





We carry out research to give more people with eye disease the chance to save their sight.

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In 2014 CERA moved forward in its mission to conduct eye research with real-life impact, to unravel the causes of disease, prevent blindness through earlier diagnosis and find better treatments, which together will restore sight and change lives.

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## We carry out research because we are passionate about saving sight and changing lives.

However, research at CERA could not happen without the support of hundreds of people.

In this report, you see the faces of just a few of the team who are changing the lives of people living with eye disease and vision loss. Our dedicated researchers, technicians and students work in collaboration with researchers from across Australia and around the world to tackle eye disease from every angle.

We were delighted to welcome a new research leader to our growing team in 2014. Ophthalmologist, Professor Mingguang He joins us from the leading ophthalmic centre for eye care in China, with research degrees from prestigious centres in the USA and UK, to take up the appointment of Professor of Ophthalmic Epidemiology. Professor He will add new strength to our research capability and open new pathways for collaboration in China.

Our Board of Directors, Research Advisory Committee, Nominations and Appointments Committee and Finance and Risk Committee expertly oversee governance of CERA. We are very grateful to the members of each of these who give up their time to bring a wealth of knowledge and experience to guide CERA's progress.

CERA is also very fortunate to have the unstinting support of the University of Melbourne, the Royal Victorian Eye and Ear Hospital, RANZCO, Vision Australia, Victorian Lions Foundation, CBM Australia, Glaucoma Australia, Diabetes Australia and the Ansell Ophthalmology Foundation, as well as strong partnerships with many organisations.

In 2014, our partnership with Bionic Vision Australia saw the successful completion of the first clinical trial of the bionic eye. The device, implanted behind the retina is the first of its type. Its positioning is less invasive and will potentially permit upgrades, something that is not possible with models being developed in the US and Europe. CERA led the clinical and surgical components of the trial, which gave some sight to three patients with profound visual loss. Investment is now being sought to progress the next phase of development of the bionic eye in a new clinical trial.

Which brings us to the funding that underpins our work at CERA. Gradual expansion of research since CERA first opened its doors in 1996 has seen staff numbers increase to 140, and funding increase to nearly \$16m per year.

A large proportion, around 40%, of our funding comes from competitive Federal and State Government grants. Only 10–20% of National Health and Medical Research Council (NHMRC) and Australian Research Council (ARC) grant applications receive funding each year so we were delighted to be awarded more than \$4m in 2014.

Over the next three years, NHMRC and ARC grants will fund the progress of stem cell research of our Neuroregeneration team; it will ensure our drug delivery research can move forward with investigating non-invasive treatment options for eye disease; fund the next stage of bionic eye research; and kick start the careers of our early career scientists and students. 2014 saw the exciting announcement of \$1.8m in Government funding for a new National Eye Health Survey, being conducted by CERA in collaboration with Vision 2020 Australia. Current data on vision impairment is some twenty years old and the survey aims to clarify the prevalence and causes of vision impairment and blindness in both Indigenous and non-Indigenous Australians residing in urban, regional and rural regions across Australia.

We are very grateful to Joan and Peter Clemenger for their generous donation towards the purchase of CERA's new stem cell robot, an amazing piece of technology, which will significantly reduce the man-hours taken to produce retinal stem cells for research. And, our Behavioural Research Unit was the proud recipient of an Equity Trustee grant and a Diabetes Australia Research Trust grant to focus on the role of behavioural and psychological factors in eye disease.

We are always delighted to meet our supporters at the regular community information sessions we hold throughout the year, which provide an update on research into specific diseases. It is heartening to know that many of you donate to CERA on a regular basis and we are spurred on in our search for better treatments and earlier diagnosis of eye disease by your investment in our work. Thank you.

This report touches on the highlights of 2014, but it is always good to see progress over time. Since 2010 our annual output of peer-reviewed journal papers, detailing new research findings, has consistently been above 200. Importantly, this puts CERA in the top five eye research groups in the world, coming in behind heavyweights such as Harvard and Moorfields/UCL.

Our aim is to further raise the impact of our research. We have started actioning our strategic plan to achieve this and we look forward to sharing our successes with you over the years to come.

Peter Nankivell, Chairman

prather Goute

Jonathan Crowston, Managing Director



#### 4 Governance

Our Board of Directors, Research Advisory Committee and Finance and Risk Committee expertly oversee governance of CERA, alongside the Nominations and Appointments Committee and the Member's Forum. We are very grateful to the members of each of these, who give up their time to bring a wealth of knowledge and experience to guide CERA's progress.



**CERA Board of Directors** Standing (from left): Dr Catherine Green, Mr Peter Larsen, Dr Malcolm Brown, Professor Terry Nolan AO, Mr Alfred Hawken. Seated (from left): Professor Jonathan Crowston, Mr Peter Nankivell, Mr James Joughin, Ms Olivia Hilton. Absent: Professor Robert Williamson AO.

We would like to thank Dr Catherine Green for her dedication and assistance on the CERA Board since 2010. Dr Green resigned from the Board in November 2014.

### 2014 CERA Board of Directors

Mr Peter Nankivell, Chairman Dr Malcolm Brown Professor Jonathan Crowston Dr Catherine Green Mr Alfred Hawken Ms Olivia Hilton Mr James Joughin, Treasurer Professor Terry Nolan, AO Professor Robert Willamson AO

#### **Finance and Risk Committee**

The Finance and Risk Committee reports to the Board and has its own charter to review financial planning and management; financial reporting; statutory and compliance obligations; and oversees risk management and commercialisation activities. Chaired by Mr James Joughin, the committee comprises Mr Peter Nankivell, Mr Peter Larsen and Professor Jonathan Crowston. The committee met five times in 2014.

### **Research Advisory Committee**

The duties of the Research Advisory Committee include critical review of research plans and evaluation of research results. Chaired by Professor Robert Williamson AO and reporting to the Board, the committee met twice in 2014. Its members are Professor Mark Cook, Dr Mirella Dottori, Dr Michelle Dunstone, Professor John Hopper AM, Professor Terry Nolan AO, Dr Ehud Zamir and Professor Jonathan Crowston. Professor Ravi Savarirayan resigned from the committee in 2014.

#### **Nominations and Appointments Committee**

The Nominations and Appointments Committee considers and advises on succession planning and new appointments to the Board, and senior staff. Reporting to the Board, it is chaired by Mr Peter Nankivell and comprises Mr James Joughin, Professor Terry Nolan AO and Professor Jonathan Crowston. The committee met twice in 2014.

#### **CERA Member's Forum**

The CERA Member's Forum fosters dialogue and active participation in the life and work of the centre and met once in 2014, represented by the following: The Ansell Ophthalmology Foundation by Ms Tina McMeckan; Vision Australia by Mr David Speyer; RANZCO Victoria by Dr Richard Stawell; the Victorian Lions Foundation by Mr Alf Hawken; Glaucoma Australia by Mr Geoff Pollard; and Diabetes Australia (Victoria) by Dr Craig Bennett. CBM Australia did not participate in the Forum in April.







research papers published in scientific journals

# competitive and philanthropic grants received



media mentions: including research findings and community education

students gained postgraduate degrees

# The people behind the research

There are currently fifteen groups of researchers at CERA across the whole spectrum of research, from laboratorybased basic science and stem cell research through to genetics and clinical studies to translational health services, and population-based studies.



In November 2014, CERA welcomed a new research leader to its growing team. Ophthalmologist, Professor Mingguang He joined us from the leading ophthalmic centre for eye care in China, with research degrees undertaken at prestigious centres in the USA and UK, to take up the appointment of Professor of Ophthalmic Epidemiology. Professor He will add new strength to CERA's research capability and open new pathways for collaboration in China.

Congratulations go to molecular geneticist, Paul Baird who was promoted to Professor by the University of Melbourne. Leading CERA's Ocular Genetics Unit, Professor Baird's research is focused on the identification of genes responsible for major eye disease. He leads several national and international groups researching AMD and myopia using cutting edge laboratory and analysis tools.

CERA also congratulates two of its senior researchers, Dr Alice Pébay and Dr Chi Luu on their appointment as Associate Professor with the University of Melbourne.

In 2012, Dr Pébay was appointed to head CERA's stem cell research program after re-locating to Melbourne from the University of Paris. Since the start of her research career she has published around 50 research articles and book chapters.

Dr Chi Luu is Deputy Head of CERA's Macular Research Unit. Since joining CERA in 2008, he has been at the forefront of CERA's research program in age-related macular degeneration (AMD) and the bionic eye.

We were delighted to congratulate two long-standing members of the CERA community, Barry Jones and Terry Nolan, who were recognised in the 2014 Queen's Birthday Honours.

The Hon Dr Barry Jones AC was a Director of CERA from 2000 to 2011 and made important contributions to the development of CERA by providing advice on government engagement.

Professor Terry Nolan AO has served as a Director of CERA since 2010 and is Foundation Head of the Melbourne School of Population and Global Health at The University of Melbourne, and Associate Dean of the Faculty of Medicine, Dentistry and Health Sciences.



- 2 Professor Mingguang He joined CERA in 2014.
- **3** Professor Terry Nolan OA received a Queen's Birthday Award.
- **4** The Hon Dr Barry Jones AC received a Queen's Birthday Award.
- **5** Paul Baird was promoted to Professor.

### Eamonn's story

# Combining medicine and research to make a difference

When Eamonn qualified as a doctor in Ireland in 2010 he could not have predicted he would be living in Melbourne five years later, writing a PhD thesis on optic nerve cells, and preparing to start specialist training in clinical ophthalmology.

"Following internships in Ireland and clinical jobs in Melbourne and Perth, I started a Masters with the University of Melbourne Department of Ophthalmology at CERA, but quickly converted to a PhD so I could give my research the time it needed."

In advanced glaucoma, optic nerve cells at the back of the eye are permanently damaged, but clinical studies show that optic nerve cells in patients with early glaucoma can recover. The question Eamonn set out to answer is: "How do optic nerve cells recover from damage caused by disease?"

The first stage of answering this question entailed describing how damaged optic nerve cells behave in comparison to recovered cells.

Using microscopic electrophysiology techniques on individual cells, Eamonn has been able to describe the differences between damaged and recovered cells and his colleagues can now take this line of questioning onto the next stage to find out why some cells recover while others remain permanently damaged.

"CERA is an amazing institute, so intrinsically linked to clinical ophthalmology but also giving researchers the platform to collaborate with leading basic scientists in Melbourne and around the world. It has given me the opportunity to develop new knowledge about optic nerve cells, which could one day make a difference in the clinical treatment of glaucoma."

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## **Research successes**

In 2014, CERA maintained its position in the top five eye research institutes in the world with researchers contributing to the advancement of knowledge in eye health through scientific publications, conference participation and translation of research into clinical applications for the benefit of patients. 2014 saw the completion of the first clinical trial of the new bionic eye in collaboration with Bionic Vision Australia. CERA leads the surgical and clinical components of the trial, and found that the prototype device has improved orientation and mobility for the three patients who received implants in 2012. Government funding was awarded to CERA in 2014 to take the bionic eye trial onto the next stage.

A major highlight of 2014 was the opening of an automated stem cell research facility in September, the first of its kind to be used exclusively for ophthalmic research in Australia. The robot produces eye cells from stem cells more rapidly than any other method to provide tissue samples needed for research into disease modeling and new treatment development. Funded by a generous donation from Joan and Peter Clemenger, the facility will shorten the time from laboratory research to clinical translation.

In the January edition of *Ophthalmology*, one of the most prestigious journals in eye research, CERA's Corneal Research group published the results of a clinical trial, which gives new hope to keratoconus patients. The study found that a promising treatment, known as corneal collagen cross-linking (CXL) was effective in stabilising keratoconus in most cases, in contrast to progression of the disease in untreated eyes.

New research from CERA's glaucoma team published in the *Neurobiology of Aging Journal* in 2014 shows that exercise is good for your optic nerve and may even reverse the effects of ageing. Research fellow, Dr Vicki Chrysostomou found that older animals undergoing exercise regimes recovered faster from optic nerve damage compared to animals not exercised. This may lead to new treatments to protect the optic nerve from damage caused by glaucoma.

In December, CERA launched a free online diagnostic tool for clinicians, such as GPs and emergency physicians, who encounter ophthalmic emergencies. The CoDEx (Computerised Diagnostic Expertise tool) was developed by Dr Ehud Zamir, an ophthalmologist and Senior Research fellow at CERA, and testing has shown that it provides an accurate diagnosis in 85% of cases.



- **2** 2014 saw the completion of the first bionic eye clinical trial.
- 3 Dr Vicki Chrysostomou published research showing that exercise is good for your optic nerve.
- 4 Dr Ehud Zamir developed a new online diagnostic tool for clinicians.
- 5 Researchers at the opening of the automated stem cell facility (from left) Dr Helena Liang, Mr Duncan Crombie, Dr Alice Pébay, Dr Alex Hewitt, Dr Raymond Wong.

## Living with keratoconus

Rob was just 15 when he lost vision in his left eye. "I remember covering what I now know is my good eye, and everything went blurry. After seeing an ophthalmologist I was diagnosed with keratoconus, which causes the cornea at the front of the eye to bulge and distort images. I was shattered."

Living with keratoconus has meant giving up career dreams and the enjoyment of a good game of football for Rob. He imagined his future would be with the police force but without 20/20 vision he couldn't apply. And, he was literally blind-sided in football, unable to see when players were approaching from his left side.

"I've had to make some adjustments but I've found that I really enjoy working out in the gym, sparring in the boxing ring, and my job in logistics is varied and interesting. I was also lucky enough to be part of a clinical trial in 2011, which has stopped the keratoconus progressing, so far."

Rob took part in a world-first corneal collagen cross-linking trial, carried out by CERA researchers, who proved that the treatment stabilises keratoconus in most patients. The technique involves applying Vitamin B2 to the cornea under UV light to strengthen the tissue and make it less likely to change shape.

"The worse case scenario for me, if the keratoconus progresses, is to have a corneal transplant. I know the Centre for Eye Research Australia is a leader in that area too, which is reassuring. Without research into eye disease, I wouldn't have any treatment options open to me at all; I have huge gratitude and respect for all the researchers, and the ophthalmologists who take care of my eyes."

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## **Research funding**

CERA was awarded more than \$4m in National Health and Medical Research Council (NHMRC) and Australian Research Council (ARC) competitive, peer-reviewed grants in 2014. Combined with State Government infrastructure funding, they provide almost 40% of the total funding needed to carry out research. CERA is grateful for the vital support received from trusts, foundations and individual donors, which forms a major part of our research funding.

NHMRC and ARC grants awarded in 2014 will fund the progress of stem cell research of our Neuroregeneration team; it will ensure our drug delivery research can move forward with investigating non-invasive treatment options for eye disease; fund the next stage of bionic eye research; and kick start the careers of our early career scientists and students.

The Federal Government announced funding of \$1.8m for a new Australian National Eye Health Survey in 2014. The survey, led by Dr Mohamed Dirani at CERA and Vision 2020 Australia, in collaboration with research organisations and the private sector, will provide the evidence on prevalence rates needed to reduce the impact of eye disease more effectively.

The annual 2014 Lions Ride for Sight raising funds for research into eye disease was a big success once again. Riders and clubs throughout Gippsland took part in the four-day ride in April, covering 370km and raising an amazing \$43,500.

In 2014, CERA received vital grant funding from several generous foundations. CERA's Behavioural Research Unit, led by Dr Gwyneth Rees was the proud recipient of an Equity Trustee grant and a Diabetes Australia Research Trust grant to focus on the role of behavioural and psychological factors in eye disease.

A generous donation from passionate supporters of eye research, Joan and Peter Clemenger enabled the purchase of an automated stem cell robot in 2014, the first of its kind in Australia. The machine will be used by researchers at CERA to produce and maintain stem cells used for investigations into major eye diseases, such as macular degeneration and glaucoma.

CERA is very grateful to the individual supporters who make regular donations to CERA, and together contributed \$400,000 towards sight saving research at CERA in 2014.



- 2 Dr Gwyneth Rees leads behavioural research funded by Diabetes Australia and Equity Trustees.
- 3 Donor, Peter Clemenger (front left) at the launch of the automated stem cell facility
- with (clockwise) Dr Alex Hewitt, The Hon Ian Macfarlane MP and Dr Alice Pébay. 4 The 2014 Lions Ride for Sight raised \$43,500 for eye research.
- 5 Dr Mohamed Dirani leads CERA's collaboration in the new Australian National Eye Health Survey.

## Judy's story

# Supporting research into the promising field of nerve repair

Judy has been taking three types of eye drops for 24 years to treat glaucoma, a condition causing damage to the optic nerve at the back of her eye. However, it wasn't the gradual loss of sight from glaucoma that prompted her to consult an ophthalmologist when she was 41.

"I went to hospital because I had blurry vision and the diagnosis turned out to be optic neuritis, inflammation of the optic nerve, which left permanent damage to the central vision of my right eye. But, I might have lost my sight completely if it wasn't for that episode of neuritis; during the eye examination, the ophthalmologist noticed cupping of the optic nerve and diagnosed glaucoma."

"I hate to think how things might have turned out if I hadn't had that examination because at the time the pressures in my eyes were normal, so the glaucoma wouldn't have been spotted through a simple eye pressure screening test."

Judy's life has changed since she gave up driving and hobbies such as oil painting due to her low vision and more recent diagnosis of multiple sclerosis. However, the accidental diagnosis of glaucoma and treatment to slow progression means she has been able to explore new hobbies such as creative writing, recently completing a short story.

Around seven years ago, Judy's ophthalmologist was running the Melbourne Marathon and asked her to sponsor him to raise funds for CERA. Judy started receiving CERA newsletters and read with interest about promising research into optic nerve repair in glaucoma, which she decided to support with regular donations.

"I live in hope that research will bring about a cure for diseases affecting nerves, such as glaucoma and multiple sclerosis. I have learnt a lot about glaucoma from the newsletters and CERA information session I attended, and I'm keen to do my bit to help the researchers get closer to that cure."

"I live in hope that research will bring about a cure for diseases affecting nerves, such as glaucoma and multiple sclerosis...I'm keen to do my bit to help the researchers get closer to that cure."



## 12 Clincial Trials Research

## Principle Investigator: Dr Lyndell Lim



CERA's strategy to increase clinical trial capacity and to conduct research with immediate patient impact, led to the consolidation of the Clinical Trials Research Unit (CTRU) in 2013, led by ophthalmologist, Dr Lyndell Lim. Now a year old, CTRU has grown to the equivalent of just over 12 full time staff consisting of investigators, a Unit manager, study co-coordinators, clinical trial assistants, graders, laboratory manager, statistician and administration.

## 2014 Research highlights

There has been a 20% increase in investigator initiated clinical trials and a 52% increase in pharmaceutical clinical trials over the past year. A further nine trials are in the planning stages. Current clinical trials focus on the disease areas of uveitis, diabetic macular oedema, age-related macular degeneration (AMD), glaucoma and other retinal diseases. CTRU also includes the Retinal Vascular Imaging Centre, providing retinal image screening and grading services internally and externally across many research projects.

#### **Presentations and achievements**

- Awarded Diabetes Australia Research Trust (DART) grant for continuing research in outcomes of cataract surgery for patients with diabetes.
- Awarded funding to conduct Good Clinical Practice (GCP) Training for our staff and collaborative sites; to conduct two investigator initiated clinical trials in CRVO and scleritis; and to employ a research fellow to aid our increased capacity to conduct clinical trials.
- Establishment of a funded and accredited GCP training course for our staff and collaborative sites, to be conducted annually for at least the next three years.
- Awarded Osmond Scholarship to travel to an international Site Solution Summit in the USA.
- Presented our work at 13 international conferences and participated in four investigator meetings.

The professionalism of our Unit in conducting clinical trials is also reflected in our patient feedback:

"The care I received has been outstanding."

"I have been made to feel valued."

## **Clinical Diagnostics Research**

Principal Investigator: Dr Ehud Zamir



The Clinical Diagnostics Research Unit has a number of projects underway that assist primary care givers such as GPs, nurses and emergency physicians to provide appropriate treatment or referral for ophthalmic issues.

#### 2014 Research highlights

The first project was the development of an online tool to assist GPs in making diagnoses of patients with eye emergencies. In the cases of patients presenting with a red or painful eye, there is a large range of possible diagnoses. Some of these are serious and require urgent treatment while others are simple and not dangerous. Often, GPs are not able to diagnose these conditions accurately without the help of an expert – an ophthalmologist.

The system developed through research simulates the process of advice from an expert. It is an artificial intelligence algorithm, which walks the doctor through a set of key questions about the patient's symptoms and analyses the answers to reach a likely diagnosis. It was trialled on over 120 emergency patients with acute eye problems and has so far demonstrated excellent diagnostic performance. The program was developed with a grant from the Melbourne Lord Mayor's Charitable Foundation and is now available online at no cost at: www.deyeagnose.org

The second project was the development of a simple, cheap method to measure the depth of the eye's anterior chamber. The depth of the anterior chamber is an important detail, which is relevant to the risk of angle closure glaucoma. The latter is a common, potentially blinding condition worldwide, but especially in Asia and India. An accurate measurement of the anterior chamber depth is only possible using expensive equipment and expertise.

Dr Zamir invented a method to derive this information from photography of the eye using a snapshot camera and simple measurements of the digital photo. This process may easily be performed on any smart phone. The method was trialled on over 200 patients and showed good accuracy compared to instruments, which cost tens of thousands of dollars.

## **Ocular Genetics Research**

### Principal Investigator: Professor Paul Baird



The Ocular Genetics team, led by Professor Paul Baird continues to make progress towards a better understanding of the risk factors associated with age-related macular degeneration (AMD), glaucoma, refractive error and keratoconus.

## 2014 Research highlights

The Unit has been using information gleaned from studies conducted on collected patient cohorts as well as through partnership with multiple groups as part of its role in international consortia. These studies are paving the way in allowing us to develop statistical models to improve disease prediction as well as identifying those patients who will best respond to treatment. Translation of these findings into improved patient care will be implanted through our associations with the clinic.

#### **Presentations and achievements**

- Srujana Sahabjada and Paul Baird were speakers at the CERA Keratoconus Community information evening.
- Srujana Sahabjada was co-organiser of the 2015 State Scientific Meetings of Australian Society for Medical Research (ASMR).
- Professor Baird was Chief Investigator on a Novartis Australia grant investigating genotype and fluid clearance in lucentis-treated individuals.
- Professor Baird was appointed to the Editorial Board of The Journal of Ophthalmology.
- Professor Baird was committee member of the 3rd Li Ka Shing Foundation International Ophthalmic Research Student Forum at the Hong Kong Eye Hospital.
- Professor Baird was a member of the International Organising Committee, Symposium organiser and Symposium speaker at The 2<sup>nd</sup> Asia-Pacific Glaucoma Congress held in conjunction with the 10<sup>th</sup> International Symposium of Ophthalmology, Hong Kong.
- Nethrajeith Srinivasalu was invited speaker at The Association for Research in Vision and Ophthalmology, Denver, USA.
- Professor Baird was invited speaker at the World Ophthalmology Congress, Tokyo, Japan; the Human Genome Meeting, Geneva, Switzerland; the Advanced Topics in Genomics and Cell Biology workshop, Campinas, Brazil; the Australian College of Optometry, Melbourne; and the Melbourne Brain Centre, Melbourne.

# Clinical Genetics Research

## Principal Investigator: Dr Alex Hewitt



The Clinical Genetics team led by Dr Alex Hewitt specialises in the clinical and genetic analysis of inherited eye diseases including glaucoma, Leber's Hereditary Optic Neuropathy (LHON), Autosomal Dominant Optic Atrophy, retinal dystrophies, cataracts, Giant Cell Arteritis (CGA) and strabismus, as well raising awareness of Retinoblastoma, a rare childhood eye cancer.

#### 2014 Research highlights

The biggest highlight during the past 12 months was the opening of the Automated Stem Cell Facility and the banking of our 500<sup>th</sup> patient-specific cell line for eye disease modelling. This resource, made possible through substantial support from Peter and Joan Clemenger, will be used to unlock the molecular mechanisms of blinding eye disease.

On the genetic epidemiology front, our team found that the prevalence of myopia was significantly higher in individuals with vitamin D deficiency compared to individuals with sufficient levels. This confirmation will allow for longitudinal studies to investigate whether higher serum concentration is protective against myopia, or whether it is acting as a proxy for some other biologically effective consequence of sun exposure.

Finally, a personal research highlight was receiving a phone call from the global head of Amazon High Performance Computing scientific team following our head-to-head comparison of genetic analysis using Amazon and Google cloud computing resources.

### **Presentations and achievements**

- Our group contributed to the identification of a number of genes associated with primary open angle glaucoma and related endophenotypes (including ABCA1, AFAP1, GMDS, FNDC3B, and ABO among others). This new insight has uncovered novel avenues for potential therapy and improved screening.
- We also showed that good quality DNA could be extracted from archived pathology specimens thereby allowing large-scale genetic investigation of Giant Cell Arteritis, a potential devastating condition affecting elderly people.

## Mitochondria and Neurodegeneration Research

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Principal Investigator: Associate Professor Ian Trounce



Our small group gained a new member in 2014 when Dr Isabel Lopez Sanchez joined us as a postdoctoral fellow. Isabel completed her PhD in 2013 at the University of Western Australia in the strong mitochondrial laboratory of Dr Aleksandra Filipovska. Isabel is committed to mitochondrial research and she brings much needed molecular biology expertise to our group.

Along with our other postdoctoral fellow Dr Nicole Van Bergen, in 2014 we commenced our new three-year NHMRC funded study to investigate the underlying mitochondrial mechanisms of vision preservation in carriers of Leber Hereditary Optic Neuropathy (LHON) mitochondrial DNA mutations.

#### 2014 Research highlights

We aim to understand why most carriers of LHON do not lose their vision, while a minority do. Work in collaboration with Drs Alice Pébay and Raymond Wong also progressed strongly, aimed at induced pluripotent stem cell modelling of LHON.

A second major project was initiated in 2014 thanks to a philanthropic grant from the DHB Foundation. In this project Associate Professor Trounce has commenced the sequencing and analysis of mitochondrial DNA from glaucoma subjects, in collaboration with Professor Doug Wallace at University of Pennsylvania, and Professor Jonathan Crowston of CERA. This funding support was pivotal in re-establishing collaboration with Dr Wallace; and in a visit in March 2014, Associate Professor Trounce established the bioinformatics work flow where the Wallace lab is a world leading authority. We also developed preliminary data for a 2015 NHMRC grant application.

## **Presentations and achievements**

- Associate Professor Trounce was invited presenter at Association for Research in Vision and Ophthalmology (ARVO), Orlando, USA.
- Dr Nicole Van Bergen gave a talk selected from abstracts at ARVO, Orlando, USA.
- Associate Professor Trounce was invited lecturer at the European Glaucoma Society Annual Meeting, Nice, France.
- Associate Professor Trounce was invited speaker at the biennial International Society for Eye Research conference (ISER) in San Francisco.
- All members of the mitochondrial group attended the fourth AussiMit conference, Australia's premier mitochondrial research meeting, held this year in Perth, where Associate Professor Trounce gave an invited presentation and Drs Van Bergen and Lopez Sanchez presented posters.

## **Neuroregeneration Research**

Principal Investigator: Associate Professor Alice Pébay



The Neuroregeneration research team, led by Associate Professor Alice Pébay, focuses on the study of stem cells for modelling diseases and regeneration. A stem cell is described as 'pluripotent', meaning that it has the potential to develop into any cell in the body. Using patients' own skin cells, the team 'reprogram' those into stem cells and then guide them to become retinal cells, such as cells of those affected in AMD and glaucoma.

These cells are then used to investigate mechanisms of disease progression. The team also studies the cellular mechanisms involved in the genetic disease Friedreich Ataxia.

## 2014 Research highlights

- Associate Professor Alice Pébay obtained a prestigious ARC Future Fellowship.
- Dr Raymond Wong obtained a NHMRC project grant to model Leber Hereditary Optic Neuropathy using stem cells (2015-17). He was also successful in obtaining funding from ORIA and Australian Mitochondria Disease Foundation (2015).
- Major philanthropic donation by Joan and Peter Clemenger allowed the purchase of an automated platform for the maintenance of stem cells to study eye diseases.
- Dr Sandy Hung was successful in obtaining multiple grants, including ORIA (2015) and Retina Australia (2015).
- Ms Grace Lidgerwood started her PhD in 2014 with an Australian Postgraduate Award scholarship.

## **Presentations and achievements**

- Associate Professor Alice Pébay was invited speaker or chair at the Optic Nerve Degeneration and Ageing Conference, Obergurgl, Austria; the Asia-Pacific Glaucoma Congress, Hong Kong, China; the World Glaucoma Congress, Vancouver, Canada; and the World Congress of the Society for Brain Mapping and Therapeutics, Sydney.
- Dr Sandy Hung was invited speaker at the Harbin International Cataract Conference, China.
- Dr Raymond Wong was invited speaker at the Frontiers in Human Engineering symposium, Melbourne; and the World Congress of Molecular & Cell Biology, China.
- Student, F Frisca graduated as a PhD student.

## **Drug Delivery Research**

Principal Investigator: Dr Hong Zhang



The Drug Delivery Research Unit, led by Dr Hong Zhang is investigating non-invasive targeted tools, treatment options and technologies for vision threatening diseases such as endophthalmitis, agerelated macular degeneration, glaucoma and diabetic retinopathy.

### 2014 Research highlights

The first objective of the Unit's NHMRC grant funded project is to optimise FITC-labelled cubosome-IgG formulations for cellular uptake and ocular penetration and test them both in vitro and in vivo. In 2014 we developed and optimised cubosomes that do not denature the proteins loaded; generated protein loaded cubosomes; detected the protein-loading efficacy of cubosomes (30%); and demonstrated that cubosomes can help protect protein denaturing.

The second objective was to determine the therapeutic potential of cubosome-conjugated anti-VEGF antibody on pathological ocular neovascularisation in two established rat models: oxygen-induced retinopathy (OIR) and laser induced choroidal neovascularisation (CNV) models. We have proved that the new generation of cubosomes is safe both in vitro and in vivo; set up CNV mouse and rat models to test the in vivo efficacy of anti-VEGF cubosomes; generated a better analysing methods of CNV; and set up the platform to determine Avastin® concentrations both in vitro and in vivo.

## **Presentations and achievements**

• Awarded an NHMRC Development grant.

- Awarded an ARC Linkage grant.
- Published three papers in high impact journals: Plos One; Experimental Eye Research; and Tissue Engineering.

## Cytoprotection Pharmacology Research

Principal Investigator: Professor Greg Dusting



The Cytoprotection Pharmacology team led by Professor Greg Dusting explores cellular signaling that regulates cell survival, proliferation and differentiation, with the aim of inventing new medicines to treat eye disease, especially the diseases that lead to loss of vision due to blood vessel growth in the retina, such as age-related macular degeneration (AMD) and diabetic retinopathy.

#### 2014 Research highlights

The Unit has discovered a new drug that might be effective in preventing blood vessel growth in the retina, which could be especially useful for patients who do not respond to treatments using anti-VEGF agents.

We also published a paper on the cell protection properties of an old drug that Professor Dusting discovered in the 1980s, which could have applications for treating many diseases, such as retinal eye disease and assist healing following glaucoma surgery.

2014 saw the beginning of a new collaboration with Professor Robyn Guymer and the Macular Research Unit. This involves treating mouse eyes with 'good' cholesterol, extracted from blood products, which is known to ameliorate artery disease and may also be able to stop inflammatory reactions in the retina caused by macular degeneration. If studies are successful, it may lead to the development of a new treatment for this major cause of vision loss in Australia.

#### **Presentations and achievements**

• Published a paper in the prestigious journal, *Stem Cells* on the discovery of a new stem cell in the heart. We found these are more efficient than any stem cells used to date in clinical trials of treatments after heart attacks.

## 16 **Population Health**

## Principal Investigator: Dr Robert Finger



The Population Health Unit, headed by Dr Robert Finger, is focused on assessing treatment outcomes (physician and patient reported); developing novel outcome measures; and investigating the cost-effectiveness of eye health services using a variety of statistical and decision analysis modelling.

#### 2014 Research highlights

The Unit has been investigating GP referral practices for diabetic retinopathy screening and found that referrals are often issued and/or taken up with considerable delay following the diagnosis of diabetes later in life. This may lead to persons with diabetes missing out on opportunities to prevent vision loss as they are not screened for diabetic eye complications early enough. The delay seems to be related both to issues at the GP and patient level, and in subsequent projects these will be investigated in more detail and potential solutions developed and tested.

In a second project, quality of life and activities of daily living assessment tools were developed and evaluated for use in people with very low vision, and all tools will be made available on the CERA homepage for download. Quality of life and activities of daily living are important aspects of daily life, which can be used to capture patient relevant outcomes in clinical trials.

#### **Presentations and achievements**

Dr Finger heads the World Health Organization Collaborating Centre (WHOCC) for the Prevention of Blindness at CERA, which has been re-designated for another three years by WHO headquarters in Geneva. The focus of WHOCC work at CERA is in addressing global blindness related to cataract as well as the integration of primary eye care in developing countries.

## **Evaluative Research and Health Services**

Principal Investigator: Dr Mohamed Dirani



NHMRC Research Fellow, Dr Mohamed Dirani leads a team that includes ten researchers; two post-graduate students supported by competitive scholarships; and 10 volunteers. Dr Dirani is working on a number of major collaborative projects, including work with the Australian National University (ANU), the Baker IDI, University of Melbourne, Guidedogs Victoria, Sigma Pharmaceuticals, Novartis Australia, IBM and Make-A-Wish-Foundation.

#### 2014 Research highlights

The key project under Dr Dirani's management is the National Eye Health Survey (NEHS) that commenced in August 2014. In partnership with Vision 2020 Australia, we are conducting, for the first time, a NEHS that aims to determine the prevalence and causes of vision impairment and blindness in both Indigenous and non-Indigenous Australians residing in urban, regional and rural regions across Australia.

The NEHS will close a major gap in the evidence base, providing up-to-date prevalence rates on blindness and vision impairment for both Indigenous and non-Indigenous Australians. Current data on vision impairment is some twenty years old. Data from the NEHS will assist in the planning of future eye health care programs.

Since data collection commenced in March 2015, we have recruited and examined more than 1000 participants residing in Darwin, South Australia and Victoria, with plans underway to recruit a further 4000 participants residing in NSW, Queensland and Western Australia.

#### **Presentations and achievements**

Supported by the Australian Government under the Chronic Disease Prevention and Service Improvement Fund, the NEHS has also attracted approximately \$1 million of in-kind contributions from CERA, OPSM, Novartis, Zeiss, Brien Holden Vision Institute, Optometry Australia, National Aboriginal Community Controlled Health Organisation, and the Royal Flying Doctor Service.

More recently, the Honourable Federal Minister for Health, Sussan Ley approved additional funds required for the completion of the NEHS, which brings the Government's commitment to approximately \$1.8 million.

## **Behavioural Research in Ophthalmology**

**Principal Investigator: Dr Gwyneth Rees** 



## The Behavioural Research in Ophthalmology (BRO) team focuses on the role of behavioural and psychological factors in eye disease and improving patient-centred outcomes.

The team has four inter-related research themes, which aim to investigate the behavioural and psychological factors that contribute to the prevention and management of eye disease; develop and validate patient-centred outcome assessment tools needed in ophthalmic settings; develop and evaluate novel interventions or models of care to improve patient-centred outcomes for people with eye conditions; design high quality implementation research to translate evidence-based interventions into eye care services and evaluate the patient-centred, clinical and economic outcomes.

### 2014 Research highlights

Dr Rees and colleagues were awarded a 2015 Underworks Millennium Type 2 Award from the Diabetes Australia Research Trust (DART) to conduct a randomised controlled trial of a new "Personalised Eye Consultation" for people with early stage diabetic retinopathy who are struggling to maintain optimal glycaemic control.

Together with funding from Lions Ride for Sight, this project will trial eye consultations that combine providing feedback and explanation of the patients' retinal images together with evidence-based strategies for behaviour change to support patients in diabetes management.

#### **Presentations and achievements**

- Dr Rees was invited to present on the Personalised Eye Consultation project at the DART grant award announcements on World Diabetes Day 2014.
- Dr Rees, Dr Bonnie Sturrock and Edith Holloway were short-listed for a Macquarie Social Innovation Award for their work with Vision Australia to reduce depression in people with vision impairment by training staff to deliver problem-solving therapy to clients experiencing depressive symptoms. The team also gave three presentations on this and other work at Vision2014, an international conference on low vision.
- Research Fellow, Dr Eva Fenwick was selected to sit as an Early Career Researcher on the prestigious Australian NHMRC Grant Review Panel (Health Services Research, Health Promotion & Ageing; Epidemiology & Population Health).

## Lions Eye Donation Service

## Director: Dr Graeme Pollock



The Lions Eye Donation Service (LEDS) is responsible for all eye donations in the States of Victoria and Tasmania, as well as the allocation of corneas and sclera for transplantation, and eyes for research purposes. Operating as a joint venture between the Lions Clubs of Victoria and Southern New South Wales, the Centre for Eye Research Australia, the University of Melbourne and the Royal Victoria Eye and Ear Hospital, it is licensed by the Therapeutic Goods Administration for these purposes.

LEDS services include medical assessment of donors, consent for donation, surgery for donation, processing and preservation of corneas for transplantation, testing and evaluation of donors and tissue, and allocation of corneas and sclera for transplantation. Responsible for follow up and correspondence with donor families and liaison with ophthalmic surgeons, LEDS also provides eyes and tissues for research purposes.

## 2014 Highlights

2014 was a record year in terms of donor numbers and the number of people who have regained vision through transplants. LEDS worked with 235 donors and their generous families to provide 377 corneas for transplant. In addition, 154 sclera were used for oculo-plastic and glaucoma surgery, and 108 items of ocular tissue were provided for research purposes to CERA.

## **Presentations and achievements**

- Developed and authored the Bioethical Framework for the Eye Banks of Australia and New Zealand.
- Developed and authored the National Professional Staff Competency Framework for the Eye Banks of Australia and New Zealand.
- Convened the first scientific meeting of the *Global Alliance* of *Eye Bank Associations* (we are a founding partner of the Global Alliance and the primary developers).

## 18 Diabetic Retinopathy Research

Principal Investigator: Dr Peter van Wijngaarden



## Ophthalmologist and research fellow Dr Peter van Wijngaarden leads the Diabetic Retinopathy team in research that aims to improve outcomes for people with diabetes, glaucoma and multiple sclerosis.

#### 2014 Research highlights

Key research activities for 2014 included understanding the role played by glial cells, the support cells in the optic nerve, in glaucoma. We have established a method of measuring the electrical activity of the optic nerve in mice and are currently conducting experiments to unravel the roles of glial cells.

The team have also been developing and testing a sustained drug-delivery vehicle for the eye. The injection of medications into the eye as often as every 4 weeks is a reality for thousands of people with eye diseases including diabetic retinopathy and age-related macular degeneration. Working in collaboration with scientists at CSIRO, the team has been testing a new biodegradable polymer that releases medication into the eye slowly over a long period of time. If successful, this research could mean that patients need many fewer eye injections.

Research in the pipeline includes work on the automated detection of eye disease from retinal photos using artificial intelligence in collaboration with Professor He & Dr Dirani; developing a non-invasive eye test to diagnose and monitor Alzheimer's Disease; examining the potential of dietary interventions to improve recovery in multiple sclerosis.

#### **Presentations and achievements**

 In 2014, the team developed a national Diabetes Blindness Prevention Program. Working together with Vision 2020 Australia and Diabetes Australia, as well as a wide range of representatives of the eye health and diabetes care sectors, Dr van Wijngaarden has been helping to develop a national approach to reduce avoidable blindness from diabetes. The approach centres on better coordination of eye examinations for people at risk and better communication between members of the health care team via eHealth resources. The team will be presenting a proposal to the Commonwealth Minister for Health in mid-2015.

## **Corneal Research**

Principal Investigator: Associate Professor Mark Daniell



The Corneal research team, led by Associate Professor Mark Daniell has two main research themes: improvement of corneal transplantation through development of a tissue-engineered cornea; and investigations into new and more effective therapies for corneal diseases such as keratoconus.

The corneal researchers also conduct clinical trials into the efficacy and safety of surgical therapies such as corneal transplants, cataract surgery and laser surgery. The ultimate aim of corneal transplantation research is to develop a tissue-engineered cornea. Growing corneal cells in the laboratory and transferring them to the patient means that problems such as rejection can be avoided. Expansion of cells in the laboratory has the potential to overcome problems of restricted donor supply and may reveal new medical treatments.

Keratoconus research includes development and assessment of new treatments, including an ultrasound based delivery system for riboflavin to allow quick and painless collagen cross-linking. We are tracking results of treatment using a registry of outcomes and continue work investigating the underlying causes of keratoconus.

## 2014 Research highlights

Work continued towards the development of a tissueengineered cornea with the completion of Karl Brown's PhD. Previously we have worked with the biomedical engineers at the University of Melbourne to produce a novel synthetic scaffold on which corneal cells can be grown. Corneal cells grown on this transparent, biodegradable scaffold have been successfully transplanted into an animal model, and we are now looking at the pathway to a commercial product.

Using riboflavin and laser to cross-link the cornea has shown great promise in preventing progression in young patients with keratoconus. The current treatment is slow and the surgery can be painful post-operatively. We have been awarded a grant to examine a novel delivery system using ultrasound. This device should be able to load the cornea with riboflavin without the need for painful removal of the surface layer of the eye. This work builds on our groundbreaking trial proving the usefulness of cross-linking and the development of a registry of outcomes for treatments of keratoconus.

## **Macular Research**

## Principal Investigator: Professor Robyn Guymer



## Professor Robyn Guymer leads the Macular Research team at CERA. The group aims to improve understanding of the disease process and treatment options for agerelated macular degeneration (AMD), the leading cause of central vision loss in Australia.

In particular, the group's research focuses on determining risk factors for progression from early AMD to advanced AMD; the genetics of AMD; environmental associations with AMD; and biomarkers of AMD.

The team also carries out a wide range of clinical trials into new treatments for retinal disease, and is a core partner in the Bionic Vision Australia (BVA) project, leading the clinical and surgical research program.

#### 2014 Research highlights

The macular group worked towards identifying the earliest changes that can be identified on retinal imaging that suggest the development of late AMD. By identifying early changes we can use these novel observations as markers of early disease for clinical trials of interventions and indeed are using them in our trial of nanosecond laser in AMD.

The team took delivery of a prototype instrument, which Medmont was commissioned to design; enabling us to test retinal sensitivity in the dark, which we believe will be important to monitor early AMD and its response to treatment. We look forward to using it in 2015 on clinical trial participants with AMD and controls for comparison.

The BVA team concluded the pilot patient trial on three participants who were implanted with a prototype device and will continue towards the next clinical trial of the bionic eye.

#### **Presentations and achievements**

- Dr Chi Luu was awarded a CIA grant from NHMRC to research biomarkers of AMD.
- Zhichao Wu was awarded his PhD in 2014 for his work in biomarkers of early AMD.
- The BVA team was awarded an NHMRC grant, which will allow the team to continue towards the next clinical trial of the next device.
- Professor Robyn Guymer was elected as a Fellow of the Australian Academy of Health and Medical Sciences.

## Glaucoma Research

#### Principal Investigator: Professor Jonathan Crowston



The Glaucoma research team goal is to develop new treatments that protect the optic nerve from glaucoma and also develop clinical tests that improve our ability to diagnose glaucoma and evaluate the effect of new treatments.

#### 2014 Research highlights

Dr Vicki Chrysostomou, a talented postdoc in our group has recently found that optic nerve recovery is impaired in older animals but that molecular pathways linked to exercise and diet modification can reverse the negative effect of advancing age. Understanding these pathways is key to developing treatments that can turn back the clock, and restore vision loss.

Eamonnn Fahy and Lewis Fry have uncovered new information about the cellular characteristics distinguishing injured from healthy optic nerve cells.

At the same time we are developing new techniques for assessing the state of optic nerve health in humans so that new therapies that protect the optic nerve can be more readily translated into the clinical studies. Exciting new work by Zhichao Wu, Marc Sarossy and Xavier Hadou is developing new insight into the development of tests that inform us on the state of optic nerve health in glaucoma patients.

Dr Michael Coote continues to pioneer glaucoma surgical devices with 3D printing to improve surgical outcomes.

#### **Presentations and achievements**

- PhD student, Dr Eamonn Fahy was awarded the McBride-White Award for best oral presentation at the Melbourne Ophthalmic Alumni Scientific Meeting 2014.
- Professor Jonathan Crowston and Dr Vicki Chrysostomou co-chaired the Obergurgl Optic Nerve Meeting, Austria.
- Professor Jonathan Crowston was keynote speaker at the Korean Glaucoma Society, Seoul; and the Argentine Glaucoma Society 7th Biennial meeting, Buenos Aires.

## **Community engagement**

## Free eye health information forums

CERA runs free, community information forums throughout the year to update supporters on the latest developments in research and treatment of diseases such as glaucoma, corneal disease, and age-related macular degeneration. In 2014, CERA supporters also had the opportunity to learn the facts about stem cells and research at a film screening and panel discussion held in Bendigo. The internationallyacclaimed documentary, *Stem Cell Revolutions* was screened, followed by a panel discussion on stem cells and eye health featuring CERA researchers Associate Professor Alice Pébay and Dr Alex Hewitt.

## **DonateLife Week February 2014**

CERA helped raise awareness of DonateLife Week in February to illustrate the difference organ donation can make in other people's lives. The Lions Eye Donation Service at CERA depends on the donation of corneas, the clear surface of the eye, to transform the lives of people with devastating eye diseases such as keratoconus. In 2014, CERA worked with 235 donors and their generous families to provide 377 corneas for life-changing transplants.

## World Glaucoma Week March 2014

CERA publicised the importance of getting your eyes checked during World Glaucoma Week in 2014. Dubbed the "sneak thief of sight", glaucoma causes damage to the optic nerve at the back of the eye causing gradual loss of vision. Often there are no symptoms until the glaucoma is advanced and vision loss is irreversible, so regular eye checks are recommended for everyone over the age of 40, especially those with a family history of glaucoma.

## Macular Degeneration Awareness Week May 2014

During Macular Degeneration Awareness Week in May this year, CERA urged Australians to act early to save their sight. Experts recommend that everyone over the age of 50, especially those with a family history of age-related macular degeneration (AMD), should have the macular at the back of their eyes checked on a regular basis. Advanced AMD can cause irreversible vision loss if left untreated.

# Channel 10 Diabetic Retinopathy news story

CERA joined forces with Amcal and Guardian pharmacies across Australia in August 2014 to remind people with diabetes to have more regular eye tests to prevent eye disease that can lead to blindness. Dr Peter van Wijngaarden, who leads CERA's Diabetic Retinopathy Research team, featured in a Channel 10 news story during the campaign to talk about the importance of diabetes eye disease checks.

## 2014 Gerard Crock Lecture

A record crowd of 200 people attended the 2014 Gerard Crock lecture, held annually in memory of Australia's first Professor of Ophthalmology, Professor Gerard Crock AO, at the Dax Centre in Melbourne in October. This year's speaker was CERA Director, Professor Jonathan Crowston talking about the future challenges for managing glaucoma, who was introduced by The Victorian Health Minister, The Honourable David Davis MP. Professor Crowston took the audience on a journey through the glaucoma research being carried out by his team at CERA, as well as the impact of the eye disease on an ageing population worldwide. Following the talk, Professor Crock's wife Jacqueline, who attended the event with her family, thanked the speakers.



**The 2014 Crock lecture** (from left) Professor Stephen Smith, Mrs Jacqueline Crock, Professor Jonathan Crowston and The Hon David Davis MP.

2014 Highlights

## **Fundraising**

2014 was a wonderful year for philanthropy at CERA. Our donors make research a reality, providing vital funding to help us save sight and change lives.

CERA supporters allow researchers to focus on their work: investigating the causes of eye diseases, improving treatments and finding solutions to the diseases that cause vision loss around the world.

## **Direct mail appeals**

Direct mail appeals are the "bread and butter" of CERA's fundraising program. Appeals provide essential funding for research projects, while also keeping supporters informed about the latest research, new initiatives and developments in treatments.

A big thank you to everyone who contributed to our record breaking tax appeal, which focused on the Neuroregeneration research group's work using patientderived stem cells to study diseases like glaucoma and AMD in the laboratory. Over \$300,000 was raised towards this research thanks to our incredibly generous donors.

The Christmas appeal introduced us to Rob Kfoury's story, also featured in this report, describing life with vision loss caused by keratoconus. Again a wonderful response from our donors ensured \$100,000 will go towards the Corneal Research group's work into this devastating disease.

Congratulations to Matthew Kingham who drew the surfing santa on the donor Christmas Card in 2014. He was diagnosed with keratoconus at the age of 12.

## **Bequests and estates**

Perhaps one of the most generous things someone can do for eye research is to include a gift in their will to CERA. No matter the size of the bequest, every gift left to eye research plays a major role in ensuring research can continue into the future. In 2014, over \$100,000 was received from nine estates. Thank you to all those who have made the profound decision to leave a gift in their will to eye research.

## **Community fundraising**

A big thank you to our supporters, staff, students and their family and friends for taking part in community events, including Run Melbourne and the Melbourne Marathon, to raise important funds and awareness for CERA.

The highlight of 2014 was the Lions Ride for Sight, which raised \$43,500 to fund the Personalised Eye Consultation trial developed by the Behavioural Research group.

To find out more about supporting the Centre for Eye Research Australia, please contact Philanthropy Coordinator, Bethan Hazell on 03 9929 8424 or bethan.hazell@unimelb.edu.au.



2014 CERA Christmas Card designed by Matthew Kingham

## Awards and achievements

## Class of 2014

Students enrolled through the University of Melbourne Department of Ophthalmology complete their higher studies with the guidance of senior researchers at CERA

We congratulate the following students who graduated in 2014:





Lyndell Lim, DMedSc Progress in uveitis: novel treatments, new disease associations, and imaging applications.

Eyn Kidd (Ryan) Man, PhD The relationship between myopia and diabetic retinopathy: potential protective effects and underlying mechanisms.





Frisca, PhD Lysophosphatidic acid signalling in neurogenesis and the establishment of midline axis.

Zhichao Wu, PhD Novel clinical biomarkers of disease in early stages of age-related macular degeneration.

Further congratulations to Dr Zhichao Wu, who was awarded the University of Melbourne Faculty of Medicine, Dentistry and Health Sciences Dean's Award for Excellence in a PhD Thesis.

## **CERA Staff Awards 2014**

Each year staff members are nominated for excellence in their contribution to CERA and a panel of judges selects the final award winners.

Congratulations to the award winners of 2014:

#### **Excellence in Research Award** Associate Professor Ian Trounce

**Excellence in Research Support Award** Dr Ann Du

**Teaching and Training Award** Dr Ehud Zamir

**Community Engagement** and Knowledge Transfer Award Dr Alex Hewitt, Associate Professor Ian Trounce and Sandra Staffieri

Award for Outstanding Contribution of a Student Mr Jonathan Noonan

The CERA Award for enhancing CERA as an organisation Ms Valma Scaf



**CERA Award winners and judging panel** Back (from left) Dr Cathy Green, Professor Jonathan Crowston, Associate Professor Ian Trounce, Dr Ehud Zamir, Dr Alex Hewitt. Front (from left) Ms Olivia Hilton, Ms Valma Scaf, Ms Sandra Staffieri, Dr Ann Du, Mr Jonathan Noonan.

# **Research Grants and fellowships**

	Scheme	Principal Investigator
Australian Mitochondrial Disease Foundation	Incubator Grant	Raymond Wong
Angior Family Foundation		Greg Dusting
Australian Research Council	Future Fellowship	Alice Pébay
BrightFocus Foundation	Glaucoma Research Grant	Vicki Chrysostomou
Bupa Health Foundation	Research Grant	Mingguang He
CASS Foundation	Medicine/Science Grant	Peter van Wijngaarden
Diabetes Australia	General Grant	Lyndell Lim
Diabetes Australia	Millennium Award	Gwyneth Rees
Equity Trustees	DHB Foundation	Ian Trounce
Equity Trustees	Eric Ormond Charitable Trust	Robyn Guymer
Equity Trustees	Myra Stoicesco Charitable Fund	Gwyneth Rees
Macular Society	Research Grant	Robyn Guymer
National Health & Medical Research Council	Career Development Fellowship	Mohamed Dirani
National Health & Medical Research Council	Development Grant	Hong Zhang
National Health & Medical Research Council	Early Career Fellowship	Paul Sanfilippo
National Health & Medical Research Council	Postgraduate Scholarship	Queena Qin
National Health & Medical Research Council	Project Grant	Penny Allen
National Health & Medical Research Council	Project Grant	Chi Luu
National Health & Medical Research Council	Project Grant	Raymond Wong
Novartis Pharma Australia	Educational Grant	Lauren Ayton
Ophthalmic Research Institute of Australia	Research Grant	Alex Hewitt
Ophthalmic Research Institute of Australia	Research Grant	Carla Abbott
Ophthalmic Research Institute of Australia	Research Grant	Sandy Hung
Perpetual Trustees	Dorothy Adele Edols Charitable Trust	Jonathan Crowston
Perpetual Trustees	Gwenneth Nancy Head Foundation	Robyn Guymer
Perpetual Trustees	Lindsay & Heather Payne Medical Research Charitable Foundation	Robyn Guymer
Retina Australia	Research Grant	Sandy Hung
Sir Edward Dunlop Foundation	Research Grant	Hitesh Peshavariya
University of Melbourne	Kaye Merlin Brutton Bequest	Greg Dusting
University of Melbourne	Early Career Researcher Grant	Carla Abbott
William Angliss Charitable Trust		Kathryn Davidson
Travel Grants	Scheme	Principal Investigator
ARCS Travel Scholarship	Osmond Russell Scholarship	Gina Kennedy
CASS Foundation	Travel Grant	Nicole Van Bergen
Harold Mitchell Foundation	Travel Fellowship	Nicole Van Bergen
Ian Potter Foundation	Travel Grant	Isabel Lopez Sanchez
International Society for Eye Research	Travel Grant	Vicki Chrysostomou
Awards	Scheme	Principal Investigator
Australian Academy of Health & Medical Sciences	-	Robyn Guymer
Global Scientists Summit	-	Mohamed Dirani

# Abridged audited financial statement\*

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# The Centre for Eye Research Australia (ABN 72 076 481 984) for the year ended 31 December 2014

Statement of Comprehensive Income	2014	2013
Revenue		
Federal Government	5,374,021	5,436,663
State Government**	1,026,230	905,103
Charitable contributions & Other Income	9,477,282	7,371,707
Total Revenue from operating activities	15,877,533	13,713,473
Less Expenditure on operating activities	15,858,706	14,452,602
Surplus/(Deficit) on operating activities	18,827	(739,129)
Net Financial Income	375,724	1,027,092
Capital Grants	_	_
Net Surplus/(Deficit)***	394,551	287,963
Statement of Financial Position		
Current Assets	9,199,703	9,286,759
Non Current Assets	2,232,657	1,842,328
Total Assets	11,432,360	11,129,087
Current Liabilities		
Trade and other payables	781,671	794,089
Employee Benefits	858,978	716,892
Other	1,505,532	1,770,674
Total Current Liabilities		
Non Current Liabilities	260,915	216,417
Total Liabilities	3,407,096	3,498,072
Net Assets	8,025,264	7,631,015
Asset Replacement Reserve	5,000,000	5,000,000
Accumulated Funds	3,025,564	2,631,013
Total Equity	8,025,564	7,631,013

\* This abridged audited financial statement has been extracted from the full, audited financial statements which include more detailed disclosures on notes and balances.

\*\* CERA receives Operational Infrastructure Support from the Victorian Government.

\*\*\* CERA is operated as a not for profit organization. Accordingly, accumulated surpluses are held in the form of working capital and fixed assets to support committed and planned research projects.



Income

**Federal Government Grants** 

## Expenditure

Direct Research Expenditure

Laboratory Support Expenditure

**Buildings/Facilities Expenditure** 

Administration

4.5%

1%



State Government Grants (Infrastructure Support)



Clinical trials and Other Income



Legacies, Bequests and Donations



**Investment Income** 



Total

100%

Total

100%

## Saving sight. Changing lives.

### Centre for Eye Research Australia ABN 72 076 481 984

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