
50 specialist programs
60 PCR classes

OUR IMPACT



169
notable
discoveries



381 institutions
collaborated
in **45** countries



114% higher grant
success rate than
the national average

linear

60 clinical trials
22 cancer trials
918 trial participants
184 cancer patients



DONORS

4.8/5 donor experience rating
41,418 donors
56 confirmed gifts in Wills
9000 couples nationally in Mackenzie's Mission

Perkins research achievements in the last year.

WA medical research into the diseases that most affect your families is secure thanks to your incredible support and loyalty.

Brain

A Perkins neuroscientist is unravelling the systems that control memory formation, storage and recollection. Understanding the molecular processes regulating memory opens the door for potential new treatments for memory disorders such as dementia and Alzheimer's.

Face

Perkins rare genetic disease experts discovered a genetic cause for the facial disorder hemifacial microsomia, a condition where one side of the face is underdeveloped and does not grow normally.

Neck/Carotid Artery

A Perkins cardio research team aims to predict a patient's risk of stroke. Using machine learning, they analyse patient data and medical histories. Testing so far has shown that this model has a higher accuracy than the regular tests most commonly used by doctors.

Breast

- Perkins biomedical engineers are testing a breast cancer probe that accurately determines the edge of a tumour – helping surgeons remove all the cancerous tissue in one operation. This saves women the physical and emotional turmoil of multiple surgeries.
- Cancer stem cells are particularly resistant to anti-cancer medicine. If any are left in the body following treatment, they can regrow a tumour and spread throughout the body. Perkins researchers are focusing on ways to combat cancer stem cells in triple negative breast cancer, a very aggressive form of breast cancer and one of the toughest to treat.
- The Perkins Cancer Epigenetics team is investigating ways to make anti-cancer treatments more effective against aggressive forms of breast cancer. They're exploring the use of a gene-editing tool to 'turn off' the parts in cancer cells responsible for growth and spread. This could slow cancer growth and make tumours more susceptible to anti-cancer treatments like chemotherapy.

Liver

- Liver cancer is on the rise. In the last 5 years, there was an approximate 30 per cent jump in new cases of liver cancer and tragically, patients have just a one in five estimated chance of survival.

Breakthroughs are urgently needed and the Perkins is testing new RNA-based treatments to combat this disease.

- Perkins researchers are undertaking a major project to identify liver cancer patients who may benefit from a new immunotherapy treatment. This new combination of drugs helps to modify the blood supply to the liver tumour, while supercharging the patient's immune system.

Arm

A new imaging technology developed at the Perkins that aims to reduce the failure rate of cannulation (inserting a needle into a vein) is moving toward first-in-human trials. There's a serious cost to the healthcare system for failed cannulation, including wasted hardware, clinician time and worst of all, delayed tests/treatments and an increase in infection rates.

Ovary

The Perkins is continuing its groundbreaking work into the use of honeybee venom as a powerful cancer treatment. The team is testing the compound on ovarian cancer cells and has found that it's extremely effective with a six-fold improvement in capacity to kill the cancer cells.

Leg

A new Perkins-developed drug could help prevent amputations, reduce hospitalisations and save limbs. The treatment is a first-in-class drug that safely clears plaque build up and improves blood flow in lower limbs. Currently, there is no drug that can remove blockage in small arteries, so this treatment could make a global life-changing difference for patients.

Bones

A gene controlling the distribution of sarcoma cells has been discovered by Perkins researchers. They're using this knowledge to help develop personalised treatment plans for sarcoma patients.

Infection

Finding the right antibiotic to heal an infection quickly can be a matter of life and death. To help solve this, Perkins researchers have developed an innovative technique that cuts down the time it takes to assess the best antibiotic for an infection from days to 3-5 hours. This breakthrough could help stem the growing issue of antibiotic resistance.

Blood

A multidisciplinary Perkins team has been investigating sepsis or blood poisoning – the potentially life-threatening condition where bacteria in your blood triggers inflammation that can damage your organs. The team has been looking into the impact of patient age and illnesses on the outcomes of patients with suspected sepsis.

Drug discovery

The building blocks of life-saving new treatments could be developed in days instead of years thanks to new software that simulates evolution. Perkins researchers have developed a new computational tool that mimics the processes of natural selection, saving countless hours of laboratory work and helping produce new enzymes that could be used for a range of new medicines.

Cancer

Very little is known about all the cell types that exist in a tumour and what impact they have. Perkins researchers are using 'single cell technologies' that identify every cell types in a person's tumour. This could help design a personalised treatment plan to help with their specific cancer.

Epigenome

The instructions for making a skin cell versus a brain cell are encoded into every single cell. The epigenome controls how cells develop and which role they're given. Perkins researchers are exploring the nature and function of the epigenome and the essential part it plays in development and disease.

Eye

Perkins melanoma experts have discovered a potential new treatment for an often fatal form of melanoma that affects the eye. They learned that an immunotherapy treatment, combined with a drug that turns off tumour cell growth, was effective in boosting the immune system while killing off melanoma cells within the eye.

Head and Neck

Some tumours are harder to treat because they can create a barrier of interlocked blood vessels that function like a shield. To combat this, Perkins researchers are developing new treatments to untangle the blood vessels around cancers, allowing immune cells and anti-cancer drugs to reach the tumour's core.

Heart

- To avoid the need for repeat surgery, Perkins biomedical engineers are developing durable artificial heart valves created on 3D printers using regenerated biomaterial, that can later evolve into a patient's own tissue.
- A team of cardiologists and Perkins biomedical engineers have developed a tool to predict and combat coronary artery disease. The tool is creating a path to more effective treatments for people with heart disease.

Lung

- Researchers have shown that people who are hospitalised with pneumonia are at a greater risk, both short and long term, of experiencing a heart attack or stroke. Researchers at the Perkins are investigating the impact that bacterial pneumonia, and the inflammation it causes, can have on your arteries.
- A Perkins team has helped uncover genetic triggers that will help identify men at risk of lung cancer. A significant benefit of genetic discoveries is that it also identifies potential targets for prevention and treatment of lung cancer.

Kidney

Perkins bioengineers are innovating a key device in kidney dialysis machines to reduce the risk of complications in patients. They are looking to improve the filters that trap blood clots and tiny air bubbles to stop them entering a patient's blood stream during dialysis.

Pancreas

Perkins has developed a drug to help people with focal segmental glomerulosclerosis (FSGS). FSGS is a kidney disease that affects both children and adults, where inflammation and scarring leads to permanent kidney damage and eventual kidney failure, requiring dialysis or transplantation.

Colon

Perkins researchers have discovered that emu oil, an oil derived from the fat of an emu, reduces the severity and amount of colon cancer tumours in pre-clinical studies.

Prostate

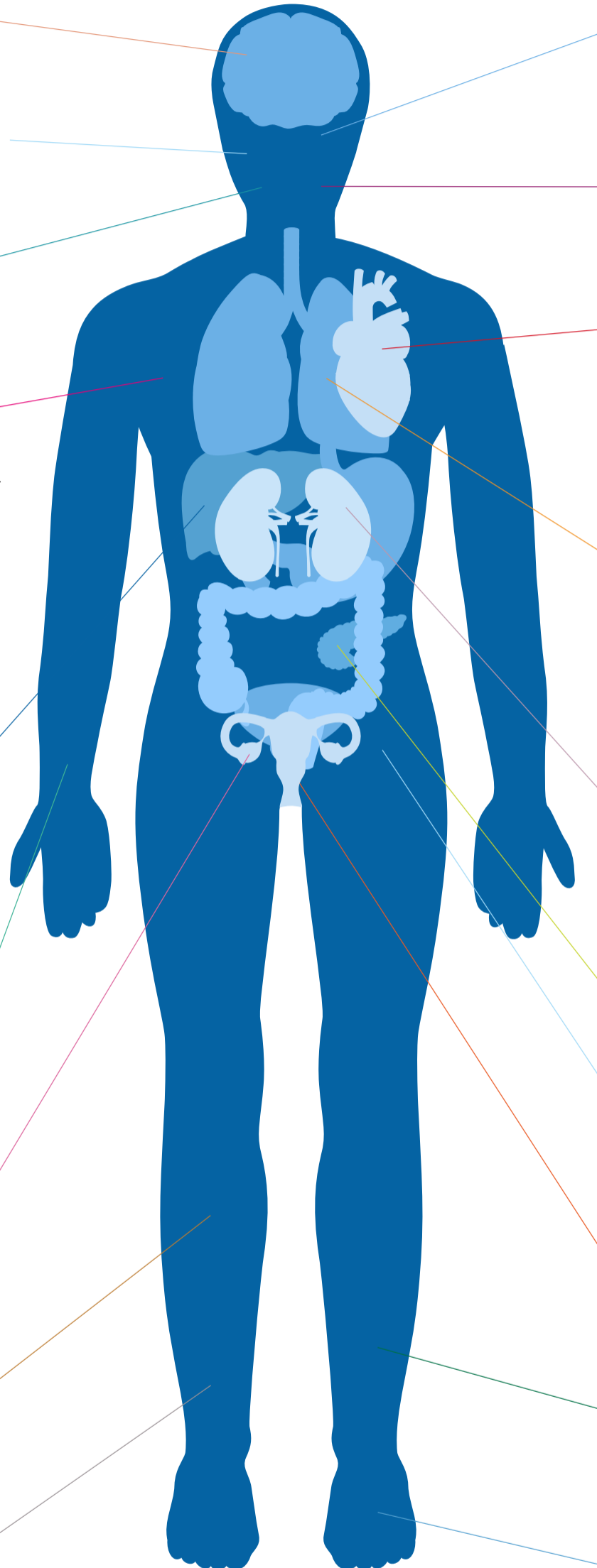
Better treatment options for an incurable form of prostate cancer are being assessed at the Perkins. Treatments are being investigated that would prolong the life of people with metastatic castration-resistant prostate cancer and have less harmful side effects.

Skin

Perkins melanoma experts are working toward WA approval for a treatment called cell-therapy. Immune cells are taken from a tumour and 'super charged' outside a patient's body. They're then reintroduced to the body in enormous numbers to help that person fight off the disease.

Foot

The Perkins has adapted groundbreaking technology to help save the limbs of people facing diabetes-related amputations. Perkins researchers are using technology that measures oxygen saturation levels in the brain and applying it to the foot to offer detailed information about blood flow.



Our Research Focus

MULTIPLE MYELOMA BRAIN PANCREATIC
CANCER PROSTATE LUNG LIVER
BONE (SARCOMA) BOWEL
HEAD AND NECK BREAST ENDOMETRIAL
NEUROENDOCRINE OVARIAN MELANOMA

DIABETES CORONARY ARTERY DISEASE
CARDIOVASCULAR
AND STROKE HEART DISEASE
DIABETES ANEURYSM
AORTIC DISSECTION
CEREBROVASCULAR DISEASE VALVE DISEASE

DEVELOPMENT AND AGEING BRAIN DISEASE
GENOME BIOLOGY
AND GENETICS AUTISM
COMPLEX GENETIC DISEASE MITOCHONDRIAL DISEASE
NEUROLOGICAL DISORDERS KIDNEY DISEASE

Our Vision



“Together, we’re tackling the diseases that most affect our families and creating kinder treatments and better health outcomes for everyone.”

VISION

Pioneering medical research with local focus and global impact

PURPOSE

To drive discoveries, provide answers and give hope

OUR VALUES

Respect

Innovation

Passion

Collaboration

Perkins Partners

Medical research is truly a team effort.

It requires collaboration from the community and corporate partners to turn eureka moments into new treatments for the diseases that affect us all. Our partners offer manpower, funds and resources, including equipment and facilities, to support our researchers so they can focus on what they do best.

The Perkins is grateful for every contribution that moves us closer to our mutual goal of helping people live longer, healthier lives.



**Private Trusts
and Foundations**

**Kailis
Family**

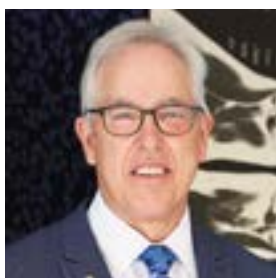
**Kirkbride Family
and donors**

**As well as the many State and Federal government
funding bodies who support Perkins researchers**

Meet the Board



**The Honourable
Wayne Martin AC QC**
Chair



**Professor
Peter Leedman AO**
Institute Director



Mr John Barrington AM



Professor Simon Biggs
Associate Director



Dr Stephen Davis



Mr Laurence Iffla



Mr Roger Port



Mrs Val Raubenheimer



Mrs Jan Stewart PSM



**Professor
Steve Wesseling**

Ex-officio members:

Professor Peter Thompson AM
Deputy Director

Ms Paige Gibbs
Chief Development Officer

Ms Donna O'Hara
Chief Operating Officer

Mr Tony Spezzacatena
Chief Financial Officer

Statement of Comprehensive Income

for the year ended 31 December 2021

OPERATING REVENUE	2021 (\$)	2020 (\$)
Event income	8,247,648	4,474,731
Facilities income	5,194,331	5,053,616
Other operating income	11,174,240	7,665,137
Other income	2,850,841	2,553,986
	27,467,060	19,747,470
OPERATING EXPENSES		
Administrative, events and utilities expenses	(14,437,174)	(12,243,292)
Laboratory services expenses	(6,784,046)	(5,822,023)
Depreciation and amortisation	(6,311,293)	(6,410,104)
Property, plant and equipment written-off	(792)	(27,363)
	(27,533,305)	(24,502,782)
Operating deficit	(66,245)	(4,755,312)
Finance income	235,694	272,551
Finance costs	(25,691)	(32,096)
Net surplus/(deficit) before taxes	143,758	(4,514,857)
Income tax expense	—	—
Net surplus/(deficit) after taxes	143,758	(4,514,857)
Other comprehensive income		
Gain on financial assets at FVOCI	177,639	150,183
Total comprehensive income/(loss) for the year	321,397	(4,364,674)

Statement of Financial Position as at 31 December 2021

ASSETS

Current assets	2021 (\$)	2020 (\$)
Cash and cash equivalents	32,571,991	27,539,986
Trade and other receivables	4,368,606	4,534,991
Prepayments	271,536	351,210
Inventories	172,845	136,904
	37,384,978	32,563,092
Non-current assets		
Investment properties	870,403	870,404
Financial assets at fair value through OCI	2,683,973	2,360,244
Property, plant and equipment	100,626,184	106,071,622
Right-of-use assets	169,517	291,221
Investment in subsidiary	1	1
	104,350,078	109,593,492
TOTAL ASSETS	141,735,056	142,156,584

LIABILITIES

Current liabilities		
Trade and other payables	(2,110,792)	(2,278,037)
Interest-bearing liabilities	(117,078)	(124,609)
Contract liabilities	(1,559,732)	(1,408,467)
Grants held in trust	(14,459,500)	(15,256,195)
Provisions	(861,374)	(715,287)
	(19,108,476)	(19,782,595)
Non-current liabilities		
Loan from related entity	(1)	(1)
Interest-bearing liabilities	(61,002)	(178,080)
Provisions	(148,488)	(100,216)
	(209,491)	(278,297)
TOTAL LIABILITIES	(19,317,967)	(20,060,892)
NET ASSETS	122,417,089	122,095,692
Accumulated surplus	121,898,147	121,754,389
Asset revaluation reserve	518,942	341,303
TOTAL EQUITY	122,417,089	122,095,692

The Statement of Financial Position provided above, together with the attached Statement of Comprehensive Income, have been extracted from the audited special purpose financial statements of the Harry Perkins Institute of Medical Research and its controlled entities. The summary financial information reflects the activities of the Association only and does not include all the information and notes normally included in an audited financial report. The audited special purpose financial report can be obtained upon request to the Chief Financial Officer.

The audited financial report (from which the summary financial information has been extracted) has been prepared in accordance with the requirements of Subdivision 60-C of the *Australian Charities and Not-for-profits Commission Act 2012* and Section 80 of the *Associations Incorporation Act 2015*, Australian Accounting Standards and other authoritative pronouncements of the Australian Accounting Standards Board.

Thank you for your support in 2021.

Together, we are reaching toward the incredible medical solutions we know are possible and bringing them closer.

Harry Perkins Institute of Medical Research

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