CENTRE FOR
Eye Research
Australia

Hope in sight®

# Annual Review 2020

# Our story

**Vision is precious and no one should ever lose the gift of sight.**

We're deeply committed to conducting eye research with real-life impact and finding ways to prevent people from going blind.

As an international leader in eye research, we use our world-class knowledge and expertise to achieve better treatments and faster diagnosis of eye disease.

Our goal is to prevent vision loss – and ultimately, find cures to restore sight. As true innovators, our scientists are on the brink of new discoveries every day.

With your support we can continue this world-leading research and accomplish scientific breakthroughs previously deemed unattainable.

Our aim is to offer hope to people affected by vision loss and protect the sight of everyone in need.

**With CERA, there's hope in sight.**

CENTRE FOR
Eye Research
Australia

**COVER: Looking forward: Clinical trial participant Ann Lally with granddaughters Cleo, Phoebe and Ivy.**


THE UNIVERSITY OF MELBOURNE

the royal victorian
eye and ear
hospital

# Contents



↑ On call: Laboratory Manager Sheridan Keene was one of the essential workers who kept our labs running and research advancing in 2020.

# Chair and Managing Director's message

As we emerge from a tumultuous 2020, the impacts of the COVID-19 pandemic on our health systems, economy and way of life are continuing to unfold.

But in uncertain times, one thing is clear - just as science and research have helped combat COVID-19, they will also be at the heart of our recovery.

The pandemic's devastating impact on eye care services and people with eye disease around the world makes our research more important than ever before.

It makes us more determined as we work towards our goal of a world free from vision loss and blindness.

And despite the many challenges of the past year, and those that lie ahead, we remain optimistic about the future of eye research.

**Rising to the challenge**

We are extremely proud of the enormous resilience and agility demonstrated by our staff in 2020 in the face of unpredictable and ever-changing circumstances.

Staff from our Clinical Trials Research Centre and Lions Eye Donation Service continued to work on site throughout the pandemic. Their efforts provided important continuity of care for trial patients and facilitated sight-saving corneal transplants.

Our lab-based scientists were also able to continue crucial experiments thanks to the Victorian Government's decision to make medical research an essential industry.

Many other staff worked from home - analysing images and data, preparing research for publication or providing support services like finance and IT that keep a medical research institute running.

Our popular community events transitioned from in-person to online, allowing us to connect with valued supporters and take our research to new audiences.

**Our impact**

Despite the many challenges, CERA continued to make an impact and attract competitive funding for key projects.

Our world-first study into the role of vitamin B3 in slowing the progress of glaucoma was released with promising results and a larger international trial is planned for later this year.

We were part of an international pre-clinical study which used gene therapy to regenerate optic nerve cells, bringing hope of new therapies for glaucoma.

We received major funding from the Medical Research Future Fund to develop an artificial intelligence eye scan to screen patients for risk of blinding eye diseases, heart disease and stroke.

Professor Robyn Guymer AM was recognised for her world-leading macular research, receiving a coveted Investigator Grant from the National Health and Medical Research Council.

We established BRAINSTORM, a new international consortium which will further research into the use of retinal imaging to detect early biomarkers of Alzheimer's disease.

Our research to develop a simple eye test

to detect people at risk of dementia saw the *Australian Financial Review* name CERA as one of the 10 Most Innovative Health Companies in Australia and New Zealand in 2020.

## Eye research after COVID

Innovation comes to the fore in a crisis, and during the pandemic this has resulted in the rapid uptake of telehealth services and new technologies to diagnose and monitor patients.

CERA has long been at the forefront of developing diagnostic tools that can be used in the home or outside of traditional eye care settings.

We are well poised to strengthen our focus in this area as demand grows for tools which can increase access to eye screenings and keep patients out of crowded waiting rooms.

And our new Health Services Unit, established in October last year, will help us better understand how health systems can use these technologies to benefit patients.

It will also focus on tackling the backlog of undiagnosed and untreated eye conditions resulting from COVID-19 lockdowns. We believe its work will have global significance.

## Thank you

Good science is a long-term pursuit. Many of our recent achievements had their genesis years earlier, backed by vital philanthropic support.

We are grateful to all the individual donors, philanthropic trusts and foundations who have continued to support CERA in 2020.

Collaboration is critical in tough times. We appreciate our ongoing partnerships with the Royal Victorian Eye and Ear Hospital, University of Melbourne, member organisations, industry and other research institutes.

We are also thankful for the Commonwealth and Victorian governments' support of the medical research sector throughout the pandemic and on the road to recovery.

And we pay tribute to our dedicated and talented staff for their enormous efforts to keep our research moving forward in the face of a global pandemic.

Together, we can put hope in sight for people with vision loss and blindness.

**Olivia Hilton**
Chair

**Professor Keith Martin**
Managing Director

# 2020 snapshot

**165**

**PUBLICATIONS**

**DR ZHICHAO WU WINS IRVIN M AND BEATRICE BORISH AWARD**

**INVESTIGATOR GRANT FOR PROF ROBYN GUYMER AM'S MACULAR RESEARCH**

**$2.33m**

**IN DONATIONS AND BEQUESTS**

**AFR BOSS**

**10 MOST**

**INNOVATIVE HEALTH COMPANIES FOR AUSTRALIA AND NEW ZEALAND**

**MEDICAL RESEARCH FUTURE FUND SUPPORT FOR PROFESSOR MINGGUANG HE'S ARTIFICIAL INTELLIGENCE RESEARCH**

**ASSOCIATE PROF PETER VAN WIJNGAARDEN RECEIVED INTERNATIONAL FUNDING FOR BRAINSTORM**

**LAUNCHED**

**OUR NEW WEBSITE**

LIONS EYE DONATION SERVICE KEEPS SAVING SIGHT

**279**
DONOR CORNEAS

**473**
CORNEAL TRANSPLANTS

VICTORIAN GOVERNMENT FUNDING ACCELERATES **PROF MARK DANIELL'S** CORNEAL RESEARCH

NEW HEALTH SERVICES RESEARCH UNIT
**ESTABLISHED**

**$867,000**
IN PHILANTHROPIC GRANTS

DR JENNIFER FAN GASKIN
**SUPERSTAR OF STEM**

PRE-CLINICAL RESEARCH BY **PROF KEITH MARTIN** REGENERATES OPTIC NERVE FIBRES

**$4.54m**
IN GOVERNMENT GRANTS

**DR FLORA HUI'S** VITAMIN B3 STUDY YIELDS PROMISING RESULTS

# Seeing the future


**Erica Blake has lived with keratoconus, a debilitating eye disease that distorts the cornea, for almost 30 years.**

Now her daughter Della, 15, is showing early risk factors.

New research from CERA is investigating how artificial intelligence can help detect keratoconus earlier, predict the path of the disease and improve the outlook for patients.

Our scientists are at the forefront of research using AI, advanced imaging and other cutting-edge technologies to improve the diagnosis, monitoring and treatment of eye disease.

And as these technologies continue to evolve, our researchers are also looking at how our health services operate so they can best utilise new technologies and other research findings to improve patient outcomes.

Erica is grateful for CERA’s research.

“It’s amazing to see how far we’ve come. Who knows what’s next?”

**Read Erica’s story on page 12.**

← **Looking forward: Della and Erica Blake are excited by what future research may offer people with keratoconus.**

# Intelligent transformation

Artificial intelligence research is set to transform medical practice.

**The COVID-19 pandemic has made Professor Mingguang He's artificial intelligence research more relevant than ever.**

In 2020, as telehealth took off – and our health system searched for ways to diagnose and monitor patients remotely - Professor He's innovative team continued to develop artificial intelligence (AI) technology to improve testing for eye conditions and other diseases.

Developing an AI system that can screen patients for eye disease, heart disease and stroke will enable health professionals to diagnose conditions earlier and improve access to screening services in regional and remote areas.

And in 2020 there was further recognition of the world-leading status of their work, when the Australian Government's Medical Research Future Fund (MRFF) granted the AI project almost $5 million over the next three years to take their technology from the lab to the clinic.

## How AI screening works

The team's high-tech integrated AI screening system is being developed in partnership with Australian company Eyetelligence Pty Ltd, the Monash eResearch Centre, St Vincent's cardiology and other health industry partners.

The team aims to improve accuracy by testing the system in primary care settings such as GP clinics, Indigenous health services, eye care clinics, and endocrinology and cardiology services.

After taking a photo of the back of the patient's eye, the non-invasive AI system scans for signs of disease and instantly prints a report on whether they need specialist assessment and treatment.

It uses AI to pinpoint subtle changes in the retina at the back of eye which show patients are at risk of sight loss from diabetic eye disease, glaucoma or age-related macular degeneration.

It also aims to identify those at higher risk of a heart attack or stroke, detecting changes in the retina to predict the risk of cardiovascular disease.

## Improving diagnosis

The new technology is being trialled with more than 1000 patients, including Indigenous people in remote communities, older Australians and people with diabetes. Professor He says that ultimately his team's new technology could help 1.3 million Australians with diabetes reduce their risk of sight-threatening complications while also tackling cardiovascular disease.

↗ **AI team: (from left) Zheng He, Professor Mingguang He, Jason Sun, Dr Liying Li and Dr Xianwen Shang.**

## Improving diagnosis

If adopted widely the system could see health professionals conduct scans locally, reducing travel time and costs for the patients while providing targeted referrals for optometrists and ophthalmologists.

"We want it to have an impact on these health conditions, improve diagnostic accuracy and ensure these tools are well received in the community," Professor He says.

"My ultimate aim is to use the technology to transform the way we practise medicine."

# Global brainstorm

CERA researchers have added international firepower to their quest to detect the early warning signs of Alzheimer's disease.

**A new international collaboration will accelerate research into the use of eye scans to identify people at risk of developing Alzheimer's disease.**

The BRAINSTORM consortium, led by CERA's Associate Professor Peter van Wijngaarden, unites international experts in brain pathology and imaging, ophthalmology and artificial intelligence.

The group aims to use eye scans to accurately pinpoint early changes in the retina that suggest someone is at risk of developing Alzheimer's disease.

Associate Professor van Wijngaarden says researchers hope to develop an early detection method for people at risk of the disease, to pave the way for new treatments and hopefully a cure.

"Changes in the brain caused by Alzheimer's disease can occur up to 30 years before the onset of memory problems, and there is an increasing focus on treatments to prevent or delay the disease," he says.

"But current tests to diagnose Alzheimer's disease – like PET scans and lumbar punctures – are invasive, expensive and not suitable for widespread screening programs.

"Their limited availability makes testing of new treatments much more difficult and slows down research to find new therapies.

"Access to a simple, inexpensive and non-invasive eye test could allow us to determine who is most at risk, and completely transform our approach to diagnosing, preventing and treating Alzheimer's disease."

**Scientists unite**

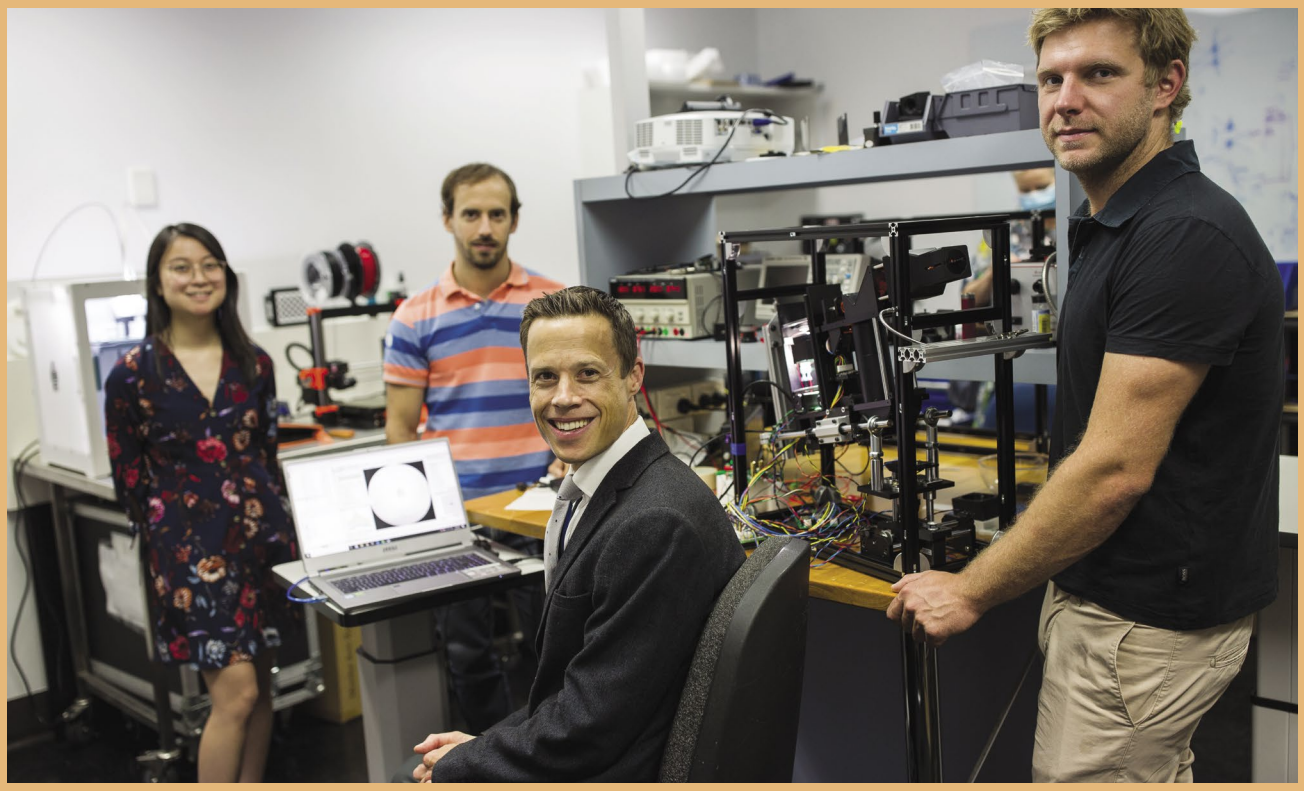
BRAINSTORM unites scientists from CERA, KU Leuven University, Belgium and Umeå University, Sweden and collaborators from University College, London.

The Victorian Brain Bank at the Florey Institute of Neuroscience and Mental Health and Lions Eye Donation Service will also be involved – providing tissues generously donated by people with Alzheimer's disease and neuropathological diagnosis in an effort to advance the detection and treatment of the disease.

The team will be funded over the next three years by Australia's National Health and Medical Research Council and the European Union's Joint Programme in Neurodegenerative Disease Research.

Their support for the project recognises how international collaborations drive advances in health and medical research, accelerating progress by pooling skills and resources, and reducing duplication.

The project will also provide opportunities for two talented PhD students to contribute to the research and receive joint testamurs from the University of Melbourne and KU Leuven.



These scholarships are funded separately by the two universities to celebrate and cultivate academic collaborations between these two leading institutions.

The international group will build on the CERA team's work to use hyperspectral imaging to identify early retinal changes that suggest someone is a risk of Alzheimer's disease.

**Powerful impact**

"By working together we can have bigger impact than just one group working alone," says Associate Professor van Wijngaarden.

The research has developed over many years thanks to the generous support from: the Yulgilbar Alzheimer's Research Program, the Pratt Foundation, H & L Hecht Trust, Joan Margaret Ponting Trust, Anne & Eldon Foote Trust, The Mason Foundation and National Foundation for Medical Research and Innovation, Cooper's Brewery Foundation, Michael Halperin, Steve Frisken and the Alzheimer's Drug Discovery Foundation.

↑ **Global collaboration: CERA members of the BRAINSTORM team (from left) Darvy Dang, Maxime Jannaud, Associate Professor Peter van Wijngaarden and Dr Xavier Hadoux.**

# Chasing down keratoconus

Researchers are using artificial intelligence to detect keratoconus earlier and improve the outlook for patients with the debilitating corneal condition.

**Erica Blake's daughters often wear bright pink socks in athletics races so she can see them from a distance.**

Erica was diagnosed with keratoconus at 17 and has since dealt – often creatively – with poor vision and a raft of expensive treatments, including two full corneal thickness grafts in the 1990s.

The debilitating eye disease causes the cornea to thin and gradually bulge outward into a cone shape. This distorts vision and may eventually require a corneal transplant.

Before the corneal transplant, Erica, now 45, struggled with contact lenses. The transplant succeeded initially, but her vision eventually deteriorated, requiring multiple transplants to reshape the cornea.

More recently, Erica has used modern contact lenses and may now consider a surgically inserted version. Her sister Prue, 53, also has keratoconus and has had transplants and a lifetime of eye issues.

"Due to the complexity of my eyes my surgeon is giving further consideration to all options," Erica says.

## Identifying risk factors

The Horsham-based sisters are now helping others as part of CERA's keratoconus research program.

This may also include Erica's daughters Della, 15, Acacia, 13, and Gretel, 9. All have signs of astigmatism and Della, who wears glasses, has all the keratoconus risk factors, including thin steep corneas.

Led by optometrist and CERA Senior Research Fellow Dr Srujana Sahebjada, the keratoconus research works to better identify genetic, environmental and clinical factors so it can detect keratoconus earlier, predict its progression, improve overall understanding, and better manage it.

Keratoconus mainly affects teenagers and young adults; one in 84 Australian 20-year-olds has the condition. The global prevalence rose five-fold from 1:2000 in 1986 to 1:375 in 2016.

When detected early, newer treatments that Erica and Prue missed out on, such as collagen crosslinking (CXL), which stiffens the cornea and slows its progression, can be offered.

## Making a difference

Dr Sahebjada established the Australian Study of Keratoconus (ASK), now among the world's largest keratoconus studies, in 2010. The team is using advanced imaging, artificial intelligence and genetic technology to better detect the condition.

One project is using images to develop an algorithm for early keratoconus detection. An algorithm was also developed to predict

whether cases will progress from mild to medium or serious.

"Earlier diagnosis will improve patient prognosis and reduce keratoconus' economic and social impact, which is huge," says Dr Sahebjada.

In 2020 Dr Sahebjada continued to investigate in-house clinical data and developed AI algorithms that can accurately and automatically identify eyes with early stages of the condition.

Working with Professor Mark Daniell and Professor Paul Baird, Dr Sahebjada also continued to develop the first global keratoconus classification/management system through the Keratoconus International Consortium they established.

It has more than 40 national and international members working to address gaps in keratoconus knowledge to prevent corneal blindness.

## Reducing the impact of keratoconus

Erica is acutely aware of keratoconus' impact. For her it has included countless expensive procedures and hundreds of 3.5 hour drives to Melbourne.

She has also noticed more people diagnosed locally. "If something goes badly wrong, the only option is to drive to Melbourne," she says.

Many procedures are not covered by Medicare or attract a tiny rebate. Erica is grateful that CERA's work is offering hope for better and more accessible treatment.

"It's amazing to see how far we've come," Erica says. "Who knows what's next?"

This research is supported by the Perpetual IMPACT Philanthropy Application Program, the National Health and Medical Research Council, the Victorian Lions Eye Research Fellowship and Keratoconus Australia.

↑ **Improving detection: Keratoconus patient Erica Blake has her eyes tested by Dr Srujana Sahebjada.**

# Future focus

Our new Health Services Research Unit will take a real-world approach to delivering better eye care to patients.

**The COVID-19 pandemic has thrown the need for new ways of delivering eye care services into sharp relief.**

Cancelled elective surgeries, restrictions of optometry services and concerns that patients have delayed treatment for sight-threatening conditions have led to predictions of a surge in serious vision problems as we emerge from the pandemic.

At the same time technology has come to the fore. Telehealth services have moved into the mainstream as clinicians look for new ways to diagnose and monitor disease without face-to-face appointments.

These technologies have the potential to transform the way we deliver eye care, but the right systems need to be in place.

And now CERA's new Health Services Research Unit is investigating solutions to help eye care providers navigate their way out of the pandemic and reduce the backlog of undiagnosed and untreated eye conditions.

Led by former Specsavers executive Peter Larsen in an honorary capacity, the new team will initially focus on tackling the COVID-19 backlog.

They will investigate how innovative new technologies, telemedicine and better coordination between different parts of the eye care sector could increase access to screening services, early treatment and prevent avoidable blindness.

**Data driven**

They will have a wealth of evidence at their finger tips – analysing de-identified data from more than 1.6 million optometry examinations at Specsavers to underpin their findings.

Evidence generated from the research will be used to formulate recommendations on how the eye care sector can evolve to improve health outcomes.

It will target diseases where blindness can often be prevented with early treatment such as diabetic eye disease, glaucoma, age-related macular degeneration and cataracts.

"Eye care services were struggling to meet demand before COVID-19 – with demand for Medicare-funded eye care services rising by about 5 per cent annually," says Peter Larsen.

"We will look at how we can better connect different parts of the system from optometrists to eye surgeons to increase access and improve the quality of care for patients."

A former CERA Board member, Mr Larsen brings great knowledge of delivering services to patients from his role at Specsavers.

This included introducing new systems and approaches which have improved the detection and referral for diseases such as glaucoma and diabetic eye disease – and support for the national diabetes eye care program KeepSight.

"Our research will focus on how to deliver services in the real world rather than the lab," says Mr Larsen.

The team also includes CERA's Head of Biostatistics Dr Myra McGuinness and Honorary Research Fellow Dr Joshua Foreman, who played a critical role in the first National Eye Health Survey.

The group is rounded out by the support of CERA Deputy Director Associate Professor Peter van Wijngaarden, who is also Clinical Director of KeepSight.

↑ **Real-world focus: Our new Health Services Unit, led by Peter Larsen, will investigate the best ways to deliver eye care to prevent vision loss.**

## Systemic approach

Another early goal is to eliminate the estimated 150 000 undiagnosed cases of glaucoma in Australia through better screening and detection.

"By having access to such a massive amount of data, our researchers can provide a framework for detecting glaucoma and help optometry practices measure patient outcomes and set benchmarks," he says.

"We want our research to have a tangible impact, so that in the future when eye health is measured in national surveys we will see fewer undiagnosed individuals."

# Through a child's eyes

**Identifying eye problems in active children is not always easy, as they don't often complain about them.**

Early detection is crucial for all children's eye diseases because eyes and vision continue to develop until the age of eight.

CERA Research Fellow Dr Sandra Staffieri has used more than 30 years of experience in paediatric ophthalmology to help families recognise problems and act.

Disease such as cataracts or the rare eye cancer retinoblastoma can be indicated by a turned eye or white pupil.

Dr Staffieri's recent University of Melbourne PhD investigated delayed diagnosis of retinoblastoma and explored ways this might be improved.

Her research, published in *Clinical & Experimental Ophthalmology* in 2020, reported the evaluation of an information pamphlet she developed for new parents and carers to recognise early signs of eye problems in children.

Her findings prompted the inclusion of eye health information into the *My Health, Learning and Development Record* book and Maternal and Child Health App for new Victorian parents.

As Retinoblastoma Care Coordinator at the Royal Children's Hospital, Dr Staffieri supports children with retinoblastoma and is passionate about reducing delays in diagnosis.

"We need to rely on parents observing signs that prompt a visit to the doctor or maternal child health nurse," says Dr Staffieri.

↑ **Early signs: Dr Sandra Staffieri is educating parents about children's eye health.**

# Preserving sight in pregnancy

**A CERA researcher's PhD could help prevent sight loss during pregnancy in women with types 1 and 2 diabetes. Her research may also influence new government guidelines for this at-risk group.**

Pregnant women with pre-existing diabetes are vulnerable to diabetic retinopathy which can cause severe vision loss or blindness if untreated. Eye checks are essential to catch the disease before it advances and becomes difficult to treat.

Dr Felicia Widyaputri and her PhD supervisor, Associate Professor Lyndell Lim, hope the project will improve early detection.

Dr Widyaputri is also working with Universitas Gadjah Mada colleagues in Indonesia to monitor diabetes prevalence and eye care access in Jogjakarta's pregnant women.

Australian guidelines recommend pregnant women with pre-existing diabetes have a comprehensive eye check in their first trimester, but Dr Widyaputri's PhD discovered that less than 50 per cent do.

Her study developed advice on when and how often pregnant women with diabetes should have eye checks.

A medical doctor planning to specialise in ophthalmology, Dr Widyaputri worked at Melbourne's Royal Women's and Mercy hospitals with 150 pregnant women who had pre-existing type 1 or 2 diabetes.

Their eyes were examined each trimester and when their baby was three months old, using a non-invasive imaging technique.

Funded by the Alfred Felton Bequest and the Australia-Indonesia Institute with some government support, the results could inform public health initiatives.

↑ **Health initiative: Dr Felicia Widyaputri and Associate Professor Lyndell Lim are investigating eye care for pregnant women with diabetes.**

# Making lives better


**When Ann Lally was first diagnosed with glaucoma she feared she would not be able see the faces of her grandchildren as they grew up.**

"Part of the grief of first learning that I had glaucoma was thinking about my grandchildren and seeing the milestones of their lives," says Ann.

Fortunately, Ann's glaucoma is stable and well managed thanks to surgery.

Finding new treatments to improve the lives of patients with eye disease is at the heart of all of our research at CERA.

Understanding how science had enabled her successful operation, Ann was keen to play her part in improving treatments for patients in the future.

She was one of more than 50 volunteers who participated in our world-first trial into the role of vitamin B3 in slowing the progress of glaucoma.

"Even if research doesn't help me today – it could make a real difference to helping someone else in the future," says Ann.

**Read about our vitamin B3 research on page 20.**

← **Future generations: Ann Lally (right) with granddaughters Ivy and Phoebe.**

# Vitamin B3's promise

Promising results in our pioneering study into the role of vitamin B3 in slowing the progress of glaucoma has sparked plans for a large international trial.

**CERA researchers are set to embark on a follow-up study into the role of vitamin B3 in preventing nerve cell damage in glaucoma, following the release of promising research findings in 2020.**

The results of our world-first study, led by former Managing Director Professor Jonathan Crowston and Research Fellow Dr Flora Hui, were published in *Clinical & Experimental Ophthalmology* in July 2020.

They showed improvement in the visual function of glaucoma patients who received a daily high dose of 3 grams of nicotinamide for 12 weeks in addition to their regular treatment to reduce eye pressure.

Following strong interest in the results, Dr Hui was named as the recipient of Glaucoma Australia's Quinlivan Research Grant.

The $200 000 funding will be instrumental in supporting the next phase of Dr Hui's research along with CERA Managing Director Professor Keith Martin and international collaborators including Professor Crowston (now at Duke NUS-Medical School Singapore), Professor Robert Casson from the University of Adelaide and Dr Peter Williams from the Karolinska Institutet, Sweden.

### Protecting nerve cells

Glaucoma is the world's leading cause of irreversible blindness, affecting more than 60 million people worldwide.

The disease, which leads to vision loss when cells in the optic nerve and retina are lost, is usually treated with eye drops or surgery to reduce eye pressure. However, there are currently no treatments to protect cells from further damage or to improve cell function.

"For the first time, we were able to show that daily high doses of vitamin B3 can lead to early improvements in patients who are also receiving traditional treatments to lower eye pressure," says Dr Hui.

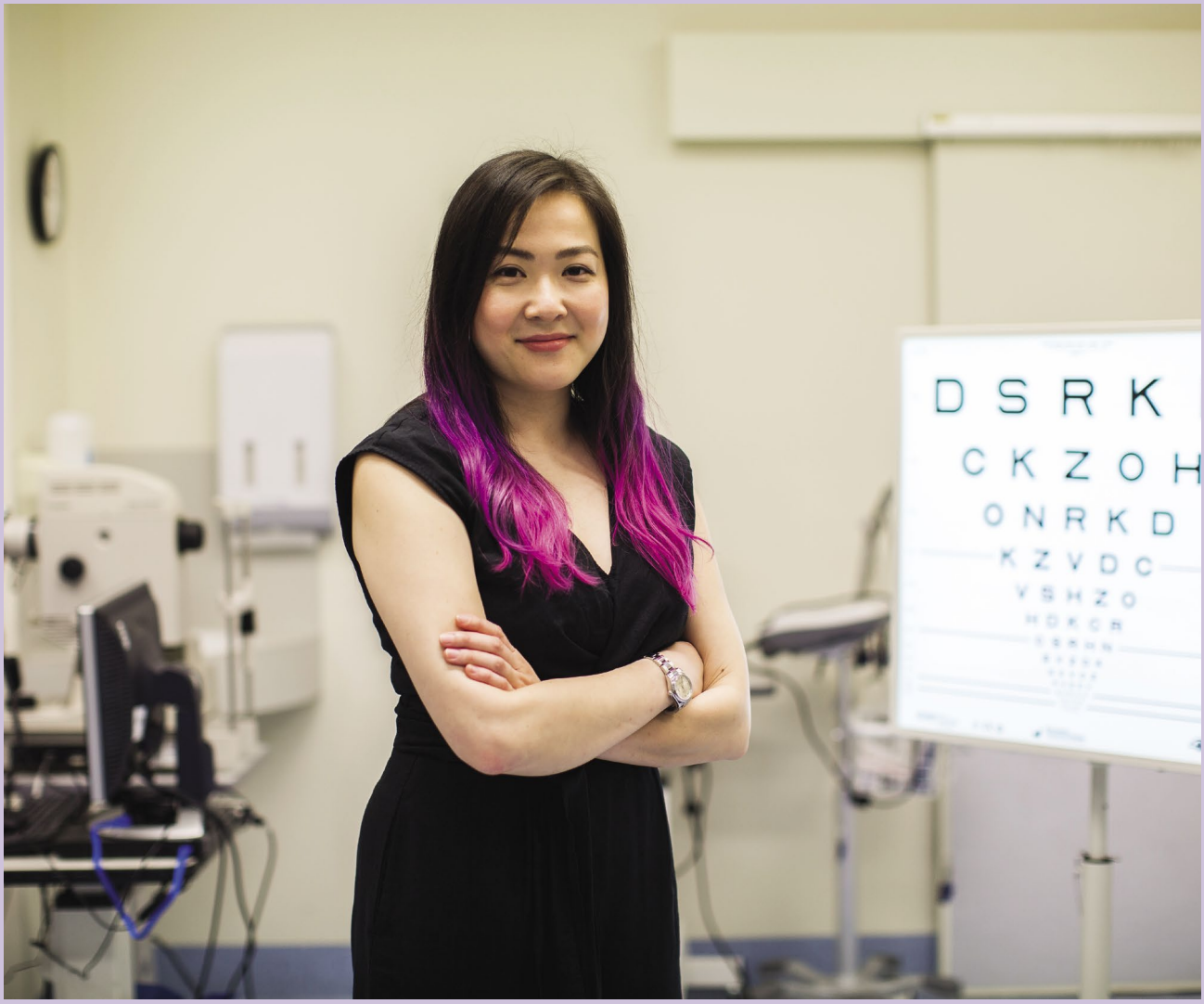
"Our follow-up study will help us determine if vitamin B3 should be taken on an ongoing basis by glaucoma patients."

### About the trial

CERA's initial trial followed 57 patients, all of whom received both placebo and vitamin B3 over the course of the study. The visual function of patients was tested using electroretinography, a diagnostic test which measures electrical activity in the cells of the retina, and visual field testing to determine any changes that occurred.

The trial found that in some people, high-dose nicotinamide improved how nerve cells were functioning in the eye. The follow-up trial will assess whether these improvements can help reduce disease progression over a longer period.

Earlier pre-clinical research in the US showed that vitamin B3 could prevent optic nerve degeneration – but this was the first time similar results have been witnessed in a human trial.




Dr Hui says the findings provide hope of a treatment that could protect nerve cells and damaged cells to function better.

"Like adding oil to a car engine to allow it to run smoothly, vitamin B3 could be used to protect cells from damage and help those that have been affected by glaucoma work better," she says.

**Research supporters**

Dr Hui and Professor Crowston's initial research was supported by the Jean Miller Foundation, Connie and Craig Kimberley Foundation, the Ophthalmic Research Institute of Australia, Jack Brockhoff Foundation, Marian and EH Flack Trust, Fund and Board of Research Faculty (Karolinska Institutet).

Dr Hui is grateful to receive Glaucoma Australia's Quinlivan Research Grant which will help support the next phase of her research.

↑ **Promising findings: Dr Flora Hui is set to conduct further research to determine if vitamin B3 can slow the progression of glaucoma.**

# Supporting glaucoma research

The Kimberley family's generous support is making a real difference for CERA's glaucoma research.

**A meeting with CERA's former Managing Director Professor Jonathan Crowston sparked Connie and Craig Kimberley's enthusiasm for CERA's research.**

Here, they met a passionate group of CERA researchers investigating the causes of eye diseases and new treatments.

"We were absolutely blown away by the young people and the commitment they had to eye research. We were so impressed that we sat down and worked out what we could do to help," says Craig Kimberley OAM. "They left an incredible impression on us."

Professor Crowston remembers feeling equally affected by the Kimberleys' dedication to philanthropy and their desire to make a difference to people affected by vision loss and blindness.

"It was a privilege meeting Connie and Craig and working with them to find the best way to support our research. It was the start of a wonderful relationship between the Kimberley family and CERA," says Professor Crowston.

The connection has continued to prosper as new faces have joined the leadership team.

"CERA's current Managing Director, Professor Keith Martin, is equally outstanding. He's been a continuation of the dedication we saw in Jonathan and his team," says Connie.

The Kimberley family founded Just Jeans and have been involved in the clothing and textile industry for over 60 years. In 2010, they established the Kimberley Family Foundation as a way to support philanthropic causes.

"We've been fortunate in our business life and, in turn, we want to give back to the community," says Craig.

CERA is incredibly grateful for the support of the Kimberley Family Foundation, which has donated $1 million to CERA's glaucoma research.

The Kimberleys' generous gift has enabled CERA to lead a world-first clinical trial showing the important role vitamin B3 could play in protecting against blindness in glaucoma.

"Individual philanthropists like the Kimberleys help to accelerate progress in medical research and development," says CERA's Head of Philanthropy, Sarah Rainbird.

"Philanthropy already has, and continues to have, a significant impact on medical research by closing critical funding gaps and supporting blue sky research that might not fall within the Federal Government's funding criteria.

"It has been a pleasure to keep the Kimberleys informed about the tremendous impact of their gift. Because of their support, CERA's

glaucoma research continues to accelerate. The team is now launching a follow-up vitamin B3 trial – a large international study," she says.

This research is particularly close to the couple's heart as Connie herself was diagnosed with advanced glaucoma several years ago.

"It's totally life-changing," says Connie.

The Kimberleys support medical research to create a brighter future for the community and generations to come.

"People need to fund research," says Connie. "The team at CERA are wonderful people and we've felt privileged to be a small part."

↑ **Life-changing research: Connie and Craig Kimberley OAM's generous support has been instrumental in advancing CERA's glaucoma research.**

# Gene therapy hope

Professor Keith Martin has led a research team which used gene therapy to regenerate damaged optic nerve fibres, in a discovery that could help treat glaucoma.

**Results of gene therapy research released in 2020 have raised hopes of new glaucoma treatments that could repair optic nerve damage.**

The pre-clinical study, led by Professor Keith Martin from the Centre for Eye Research Australia and University of Melbourne and Dr Richard Eva, Dr Veselina Petrova and Professor James Fawcett from the John van Geest Centre for Brain Repair at the University of Cambridge, was published in *Nature Communications*.

Professor Martin says the findings bring hope of future treatments which could repair the nerve damage that causes blindness in glaucoma and potentially even restore sight.

Around 60 million people worldwide have glaucoma, a disease caused by progressive damage to the optic nerve, which transfers visual information from the eye to the brain.

Conventional treatments focus on reducing eye pressure to prevent optic nerve damage, but they do not work for about 15 per cent of patients and there is currently no way to repair damaged nerve cells.

## Powerful techniques

Professor Martin says the results of the study are promising.

"What we've seen is the strongest regeneration of any technique we've used before," he says.

The team tested whether a gene responsible for producing a protein known as protrudin could stimulate the regeneration of nerve cells and stop them from dying.

They used a cell culture system to grow brain cells in the lab and then injured them using a laser, before introducing a gene to increase the amount of protrudin in the cells, vastly increasing their ability to repair.

Tests of eye and optic nerve cells found the protein enabled significant regeneration weeks after a crush injury to the optic nerve.

The research demonstrated almost complete protection of nerve cells from a mouse retina growing in cell culture, a technique which would usually be expected to result in extensive cell death.

## Continuing collaboration

The international team is continuing its collaboration in Melbourne and Cambridge. Professor Martin says next steps are to explore the ability of protrudin to protect and regenerate human retinal cells.

Ultimately, they hope to test the technique in clinical trials although that is still several years away.

The research was supported in the UK by The Medical Research Council, Fight for Sight, The Bill and Melinda Gates Foundation, Cambridge Eye Trust and National Eye Research Council.


↑ **Powerful techniques: Professor Keith Martin's team have used gene therapy to regenerate the optic nerve in pre-clinical studies.**

# Anti-scarring agents

CERA's ocular fibrosis researchers are striving to find safe and effective ways to stop scarring after glaucoma surgery.

**As a glaucoma surgeon and researcher, Dr Jennifer Fan Gaskin is devoted to discovering new ways to control scarring after glaucoma surgery, giving patients the best chance of keeping their sight.**

"Any vision loss from glaucoma is irreversible, so it's essential that we do everything we can to slow or stop the progression of the disease, protecting the sight the patient has left," says Dr Fan Gaskin, who leads CERA's ocular fibrosis research.

Along with colleagues Dr Elsa Chan and Dr Manisha Shah, her research aims to find new glaucoma treatments that can prevent blindness and maintain a patient's quality of life.

## Glaucoma causes

Glaucoma affects the optic nerve, the connection between the eye and brain. The most common cause is too much fluid build up in the eye, which applies pressure on the optic nerve, causing injury.

The first line of treatment for glaucoma is usually medicated eye drops or laser therapy to reduce this eye pressure. For some patients, however, filtration surgery may be necessary.

In this procedure, surgeons create an extra 'drain' in the eye that can release excess fluid, reducing pressure and protecting the optic nerve from further damage.

While glaucoma surgery is generally a very effective treatment, the body's natural healing response – forming scar tissue – can block the newly created drain.

## Preventing scarring

"This is one instance where we don't want this natural scarring response – we need the drain to stay open and keep working," Dr Fan Gaskin says.

"If scarring causes the surgery to fail, then the eye pressure will go back up, the disease will progress, and the patient could continue to lose vision and eventually go blind. Currently, anti-cancer drugs are used to control scarring in glaucoma surgery. While these are effective, there are some downsides.

"Because these drugs are harsh and non-specific, they have some unfavourable risks and can damage the healthy tissue around it," Dr Fan Gaskin explains. "Our goal is to find a less toxic, more specific and highly effective anti-scarring medication to improve the safety and efficacy of glaucoma surgery."

The team is investigating several possible drugs, including an antioxidant compound.

While the research is still in the laboratory phase, Dr Fan Gaskin is hopeful that an effective solution will be available in the not-to-distant future.

CERA's ocular fibrosis research is supported by an Ophthalmic Research Institute of Australia grant.

→ **New solutions: Dr Manisha Shah, Dr Jennifer Fan Gaskin and Dr Elsa Chan are searching for new ways to stop scarring from glaucoma surgery.**

# Working together

"I'm very excited by the plans for gene therapy trials and the capability we have here." – Associate Professor Lyndell Lim

**Clinicians, scientists and industry working closely together helps accelerate the pace of research and develop better treatments for patients.**

Clinical trials play a vital role in this process. An expertly run trial gathers the evidence needed to determine if a treatment is safe, effective and can make a difference for someone with eye disease.

In 2020, CERA's Clinical Trials Research Centre (CTRC) managed 20 clinical trials and collaborated with industry partners ranging from small start-ups to large international pharmaceutical companies.

Despite the challenges of the COVID-19 pandemic, the team kept trials running safely and delivered sight-saving treatments to patients.

"Strong relationships with industry trial sponsors were critical in keeping trials operating safely," says Head of Clinical Trials Research Associate Professor Lyndell Lim.

The team continued its work to expand access to trials for patients with eye disease outside of central Melbourne and is optimistic about 2021.

"I'm very excited by the plans for gene therapy trials and the capability we have here at CTRC," says Associate Professor Lim.

**Read more about our Clinical Trials Research Centre on page 32.**

← **Clinical Trials Research Centre staff (from left) Angelica De Guzman, Marios Constantinou and Lilian Stojimenov.**

# Creating an eye drop alternative

**Daily eye drops are an essential part of glaucoma treatment but they can be difficult to use and many patients forget to take them.**

"Many patients have told us they don't like using eye drops," says Dr Russell Tait, chief executive officer of Melbourne ophthalmic biopharmaceutical company PolyActiva. "They can cause surface irritation and red eyes and using them over the longer term ends up being quite uncomfortable."

To create a better solution, PolyActiva has developed the Latanoprost FA SR Ocular Implant – a tiny implant that slowly releases glaucoma medication into the eye over six months before biodegrading.

In 2020, the company successfully completed a Phase I clinical study at CERA which showed the device was safe and well tolerated with no significant safety findings. The company has now initiated a Phase Ib study at nine clinical trial sites around Australia, including CERA.

Dr Tait said CERA had been involved in the project since its pre-clinical stages. The expertise of Professor Jonathan Crowston, Dr Nathan Kerr and Associate Professor Michael Coote was critical.

"It's an example of the effective collaboration between industry and academia that happens in Melbourne," says Dr Tait.

CERA Managing Director Professor Keith Martin says the collaboration demonstrates how CERA's expertise can benefit small local companies developing new ophthalmic therapies and devices.

↑ **New approach: Patient Peter talks with CERA's Dr Nathan Kerr and PolyActiva's Dr Russell Tait.**

# Fast tracking transplant technology

**Research to improve corneal transplants for millions of patients is on the fast-track to clinical trial.**

CERA's corneal researchers and University of Melbourne colleagues have received the funding from the Victorian Medical Research Acceleration Fund (VMRAF) to develop a surgical device known as 'CorGel'.

The ultra-thin hydrogel film is used to insert donor corneal tissue into a patient's eye to restore vision. After surgery the gel dissolves safely into the body.

The $500 000 grant will fund pre-clinical work with the University of Melbourne and US eyebank Eversight.

Professor Mark Daniell, CERA's Prinicipal Investigator of Corneal Research, says the team hopes to move the technology into a clinical trial and do the first human study.

Damage to the cornea, the clear front window to the eye, from injury and diseases such as Fuchs' Dystrophy is a leading cause of blindness globally.

Historically, the surgery has involved cutting through all layers of the cornea to remove the affected part. But where damage is limited to the innermost layer of the eye, a newer technique replaces only this layer, the endothelium. The procedure is called Descemet's Membrane Endothelial Keratoplasty, or DMEK.

It can be a difficult surgery and CorGel has the potential to be a game changer.

↑ **Fast-track: Professor Mark Daniell is aiming to take CorGel research to clinical trial.**

# Testing times

A global pandemic could not stop our Clinical Trials Research Centre from continuing its critical work testing new treatments for eye disease.

**Challenging, unprecedented, unpredictable. The Head of CERA's Clinical Trials Research Centre (CTRC) Associate Professor Lyndell Lim says the adjectives many people have used to describe 2020 apply to the situation her team found itself in when COVID-19 arrived in Australia.**

"But I would also say it was a learning experience, and our team quickly embraced the changes we had to make," she says. "Even though there was a lot more physical distancing, we became a more cohesive team."

When the pandemic hit, CTRC was managing 20 clinical trials involving almost 70 patients, testing new treatments for eye diseases ranging from diabetic macular odema to uveitis. There were also seven other trials operating in other research teams at CERA. In addition, there were also several other trials in the pipeline, which were set to start recruiting new patients.

Once a participant has started receiving a treatment in a trial, it's critical their care continues. Adding to an already complex situation, many of CTRC's patients are immunosuppressed or have pre-existing conditions which may make them even more vulnerable if they catch the virus.

"The most important priority was to make sure that everyone – patients and staff – was safe and felt safe," says Associate Professor Lim.

Already stringent safety and hygiene measures were further strengthened to meet COVID-safe standards. A rigorous pre-appointment screening program was introduced and CTRC staff adhered to strict physical distancing both inside and outside of clinic.

### Strong relationships

Strong relationships with industry trial sponsors were also critical in keeping trials operating safely.

Sponsors provided additional personal protective equipment for staff and patients and perspex guards for eye examination equipment in some trials.

"Sponsors were able to continue many of their trials in Australia because of the comparatively low COVID-19 numbers compared to some international sites," says Associate Professor Lim.

"They were very responsive to working with us so we could fulfil any requirements to keep our patients and staff safe.

"Of all the trials we had underway at the start of the pandemic, only one was permanently closed as a result of it. None of our patients dropped out – and we are now at the point in 2021 where we have begun recruiting for new trials."

### Rise of telehealth

Like many other parts of the health system, clinical trials staff also increased their use of telehealth to minimise in-person patient contact.

While patients still needed to attend clinic in person to receive treatments, many follow-up visits were conducted on the phone or via videoconference – or these methods were used to shorten the time of face-to-face appointments.

And after a tough year, Associate Professor Lim is looking ahead to 2021 with optimism.

"I'm very excited by the plans for gene therapy trials and the capability we have here at CTRC to assess and deliver gene therapy," she says.

"We have the ideal model of a dedicated clinical trials site and the expertise in gene therapy to make Melbourne a specialist centre for ocular gene therapy research."

She says the experience has shown the value of telehealth which will have a long-lasting impact on the way trials are offered and ultimately increase access for patients.

↑ **Patient focus: The safety of trial participants was paramount throughout the pandemic.**

## Increasing access

The establishment of an Eye Trial Network branch in Rowville in 2019 also proved to be another benefit during the pandemic.

The site continued to operate without the need for patients to travel far from their homes to be involved in trials.

And despite the many challenges of 2020, the CTRC continued to expand its network to increase access to trial locations outside of central Melbourne. An agreement with Eye Surgery Associates will provide trial access in the south-eastern suburbs, particularly for patients with retinal conditions and glaucoma.

"We've now demonstrated that our network model can work - and that we can provide trials on other sites," says Associate Professor Lim.

"In the future we hope to keep expanding so that we can offer patients access to trials in even more locations and regional areas."

# Future vision

**The Australian bionic eye has captured the world's attention after a landmark clinical trial at CERA showed that it's capable of improving functional vision in blind patients.**

A bionic eye works by stimulating visual impulses in people who have lost their sight. It gives a 'sense of vision' by producing flashes of light called phosphenes that can help patients detect edges, shapes and movement.

The Australian bionic eye comprises an electrode array that is inserted surgically into the eye, coupled with external components that capture images and translate them into electrical signals.

This second-generation device improves on the original prototype, trialled in 2012. It includes a larger field of vision to improve navigation and a portable design to test the device outside the lab for the first time.

Four Victorian participants took part in the rigorous two-year trial to assess the new device's safety and whether it could produce the phosphenes that would help them navigate and locate objects.

The National Health and Medical Research Council and commercial partner Bionic Vision Technologies (BVT) funded the trial.

All participants have severe vision impairment from an inherited eye disease called retinitis pigmentosa. Patients with this condition are perfect candidates for a bionic eye. While they have lost the cells that produce sight, they still have nerve tissue that can be stimulated to produce visual impulses.

For the trial volunteers, participation was largely altruistic – a chance to contribute to a better future for other people who have lost vision from retinitis pigmentosa.

### Making history

"I saw being involved as a history-making opportunity for vision impaired people," says participant Colleen Knowles.

Before the trial, participants could only perceive light and dark. They could not detect objects and hadn't been able to

navigate independently for at least 15 years.

But after several months of training to learn how to interpret the electrical signals from the bionic eye, all four could perceive – and navigate – the world around them.

"The first time we went outside I actually got a shock to know that there were so many trees on the nature strip!" says Colleen. "I've now become a people watcher. I'm checking things out all the time.

"It's been amazing to navigate around certain objects and find something on the table instead of knocking it over and breaking it."

## Enriching lives

The bionic eye trial showed that it was safe and enriched the patients' lives in many ways.

One gained more enjoyment from live theatre because he could gauge people's location. Another could more easily locate tools and machinery in woodwork class. Increased motivation, feeling more energetic and positive, and a greater sense of belonging in a gathering were other positive outcomes described by participants.

Associate Professor Penny Allen, CERA's Principal Investigator on the Bionic Eye Project acknowledges the "huge collaborative effort" it took to produce these ground-breaking results but credits the participants' dedication as a key factor.

"We are so grateful for the support they have provided," she says.

## Where to next

In late 2020, BVT received $1 million funding from the Medical Research Future Fund to further develop the device's visual processing.

Learnings from this important clinical trial will be used by BVT for the next phase of bringing the bionic eye to more people with blindness.

↑ **Team effort: The Bionic Eye Project has been a huge collaboration including (from left) Dr Matt Petoe, from the Bionics Institute, patients Sefa 'Sam' Kuzu, Mark Boyd, Colleen Knowles (with guide dog Freeman) and Scott Nixon, CERA's Associate Professor Penny Allen and a host of other partners. The patients are holding awards thanking them for their involvement in this pioneering project.**

# Field tests get smart

Dr George Kong is developing new technology to make smartphones a vital weapon in the battle against glaucoma.

**One of the most challenging aspects of treating glaucoma is that many patients do not realise they have the disease until they've suffered irreversible vision loss.**

"The problem is that about 50 per cent of people with glaucoma are undiagnosed," says Dr George Kong, an ophthalmologist and Honorary Researcher at the Centre for Eye Research Australia.

"In the early stages, glaucoma is asymptomatic, so people will not know they have a problem. Even if someone has been diagnosed early, we sometimes see patients in clinic whose vision has deteriorated rapidly between appointments without them noticing it."

In the early stages of glaucoma, because much of the damage occurs in the peripheral vision, patients do not know they are losing their sight until significant damage has occurred. However, early detection and treatment can help prevent vision loss.

## Difficult diagnosis

Even when patients do attend an eye examination, it can be difficult to accurately assess the disease.

The traditional visual field test – which relies on a patient clicking a button to indicate whether they can see small spots of light that are beamed into their peripheral vision – is subjective and difficult for many patients to complete.

"I want to create a simpler, accurate, objective visual field test that a patient can take in less than five minutes to detect any changes in their vision," says Dr Kong, who is also a glaucoma specialist at the Royal Victorian Eye and Ear Hospital.

His plan is to develop a smartphone test using artificial intelligence to check for early changes or monitor vision changes between eye examinations. The ultimate aim is to detect many of the currently undiagnosed cases of glaucoma in the community.

## Home monitoring

Dr Kong says the COVID-19 pandemic has highlighted the need for technologies that allow patients to monitor their vision at home.

"During the COVID-19 lockdowns many patients could not visit their optometrist or ophthalmologist and a test like this will enable them to monitor their vision in an objective way. When resources are scarce it can also help our health services free up clinical resources for the most urgent patients."

Dr Kong says the eye test could also be a game changer in remote regions and developing countries.

"Even in places where there is a lack of specialist equipment or trained professionals, the smartphone in ubiquitous," he says.

"The smartphone technology could be used by people to monitor their own vision, or by health care workers in the field who are not eye specialists."

### Innovation Fund

Dr Kong's research is one of four projects supported in 2020 by the CERA Innovation Fund to help kick-start research that has clinical or commercial potential.

CERA's Head of Commercialisation and Legal Tena Cheng says the fund aims to accelerate the translation of research from the lab to the clinic to benefit patients.

"The Innovation Fund help researchers deliver proof of concept data or develop projects to the point where they can attract further commercial investment or funding from traditional sources like the National Health and Medical Research Council," she says.

The CERA Innovation Fund is generously supported by the Estate of the late Ruth Chitty.

### 2020 Innovation Fund recipients

Dr Carla Abbott – creating a new technique to improve the effectiveness of gene therapy.

Dr George Kong – developing technology to deliver visual field testing for glaucoma via a smartphone.

Associate Professor Peter van Wijngaarden, Dr Xavier Hadoux and Maxime Jannaud – developing annotation software to improve retinal imaging.

Dr Raymond Wong – investigating the use of CRISPR technology to rescue splicing defects in inherited retinal disease.

↑ **Smart approach: CERA Head of Commercialisation and Legal Tena Cheng and Honorary Researcher Dr George Kong check out the new smartphone technology.**

# Pandemic progress

**COVID-19 did not slow Professor Robyn Guymer AM and her team in 2020. She had to pivot but the CERA Deputy Director and Head of Macular Research enjoyed a productive year.**

Professor Guymer continued to help coordinate her team's Australian projects while completing a sabbatical year as a visiting professor with Hoffmann La-Roche, in Basel Switzerland where she worked as a Global Principal Medical Director.

Like many of her CERA colleagues, she continued to progress her research despite the constraints of the pandemic.

In 2020 she was invited to deliver the Macula Society's prestigious W Richard Green Award and Lecture.

Professor Guymer also won a National Health and Medical Research Council (NHMRC) Investigator Grant to fund her work for five more years.

This followed a $5 million NHMRC Synergy grant in 2019 to support research into the genetic and other causes of a subgroup of age-related macular degeneration, which is associated with a higher risk of vision loss.

Professor Guymer is leading the Synergy work undertaken by several teams investigating the specific cause for this high-risk AMD phenotype which is characterised by deposits called reticular pseudodrusen (RPD).

**Continued page 40.**

← **Forging ahead: Professor Robyn Guymer AM and her team continued to progress their research in 2020.**

## Powering through a pandemic

(continued from page 39)

CERA's Macular Research Unit (MRU) is a world leader in describing the early changes in eyes with AMD, including the first signs of cell death in the retina and high-risk RPD deposits.

They are using this expertise to apply it to developing, with international colleagues, artificial intelligence (AI) algorithms that can detect changes in the retina that might predict who will have a progressive disease and who will not.

As part of the AI and the Synergy grant work, the team now has access to the UK Biobank, which has thousands of retinal scans to analyse using AI and the participants' genotypes.

The Synergy grant united researchers from CERA, WEHI, and the University of Melbourne. Dr Carla Abbott took on the role of the project manager of this large project in 2020 and is working to invite several international groups to join.

"To find new genes that might be associated with RPD we need thousands of cases, which is why we need not only the international cohorts but also AI algorithms to run on the images of other cohorts, who don't have the clinical information, to get the numbers we need," Professor Guymer says.

## Artificial intelligence

Two first-in-human trials, conducted by the MRU and sponsored by international companies, were put on hold in 2020 due to COVID-19.

Instead, team members used their time to learn new annotation skills to help contribute to their AI research.

"We continue to answer important research questions, but made use of the many thousands of images we already had collected of eyes with AMD," says Professor Guymer.

"Virtually the entire MRU team upskilled in grading and annotating images to work on our artificial intelligence research.

"This is a very important step in the process of developing algorithms that will allow us to find markers in eyes that would increase the risk of progressing to vision loss."

## Shifting focus

An enforced delay in starting several human trials until 2021 allowed more focus on work that didn't require our clinical researchers to physically see patients.

"It was actually a very productive year in terms of our research," Professor Guymer says. "We were able to finish off projects, get our processes all streamlined, and learn new skills.

"We started working on many of our international collaborating agreements which need to be in place so that we're ready to get going on doing our Synergy project in 2021," Professor Guymer says.

"In addition, in 2020, despite COVID, we finished the five-year follow-up of the first trial of a novel Australian nanosecond laser treatment which aims to slow AMD progression. The results are currently in a manuscript under peer review."

## Incremental change

Professor Guymer has led the MRU since she established it in 1997 and oversees around 18 researchers and students, all seeking to prevent vision loss from AMD.

She has seen big improvements in the treatment of one form of late AMD, known as 'wet AMD', where vessels bleed and destroy the retina.

But there is still a great need to treat the disease early to stop or slow progression, and to be able to treat the other late vision-threatening complication which kills cells, known as 'dry AMD'.

"The problem is that currently you have to wait until the disease is quite far down the track before you can intervene," Professor Guymer says. "We've been trying, and have been quite successful, in identifying what are called early biomarkers that we hope will enable trials of new treatments to begin earlier in the disease process, before irreversible damage occurs."

The MRU also hopes to continue to develop a network of community-based optometrists who have a very important role to play in identifying and referring people with early stages of AMD into trials and other research projects.

↑ **Productive year: Clinical trial coordinator Tony Pham was one of many staff members who kept CERA's macular research progressing throughout the pandemic.**

# Open for transplants

Since it started 30 years ago, the Lions Eye Donation Service has never closed down, and staff weren't going to let a global pandemic break that record.

**When someone donates their eye tissue after death, it can become a life-changing gift. It has the power to restore vision through corneal transplant surgery.**

It can also be donated to medical research to help scientists better understand and treat blinding eye diseases.

As one of Australia's largest providers of donated eye tissue, the Lions Eye Donation Service works around the clock.

The small team coordinates all aspects of the donation process – from talking to families about the option to donate, to surgically removing the eye tissue and allocating the donation to hospitals and researchers.

"It's challenging and often emotionally draining work," says senior coordinator Dr Prema Finn, who has worked at the service for 20 years. "But at the end of the day, it's incredibly rewarding."

## Stringent standards

The service has always had stringent safety and hygiene protocols. But when COVID-19 hit, it took on even greater precautions to protect staff and transplant recipients.

"Initially so little was known about this infectious virus so we had to be really conservative with donor selection. If a potential donor had any warning symptoms like fever or cough, we were unable to accept the tissue," says Dr Finn.

Delays in medical supplies like masks and face shields arriving from overseas created additional challenges.

When elective surgery was cancelled in Victoria and scheduled corneal transplants could not go ahead, the eye bank had to adapt yet again. Working quickly, the service managed to navigate the logistics of reduced air transport to reallocate donated corneas to New Zealand and other Australian states not impacted by lockdown.

"Despite the challenges of COVID-19, the Lions Eye Donation Service facilitated 279 eye donations which resulted in 473 sight-saving corneal transplants. The eye bank also provided 30 donations to research institutes like CERA, allowing scientists to continue making important discoveries during the pandemic.

"In 30 years we have never closed, and we didn't during the pandemic either," says Dr Graeme Pollock OAM, Director of the Lions Eye Donation Service.

"I'm proud that we were able to continue to provide our service 24/7, without compromising quality or safety. Flexibility and adaptability have been built into the Lions Eye Donation Service simply because of the type of work that we do – the environment is constantly changing and often unpredictable," he says.

"We are also fortunate in having a good skill spread among staff. This meant that if

any of our coordinators had to go into quarantine or isolation, we had a backup workforce to continue providing our essential service."

## Solace in dark times

Victoria's lockdowns were a difficult time for many people – especially those grieving the death of a friend or relative. But as Dr Finn discovered, being able to donate a loved one's eyes could provide solace in these dark times.

"Families of donors have expressed gratitude that our service has allowed something positive to bloom in some of the worst days of their lives," she says.

"The fact that their loved ones were still able to give the gift of sight was something many families took great comfort in."

The Lions Eye Donation Service is a collaboration between CERA, the Royal Victorian Eye and Ear Hospital, University of Melbourne and the Lions Clubs of Victoria and Southern New South Wales. The service has since given back to the community many times over, performing more than 7000 corneal donations and providing eye tissue for over 15 000 transplants.

↑ **Saving sight: Lions Eye Donation Service Director Graeme Pollock OAM led a team delivering corneal transplants throughout the pandemic.**

# On the pandemic frontline

**Registered nurse Heather Machin is usually to be found hard at work for the Lions Eye Donation Service, as a project officer in the small team that facilitates hundreds of corneal transplants every year.**

The service continued to operate throughout the pandemic, providing an important link between hospitals, patients and the families of donors, but at the height of the crisis, Ms Machin joined the effort to tackle COVID-19.

She moved into a pilot telehealth program run by community health provider cohealth and spent two months coordinating a team of nurses supporting isolated and vulnerable members of the community who were diagnosed with COVID-19.

Ms Machin and her telehealth team contacted people who had tested positive to assess any social risk factors that may affect their ability to self-isolate. It was a diverse group of people, many with complex needs. The nurses advised positive clients on the support they could receive to isolate safely, linking them with practical help and support services as well as checking on their health and wellbeing.

It was an eye-opening experience about the turmoil a positive result could place on someone's life – particularly if they were already doing it tough.

At the same time, Ms Machin was continuing work on her PhD about if Australia should export corneas.

When Victoria's COVID numbers dropped, Ms Machin returned to her role at the eye bank, but the experience will stay with her.

"It was a really rewarding and invigorating experience to be able to help," she says.

↑ **Crisis response: Heather Machin joined Victoria's COVID-19 effort.**

# International research recognition

**Dr Zhichao Wu's efforts to find better treatments for age-related macular degeneration and glaucoma have been recognised with a major international award for early career optometrists.**

Dr Wu's work has already led to improved detection methods and expedited the discovery of possible treatments for early eye diseases.

In 2020 he was awarded the prestigious American Academy of Optometry Irvin M and Beatrice Borish Award.

The winner is described as an outstanding early-career scientist or clinician-scientist to have shown exceptional promise conducting independent research related to etiology, prevention, detection, diagnosis, or management of clinical ocular disorders.

It was during his early years in clinical practice at the Australian College of Optometry that Dr Wu fully appreciated the impact of age-related macular degeneration.

"What really struck me was when I first saw a person that came in with bleeding in her eye because of AMD," he recalls. "Surely in the 21st century we should be able to do something to prevent this from happening."

Dr Wu wants to help the one in seven Australians aged over 50 with AMD, which has no cure and affects the macula – the central part of the retina at the back of the eye.

He is using new technology to assess deposits in the eye that cause AMD, and also worked with CERA Deputy Director Professor Robyn Guymer AM, and other collaborators to trial nanosecond laser technology, which hits cells in the eye with light that is thought to trigger healing.

Dr Wu is also undertaking research to prevent irreversible vision loss from glaucoma.

↑ **Outstanding research: Dr Zhichao Wu has been honored for his early career impact.**

# Maintaining the momentum

## Despite the challenges, 2020 was a huge year for Dr Carla Abbott.

**Dr Abbott spent the year contributing to three major research projects, received funding to kickstart an innovative research idea, was recognised for her contribution to CERA as an early career researcher and earned a place on an emerging leaders program.**

Dr Abbott was already established in her work on developing a bionic eye for those with advanced retinitis pigmentosa, studies into age-related macular degeneration, and pre-clinical research on gene and cell treatments for retinal disease, so the impact of lockdowns was manageable.

In 2020, Dr Abbott became Research Project Manager on the new Synergy research collaboration between CERA, the University of Melbourne, WEHI and international partners, to learn more about a sub-group of people with age-related macular degeneration who are at high-risk of central vision loss. Her unique mix of basic science and clinical research skills made her a perfect candidate for the role.

"When I started my PhD there were new retinal and optic nerve imaging modalities becoming available and researchers and clinicians were able to start solving problems using these non-invasive technologies," she says.

"The application of the new imaging techniques to understanding more about retinal and optic nerve disease and assessing potential therapies is still a very exciting and dynamic field of research."

Her hard work within a ground-breaking team has seen her named a *veski inspiring women in STEM side by side* participant.

The professional development program supports mid-career emerging leaders to progress in the Science Technology Engineering and Mathematics industry, with career workshops, industry networking, leadership skills, and developing impact frameworks.

"I am passionate about the eye health sector, the importance of research and evidence-based practice and wish to contribute in a meaningful way to the growth and development of the sector into the future," she says.

In 2020, Dr Abbott also received funding from CERA's Innovation Fund to further her work into a novel device to improve the effectiveness of gene therapy.

Dr Abbott was also recognised for work throughout the year when she won CERA's Hitesh Peshavariya Award for 2020. This award is made in honour of the late Dr Hitesh Peshavariya (1976-2017) to an outstanding early or mid-career researcher.

↖ **Positive focus: Dr Carla Abbott was recognised for her research and leadership in 2020.**

# National partnership puts hope in sight

Support from the National Stem Cell Foundation of Australia has accelerated funding for CERA's gene therapy research to prevent blindness and restore sight.

**CERA Principal Investigator Retinal Gene Therapy Research Dr Tom Edwards is developing a gene therapy for an inherited eye disease that causes irreversible vision loss.**

In 2020, the life-changing potential of this research earned him a coveted place in the National Stem Cell Foundation of Australia's Matched Funding Program.

"CERA's gene therapy research fits with the Foundation's mission to fund and promote stem cell science that may lead to cures of currently untreatable diseases," says the Foundation's General Manager Graeme Mehegan.

"Dr Edwards' team has the experience and expertise to undertake this important and exciting research."

The Foundation's program matches up to $50 000 in donations raised by the recipient organisation, providing $100 000 to a successful research project.

CERA's inaugural Hope in Sight Giving Day – coinciding with World Sight Day – was the perfect platform for supporters to get behind Dr Edwards' research. For 24 hours, all donations were tripled by matching partners the National Stem Cell Foundation of Australia and the CERA Foundation.

"Many of our supporters have personal experience with the devastating vision loss caused by inherited eye diseases. Our Giving Day was an exciting opportunity for donors to triple their impact," says CERA's Head of Philanthropy, Sarah Rainbird.

"We are incredibly grateful for the support of the National Stem Cell Foundation of Australia, as well as the CERA Foundation and our many generous donors. Through this combined effort we raised over $165 000 – exceeding our target of $150 000," she says.

"The Hope in Sight Giving Day was a great success," says Mr Mehegan. "CERA has a special place in our heart and we were delighted to work with the team again."

↗ **Successful partnership: National Stem Cell Foundation of Australia General Manager Graeme Mehegan with CERA Principal Investigator Dr Tom Edwards.**


CENTRE FOR
Eye Research

# Jacquie's foresight helps others

Jacquie Stephens was so determined to make a difference that in her late 80s, she asked if she still 'qualified' to donate her eyes for research if they had cataracts.

**A generous benefactor to many charities, Jacquie had a strong interest in medical research, in particular diabetic retinopathy, stem cell research, age-related macular degeneration and glaucoma.**

When she died in 2019 aged 90, Jacquie left a generous bequest to CERA, along with donations to many other charities including the Royal Victorian Eye and Ear Hospital and Guide Dogs Victoria.

An only child, Jacquie was always strong, forthright and in many ways ahead of her time with her views of life and the wider world.

Born in Dimboola on the cusp of the Great Depression, her family later moved to Melbourne. Jacquie worked as a personal assistant and travelled Australia and the world, living in London at one stage. She loved the arts, particularly theatre, opera, orchestral performances, and ballet.

Jacquie, who didn't marry and lived most of her adult life in Malvern, loved people and animals. She made the first of 20 CERA donations in 2001.

## Soft spot

While she also donated to WEHI and the Florey Institute of Neuroscience, Jacquie had a soft spot for CERA. She remained engaged and attended bequest nights until early 2019, even after a fall.

Jacquie told CERA that she knew people with AMD, glaucoma and diabetic retinopathy. Supporting CERA was important to her because "with an ageing population we need to be as prepared as possible to deal with emerging problems".

When CERA Donor Relations Advisor Elaine Levine met Jacquie at a research event she was immediately drawn to her warmth and sharp wit.

"She invited me to lunch at her home where we shared more stories about her life and travels," Elaine says. "I will miss her presence at our future events and will remember her fondly."

↑ **Warmly remembered: Jacquie Stephens was a strong supporter of eye research.**

# Betty's gift

**Betty Gibson lost her sight at age 16, but she never let it hold her back from living a full and vibrant life.**

Born in 1936, Betty spent most of her life in Monteagle, a small farming village outside Young, New South Wales. She grew up with a loving family – parents Margaretha and William, younger brother Maurice, and lots of cousins, with whom she loved to play games and swim in the local dam.

As a teenager, Betty's eyesight started to deteriorate, causing her to leave high school in her second year. At age 16, she was diagnosed with retinitis pigmentosa, an inherited condition that causes serious vision loss and blindness.

While the diagnosis was upsetting for the whole family, Betty remained positive and always wanted to be involved in the social life of the village.

Betty's mother, Margaretha, was a wonderful support to her. She helped Betty walk through the town and read to her from newspapers and magazines, so she was always up to date with the current news and trends.

Throughout her life, Betty was well loved in her community and was actively involved in the church, the CWA, Red Cross and other local groups and activities.

Betty passed away peacefully in 2019 at age 83. As part of her legacy, she wished to donate money to Vision Australia for the training of guide dogs for children, and for research that could help cure retinitis pigmentosa.

"We are incredibly grateful for this support from the Estate of Betty Gibson, which will help us in optimising the technique for this new regenerative therapy," says Dr Raymond Wong, Principal Investigator of Cellular Reprogramming at CERA.

↑ **Lasting legacy: Bequestor Betty Gibson, pictured in her earlier years with her brother Maurice.**

# Principal Investigators and Lead Researchers

**Associate Professor Penny Allen**
Bionic Eye Project
**MBBS, FRANZCO**

**Associate Professor Michael Coote**
Surgical Glaucoma Research
**MBBS, FRANZCO, GAICD**

**Professor Mark Daniell**
Corneal Research
**MBBS, MS, FRANZCO, FRACS**

**Dr Thomas Edwards**
Retinal Gene Therapy Research
**MBBS, PhD, FRANZCO**

**Professor Alex Hewitt**
Clinical Genetics
**BMedSci (Hons), MBBS, PhD, FRANZCO**

**Dr Stuart Keel**
Ophthalmic Epidemiology
**BOrth (Hons), PhD**

**Dr Nathan Kerr**
Glaucoma Surgical Trials
**MBChB, MD, FRANZCO**

**Peter Larsen**
(Honorary from October 2020)
**BSC (Optometry)**

**Associate Professor Ian Trounce**
Mitochondria and Neurodegeneration
**BSc, PhD**

**Associate Professor Peter van Wijngaarden**
Ophthalmic Neuroscience
**MBBS, PhD, FRANZCO**

**Dr Raymond Wong**
Cellular Reprogramming
**B. Biomed Sci (Hons), PhD**

**Dr Jennifer Fan Gaskin**
Ocular Fibrosis Research
**MBChB, MD, FRANZCO**

**Professor Robyn Guymer AM**
Macular Research
**MBBS, PhD, FRANZCO, FAHMS**

**Professor Mingguang He**
Ophthalmic Epidemiology at the University of Melbourne
**MD, PhD, FRANZCO**

**Associate Professor Wilson Heriot**
(until November 2020)
Vitreoretinal Research
**MBBS, FRANZCO**

**Associate Professor Lyndell Lim**
Uveitis Research
**MBBS, DMedSci, FRANZCO**

**Dr Isabel Lopez Sanchez**
Mitochondrial Biology and Disease
**BSc, PhD**

**Associate Professor Chi Luu**
Macular Research
**BOrth (Hons), Grad Dip (Epi&Biostats), PhD**

**Professor Keith Martin**
Glaucoma Research
**MA, BM, BCh, DM, MRCP, FRCOphth, FRANZCO, FARVO, ALCM**

## For more details about our research leaders visit cera.org.au

# CERA Executive team

**Leah Borsboom**
Chief Operating Officer
and Company Secretary
**LLB (Hons)**
**Graduate of the Australian Institute of Company Directors (GAICD)**

**Tena Cheng**
Head of Commercialisation
and Legal
**LLB, BSc**

**Professor Robyn Guymer AM**
Deputy Director,
Head of Macular Research
Professor of Surgery (Ophthalmology),
University of Melbourne
**MBBS, PhD, FRANZCO, FAHMS**

**Associate Professor Lyndell Lim**
Head of Clinical Trials Research
Principal Research Fellow –
Surgery (Ophthalmology),
University of Melbourne
**MBBS, DMedSci, FRANZCO**

**Professor Keith Martin**
CERA Managing Director,
Head of Glaucoma Research
Ringland Anderson Professor
and Head of Ophthalmology,
University of Melbourne
**MA BM BCh DM MRCP FRCOphth FRANZCO FARVO FAAPPO ALCM**

**Sarah Rainbird**
Head of Philanthropy
and Fundraising
**BComLLB(Hons)**
**Grad Cert Arts Management**
**Grad Cert Public Art**

**Associate Professor Peter van Wijngaarden**
Deputy Director, Principal Investigator Ophthalmic Neuroscience
Associate Professor of Surgery (Ophthalmology),
University of Melbourne
**MBBS, PhD, FRANZCO**

# Our Board

We appreciate the contribution of our Board members who generously give their time and expertise to provide strategic direction and governance to CERA.

**Olivia Hilton**
Chair
**BBus (Mkt) (Hons)**

**Simon Brewin**
Royal Victorian Eye and Ear Hospital Representative
**B Bus, Grad Dip HSM, MBL, GAICD**

**Andrew Cowlishaw**
(until February 2020)
**BComm (Accounting & Finance), CA**

**Professor Andrew Cuthbertson AO**
**BMedSci, MBBS PhD FAA FTSE FAHMS**

**Suwanee Dharmalingam**
**B. Comm (Accounting and Finance) LLB (UNSW)**

**Christine Edwards**
**B App Sc, Post Grad Cert Public Sector Management, M Health Admin, GAICD, Post Grad. Cert. Editing and Publishing**

**Professor Darren Kelly**
**BAppSc (MedLabSc) PhD FASN**

**Nuala Kilgallon**
**BComm (Hons) FCA**

**Professor Keith Martin**
Managing Director
**MA BM BCh DM MRCP FRCOphth FRANZCO FARVO FAAPPO ALCM**

**Wendy Miller**
**BA LLB (Hons)**

**Professor John Prins**
University of Melbourne representative
**MBBS PhD FRACP FAHMS**

## Alternate Directors

**Llewellyn Prain**, BA (Hons) LLB (Hons) GAICD (for Simon Brewin)

**Professor Jenny Wilkinson-Berka** BSc(Hons) PhD (for Professor John Prins)

**Associate Professor Peter van Wijngaarden** MBBS (Hons), PhD, FRANZCO (for Professor Keith Martin).

**For full details of the CERA Board visit cera.org.au**

# Abridged financials

## CONSOLIDATED STATEMENT OF FINANCIAL POSITION
as at 31 December 2020

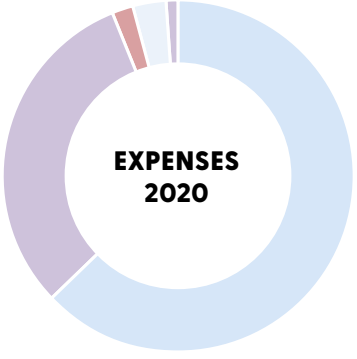
| | 2020 $'000 | 2019 $'000 |
|---|---|---|
| **ASSETS** | | |
| **Current assets** | | |
| Cash and cash equivalents | 1410 | 689 |
| Trade and other receivables | 1678 | 729 |
| Other assets | 244 | 83 |
| **Total current assets** | **3 332** | **1501** |
| **Non-current assets** | | |
| Trade and other receivables | 80 | 0 |
| Financial assets | 26 337 | 25 194 |
| Property, plant and equipment | 667 | 794 |
| Right-of-use assets | 532 | 854 |
| **Total non-current assets** | **27 617** | **26 842** |
| **Total assets** | **30 948** | **28 343** |
| **LIABILITIES** | | |
| **Current liabilities** | | |
| Trade and other payables | 3 455 | 1664 |
| Lease Liabilities | 330 | 298 |
| Provisions | 1560 | 1263 |
| **Total current liabilities** | **5 345** | **3 225** |
| **Non-current liabilities** | | |
| Lease Liabilities | 255 | 570 |
| Provisions | 179 | 263 |
| **Total non-current liabilities** | **435** | **833** |
| **Total liabilities** | **5 779** | **4 058** |
| **Net assets** | **25 169** | **24 285** |
| **EQUITY** | | |
| Reserves | 13 316 | 10 677 |
| Retained earnings | 11 853 | 13 608 |
| **Total equity** | **25 169** | **24 285** |

## CONSOLIDATED STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME

for the year ended 31 December 2020

| | 2020 $'000 | 2019 $'000 |
|---|---|---|
| **REVENUE** | | |
| Federal and State Government grants | 4 549 | 2 730 |
| Clinical trials and contract research | 4 681 | 6 508 |
| Donations and bequests | 2 332 | 2 348 |
| Philanthropic and other grants | 867 | 1 378 |
| Government subsidies* | 2 504 | - |
| Investment and other income | 558 | 4 418 |
| **Total revenue** | **15 491** | **17 382** |
| **EXPENSES** | | |
| Research expenses | 9 257 | 8 915 |
| Research support expenses | 4 481 | 4 570 |
| Occupancy expenses | 253 | 509 |
| Depreciation and amortisation | 434 | 458 |
| Finance expenses | 182 | 155 |
| **Total expenses** | **14 607** | **14 607** |
| **Net surplus** | **884** | **2 775** |


**29%** Federal and State Government grants
**30%** Clinical trials and contract research
**15%** Donations and bequests
**6%** Philanthropic and other grants
**16%** Government subsidies
**4%** Investment and other income




**63%** Research expenses
**31%** Research support expenses
**2%** Occupancy expenses
**3%** Depreciation and amortisation
**1%** Finance expenses

*These abridged audited Financial Statements have been extracted from the full audited Financial Statements for CERA and its controlled entity. The full audited Financial Statements can be extracted from the ACNC (Australian Charities and Not-for-profits Commission) website.*

*CERA operates as a not-for-profit organisation. Accordingly, accumulated surpluses are held as reserves to suport future research projects and operations.*

*Centre for Eye Research Australia – ABN: 72 076 481 984*

**Commonwealth Government JobKeeper and Cash Flow boost payments.*

# 2020 Supporters and acknowledgements

**Thank you to the many individuals and organisations whose support in 2020 enabled us to keep advancing our work towards a world free from vision loss and blindness.**

**We are grateful for the generous contributions to our research from individual donors, along with the support of philanthropic trusts and foundations, industry, government and other member organisations.**

## Major gifts ($10 000+)

Ainslie M Cummins

Professor Andrew Cuthbertson AO

Renate Daniell

Connie Kimberley and Craig Kimberley OAM

Peter Lemon

Andrew G Michelmore AO and Janet Hailes Michelmore AO

Baillieu Myer and Samantha Baillieu and a network of generous donors through their support of the Yulgilbar Alzheimer's Research Program (YARP)

Dennis and Fairlie Nassau

Loris Peggie

Margaret S Ross AM

Elizabeth Xipell

*We would like to acknowledge the support of an anonymous donor who made a generous donation to acknowledge Dr Brian Harrisberg's excellence in the treatment of eye disease.*

*We would also like to acknowledge the support of other donors who wish to remain anonymous.*

*CERA would like to acknowledge the generous donation of the Macquarie Group Foundation of $10 000 under its staff non-profit support policy in recognition of the Board service provided by employee Suwanee Dharmalingam.*

## Trusts and foundations ($10 000+)

Angior Family Foundation

Australian Ophthalmic Nurses' Foundation (Victorian Chapter)

Betty Brenda Spinks Charitable Trust

Bright Focus Foundation

Centre for Eye Research Australia Foundation

DHB Foundation managed by Equity Trustees

Glaucoma Australia

GRAS Foundation

Gwenneth Nancy Head Foundation

Harold Mitchell Trust

Juvenile Diabetes Research Foundation

Kel and Rosie Day Foundation

Lions Ride for Sight – Lions District 201V3

Macquarie Foundation

Margaret Miller Foundation

Margery M Kingston Charitable Trust

Mito Foundation

Myra Stoicesco Charitable Trust

National Stem Cell Foundation of Australia

National Foundation for Medical Research and Innovation (NFMRI)

Ophthalmic Research Institute of Australia (ORIA)

Retina Australia

The CASS Foundation

The Fred Hollows Foundation

Telematics Trust

The Murray R and Rodney A Brownless Charitable Trust

The Miller Foundation

The Pratt Foundation

Victorian Lions Foundation

Wolf and Dora Rajcher Memorial Fund

**Bequests ($10 000+)**

Estate of the late Anne Frances (Frankie) Frees

Estate of John Gershon Redapple

Estate of Valerie Stanley

Estate of Marcel Gysbertus Petrus Visseren

Estate of the late Mr Michael Galea

Estate of the late Elizabeth Mary Gibson *(with thanks to Vision Australia for facilitating the distribution of this bequest to support our retinitis pigmentosa research).*

**Corporate supporters**

Eye Bank Association of America

Genetic Kingdom Pty Ltd

Bayer

Fight for Sight

Novartis

Teachers Health Fund

**Royal Victorian Eye & Ear Hospital**

*We gratefully acknowledge the Royal Victorian Eye & Ear Hospital for facilitating support from the following donors for our research:*

H & L Hecht Trust

**Endowments**

*We gratefully acknowledge the support of the University of Melbourne in the ongoing management and direction of the following endowed funds to support our research:*

Dorothy Adele Edols Research Fund (managed by Perpetual Ltd)

Hazel Jean Eastham Bequest

Louisa Jean de Bretteville Bequest

Maurice Cantelon Memorial Fund

The Annemarie Mankiewicz Zelkin Fellowship Fund

The Mavis and Ivan Rowe Prize for Retinal Diseases Research

The Ringland Anderson Chair of Ophthalmology Fund

Wiseman Trust

Winifred Hallam Monds Bequest

**Government**

Commonwealth Government

Department of Industry, Innovation and Science

National Health and Medical Research Council

Victorian Government

**Members**

Diabetes Victoria

Glaucoma Australia

The Royal Australian and New Zealand College of Ophthalmologists (RANZCO)

The Royal Victorian Eye & Ear Hospital

The University of Melbourne

The Victorian Lions Foundation

Vision Australia

**Partnerships**

Medical Research Commercialisation Fund

The Actuator

The Baker Heart and Diabetes Institute

World Health Organisation

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Andrew Fairlie AM

Professor John Funder AC

The Hon Dr Barry Jones AC

Charles Macek

Tina McMekan

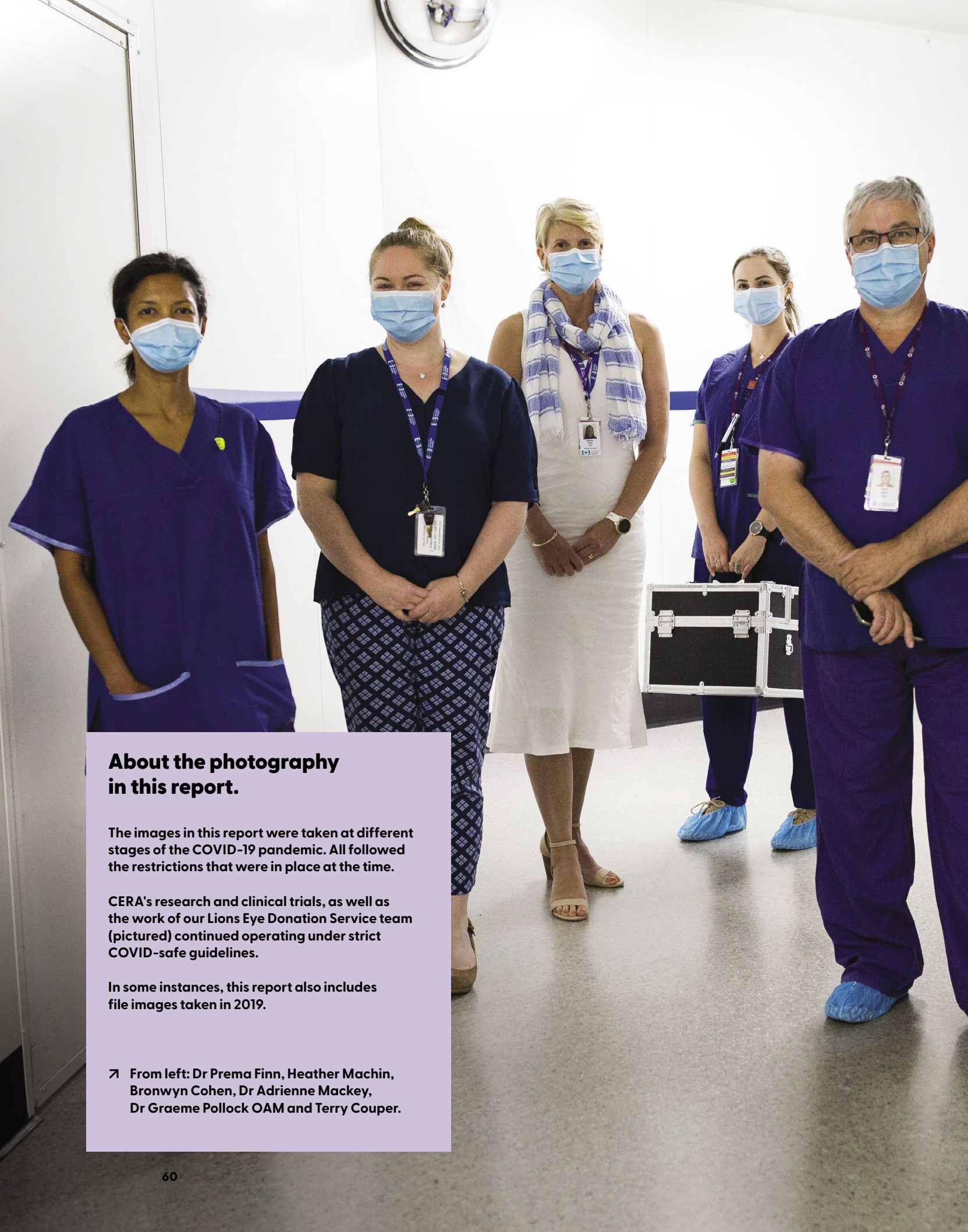
Andrew G Michelmore AO

Peter Nankivell

Margaret S Ross AM

Professor Hugh Taylor AC

Professor Bob Williamson AO



## About the photography in this report.

The images in this report were taken at different stages of the COVID-19 pandemic. All followed the restrictions that were in place at the time.

CERA's research and clinical trials, as well as the work of our Lions Eye Donation Service team (pictured) continued operating under strict COVID-safe guidelines.

In some instances, this report also includes file images taken in 2019.

↗ From left: Dr Prema Finn, Heather Machin, Bronwyn Cohen, Dr Adrienne Mackey, Dr Graeme Pollock OAM and Terry Couper.



# How you can support us

**Donate**

With your support we can continue our world-leading research and accomplish scientific breakthroughs previously deemed unattainable.

Please visit cera.org.au/donate

**Leave a bequest**

Make a gift in your will and leave a lasting legacy.

**Partnership and funding opportunities**

As true innovators, our scientists are on the brink of new discoveries every day. For a confidential discussion about how you can partner with our researchers to help them discover new ways to prevent vision loss, contact Sarah Rainbird, Head of Philanthropy on srainbird@cera.org.au or +61 3 9929 8796.

**Register for a clinical trial**

Be part of clinical research by registering at cera.org.au/take-part-in-research

**Stay in touch**

Visit our website cera.org.au to register for our bi-annual supporter magazine *Visionary* or monthly e-newsletter *Eye-News*.

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CENTRE FOR
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