



Lions Eye Institute
Celebrating 30 Years
1983-2013

LIONS EYE INSTITUTE ANNUAL REPORT 2013

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A digital version of this report is available on our website:

www.lei.org.au

mission and vision



Glaucoma screening, 1960's

Our Vision

To prevent and cure blindness and eye disease

Our Mission

To achieve leadership in scientific research and clinical practice in the prevention of blindness and eye disease through:

- ▶ Being a global leader in scientific research
- ▶ Recognised for translation of research into community outcomes
- ▶ Commitment to growing the reach of our research capability and clinical services
- ▶ Development and training of outstanding eye care professionals and researchers
- ▶ Engagement with- and education of- the community in building awareness, reputation and funding

We are achieving our mission

The Lions Eye Institute holds the top level five in the federal government's Excellence in Research for Australia (ERA) ranking. ERA assesses research quality within Australia's higher education institutions using a combination of indicators and expert review by committees comprising experienced, internationally-recognised experts.

Our History

The Lions Eye Institute was established in 1983 and rapidly became a global centre for ophthalmological care and first-class scientific research into the prevention of blindness.

Our activities are underpinned by a continuous improvement program and worldwide collaborative research as we strive to achieve our mission – excellence in scientific research and clinical practice to prevent blindness.

Our Clinical Services are internationally recognized for providing high-quality care, a dedicated, passionate and professional team, continued investment in the latest equipment and technology, ongoing ISO 9001 accreditation and strong patient satisfaction ratings.

Our scientists work in close association with our clinicians to bring laboratory generated ideas and techniques to the level where they can be of benefit to people suffering blinding eye conditions. Our patients benefit by receiving the most advanced treatments available anywhere in the world.

a common vision: the crusade against darkness



Dr Robert Linton (left) testing a patient inside the glaucoma caravan

“I appeal to you
Lions ... will you not
constitute yourselves
Knights of the Blind
in this crusade
against darkness?”

**Helen Keller addressing the 1925
Lions International Convention,
Cedar Point, Ohio, 1925**

The dedication of a group of visionary Western Australian doctors, scientists and community members to the cause of saving sight stretches back well beyond the 30 years of the Lions Eye Institute (LEI).

The LEI represents a natural outcome of many years of hard work by the Lions movement in WA, inspired by the words of the famous humanitarian and disability advocate Helen Keller.

Her petition for Lions to become Knights of the Blind – “to hasten the day when there shall be no preventable blindness” – was taken up by Lions Clubs all over the world.

In WA, one of the early members of the City of Perth Lions Club was Dr Robert Linton – considered the father of modern ophthalmology in Western Australia.

In 1963, Dr Linton became national president of the Ophthalmological Society of Australia and in the same year, organised the first national congress to be held in Perth.

At this congress he helped establish the Western Australian division of the Australian Foundation for the Prevention of Blindness (AFPB).

In his Presidential Address to the Ophthalmological Society, Dr Linton described the goals of the new Foundation as educating the wider community about eye health, workplace safety, glaucoma, the impact of genetics on eye health and the importance of regular eye checks. He believed preventable blindness could be reduced by 50 per cent through public education in the WA community.

In 1964, the AFBP began community glaucoma screenings out of a customised mobile caravan.

The screening process was embraced by the community and very effective, with thousands of people lining up for free tests. The caravan was manned by a voluntary workforce of ophthalmologists, nurses and Lions members and travelled all over the State offering free eye screenings. The first, set up outside Council House, attracted hundreds of people.

Over the next few years, the program became the largest district project of the local Lions movement and there was a growing recognition that a more formal approach was needed to its operation.

At the Lions convention in Albany in 1970, the Lions Save-Sight Foundation (LSSF) was formed, with Lions District Governor Dr Jack Hoffman appointed inaugural chair.

The LSSF greatly expanded the screening programs already begun by Dr Linton

and added screenings for amblyopia (lazy eye) in children from 1973, and diabetic retinopathy among the population with diabetes mellitus from 1978.

With a landmass of more than 2.25 million square kilometres, providing eye screening services to Western Australia was a huge undertaking and at its peak the screenings were offered out of 69 regional locations.

Over its lifetime, the screening program measured the intraocular pressure of an estimated 300,000 Western Australians and saved the eyesight of many people. It had also done much to raise public awareness of eye disease and preventable blindness.

A critical moment for the save sight movement came with the creation of the Lions Chair of Ophthalmology at The University of Western Australia and the appointment in 1975 of Ian Constable - a talented young ophthalmologist who had been working at Harvard University.

Ian Constable saw the enormous potential for Western Australia as a research hub with its excellent health care system, stable population, long genetic lines from early settlers and proximity to Asia.

Initially working from a clinic at Royal Perth Hospital, Professor Constable was soon extremely busy setting up a number of research and teaching programs, providing specialist eye treatment and properly equipping the clinic.

He recruited two outstanding scientists – Valerie Alder and Frank van Bockxmeer – who quickly attracted Federal research funding through the National Health and Medical Research Council.

Professor Constable's impact on ophthalmology in Western Australia was hugely significant because there had not been a strong focus on specialisation and previously, many patients had to travel to Sydney, Melbourne or Adelaide if they required treatment for more complex eye disease.

The second impact was on the reputation of Perth as a place to study. The clinic started to attract talented young post-graduate students from Melbourne, Sydney, Brisbane, Adelaide, New Zealand and a number of Asian countries and many of them stayed in Perth following their training.

The third impact was a rapid escalation of laboratory-based research.

By the early 1980s, ophthalmology had become the largest research consortium in UWA surgery.

As early as 1979, the LSSF recognised the resourcing of eye programs was beyond the capacity of a volunteer service group and planning began for the establishment of the Lions Eye Institute (LEI).

In 1983, Professor Constable and his team moved to converted clinical and research laboratories in the former Chest Hospital, now A Block of Sir Charles Gairdner Hospital at the Queen Elizabeth II (QEII) Medical Centre in Nedlands.

In the same year, the Lions Eye Institute was established – conceived as a totally independent body with a separate Board of Governors under the directorship of Professor Constable.

The LSSF, and Professor Constable, had very specific aims in mind for the LEI:

the need to get more research units; government acceptance of the Institute's role; a strong clinical service to ensure LEI offered a tertiary referral centre for the major causes of blindness; maintenance of strong links with the state-wide community and Lions Clubs; links with – but independence from – The University of WA; a strong independent board of community-minded people and a commitment to making WA a leader in ophthalmology in research and clinical services.

Thirty years on, the Lions Eye Institute has established a reputation for providing world-class ophthalmic care and leading laboratory and translational research into blindness.



Valerie Alder

chairman's report



The completion of the new Harry Perkins Institute of Medical Research and our occupancy of one floor provided much-needed space for the Lions Eye Institute (LEI) to expand in 2013.

This physical expansion corresponded with a major strategic review of all LEI operations.

Strategic planning workshops managed by Robert Radley of Bain and Co allowed our management team to bring fresh thinking to future challenges, including the best growth strategy for the LEI, funding mechanisms and financial sustainability. The strategy outlines our vision and our mission which are underpinned by the core values which we foster: leadership, translation, innovation, integrity and service

The strategic plan developed from the process that occurred in 2013 will now be implemented by the Institute's management team over the next three years (2014-16).

On the financial front, the Institute achieved a reasonable \$2.8 million surplus in spite of a substantial increase in its operating expenditure - mainly in the supply of clinical services.

Operating expenditure is expected to increase again next year with the additional facility cost of the new research floor in the Harry Perkins building. There will be pressure on our financial performance in 2014.

Funds from the Building the Vision capital fundraising campaign have been put to good use in equipping our new research facilities. Money raised will also support the refurbishment of the existing LEI building to accommodate an expansion in clinical and surgical services.

Clinic services continue to grow at a rapid rate – up almost 50 per cent in six years.

The LEI was again well-supported by many private individuals during the year, including the finalisation of a major bequest from the Estate of Douglas McMillan worth \$471,739 in total.

To all community members and corporate entities that supported the Institute through donations large and small, the Board offers sincere thanks.

The Institute also continued to receive vital support from the Lions Save-Sight Foundation and the Australian Foundation for the Prevention of Blindness.

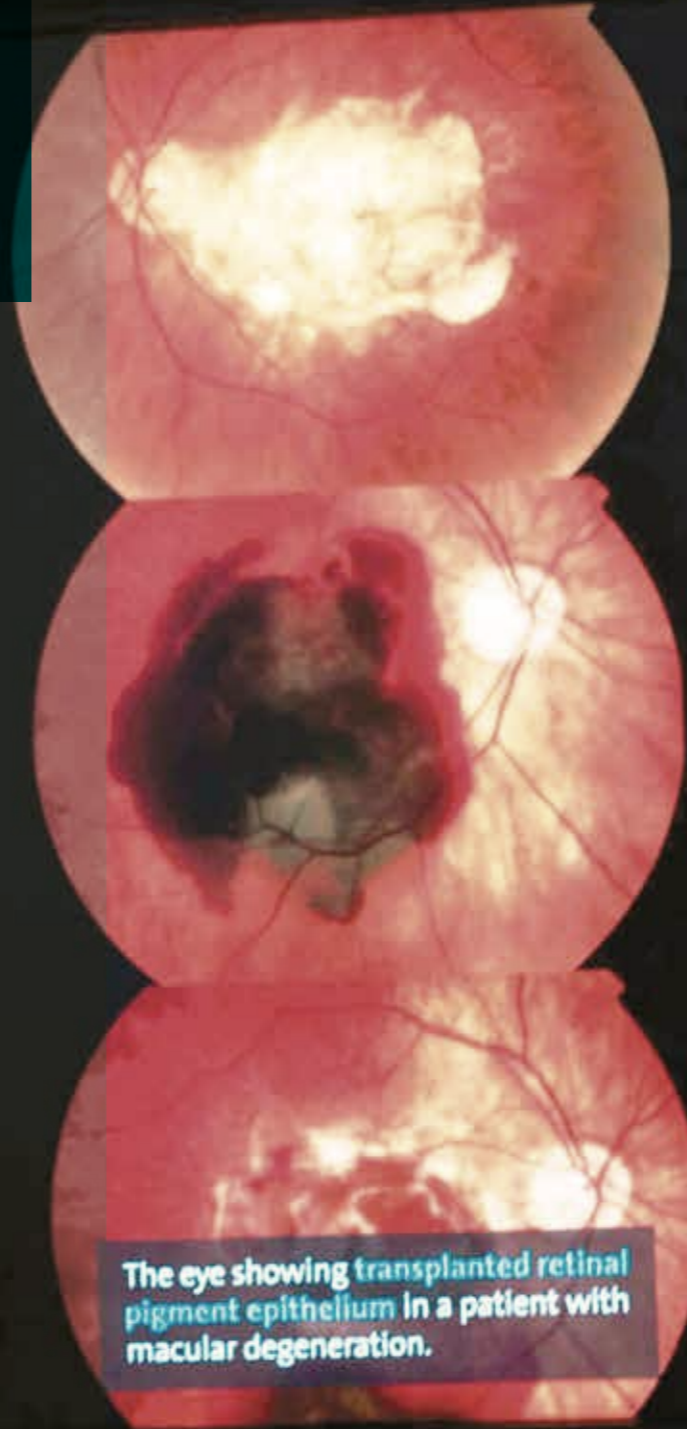
As Chairman of the Board, I wish to thank former Director Bill Bloking, who retired in 2013. We are particularly grateful for Bill's efforts in chairing the capital fundraising campaign.

Jason Ricketts, another valued Board member, relocated to Sydney during the year and retired from the Board but we were fortunate to recruit Tony Joyner, who continues our strong relationship with Herbert Smith Freehills.

Finally, on behalf of the Board, I wish to thank the LEI management team under the leadership of Professor David Mackey, our valued staff and wonderful volunteers.

David Eiszele
NON-EXECUTIVE CHAIRMAN

managing director's report



2013 – celebrating 30 years

As we celebrated the 30th anniversary since the foundation of the Lions Eye Institute (LEI), it gave us the opportunity to reflect on some of the Institute's outstanding achievements – human gene therapy, technology to target age-related macular degeneration, new microsurgical techniques to control glaucoma and ultra-microsurgical robotics – to name a few.

And while celebrating the past, we continued to build for the future.

December 2013 saw the culmination of years of effort by the State's top medical research institutes and agencies – principally the WA Institute for Medical Research (now known as the Harry Perkins Institute of Medical Research), The University of Western Australia, the WA Department of Health and the LEI – to create a new purpose-built research facility on the QEII Medical Centre site.

The LEI occupies one floor of the new building, with its state-of-the-art research capabilities and access to cutting-edge equipment.

We now have a unique opportunity to foster greater collaborations between research groups within the LEI as well as with other medical research institutes and retain and attract talented young researchers.

Planning for the next 30 years

The freeing up of space within the original building now allows for the first major physical restructure of the LEI since the opening of the Verdun Street building in 1996. We are planning to increase research clinical trials of new treatments for patients with eye diseases and meet the needs of patients.

In 2013, the LEI treated a record number of patients and experienced growth in the majority of clinical departments. In the past six years, clinic activity has grown by 47 per cent. We will move clinical services to the ground floor, bringing greater capacity for clinics and clinical trials to service a growing Western Australian population seeking high-quality medical care. This redevelopment will also enable the commissioning of a second operating theatre to cope with the growing load of day surgery cases associated with our ageing population. It also allows us to expand the facilities for the Lions Outback Vision administration centre.

Bigger and better

2013 has also been a year of strong growth for the LEI's Clinical Trials department – with team numbers doubling to 11 and studies initiated this year tripling to more than 20 current active clinical trials.

We are conducting the largest number of eye-related clinical trials of any group in the country.

Clinical trials are essential in translating laboratory research into clinical practice. Participants in clinical trials have the opportunity to receive new treatments before they are released to the general public.

The largest Phase II gene therapy trial in ophthalmology in the world, led by the LEI's Molecular Ophthalmology division's Human Gene Therapy group, progressed significantly in recruiting its 38th patient.

Capacity and capability also increased at the Lions Laser Vision Centre with the purchase of the world's fastest and most advanced excimer laser. This investment in the latest and most advanced technology in the world, combined with the expertise of the centre's surgeons, ensures patients will have the best possible visual outcome after laser vision correction.

Our Immunology Research Centre, which studies eye diseases that have an immune component, remains unique in the world and combines a highly acclaimed general immunology program with a unique ocular immunology program.

The LEI's Physiology and Pharmacology team continued to develop new diagnostic and therapeutic techniques for clinical ophthalmology along with studies contributing to our knowledge of blinding diseases such as glaucoma and diabetic retinopathy.

The Ocular Tissue and Engineering Laboratory forged partnerships with stem cell laboratories in Europe and the United Kingdom to explore alternative cell sources for deriving retinal pigment epithelium and new techniques for deriving induced pluripotent stem cells.

Our commitment to Indigenous eye health also strengthened in 2013, with Lions Outback Vision hosting a large number of optometrists, Aboriginal health workers, eye policy advocates and ophthalmologists in Perth. The Diabetic Eye Screening Service received significant support from the Royal Australian and New Zealand College of Ophthalmology's Eye Foundation to improve coverage and systems in the Kimberley region, while an Ophthalmic Research Institute of Australia grant was awarded to study

the implementation of Telehealth services between optometrists and ophthalmologists.

In 2013 we welcomed many national and international visitors to the LEI, including Professor Jesús Ruberte Paris from Universitat Autònoma de Barcelona; Raine Visiting Professor Elizabeth Engle; Pfizer Visiting Professor Stephanie Watson; LEI Visiting Professors Robyn Guymer, Damien Harkin and Alan Stitt; LEI Visiting Lecturer Dr Alice Pébay; Dr Ana Belen Alvarez, from the University of Barcelona and Leylani Taylor of Retina Australia WA.

We also said goodbye to a highly valued colleague and friend, Chee-Peng Yao. Chee-Peng worked at the LEI for 10 years as Chief Financial Officer and helped guide the Institute through a period of significant growth and change while providing accurate and timely financial advice to the Board and management. We wish him well in retirement.

Looking back, looking forward

As we look to the next 30 years, we will build on our mission of international best practice medicine and surgical eye care, original and translational eye research and community outreach.

The LEI will be working to ensure our research and clinical services meet the needs of a growing and ageing population while consolidating our reputation as a centre of global excellence in eye health.



David Mackay
MANAGING DIRECTOR



Growing clinic



PhD student Seyhan Yazar with Prof David Mackay in the Perkins Institute

30th anniversary celebration



Celebrating 30 years of the Lions Eye Institute.

More than 150 people gathered to celebrate the Lions Eye Institute's (LEI) 30th anniversary in 2013.

LEI staff and Board members, LSSF and Lions Club members, business people and benefactors paid tribute to the LEI's achievements during the gala dinner, held at Perth Arena on August 31.

Managing Director Professor David Mackey reflected on the LEI's record of scientific innovation and achievement, as well as the remarkable support the LEI had received from the Western Australian community since its creation in 1983.

Professor Ian Constable gave a speech outlining the LEI's achievements – with many entertaining anecdotes thrown in for good measure - and Dr Angus Turner spoke about his Lions Outback Vision program, with its aim to improve eye health services in indigenous communities.

Dr Turner was joined by Sharon Yarran, a Noongar woman from the Kanyang group, who explained the impact of diabetic eye disease on her and her family.

A short history of the LEI was also distributed to people at the dinner.

The history will form part of a book to be published in 2014 which charts the pre-history of the LEI, including the birth of the save sight movement in Western Australia under the guidance of Dr Robert Linton, the involvement of Lions Clubs in early glaucoma screening, how a young and talented ophthalmologist by the name of Ian Constable was attracted to WA to take up the first Chair of Ophthalmology at The University of Western Australia and how his vision laid the foundations for the LEI itself.

It also lists the Institute's key research achievements, our clinical services, Indigenous work and collaborations in Asia and beyond.

Research publications, lists of Fellows and an historical timeline will also feature to ensure important information about the LEI is not lost to future generations.



Download the history:
www.lei.org.au/pdf/lei-history-book-chapter1.pdf

acknowledgements



Anthony Tighe and David Mackey



Jeanette Morgan and Fran Snabel with Dr Tim Isaacs and Prof David Mackey

To find out more about donations and partnerships at the Lions Eye Institute contact Kari Legge on: (08) 9381 0823 or karilegge@lei.org.au

Bequests in Perpetuity

The Alan and Lilian Cameron Charitable Endowment
 Joyce Henderson Bequest Fund
 Harry and Margaret Kerman Trust Fund

Bequests

Estate of Jennie Allen
 Estate of Ruth Ashforth
 Estate of Kenneth Butterly
 Estate of Frederick Daniels
 Estate of Jane Longton
 Estate of Barbara Lord
 Estate of Douglas McMillan
 Estate of Douglas Measey
 Estate of Daphne Minus
 Estate of Winifred Rogers
 Estate of Ronald Rupert

Special Gifts

Anonymous
 Antony Accordino, Oxford Compounding Chemist
 Apache Energy
 David and Kathy Aspinall - Orberwill Pty Ltd
 Mr Bill Bloking
 Ms Odna Borlaug
 Mr Bruno Camarri
 Ian and Elizabeth Constable
 Professor Geoffrey Crawford
 Mr John Cruickshank
 Dr Jean-Louis deSousa
 Mr Kerry Hamanis
 Dr Tim Isaacs
 Professor David Mackey
 Mandurah Murray Mayday Club
 Professor Ian McAllister
 Lotterywest
 Mrs Elva Moore
 Mrs Jeanette Morgan & Francis Snabel & Friends
 Mr Eric Pearton
 Mr and Mrs John and Lee Saleeba
 Medical Centre Chemist, Nedlands
 Mr Reginald Watts
 Wesfarmers Limited

Trusts and Foundations

Channel 7 Telethon Trust
 The Constantine Family Foundation
 Eye Surgery Foundation
 Freehills Foundation
 Lions Save-Sight Foundation
 McCusker Charitable Foundation
 Quality of Life Foundation
 Raine Medical Research Foundation
 RANZCO Eye Foundation
 Stan Perron Charitable Foundation

Major Institutional Support

ARC Centre of Excellence
 Federal Government of Australia
 National Health & Medical Research Council
 Department of Foreign Affairs and Trade
 Government of Western Australia
 Department of Health
 Indigenous & Remote Eye Health Service
 Ophthalmic Research Institute of Australia
 Retina Australia (WA)
 The University of Western Australia

clinical genetics and epidemiology



Genetics and Epidemiology Team

Genetics and Population Health

Summary

1983, the year the Lions Eye Institute (LEI) was founded, was also the year when a major discovery revolutionised genetics research.

It was the year Kary Mullis came up with the idea for the Polymerase Chain Reaction (PCR). PCR is used to amplify DNA. This method allows researchers to quickly make billions of copies of a specific segment of DNA, enabling them to study it more easily. Mullis went on to be awarded the 1993 Nobel Prize in Chemistry.

In 2009, Professor David Mackey and Associate Professor Alex Hewitt visited milepost 46.58 on the road from San Francisco to Mendocino, where Mullis stopped to write down his idea.

1983 was also the year that a gene (for Huntington's disease) was first mapped to a specific chromosome (4) using modern genetic markers. The last 30 years has seen thousands of diseases mapped, including hundreds of eye disease genes that have been fully sequenced.

In 1983 the method of DNA sequencing was less than a decade old. Now, with next generation sequencing, researchers at the LEI are able to get the entire genome of eye disease patients sequenced in less than a week.

The next 30 years will see a considerable translation of genetic discoveries into clinical practice and LEI researchers are part of the international consortia working in this area.

Projects

The Western Australian Eye Protection Study

Outdoor sports involve exposure to sun, which has both beneficial and potentially harmful effects. For example, ultraviolet (UV) light helps

us make Vitamin D - important for bone strength - but UV also increases the risk of skin cancer. Thus a balance is important. Similarly some outdoor exposure seems to protect adolescents from developing short-sightedness (myopia) but excess UV exposure increases the risk of damage to the front of the eye, causing pterygium. Wearing hats and sunglasses is practical for some sports and outdoor activities but it is less so for others.

In 2013 Professor Mackey received funding from the Channel 7 Telethon Trust to employ a research assistant to support his current investigation into the outdoor environment and vision among children and adolescents. Members of the research group attended many swimming clubs to present information and recruit participants, with 521 people examined during the year.

Rowing groups in high schools are now being targeted to continue the investigation of the use of eye protection and the prevalence of early signs of eye damage in sporting groups.

Translation of Genetic Eye Research

In 2013 the National Health and Medical Research Council's Centre of Research Excellence project - The Translation of Genetic Eye Research - completed the second year of a five-year \$2.5 million national research effort to translate the new discoveries in genetics of eye disease into improved patient care.

The project involves research teams from Western Australia, South Australia, Victoria and Tasmania. Significant progress has been made in establishing a new genetic testing centre in South Australia, consolidating data and bio-specimens in one national register in Western Australia and contributing to international consortia looking to discover new genes affecting eye diseases.

Raine Eye Health Study

The Raine Study is a longitudinal study that is one of the world's largest and most successful studies of the influences of genetics, pregnancy, childhood and adolescence on subsequent health and developmental outcomes. The 20-year-old follow-up of 2000 cohort participants had a predominant focus on eye health and was one of the first studies of eye health and diseases in young adults.

All available DNA samples have been genotyped and samples not previously genotyped were also analysed on a genome-wide array, with analysis of data continuing in 2013. Data from this study have been contributed to two international consortia that have identified genes involved in corneal curvature, corneal diameter and central corneal thickness, and risk factors for refractive error and keratoconus.

Western Australian Strabismus Inheritance Study

Strabismus (misalignment of the eyes) affects three per cent of the general population. It is often associated with amblyopia, a failure of normal visual development (otherwise known as a lazy eye) and reduced or absent binocular (stereoscopic) vision. Thus early diagnosis and treatment enables optimal visual outcomes.

We have been collaborating with the Engle laboratory at the Children's Hospital, Boston, affiliated with the Harvard Medical School, since 2003 as part of the Strabismus Inheritance Studies in Tasmania and Western Australia with a primary focus on CFEOM, congenital ptosis and Duane's Syndrome.

Busselton Healthy Ageing Study

The Busselton Study is well known as a major population health study that has been ongoing since the 1960s. In 2010, the Busselton Population Medical Research Foundation started a study to explore why some people are able to remain healthy and

active throughout their senior years, whilst others suffer ongoing illness and infirmity – the Busselton Healthy Ageing Study.

There is an eye component within this study, for which the LEI through Professor David Mackey is providing financial and equipment support.

Grants/Funding

Channel 7 Telethon Trust

Australia-India Council

National Health and Medical Research Council

Key publications

Guggenheim JA, McMahon G, Northstone K, Mandel Y, Kaiserman I, Stone RA, Lin X, Saw SM, Forward H, Mackey DA, Yazar S, Young TL, Williams C Birth Order and Myopia. *Ophthalmic Epidemiol.* 2013;20:375-84

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Lu Y, Vitart V, Burdon KP, Khor CC, Bykhovskaya Y, Mirshahi A, Hewitt AW et al. Genome-wide association analyses identify multiple loci associated with central corneal thickness and keratoconus. *Nat Genet.* 2013;45:155-63

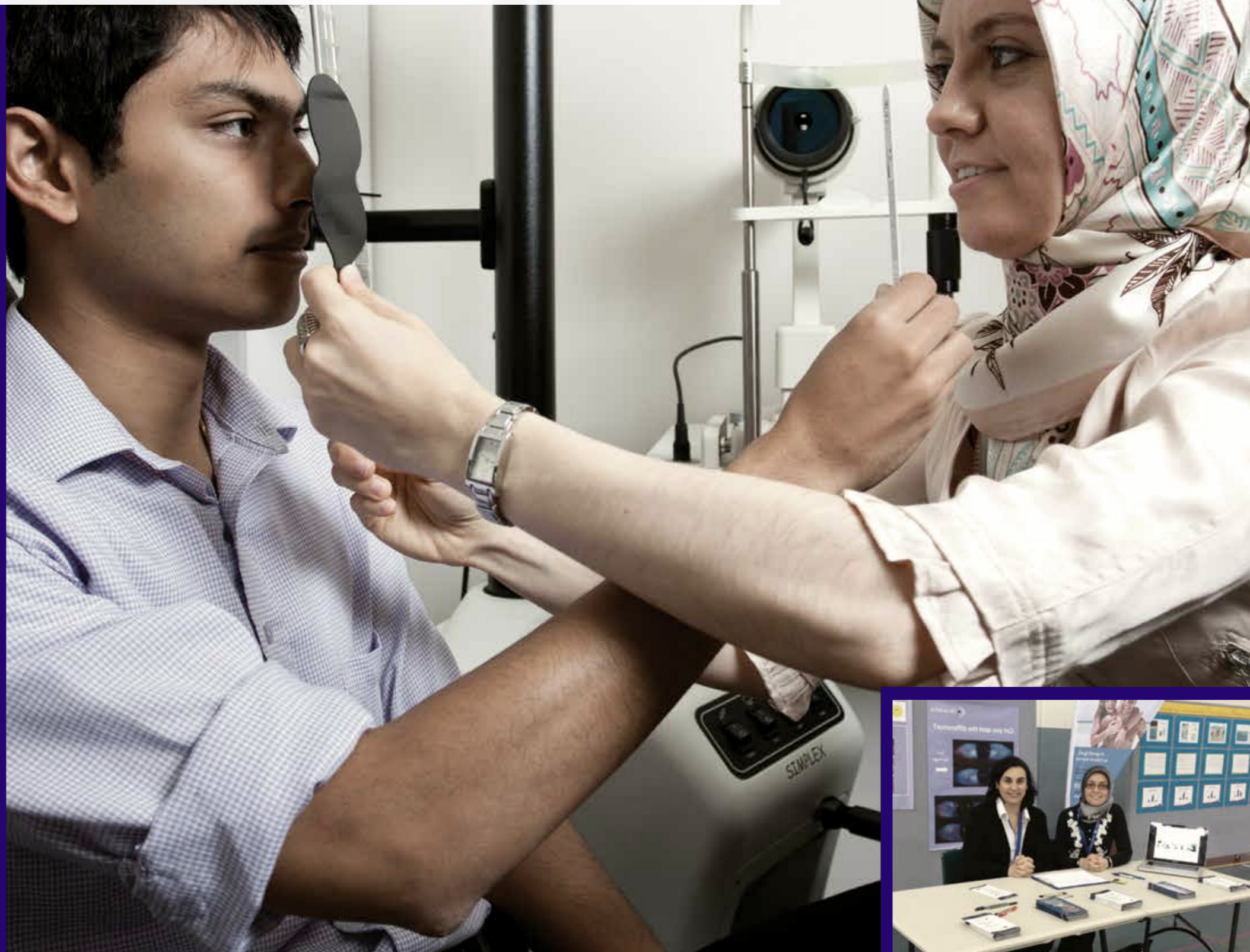
Staff

Professor David Mackey (Group leader)
 Dr Alex Hewitt PhD (NHMRC Research Fellow)
 Dr Maria Franchina PhD (Research Associate)
 Dr Justin Sherwin (Research Associate)
 Mr Paul Sanfilippo (Research Associate)
 Ms Kate Hanman (Research Assistant)
 Ms Lisa Booth (Research Assistant)
 Mr Joel Tan (Research Officer)
 Mr Kashif Syed (Data Management Officer)
 Ms Alla Soloshenko
 (Ophthalmologist Assistant)
 Dr Clairton de Souza (Joyce Henderson Paediatric Ophthalmology Fellow Jan-June)
 Dr Swetha Philip (Research Associate Jan-June, Joyce Henderson Paediatric Ophthalmology Fellow July-Dec)
 Ms Annette Clayfield-Hoskin (Joyce Henderson Research Fellow)

Students

Ms Seyhan Yazar (PhD)
 Dr Hannah Forward (Masters by research)
 Dr Charlotte McKnight (Masters by research)
 Dr Alex Tan (Masters by research)
 30 UWA Year 4 medical students completed an IMED R&D project.
 Four students from China undertook a 3-week research assignment as part of University of Western Australia Winter School studies.

eye protection under scrutiny



Examining the prevalence of eye damage.

In 2013, the WA Eye Protection Study lead by Professor David Mackey invited members of local sporting and outdoor activity groups to undergo an eye examination.

The study is examining the use of eye protection and the prevalence of early signs of eye damage.

Seyhan Yazar and Maria Franchina from Professor Mackey's Genetics and Epidemiology research group visited the 2013 AUSTswim conference in Fremantle to promote the eye protection study with their information booth receiving great interest from delegates.

Outdoor sports involve exposure to sun, which has both beneficial and potentially harmful effects. For example, UV light helps us make Vitamin D, which is important for bone strength, but UV also increases the risk of skin cancer.

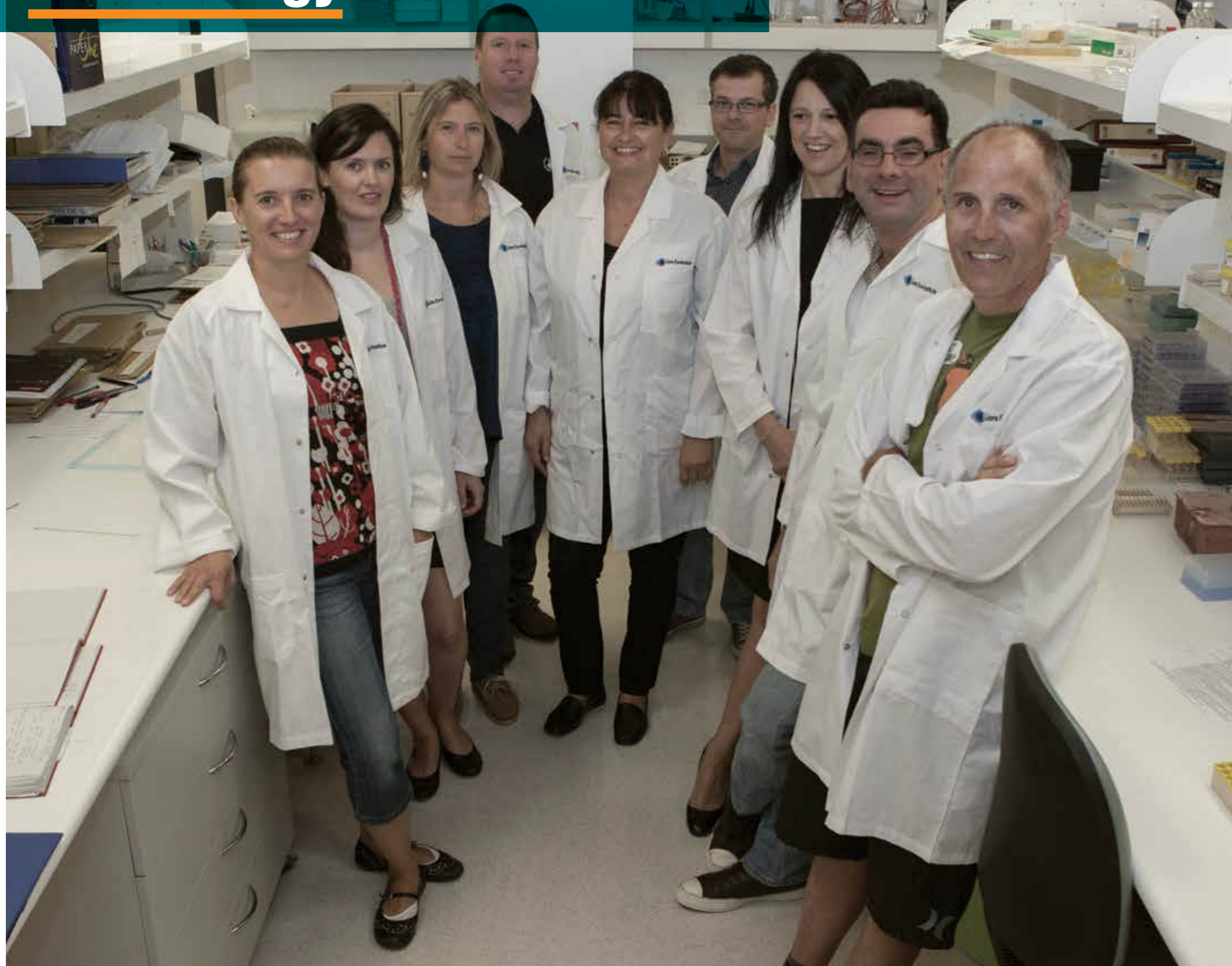
Research also shows some outdoor exposure seems to protect adolescents from developing short-sightedness (myopia) but excess UV exposure increases the risk of UV damage to the front of the eye, causing pterygium.

The study builds on earlier work at the LEI by Professor Bill Morgan.



L to R: Maria Franchina, Seyhan Yazar

centre for experimental immunology



Immunology staff

The Lions Eye Institute (LEI) has a long history of cutting-edge research. Our Immunology Research Centre is the only one of its kind in the world and combines a highly acclaimed general immunology program with a unique ocular immunology program.

The Immunology Research Centre encompasses five independent groups that work in close collaboration: experimental immunology, viral immunology, cell signalling and apoptosis, ocular immunology and ocular autoimmunity. These groups work collaboratively to study eye diseases that have an immune component.

The central focus of the general immunology research is to determine the key cellular and molecular interactions that occur in response to viral infection.

In recent years, this research has provided important insights into understanding how the immune system responds to infection and how, in turn, pathogens manipulate host immunity to improve their chances of survival. Mouse cytomegalovirus (MCMV) is used as a model virus infection, due to its similarity in structure and biology with human cytomegalovirus (HCMV). This virus causes a chronic viral infection



Prof Mariapia Degli-Esposti

that can result in significant systemic disease, as well as severe ocular complications - especially in individuals whose immune systems are compromised.

The LEI's general immunology program integrates closely with the ocular immunology program with the purpose of understanding immune responses in the eye and designs new therapies for sight-threatening diseases that have an immune component. To this end, we have developed a number of unique animal models to define the role of viral infection in the etiology of autoimmune disease, transplantation and complications of these conditions - including those that affect vision.

Our recent research has focused on understanding how a common chronic viral infection affects vision using a model of systemic (peripheral) viral infection.

Unlike previous studies that focused on direct infection of the eye, in a setting of systemic infection the virus only enters some parts of the eye. However, infection induces some profound changes in most eye compartments, including the neural retina. How these changes affect vision - and whether these effects are temporary or long-

term - is being investigated. Furthermore, the mechanisms involved in these processes are under investigation. These studies have and will continue to provide important information that will help us to prevent ocular diseases that occur following viral infection.

With our collaborators, we have established a program to investigate complications during bone marrow transplantation (BMT) and have developed relevant mouse models. One common complication following BMT is ocular graft versus host disease (GVHD). Symptoms of ocular GVHD include blurry vision, severe light sensitivity, chronic conjunctivitis (pink eye), dry eyes, burning sensation and general eye pain. In severe cases, ocular surface disease with corneal perforation can ensue. Our studies are addressing whether immune-mediated mechanisms participate in the pathology of ocular GVHD, and whether this complication is exacerbated by concomitant viral infection. Ultimately, we aim to develop improved therapies for this important ocular condition.

An additional focus of our immunology research is inflammatory ocular disease or uveitis. Uveitis is an autoimmune disease that affects the eye, damaging the retina and causing blindness. Uveitis mainly occurs in the 20-50 year age group, and can affect one or both eyes. Uveitis is an important problem and accounts for 10 per cent of blindness in people of working age in the western world. Little is known about the cause of uveitis and it remains one of the most important unsolved problems in ophthalmology. We are investigating the development of autoimmune uveitis using a novel mouse model of spontaneous disease.

Together with our collaborators we have also developed mouse models to define the causes of uveitis that occurs as a complication of another autoimmune disease. These studies were the first to describe a model of spondylarthritis where uveitis occurs as part of the disease process, as is the case in humans. It is hoped that ultimately the insights gained from these studies will lead to improved treatments for these ocular conditions and autoimmune diseases in general.

Current Laboratory Members

Professor Mariapia Degli-Esposti
Professor John Forrester

Research Coordinator

Dr Serani van Dommelen

Senior Research Staff

Assistant Professor Christopher Andoniou
Dr Matthew Wikstrom (PDG Brian King
Research Fellow)
Dr Jerome Coudert

Research Staff

Dr Valentina Voigt
Dr Iona Schuster
Dr Monique Ong
Dr Marie Estcourt

Research Associates

Peter Fleming
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ian constable lecture



Professor John Forrester

Professor John Forrester delivered the 14th annual Ian Constable Lecture at The University of Western Australia on October 3, 2013.

His lecture, Autoimmunity and Latent Infectious Disease, explored our changing understanding of autoimmunity and the role played by viral infection in its pathogenesis.

Professor Forrester divides his time between his native Scotland – where he holds the Cockburn Chair of Ophthalmology at The University of Aberdeen – and Western Australia where he is Professor of Ophthalmology at UWA with joint appointment to the LEI's Immunology division.

He is working in collaboration with LEI researchers Dr Matthew Wikstrom and Professor Mariapia Degli-Esposti studying the causes of inflammatory ocular disease, also known as uveitis.

Uveitis, an autoimmune disease that damages the retina, accounts for 10 per cent of blindness in people of working age in the western world and carries with it a huge social and economic cost.

The first Ian Constable Lecture, named after the founder of the Lions Eye Institute, was held in 2000 and continues to attract outstanding scientists to speak on a diverse range of subjects.

Audio of the lecture is available on the Institute of Advanced Studies website at

www.ias.uwa.edu.au/lectures/forrester



L to R: Mariapia Degli-Esposti, Bill Bloking, John Forrester

molecular ophthalmology



Molecular Ophthalmology staff

The Human Gene Therapy Trial - the culmination of basic research work by Molecular Ophthalmology - progressed significantly and recruited its 38th patient in 2013. It is the largest gene therapy trial in ophthalmology in the world with the highest number of patients treated with gene therapy.

Projects and Outcomes

Recombinant adenoassociated virus mediated gene therapy trial

To date, the vast majority of patients were recruited from Professor Ian Constable's clinic with the help of trial coordinators Cora Pierce and Kate Maslen. All patients are doing well and we are looking forward to further data analysis in 2014. Molecular Ophthalmology provides laboratory support and analysis for the participating trial patients by handling, processing, testing and analysing thousands of patient samples.

Diabetic Retinopathy

Development and characterisation of animal models

In previous years, Molecular Ophthalmology successfully developed a mouse model for retinal neovascularisation that can be examined in normal (Kimba) and diabetic (Akimba) animals. These models were met with an enthusiastic world-wide response and in 2013 further licenses were granted to Regeneron Pty.Ltd.; University of Charlottesville, USA; Harvard University, USA; Justus-Liebig University, Germany; and University of Southampton, UK.

Retinitis Pigmentosa

Molecular Ophthalmology has developed a new cell-based procedure to measure an



L to R: Dr Aaron Magno, Prof. P. Elizabeth Rakoczy, Assoc. Prof. May Lai

important cell biological marker - the amount of rhodopsin on the cell surface - and showed a correlation between the stability of rhodopsin mutations and disease severity and how the amount of surface rhodopsin could be increased with treatments.

Grants/Funding

- ▶ Richard Pearce Bequest
- ▶ Avalanche Biotechnologies, USA

Publications

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EP Rakoczy. From Mice to Humans. *Royal Australian and New Zealand College of Ophthalmologist's Meeting, Hobart 2013*.

Staff

Professor P. Elizabeth Rakoczy
Associate Professor May Lai
Dr Richard McKeone
Dr Aaron Magno

human gene therapy trial

The Human Gene Therapy Trial is the culmination of 20 years' award-winning research work by the Lions Eye Institute (LEI)'s Molecular Ophthalmology team to develop a new treatment for wet Age-Related Macular Degeneration (AMD), which would eliminate the need for regular injections into the eye.

The trial is one of the best examples of successful research that started as a basic research project translating into a revolutionary treatment for patients with wet AMD.

All stages were developed at the LEI.

Over the years, close to 100 scientists, ophthalmologists, veterinarians, virologists and PhD students across three continents have participated in the project. In 2005, the research was ranked in the top 10 best pieces of National Health and Medical Research Council-supported research in the country.

The original laboratory work headed by Professor Elizabeth Rakoczy that led to the trial was supported during the early 1990s by the NHMRC, Juvenile Diabetes International, Retina Australia, the Lions Save-Sight Foundation (LSSF), Lions Clubs and the Australian Foundation for the Prevention of Blindness (AFPB).

First the researchers used gene therapy to correct one form of childhood onset

retinitis pigmentosa. The team used a small genetically engineered and harmless virus to carry a healthy copy of the missing gene into the retinal pigment cells of the eye.

The research started in a mouse model and progressed to Briard dogs. Professor Rakoczy and her team, in collaboration with Professor Kristina Narfstrom in Sweden, injected a virus containing cells with genetic material into the eyeballs of the blind Briards. Within a month, the dogs could see.

Following this success, the team turned its attention to AMD, which is the major cause of blindness in the developed world.

Thus the research continued with objectives to:

- ▶ Understand the pathomechanism of wet-AMD
- ▶ Develop animal models for the disease
- ▶ Develop long-term treatment strategies for wet-AMD - gene therapy
- ▶ Produce the appropriate viral constructs
- ▶ Test the viral constructs in vitro (cell cultures), in vivo (mouse model) and in pre-clinical settings (monkey model)
- ▶ Conduct Phase I and II human trials

All this work was facilitated by a NHMRC Program Grant (2002-2007) that enabled the research team to take the basic research project to the clinical trial phase.

Following an approval from the Australian regulatory authority – the Therapeutic Goods Administration (TGA) – the know-how and associated data were acquired by Avalanche Biotechnologies, based in San Francisco, USA.

Human trials at the LEI began in early 2012, with Professor Ian Constable as the trial's chief clinical investigator. To date 38 West Australian patients have been recruited into the trial.

ocular tissue engineering laboratory



Assoc. Prof. Fred Chen's children view his research talk at the Perkins Institute of Medical Research

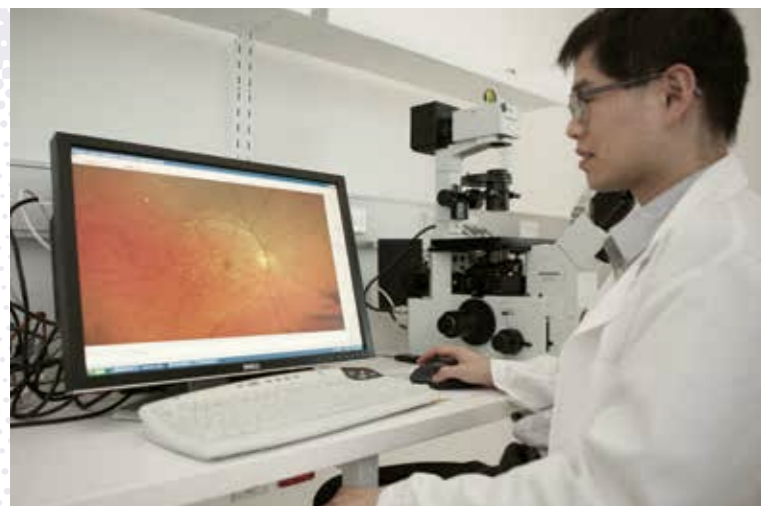
Associate Professor Fred Chen heads the Ocular Tissue Engineering Laboratory and the Functional Ocular Imaging Laboratory. He has gained international recognition in the field of retinal pigment epithelium transplantation, retinal-tracking microperimetry and spectral domain optical coherence tomography. Through his doctoral thesis, surgical techniques of cell transplantation have evolved and functional and anatomical outcome measures for measuring retinal cell therapy success have been validated.

His group is currently collaborating with stem cell laboratories in Europe and UK in exploring alternative cell sources for deriving retinal pigment epithelium and new techniques for deriving induced pluripotent stem cells. His ocular imaging laboratory is also working with groups in the UK and US on designing the testing protocol for detecting functional progression in dry macular degeneration. In addition to this group's major focus on stem cells and retinal imaging, it also conducts research into visual acuity measurement, retinal detachment surgical success rates, long term outcomes of lucentis therapy and phenotype-genotype correlations in toxic and inherited retinal diseases.

Research Projects

A Comparative Study of Two Automated Microperimeters: Nidek MP1S versus CenterVue MAIA

Aim: To examine the repeatability and comparability of 2 visual field instruments (microperimeters): the Nidek MP1S and the CenterVue MAIA microperimeters, which use the latest imaging technology



Assoc. Prof. Fred Chen

to simultaneously test the function of the retina and track retinal image motion due to eye movement. As new regenerative medicine and neuro-protective treatments for macular degeneration are emerging, these microperimeters are becoming more important in the monitoring of disease progression and response to therapy. The result from this study will be critical for future studies using microperimetry and design of clinical trials which use microperimetry as outcome measures.

A natural history study for the assessment of visual function measurements in patients with macular degeneration

Aim: To examine the changes in vision in patients with retinal degeneration. We know that patients with retinal degeneration often have stable visual acuity for many decades. However, they notice progressive patchy loss of paracentral vision that can't be measured by conventional visual acuity test. We want to document the gradual decline in paracentral vision over a period of 12 months in patients with dry retinal degeneration. This study will involve specialised visual field testing using a new microperimeter called the Nidek MP1S. In addition to microperimetry, these patients will undergo detailed reading tests, questionnaires and retinal imaging for correlation. The results from this study will be used for planning large clinical trials looking at efficacy of neuro-protective agents and cell transplantation in preventing degeneration of the macula.

Dedifferentiation of human limbal stem cells to pluripotency

The human corneoscleral limbus contains

multipotent stem cells that can be isolated and cultured for clinical applications, such as the treatment of limbal stem cell deficiency. Studies in rodents have shown that stem cells in the limbus can be induced to form floating neurospheres in the presence of the BMP receptor antagonist Noggin and that these neurospheres can be further dedifferentiated to pluripotency using conditioned media. Limbal neurospheres (LiNS) express three (SOX2, KLF4 and C-MYC) of the four transcription factors identified as being sufficient for reprogramming cells to pluripotency, lacking only Oct4, the master pluripotency gene. The induction of Oct-4 expression in rodent LiNS by microenvironmental signals suggests close similarities between the LiNS transcriptome and that of pluripotent stem cells. Although results from our lab and others have described the induction of LiNS from human limbal tissue, the induction of pluripotency from primary human LiNS has not yet been reported. Our project aims to examine the effects of microenvironmental factors on pluripotent gene expression in human LiNS.

Production of Retinal Pigment Epithelium by Cellular Reprogramming

Since the development of the induced-pluripotent-stem (iPS) stem cell reprogramming technique by Yamanaka in 2006, the field of cellular reprogramming has progressed rapidly and the principle of using exogenous transcription factors to control cell fate has been widely studied in the context of inducing pluripotency. Recent developments, such as the replacement of retroviral transgene delivery with the use of synthetic mRNA to achieve

reprogramming factor expression, have begun to address the technical obstacles that remain between the new method and its implementation in a clinical setting. The primary aim of this project is the production of retinal pigment epithelium (RPE) using exogenous transcription factors delivered as synthetic mRNA. RPE dysfunction is a major contributor to retinal disease, including age-related macular disease, and transplantation of healthy RPE has been shown to improve visual function in human patients. RPE patches are currently being developed using human embryonic stem (hES) cell cultures, however, immunological and ethical concerns limit the suitability of these cells for clinical application. To address these concerns, this project aims to evaluate a number of donor cell populations for reprogramming potential, including umbilical cord blood, towards the end of identifying the most suitable cells for tissue engineering applications.

Staff

Associate Professor Fred Chen

Dr Sam McLenachan

Dr Dana Zhang

retinal vein occlusions



Prof. Ian McAllister

Professor Ian McAllister has been the lead researcher for a number of trials related to retinal vein occlusions – the third most common type of retinal disorder after diabetic retinal disease and Age-Related Macular Degeneration.

Retinal vein occlusion is a blockage of the small veins that carry blood away from the retina.

Professor Ian McAllister, Professor Dao-Yi Yu and Associate Professor Sarojini Vijayasekaran have performed extensive pre-clinical studies to demonstrate the feasibility of the laser venous bypass treatment for retinal vein blockages before clinical trials.

In 1999, Professor McAllister was awarded a national multicentre research grant to evaluate a laser venous bypass treatment for retinal vein blockages.

This new procedure was wholly invented at the LEI.

In this study, laser treatment created a bypass in 42 of 55 patients. Patients with successful treatment showed an improvement of 12.5 letters compared with control patients at 18 months.

This treatment is the first and the only one worldwide to address the causal pathology in this condition, representing a major advance in our ability to restore visual loss in sufferers.

lions outback vision



Assoc. Prof. Angus Turner

The Indigenous and Remote Eye Health Unit changed its name to Lions Outback Vision in February 2013.

An inaugural conference was held inviting optometrists, Aboriginal health workers, eye health policy advocates and ophthalmologists. The well-attended conference included a dinner attended by His Excellency Malcolm McCusker AC CVO QC, Governor of Western Australia.

A comprehensive website outlining all ophthalmology services available in rural and remote WA as well as a telehealth booking portal was also launched.

Access to adequate and equitable eye health services continues to be a significant issue for patients living in rural and remote areas. A practical and evidence-based approach is adopted by Lions Outback Vision to address these barriers.

Highlights

The Diabetic Eye Screening Service has had significant support from the RANZCO Eye Foundation to improve coverage and systems in the Kimberley region. Generous supporters and partners have helped to improve this service and other regions are now benefiting - including urban Aboriginal health services.

An Ophthalmic Research Institute of Australia grant was awarded in 2013 to conduct a study implementing Telehealth services between optometrists and ophthalmologists. Two medical students completing an honours year (BMedSci) produced a video outlining applications of telehealth services. They were awarded best community film at the RANZCO congress in Hobart. This rapidly evolving area continues to be a



Lions Outback Vision conference

major focus of Lions Outback Vision work with new honours students from medicine starting in 2014 to continue the projects.

Lions Outback Vision has also taken over management of the Northwest Optometry program from retiring private optometrist Margie O'Neill. This outstanding program involves the amalgamation of optometry outreach with visiting ophthalmology and plays an integral role in the improvement and efficiency of eye health visits.

Assoc. Prof. Angus Turner, the Director of Lions Outback Vision, worked in a rural hospital in Eastern Cape, South Africa, for the final month of 2013. The project, run by Mercy Ships at Zithulele Hospital, trains local staff - including general doctors - in ophthalmology and supports an outreach optometry service. Excellent links for future collaboration and work were established.

Funding has been secured from the Federal government to support an Outback Ophthalmology Fellowship. The post begins in 2014 and a senior registrar completing final year in ophthalmology training will attend all outreach trips through Lions Outback Vision. Research opportunities and developing country community ophthalmology will also form a component of the year with a month spent at Zithulele Hospital in South Africa.

Grants and funding

- Lions Eye Institute
- The University of Western Australia
- McCusker Charitable Foundation
- The RANZCO Eye Foundation

Staff

- Associate Professor Angus Turner – ophthalmologist
- Sandy Oates – orthoptist
- Julie Maiolo – outreach administrator
- Helen Wright – optometry coordinator

Students

- Verity Moynihan
- Richard O'Halloran
- Emily Frost



Training at Outback Vision conference



Assoc. Prof. Angus Turner with registrars

early work in indigenous eye health



Ilan McAllister looking for trachoma and teaching an interested bystander

Addressing the high rates of preventable eye disease in Indigenous communities has always been an important long-term goal for the Lions Eye Institute (LEI).

A pioneer and inspiration in this field was Dame Ida Mann, who diagnosed a trachoma epidemic in the Kimberley Aboriginal population in the 1950s.

Dame Ida had relocated to Australia from Oxford University and came to know Dr Robert Linton, who established the Australian Foundation for the Prevention of Blindness and was a key driver of the mass glaucoma-screening programs.

Shortly after arriving in Perth to take up the position as inaugural Chair of Ophthalmology at The University of Western Australia, Professor Ian Constable spent six weeks working in the Kimberley with Fred Hollows as part of his Australia-wide mass screening program of the Indigenous population.

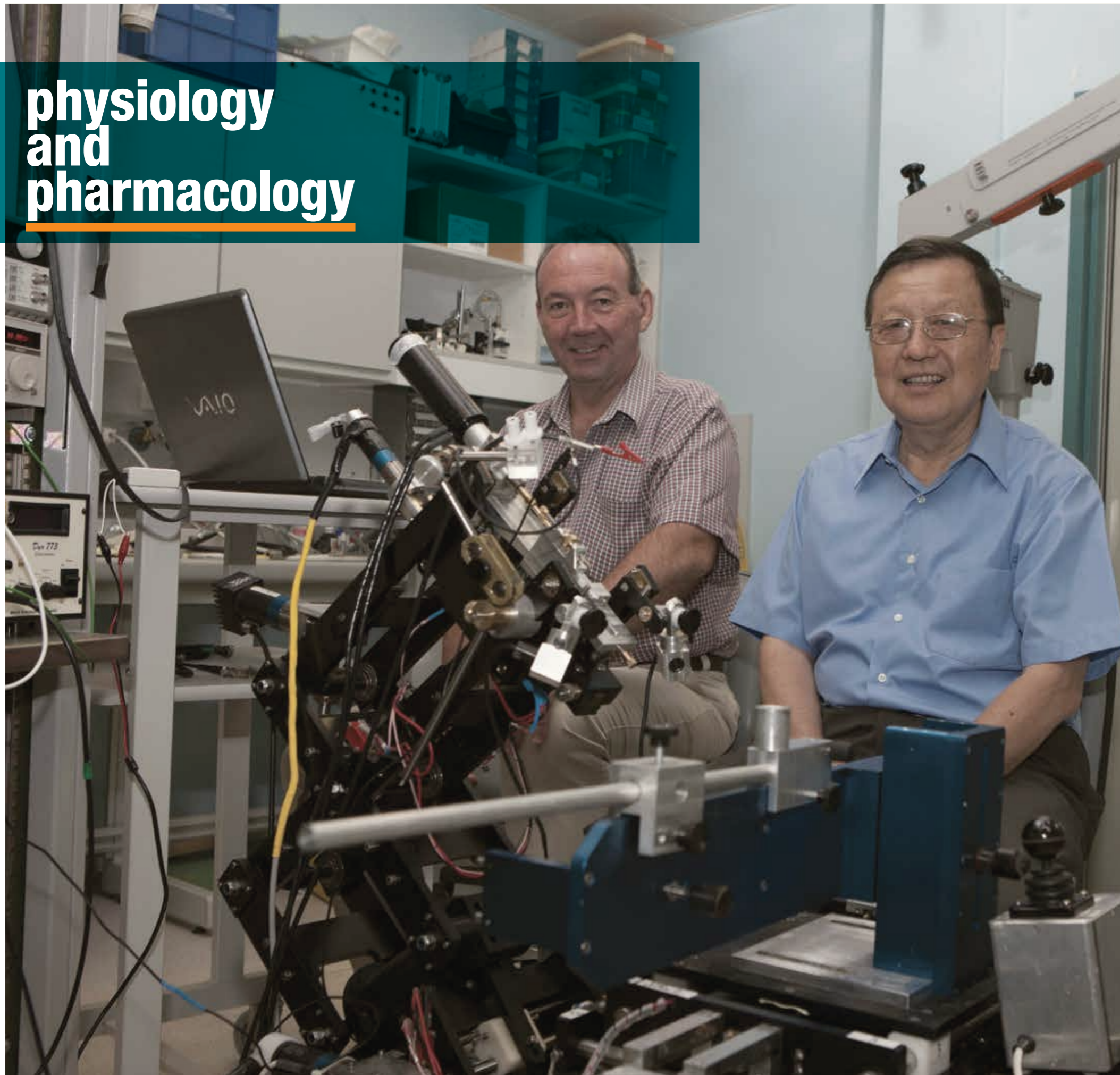
Many LEI ophthalmologists have subsequently been involved in Indigenous health work – much of it voluntary.

They found the main issues affecting the Indigenous population were corneal scarring from trachoma and bacterial infections, cataract and diabetic retinopathy.

In 2005, the Pilbara Aboriginal Eye Health Program, sponsored by BHP was launched, with the aim of helping hundreds of indigenous people in the Pilbara suffering from diabetes and associated blinding eye diseases.

Assoc. Prof. Angus Turner continues this important work through Lions Outback Vision.

physiology and pharmacology



Leading edge ophthalmic research

2013 saw a sustained effort in a wide range of projects within the Physiology and Pharmacology group, mostly funded by grants from the National Health and Medical Research Council (NHMRC).

Areas of investigation included the use of new laser techniques for performing intraocular surgery, a novel diagnostic approach for predicting glaucoma progression and studies of the underlying pathology in common sight threatening diseases such as glaucoma and diabetic retinopathy.

The group is now looking to develop several new projects and compete for national grant funding from the NHMRC.

Physiology and Pharmacological has been established at the LEI for more than two decades and has continuously progressed, supported by national and international grants.

The group has more than 13 labs equipped with leading edge equipment. Many technologies have been developed by team members to address specific and high impact questions in ophthalmic research.

An interdisciplinary team and close links with the ophthalmic clinic have been established. This group's achievements and discoveries have attracted collaborative work with major instrument and pharmaceutical companies and prestigious research teams.

Outcomes

The team continues to develop new diagnostic and therapeutic techniques for clinical ophthalmology and perform basic science studies that contribute to knowledge related to key blinding diseases such as glaucoma and diabetic retinopathy.

Research output resulted in 16 papers published in the ophthalmic literature during 2013.

Grants

NHMRC Project Grants
 NHMRC Development Grant
 Australian Research Council Centre of Excellence in Vision Science grant

2013 Publications

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Staff

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 Dr Geoffrey Chan
 Dr Yongfang Yang

intraocular laser microsurgery

The eye is a fragile organ...

requiring extreme care during surgical procedures, particularly for the intraocular tissues.

A common problem with current mechanical surgical procedures that use scissors, blades, or forceps, is that collateral damage to surrounding tissue is unavoidable.

This limits the type of surgery that can be attempted - and the success rate of those procedures that are attempted.

UV laser technology has the potential to provide improved precision and control in the transection and removal of tissue, with minimal collateral damage to surrounding tissue.

Professor Yu and Dr Joe Miller (Laser Physicist) initially started this project joined by Dr Paula Yu and a number of ophthalmologists from Sydney and Shanghai.

Professor Steve Cringle and Dean Darcey have continued with the laser development work in recent years. Potential target tissues such as trabecular meshwork, the sheath of the retinal artery and vein crossing site, the retinal pigment epithelium, Bruch's membrane, and sub-retinal tissues have been studied.

Ablation threshold and laser fluence required to ablate the tissue have been clearly defined that mimic the effect of intraocular surgeries.

Currently, this project has been supported by an NHMRC grant to further develop a prototype laser and delivery system for potential clinical use.

clinical research and trials



The Lions Eye Institute (LEI) conducts a wide range of clinical trials that are approved by a Human Research Ethics Committee and comply with stringent national and international regulations and guidelines.

Clinical trials can include the testing of new drugs or new devices, the collection of information from patients to improve the understanding of a particular condition or a review of patient medical notes to establish treatment outcomes and highlight areas where improvements can be made.

2013 has been a year of exponential growth for the LEI's Clinical Trials Department. The team has more than doubled to 11 members and studies initiated this year have more than tripled to over 20 currently active clinical trials. As a result, the core capabilities and competencies of the department have widened considerably.

Our current main areas of research are highlighted below:

Age-Related Macular Degeneration

Age-Related Macular degeneration (AMD) is the leading cause of severe vision loss in the ageing population in Australia and the developed world. There are two types: dry and wet AMD. Dry AMD is the most common type of macular degeneration affecting 90 per cent of people with the condition.

In the dry form, there is a breakdown or thinning of the layer of retinal pigment epithelial cells (RPE) in the macula. These RPE cells provide vital support to the light sensitive photoreceptor cells that are critical for vision. When we look at something, the photoreceptors (rods and

cones) receive light and begin a signal cascade resulting in the conversion of light to an electrical signal sent to and interpreted by the visual cortex of the brain.

Death or degeneration of photoreceptor cells is called atrophy. Hence, dry AMD is often referred to as atrophic AMD. It is characterised by the development of drusen (dots of yellow crystalline deposits within the macula) and thinning of the macula. Dry or atrophic AMD reduces the central vision and can affect colour perception. Generally, the damage caused by the "dry" form is not as severe or rapid as that of the "wet" form. However, over time, it can cause profound vision loss. The more advanced stage of dry macular degeneration is Geographic Atrophy, where a patch of photoreceptor cells die.

There is currently no proven therapy for dry AMD, but LEI is trialling a novel laser-based approach.

Dry AMD may progress to Wet AMD, which is characterised by the development of abnormal blood vessels under the retina. These vessels leak fluid, bleed and can eventually transform into scar tissue. This process disrupts the overlying photoreceptors and causes visual impairment. Wet AMD is also known as neovascular AMD.

Currently approved treatments for wet AMD are based on the administration of anti-VEGF therapy. Vascular Endothelial Growth Factor (VEGF) is a protein essential for the growth of blood vessels and anti-VEGF drugs work by inhibiting the activity of this protein. Anti-VEGF therapy is delivered into the eye via intravitreal injection. Currently available anti-VEGF drugs include Lucentis® and Eylea®.



Clinical trials

The development of these drugs represents an important medical advance and the LEI has been involved in many of the initial and ongoing trials of these medications.

Studies are currently underway to analyse patient outcomes for each of the currently available anti-VEGF regimes as well as reviewing the most appropriate therapeutic protocols and trialling novel compounds for AMD treatment.

The LEI is also involved in the development of a novel genetic therapeutic approach to blockade VEGF with a normally occurring endogenous splice variant of the VEGF receptor (a small piece of genetic material). Clinical Trials is actively recruiting patients with wet AMD to be involved in this study comparing Genetic Therapy with the currently approved Lucentis treatment.

Diabetic Retinopathy

Diabetic retinopathy is a common cause of severe loss of vision and the most common cause of blindness in individuals between the ages of 20 and 65 years.

Swelling of the central retina, or “macular oedema” (DME), is a major cause of visual impairment which can lead to blindness in diabetic retinopathy. The oedema is caused by the leaking of abnormal blood vessels in eyes affected by diabetes. The macula becomes swollen and as a result, central vision becomes distorted.

The standard treatment for diabetic retinopathy has been macular laser photocoagulation. Vitrectomy is sometimes used in advanced stages of the disease and in some select cases of macular oedema. There is a growing body of evidence that

anti-VEGF treatment is superior to laser and this is now the standard of care for DME, perhaps still combined with some laser.

We are involved in trials of both novel intra-vitreous slow-release steroid formulations and anti-VEGF treatments which may reduce the risk to loss of vision in eyes with advanced diabetic macular oedema for which further laser treatment is unlikely to be beneficial.

Diabetic Macular Oedema (DME) and Cystoid Macular Oedema (CME) are common complications following uneventful cataract surgery. Macular changes are more likely to occur following cataract surgery in diabetic patients, especially those with pre-existing retinopathies, compared to non-diabetic patients.

The use of non-steroidal anti-inflammatory drugs (NSAIDs) has been considered as a potential therapy to reduce the incidence, duration and severity of the oedema.

We are currently conducting clinical trials using a new type of NSAID eye drop following cataract surgery in diabetic patients. The aim of this study is to reduce the incidence of macular oedema in patients with diabetes following cataract surgery.

Retinal Vascular Occlusive Disease

Retinal vascular diseases, such as vein occlusions, are the second most common retinal vascular permeability disorders after diabetic retinopathy, and can also cause significant visual impairment.

In Central Retinal Vein Occlusion (CRVO) there is a build-up of fluid and leakage of the fluid from the affected blood vessel. The swelling of the macula

results in distortion of central vision.

Branch Retinal Vein Occlusion (BRVO) can also result in leakage of fluid and visual disturbance in the region of retina supplied by the affected vessel

Laser photocoagulation has been the standard of care for both CRVO and BRVO, but recent trials, in which the LEI was involved, have shown better visual results with anti-VEGF therapy.

The LEI has also developed a novel treatment for CRVO aimed at creating a by-pass around the blockage. This has been proven in a large Australia-wide trial and is the first treatment worldwide aimed at the cause of the disease.

The LEI is involved in ongoing trials for both CRVO and BRVO, refining treatment protocols and regimes.

Ocular Inflammatory Disease

Ocular inflammatory diseases, such as uveitis, usually involve inflammation affecting the structures in the eye including the iris, ciliary body and choroid.

The inflammation may affect only one eye structure or multiple structures. In many cases, both eyes are involved and symptoms may include decreased vision, eye pain, ocular redness, tearing, photophobia (pain and/or sensitivity to light), elevated intraocular pressure, intraocular scarring, macular oedema, and even vessel occlusion.

With the appropriate therapy, patients with uveitis can have periods when their disease is quiet or “inactive”.

Uveitis can lead to vision loss. The signs and symptoms of uveitis may be relieved by the use of corticosteroids (also known

as steroids or glucocorticoids), such as prednisone. These drugs suppress the immune system by blocking the production of substances that trigger inflammation.

We are currently investigating the impact of novel anti-TNF (tumour necrosis factor) monoclonal antibodies alone or in combination with high-dose corticosteroids for active or inactive non-infectious intermediate, posterior or pan-uveitis.

Non-treatable Eye Diseases

Macular telangiectasia type 2 (MacTel) is a rare degenerative condition of the macula that may cause progressive loss of vision. Currently, there is no effective treatment for MacTel.

Recent research implies that photoreceptor cell loss is intrinsic to the disorder rather than being consequent upon blood vessel

changes. This discovery has resulted in the development of a therapy to reduce the rate of the photoreceptor layer deterioration.

We are currently recruiting patients with MacTel to participate in a study investigating this potential new therapy.

The studies that we conduct fall mainly into two categories; multicentre clinical trials sponsored by major pharmaceutical companies investigating new therapies or new dosage regimes for established medications or research studies financed by research grants.

Our strength has been recognised by major pharmaceutical companies, as reflected in the number of pharmaceutical company-sponsored clinical trials we have initiated this year.

Condition	Number of studies currently recruiting	Lead investigator
Retinal – wet AMD related	4	Prof Ian McAllister
Retinal – early and dry AMD	3	A/Prof Fred Chen
Diabetic retinopathies	4	Prof Ian McAllister
Retinal Vascular diseases	4	Prof Ian McAllister
Genetic Therapy research	1	Prof Ian Constable
Infectious eye disease	5	A/Prof Mei-Ling Tay Kearney
Non-treatable eye disease	2	Prof Ian Constable
Retrospective data audits	3 audits ongoing	

early laser development

In 1991, Professor Ian Constable performed the first human application of excimer laser for corneal disease after 3 ½ years of development of the LEI’s own laser system.

To achieve this, Dr Paul van Saarloos was recruited from New Zealand as a post-graduate student.

He completed his PhD at the LEI with Professor Constable as his supervisor and built one of the earliest prototypes of excimer lasers in the world.

A new excimer laser glaucoma operation was also developed with this machine by Dr Bruce Allan, a research fellow from the United Kingdom.

By 1998, the Lasers and Bioengineering Group had perfected its refractive laser delivery system – a new large beam, excimer laser.

This work was also funded by a multi-million dollar research and development grant from the Australian Government.

A subsidiary company, The Excimer Laser Company Pty. Ltd. was created to export excimer lasers to several countries, with a number of prominent Western Australian supporters of the LEI contributing the capital.

In 1998, the laser developed by Dr Paul van Saarloos – now known as the Eye:Q Solid State Laser - was displayed at the American Academy of Ophthalmology meeting in New Orleans.

The program to develop and market the laser faced major hurdles however. Engineering difficulties in the company responsible, Q-Vis Limited, and the sheer cost of mounting American-based FDA trials for approval saw the program falter by 2003.



Dr Paul van Saarloos (left), responsible for early laser development at the LEI, pictured in the LEI Laser Physics Laboratory

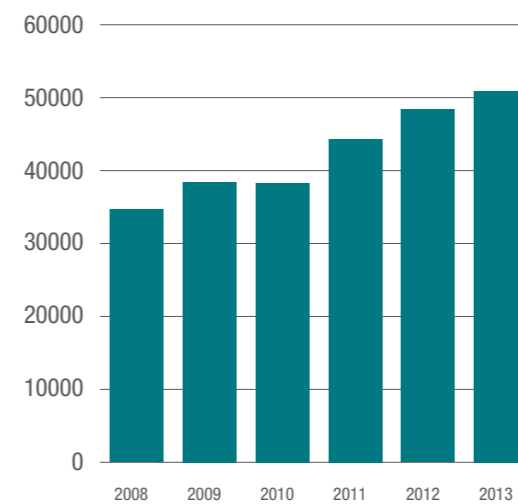
clinical services



In 2013 the Lions Eye Institute (LEI) treated a record number of patients and experienced growth in the majority of clinical departments. The structure of Clinical Services continued to evolve in response to this growth and the requirements of clinicians.

The Elsie Gadd Clinic treated 51,000 patients in 2013 - an increase of 5.4 per cent on 2012. In the six-year period 2008-2013, clinic activity has grown by 47 per cent.

Annual Patient Throughput Elsie Gadd Clinic 2008-2013



The Day Surgery Unit increased throughput by 14 per cent from 2165 in 2012 to 2478 in 2013. This can be attributed to improved utilisation of operating sessions and the addition of two new clinicians to the schedule.



Eye examination



Eye examination



Heather Thorburn, Clinical Operations Manager



Clinic staff

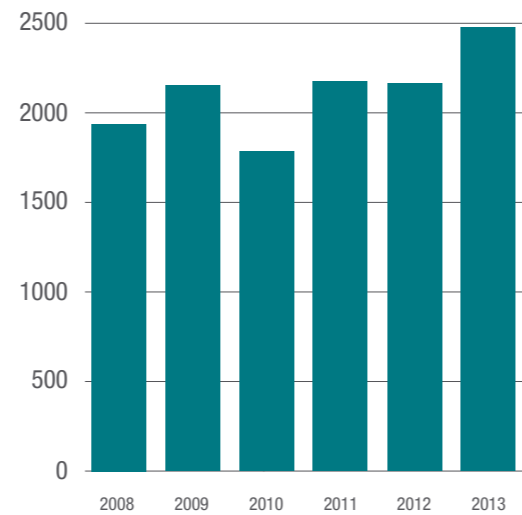


Clinic staff



ITC Manager Matthew Raisin and Director Clinical Operations Paul Seats

Day Surgery Prodeures 2008 - 2013



The introduction of a new management structure within Clinical Services has provided strong leadership and direction for the department as a whole and has resulted in a more coordinated approach to service delivery and patient care.

Early in 2013 the Institute created and filled the position of Clinical Research Manager. This replaced the role of Clinical Trials Manager and includes the added responsibility of coordinating the administration of clinical research staff. The department has grown substantially in the last 12 months and has been allocated extra floor space in "A" block to cater for an increase in staff numbers. The creation and appointment to the position of Training Manager in 2013 has been a welcome addition to LEI. The purpose of this role is to ensure that the training needs

of our staff are planned and coordinated, ensuring accessibility and equity.

The Clinical Services division maintained its ISO9001 quality accreditation with recertification completed in March 2013. This was the first time that our services have been assessed against the new National Quality Standards. We continue to monitor all aspects of patient care with processes such as Patient Satisfaction Surveys, Customer Feedback Forms, Consumer Advisory Committee, Clinical Incident Policy and activity versus staffing levels. Patients who receive treatment at our Day Surgery Unit, Laser Vision Centre and clinics do so in the knowledge that they receive expert and personal care. Late in 2013 the Medical Records Department was centralised to one physical location in "A" block and is now co-located with the Scanning Department. The implementation of the "paperless clinic" for one clinician is almost complete and helps provide a roadmap for the replication of this process.

Continued investment in ITC systems has provided improved access and flexibility for all users. The upgrading and streamlining of major network switches and installation of fibre optic cable was the enabler for much of the project work completed in 2013.

New work in this area includes: the installation of a wireless network in AA block which has provided multiple benefits including free Wi-Fi for patients and relatives, installation of a new phone system which allows seamless communication across all LEI sites including Verdun St, Harry Perkins, Hollywood and Murdoch, commissioning of the new network systems and links to the new Harry Perkins building,

networking the new LASIK equipment, upgraded firewalls and security, improved backup and disaster recovery processes.

Our Volunteer Concierge service continues to provide indispensable support to our patients and staff.

They are an integral part of the LEI and on any given day are busy at work with the rest of the team ensuring that each patient has had a safe and comfortable experience.

Clinical Services has achieved a great deal in the last 12 months. We have treated a record number of patients, welcomed new clinicians, opened new clinics and commenced planning for the expansion of our services. Staff are to be congratulated for the seamless way they have managed all of this and especially for the care they provide to each and every patient.

lions laser vision



L to R: Prof. Geoff Crawford, Prof. Graham Barrett, Dr Andrea Ang, Assoc. Prof. Steven Wiffen

In December 2013, the Lions Laser Vision Centre brought the world's fastest and most advanced excimer laser source to Perth.

This laser, the Schwind 1050RS, can correct one dioptre of myopia in just 1.3 seconds.

This investment in the latest and most advanced technology in the world, combined with the extensive experience of the Lions Laser Vision Centre's surgeons, means patients will have the best possible visual outcome after laser vision correction.

Patient safety is the centre's number one priority and investment in the latest technology supports this goal.

The history of the Lions Laser Vision Centre has been one of firsts - the first refractive laser centre in Western Australia, the first centre to perform laser PRK surgery in Australia in 1991, the first centre to perform LASIK in Western Australia in 1996 and the first and still the only accredited laser vision centre in Western Australia.

The centre has achieved ongoing accreditation since 2006 with ISO 9001 - an internationally-recognised quality management system.

Laser refractive surgery began with the introduction of an excimer laser in 1982 to reshape the surface of the human cornea and achieve correction of refractive errors in the eye that normally would require glasses or contact lenses.

Initially the surface of the cornea was lasered to flatten the cornea for correction of short sightedness (myopia). It is now possible to also correct long sightedness (hyperopia) and astigmatism. In 1990 the technique was improved by adding the

creation of a flap with the ablation performed under this. LASIK was more effective and accurate, and more comfortable post-operatively with more rapid visual recovery.

LASIK is the gold standard of laser refractive surgery and the second most commonly performed eye operation in the world after cataract surgery.

Until now there have been three refractive surgeons at the Lions Laser Vision Centre: Professor Geoffrey Crawford (Director of Surgical Services at the LEI), Professor Graham Barrett and Associate Professor Steven Wiffen who together have 80 years of refractive experience.

A new surgeon, Dr Andrea Ang, has joined the corneal and refractive group. Dr Ang did her initial training in Perth and has done further sub-specialty training in corneal and refractive surgery at centres in the USA and Singapore. This has enabled the centre to expand laser eye surgery consultations to its Murdoch location.

The future is bright for laser vision correction with new techniques becoming available to correct all forms of refractive errors.

The Lions Laser Vision Centre will continue to provide the latest and safest technology for patients to provide them with the best possible vision without glasses or contact lenses.

The centre's goal for 2014 is to make the treatment process easier for patients. Through investment in technology and staff training, the centre wants to streamline the process so more people can enjoy seeing the world through their own eyes.

Dr Andrea Ang



Dr Andrea Ang trained in Ophthalmology in Perth (MBBS (Hons), UWA) and the USA (MPH, Harvard) before undertaking fellowships in Cornea, Anterior Segment, and External Diseases at the Cincinnati Eye Institute, USA, and at the Singapore National Eye Centre, Singapore. Dr Ang is a consultant ophthalmologist at Royal Perth Hospital and a member of FRANZCO. She specializes in the management of cornea, anterior segment, and external diseases, including pterygium surgery, all forms of corneal transplantation, limbal stem cell surgery, and keratoprotheses. Dr Ang also performs cataract surgery and refractive surgery including LASIK and PRK.

Areas of Expertise

Management of cornea, anterior segment, and external diseases ; corneal surgery: pterygium surgery, corneal transplantation (penetrating keratoplasty, deep anterior lamellar keratoplasty, endothelial keratoplasty) ; ocular surface reconstruction: limbal stem cell transplantation and keratoprotheses ; cataract surgery; refractive surgery LASIK, PRK.

Professor Graham Barrett



Professor Graham Barrett trained in ophthalmology in Perth, Western Australia, and undertook specialty training in the USA. He is a consultant ophthalmic surgeon and Head of Department at Sir Charles Gardiner Hospital. Professor Barrett is founding and current president, Australasian Society of Cataract & Refractive Surgeons and president, Asia Pacific Association of Cataract and Refractive Surgeons. He is the recipient of major international awards including the Ridley Medal (European Society of Cataract & Refractive Surgeons), the Binkhorst Medal (American Society of Cataract & Refractive Surgeons) and the Ridley Medal (Congress of German Ophthalmic Surgeons).

Areas of Expertise

Cataract & refractive surgery, corneal and anterior segment disorders and surgery.

Associate Professor Fred Chen



Associate Professor Fred K Chen was born in Taiwan and studied Medicine at the University of Western Australia. After ophthalmology training at Royal Perth Hospital, he moved to London to do research and clinical fellowships in medical and surgical retina at the University College of London Institute of Ophthalmology and Moorfields Eye Hospital. There, he also completed a doctorate in philosophy (PhD) in surgical techniques of retinal pigment epithelium transplantation for treatment of dry and wet macular degenerations.

Fred returned to Perth, also as a Consultant Vitreoretinal Surgeon at Royal Perth Hospital and Princess Margaret Hospital for Children, to establish an Ocular Tissue Engineering Laboratory and a Functional Ocular Imaging Laboratory at the Lions Eye Institute.

Areas of Expertise

Surgical retina: small gauge vitrectomy, retinal detachment repair, epiretinal membrane peel, macular hole repair, cataract complications and retinal cell transplantation. ; Medical Retina: Macular degeneration, Avastin, Lucentis and Eylea injections, Stargardt's disease, retinitis pigmentosa, diabetic retinopathy and retinal vascular diseases.

Professor Ian Constable AO



Professor Ian Constable AO trained in ophthalmology in New South Wales before being appointed as Clinical Retinal Fellow at the Massachusetts Eye and Ear Infirmary and a Lecturer at Harvard University. He is a consultant retinal surgeon at Royal Perth, Sir Charles Gairdner and Princess Margaret Hospitals and was Managing Director at LEI from 1983 to February 2009.

Areas of Expertise

Vitreoretinal surgery, retinal vascular disease, diabetic retinopathy, macular degeneration, complex referrals and cataracts

Professor Geoffrey Crawford



Professor Geoffrey Crawford completed his ophthalmic training in Western Australia and is a Fellow of the Royal Australian and New Zealand College of Ophthalmologists and a Fellow of the Royal Australasian College of Surgeons. He completed further subspecialty training in Oculoplastic Surgery at Moorfields Eye Hospital in London and then Cornea and Refractive Surgery at Emory University in Atlanta, Georgia, USA. He is the Director of Surgical Services and the Director of the Laser Vision Centre at the Lions Eye Institute and is a Consultant Ophthalmic surgeon at Royal Perth Hospital and Princess Margaret Hospital for Children.

Areas of Expertise

Refractive surgery: LASIK, PRK, Phakic IOL's ; refractive lens surgery ; corneal disease and surgery: corneal transplantation, pterygium surgery, corneal collagen crosslinking, insertion of Intra-corneal ring segments, management of kertoconus, ocular surface turnovers ; cataract surgery. He is a pioneer in many of these techniques.

Dr Jean-Louis deSousa



Dr Jean-Louis deSousa trained in ophthalmology in Perth before completing fellowships in ophthalmic plastic and reconstructive surgery in Oxford and East Grinstead in the UK. He is a member of the Australian and New Zealand Society of Ophthalmic Plastic Surgeons. A consultant ophthalmologist at Royal Perth Hospital he also provides ophthalmic services to the central wheatbelt from Merredin. Dr deSousa is the WA representative for continuing professional development and a basic sciences examiner for RANZCO.

Areas of Expertise

Oculoplastic surgery – eyelid tumours, eyelid malposition, cosmetic surgery, non-surgical cosmetic procedures ; orbital disease – tumours, trauma and inflammatory orbital disease ; lacrimal surgery – endoscopic lacrimal surgery.

Professor John Forrester



Professor Forrester graduated from the University of Glasgow in 1970 and is currently Cockburn Professor of Ophthalmology at the University of Aberdeen. He has been Editor of the British Journal of Ophthalmology and has over the years received 16 awards and Visiting Professorships including the London Hospital Prize for Original Research in Ophthalmology in 1977, the Duke Elder Medal and the Ida Mann Medal in 1991. His research interests are in the areas of diabetes, retinal disease, inflammation, autoimmunity and immunology of the eye.

Areas of Expertise

Ocular immunology, uveitis, autoimmune disease ; wound healing and experimental corneal transplantation ;diabetic retinopathy, angiogenesis, endothelial cell function ; clinical studies in uveitis, translational research in ophthalmology, imaging in ophthalmology.

Associate Professor Adam Gajdatsy



Associate Professor Adam Gajdatsy trained in ophthalmology in Western Australia before undertaking fellowship training in oculoplastic, lacrimal and orbital surgery at the University Hospital of Wales, Cardiff, and Moorfields Eye Hospital, London. He is consultant ophthalmic surgeon at Sir Charles Gairdner Hospital and an honorary consultant ophthalmologist at Princess Margaret Hospital. Dr Gajdatsy is a State Councillor for RANZCO, a Fellow of the Australian and New Zealand Society of Ophthalmic Plastic Surgeons and coordinator of ophthalmology teaching at UWA. His research interests currently include novel methods of eyelid reconstruction and tear drainage following chemotherapy for breast cancer.

Areas of Expertise

Oculoplastic and cosmetic eye surgery.

Dr Antonio Giubilato



Dr Antonio Giubilato underwent specialty fellowship training in glaucoma at the Royal Victorian Eye and Ear Hospital after training in ophthalmology in Perth, Western Australia. This included both clinical and surgical management of glaucoma as well as research into new therapies for the condition. He is presently consultant ophthalmologist in the Glaucoma Clinic at Royal Perth Hospital and also consults at Bentley Hospital for public patients. Dr Giubilato is currently Director of Training for the WA branch of RANZCO and an LSSF Board Member.

Areas of Expertise

Glaucoma.

Dr Tim Isaacs



Dr Tim Isaacs studied medicine in the UK, and underwent ophthalmology training at the Western Ophthalmic Hospital and Moorfields Eye Hospital in London. He completed sub-specialty training in vitreoretinal surgery at Royal Perth Hospital and Sir Charles Gairdner Hospital. He is currently an consultant ophthalmologist at Royal Perth Hospital, and also practices at LEI's satellite clinic at Murdoch. His research interests include the diagnosis and management of intraocular tumours, evaluation of new therapies for diabetic retinopathy and macular degeneration.

Areas of Expertise

Vitreoretinal surgery, diabetic retinopathy, macular degeneration, retinal vascular disease, ocular oncology, choroidal melanoma.

Professor David Mackey



Managing Director, Lions Eye Institute and Professor of Ophthalmology/Director Centre for Ophthalmology & Visual Science, at The University of Western Australia.

Professor Mackey is a world authority on the genetics of eye disease, with his research extending beyond the laboratory to cascade genetic screening for at-risk individuals. He was born and educated in Tasmania, studying medicine at the University of Tasmania, completing fellowships in Melbourne, Baltimore and London.

He is on the National Health and Medical Research Council's (NHMRC) Human Genetics Advisory Committee and chief investigator for the NHMRC Centre of Research Excellence – Translating Genetic Eye Research. Professor Mackey is also president of the International Society for Genetic Eye Disease and Retinoblastoma. He sees patients at the Lions Eye Institute for second opinions on rare genetic eye diseases and more common genetic eye diseases involving new genetic research.

Areas of Expertise

Hereditary and genetic eye diseases. He sees patients at the Lions Eye Institute for second opinions on rare genetic eye diseases and more common genetic eye diseases involving new genetic research.

Professor Ian McAllister



Professor Ian McAllister undertook training in Western Australia with additional sub-specialty training in vitreoretinal disorders in the USA. He is Director of Clinical Services at LEI and a consultant ophthalmologist at the Royal Perth and Sir Charles Gairdner hospitals Professor McAllister is actively involved in research for cures for vitreoretinal disorders, especially retinal vascular disorders, and has held ten NHMRC grants in this area as well as numerous minor grants. He has been involved for many years in statewide diabetic retinopathy screening and treatment and was vice chairman of the Ophthalmic Research Institute of Australia and chairman of the Research Board for many years. He has published over 100 papers in scientific journals and has given over 150 papers at meetings as a invited guest speaker. He has recently received a achievement award for distinguished service to ophthalmology from the American Academy of Ophthalmology.

Areas of Expertise

Vitreoretinal surgery and disorders, retinal vascular disease, diabetic retinopathy, macular degeneration, ocular trauma, cataract surgery.

Professor William Morgan



Professor William Morgan initially trained in Perth, Western Australia, and undertook his fellowship at the Centre for Ophthalmology and Visual Science based at the LEI. He is Head of Department of Ophthalmology and consultant ophthalmologist at Royal Perth Hospital, consultant ophthalmologist at Princess Margaret Hospital, a Professor at UWA and also Co-Director of LEI's McCusker Glaucoma Centre. He has completed a doctorate in philosophy studying the response of the optic nerve to pressure, particularly in relation to glaucoma. Professor Morgan maintains an active research interest in glaucoma as well as in the epidemiology of blinding eye disease and eye diseases within aboriginal populations.

Areas of Expertise

Glaucoma, ophthalmic public health.

Associate Professor Mei-Ling Tay-Kearney



Associate Professor Mei-Ling Tay-Kearney completed her medical training in Perth, Western Australia before pursuing postgraduate study at Johns Hopkins Hospital in Baltimore, USA. In 2003 Associate Professor Tay-Kearney was appointed Head of Department of Ophthalmology at Royal Perth Hospital. She is a Senior Lecturer at UWA and a member of the Australian Society for HIV Medicine and the Australian Uveitis Study Group. She is the Chair of Qualifications and Education as well as an Examiner for the RANZCO Part 2 College examinations.

Areas of Expertise

Ocular infections, uveitis and inflammatory disorders of the eye.

Associate Professor Angus Turner



Dr Angus Turner completed medical training at The University of Western Australia (UWA), before studying at Oxford University and completing a Masters of Evidence Based Medicine. Ophthalmology training was undertaken in Melbourne, followed by post-graduate training at University of Sydney in refractive surgical procedures. As Director of Outback Vision, Dr Turner is actively involved in the delivery of specialist outreach services to remote and Indigenous communities in the Kimberley, Pilbara, Goldfields, Great Southern, and South West regions. Dr Turner is an Associate Professor at UWA, where he is engaged in a number of research projects at the Lions Eye Institute, focusing on service delivery for remote and Indigenous people. Dr Turner is also a consultant at Fremantle Hospital and an ophthalmology teacher for the Rural Clinical School.

Areas of Expertise

General ophthalmology.

Associate Professor Steven Wiffen



Associate Professor Steven Wiffen trained in ophthalmology in Western Australia before undertaking fellowships at the Corneo-Plastic Unit, East Grinstead, UK, and at the Mayo Clinic, Rochester, Minnesota, USA. Associate Professor Wiffen is a consultant ophthalmologist at Fremantle Hospital and a Senior Lecturer at UWA. He is Director of the Lions Eye Bank of Western Australia.

Areas of Expertise

Ocular surface disorders, corneal and refractive surgery, anterior segment disorders and surgery.

lions eye bank of wa



Eye Bank Manager Lisa Buckland

Established in 1986, the Lions Eye Bank is the only facility in Western Australia that coordinates the collection, processing and distribution of eye tissue for transplantation.

More than 4000 corneal transplants have been performed to date.

In 2013, 184 corneal transplants were performed, with 162 sourced locally and 22 from interstate. In addition to corneal transplants, scleral tissue was used in 148 other surgical procedures.

All donor tissue is utilised either for transplantation or, if unsuitable, for ethically approved research or surgical training with the consent of the donor's family. This tissue is crucial to advancing research and developing surgical techniques.

New storage methods have contributed to the most significant growth in more than 25 years of eye banking in Western Australia. Where some patients used to wait more than two years for a graft, transplants are now being performed within four months.

State-of-the-art surgical techniques have evolved so only the diseased portion of the cornea is replaced, enhancing the recovery period and visual outcome for the patient. Previously, the entire cornea was replaced regardless of the diagnosis.

Ten surgeons perform corneal grafts for both public and private patients, including LEI clinicians Professor Graham Barrett, Professor Geoffrey Crawford, Associate Professor Steven Wiffen and Dr Andrea Ang.

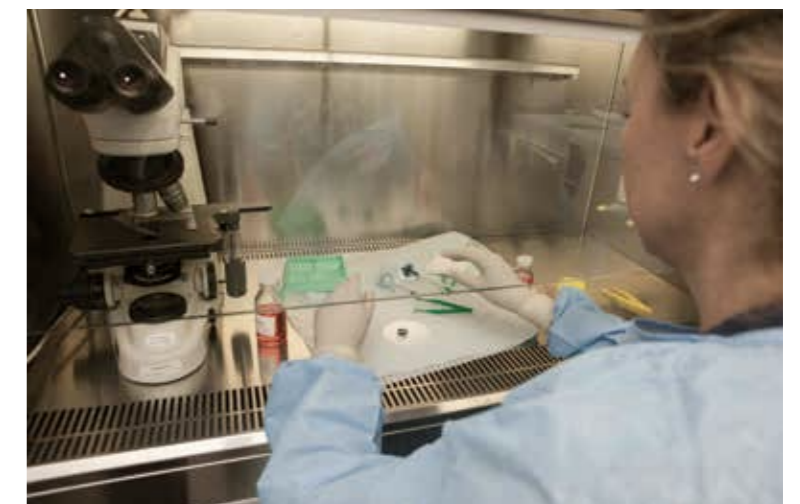
As a member of the Eye Bank Association of Australia and New Zealand (EBAANZ), the Lions Eye Bank works collaboratively with other eye banks to maintain consistently

high levels of quality, safety, proficiency and ethics. Excess tissue is shared when appropriate and emergency requests for tissue are always supported.

As an independent organisation, the Lions Eye Bank is self-funded through cost recovery and is supported by the Lions Save-Sight Foundation.



Maryanne Ross



Lisa Buckland

global alliance of eye bank associations



Top: Corneal transplant patient. **Bottom left:** specular microscope donation. **Bottom right:** L to R: Louise Moffat, Graeme Pollock, Lisa Buckland

In 2010, the World Health Organization began looking at eye donation and corneal transplantation. However, most of their information and data were from North America and a more global approach was sought.

Dr Graeme Pollock, Chairman of the Eye Bank Association of Australia and New Zealand (EBAANZ), initiated discussions with global members and an MOU was subsequently signed by American, European, Asian, Australasian and Pan-American eye bank associations leading to the creation of the Global Alliance of Eye Bank Associations (GAEBA).

The global body has an emphasis on information sharing and harmonisation in relation to training, education coding and labelling of human tissues, adverse reaction reporting and minimum standards.

In 2013, Lisa Buckland, Manager of the Lions Eye Bank of WA attended the first World Eye Bank Symposium (WEBS), held in conjunction with the Pan American Academy of Ophthalmology meeting in Rio de Janeiro. The Lions Save Sight Foundation was a generous sponsor of Lisa's trip.

Lisa attended with Dr Graeme Pollock, Director of the Lions Eye Donation Service in Melbourne, and Louise Moffatt, Manager of the New Zealand National Eye Bank.

The symposium was a valuable opportunity for these associations to meet face to face to facilitate a global focus on corneal transplantation. Common problems were presented, thoughts and ideas shared and networks formed.

With strong support readily available through the newly established global alliance, a call went out to help the Lions Eye Hospital in Andhra Pradesh. The hospital would only be granted recognition and the status of an eye bank if they were able to source a specular microscope. This vital piece of equipment is used for evaluating the endothelial cells of a cornea prior to transplantation.

The Lions Eye Bank of WA was able to assist, and donated a microscope. The donated analogue specular microscope, although fully functioning, was not compatible with the rest of their digital environment.

NSW corneal surgeon Geoff Cohn arranged the microscope transfer from the Perth Lions Eye Bank, delivering the device to Dr Sunil Thangaraj at the Andhra Pradesh hospital in person. A formal inauguration, complete with a ribbon cutting followed.

Dr Cohn said the specular microscope would serve the needs of rural and small town Indian communities, where the need for such services was extreme.

lions save-sight foundation



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2013 was a milestone year for the Lions Eye Institute (LEI), having achieved 30 years of significant research into ophthalmic medicine and the treatment of patients with a vast range of sight disorders.

The Board of the Lions Save-Sight Foundation (WA) Inc. (LSSF) extends sincere congratulations on not only arriving at this milestone, but more importantly, the incredible achievements that have occurred along the way. The LSSF's satisfaction can be likened to that of a proud parent who has seen their child grow and develop into an adult to become a strong citizen in the community.

The LSSF was formed by the Lions Clubs of Western Australia in 1971. From humble beginnings it was able to recruit people of the calibre of Professor Ian Constable, underwriting the funding and establishment of the Lions Chair of Ophthalmology at The University of Western Australia, resulting in a real presence for the ophthalmic profession here in Western Australia.

The dynamic development that followed saw the LSSF all but outgrow itself over the first decade of its existence, and in the early 1980s it was resolved to create a new entity to concentrate on the technical and medical research speciality area. This resulted in the formation of the LEI.

The LSSF continued and today still acts as a link between the Lions Clubs of Western Australia and the LEI.

The last 30 years has also seen significant changes in the LSSF. In 1983, the Foundation was still very active in community screenings for the detection of glaucoma and amblyopia (lazy eye disease in children). These screenings in the main

were organised by Lions Clubs for the benefit of their local communities and many thousands were tested each year. Following the establishment of the Lions Eye Bank in 1986, the LSSF became involved with the distribution of organ donor cards in support of this initiative.

With the establishment of a purpose-built facility at 2 Verdun Street, the LSSF co-ordinated an appeal through its Lions Club members to assist in equipping the building - a project repeated in 2013 with the expansion of the LEI into the new Harry Perkins research facility.

Like the LEI, 30 years has seen the LSSF's activities change and develop.

Our early glaucoma screening programs, a service now commonly offered by opticians, have been overtaken by growth in our spectacles collection program.

Lions Clubs were the original instigators of these collections but we now have opticians, funeral parlours and other parties also collecting on our behalf. After sorting, those spectacles that pass muster are donated to Third World countries, allowing many people to resume a more normal lifestyle.

The LSSF continues to fund the Lions Chair of Ophthalmology at UWA; the salary of the Director of Research; co-fund the Post-Doctoral Brian King Fellowship and fully fund the Jack Hoffman Scholarship.

We again congratulate LEI on 30 years of achievement and trust the next 30 years are just as exciting.

Ambrose Depiazzi

CHAIRMAN | Lions Save-Sight Foundation (WA) Inc.

bali eye collaboration continues



Dr deSousa and Dr Dharmawidari operate

Bali's poorest and most disadvantaged people are receiving the gift of sight thanks to a unique partnership between Bali Eye and the Lions Eye Institute (LEI).

The LEI helped set up Bali Eye 22 years ago, and it is now supported by many medical specialists – including LEI ophthalmologists.

Bali Eye projects include sight restoration and blindness prevention, children's corrective surgery, education assistance, assistance to desperately ill children and young people and prosthetic eyes.

In March 2013, LEI ophthalmologist Jean-Louis deSousa travelled to Bali to operate with Dr Dini Dharmawidari.

Together they saw about 20 patients – some of whom had travelled from remote islands – and operated on 12 patients, including four children.

All were complex oculoplastic cases. The intention is to continue the skills transfer to Dr Dini so she will be able to manage the cases herself.

Bali ties

The LEI's strong ties with Bali were called upon in the aftermath of the Bali bombings in October, 2002.

Bali bomb victim Thiolina Marpaung was treated in Perth by Associate Professor Ian McAllister for an eye injury sustained during the blast.

She said at the time: "I cannot express how blessed I feel to have survived the Bali bomb blast and to have had my sight almost fully restored so that I can continue on with life."

When the Australian Government subsequently committed to funding a major eye hospital – the Australia-Bali Memorial Eye Centre – in Bali, it called on the expertise of the LEI to drive its development, with then Director of Nursing Elizabeth Zambotti playing a crucial role.

She recalls the project was driven by humanitarian John Fawcett (founder of the John Fawcett Foundation in Bali) who rang Professor Constable to discuss the need for an eye hospital on the back of the bombings.

"I went up as a representative of the Institute and worked with AusAid putting the project together as part of a team of people," she said.

"I was involved in the planning of it, fitting it out and the purchase of equipment and also developed policies and procedures for its operation."

The centre was eventually opened in 2007 by former Prime Minister John Howard and the President of Indonesia Susilo Bambang Yudhoyono.



Drs deSousa and Dharmawidari examine a patient

volunteers



L to R: Volunteers Robin Miller, Meng Goh, Margaret Emmett and Sue Renton

The Volunteer Program began in May 2010 and is now an integral part of the Lions Eye Institute (LEI).

There are now more than 40 volunteers - 30 of whom are regularly engaged - and the program has developed its activities to complement the LEI's thriving clinic and support its research and training programs.

The "concierge" volunteers smooth the way for clients and visitors to the LEI. They meet and greet clients at the door, show them to their clinics, fetch prescriptions, guide them after day surgery or injections, provide suggestions about nearby parking, help infirm patients with wheelchairs or walking frames, ensure transport home has been arranged, obtain a welcome cup of tea or coffee and generally offer a friendly hand.

With the increasing number of clients having injections for Age-Related Macular Degeneration, the LEI has made changes to clinic operations and commenced high volume "injection clinics" in 2013.

Complementary changes were also made within the volunteer training and roster programming to support the clinic during these busy periods.

Changes included some skills training about the nature of the injections and client requirements and the rostering of extra volunteers to guide patients out of the injection room and through the next steps

of their visit to the LEI. Both clients and carers have expressed their appreciation for the support and friendly assistance of volunteers during the injection process.

Volunteers are also engaged in supporting the LEI research library - ensuring journals are catalogued, bound and shelved and that reference books are recorded and made available. Other volunteers carry out the ongoing digital recording of clinical research information critical to ensure easy access to information needed for future eye research.

Volunteers have enjoyed working on a number of other projects, utilising their own range of skills, including:

- ▶ Helping at the LEI's stand at Telethon, promoting eye research to families and children;
- ▶ Guiding visitors during LEI open days;
- ▶ Assisting LEI research applications and submissions – proof-reading, presentation and formatting;
- ▶ Providing support at LEI events such as “meeting and greeting”, food and drink hosting; and
- ▶ Continuing the LEI library work including the recording and display of documents, photos and equipment pieces in the “museum” section.

Through their interaction with clients on a daily basis, the volunteers are in an excellent position to provide advice to other decision makers on the QEII medical campus about facilities and operations that might affect clients and visitors to the LEI.

Volunteers have taken part in QEII workshops on landscape planning, car

parking, transport, access and signage and other amenities on the campus.

Volunteers are also represented on the LEI Consumer Advisory Group.

It is the aim of the Volunteer Program to continue to form an integral part of the LEI, to expand the range of support within other programs, support volunteers in building on their own skills and activities and ensure that the client visit to LEI is as comfortable and happy as possible.

To find out more about volunteering at the LEI call (08) 9381 0777 or email enquiry@lei.org.au



Volunteer in clinic

national volunteer week



The Lions Eye Institute (LEI) held a morning tea on June 14 as part of National Volunteers Week celebrations.

During the event, Director of Clinical Operations Paul Seats and volunteer coordinator Lyne Thomas recognised the valuable contribution of LEI's many volunteers.

National Volunteer Week is the largest celebration of volunteers and volunteering in Australia and the 2013 theme was “Thanks a Million”.

Across Australia each year, more than six million people volunteer – representing just over 35 per cent of the adult population.

The LEI volunteer concierges provide invaluable assistance to our patients.



appointments awards and honours

Assistant Professor Christopher Andoniou

APPOINTMENTS

Assistant Professor, The University of Western Australia

Member, Australasian Society for Immunology

AWARDS

Recipient, NHMRC Project Grant

Professor Graham Barrett

APPOINTMENTS

Consultant Ophthalmologist, Sir Charles Gairdner Hospital

Professor, The University of Western Australia

President, Asia Pacific Association of Cataract and Refractive Surgeons

President, Australasian Society of Cataract and Refractive Surgeons

Member, American Society of Cataract and Refractive Surgery

Member, European Society of Cataract and Refractive Surgery

Member, International Society of Refractive Keratoplasty

President-Elect International Intraocular Implant Club

AWARDS

American Society of Cataract and Refractive Surgeons. ASCRS 4-B Intraocular Surgery Monofocal IOL's. Best Paper of Session: Contrast Sensitivity & Spherical Aberration with Extended Depth of Focus IOL.

Mr Chris Barry

APPOINTMENTS

Managing Editor: Journal of Ophthalmic Photography

Fellow Ophthalmic Photographers' Society

Fellow: Australian Institute of Medical and Biological Illustration

AWARDS

American Society of Cataract and Refractive Surgery/Ophthalmic Photographers' Society ophthalmic photography photographic competition 2011: "Best of Show" 1st Fluorescein angiography (PDR)

American Academy of Ophthalmology/Ophthalmic Photographers' Society ophthalmic photography photographic competition 2011: 1st Fundus photography normal angle, 1st Fundus photography high magnification, 1st Monochromatic photography, 1st Clinical setting photography

Associate Professor Fred Chen

APPOINTMENTS

Fellow, Royal Australian and New Zealand College of Ophthalmologists

Member, Vitreo-retinal Curriculum Review Committee, Royal Australian and New Zealand College of Ophthalmologists

Member, Younger Fellow's Advisory Group, Royal Australian and New Zealand College of Ophthalmologists

Associate Professor, The University of Western Australia

Consultant Ophthalmologist, Royal Perth Hospital

Consultant Ophthalmologist,

Princess Margaret Hospital

Consultant Ophthalmologist, Lions Eye Institute Ltd

Director, Ophthalmic Research Institute of Australia

Member, Research Advisory Committee, Ophthalmic Research Institute of Australia

Local Radiation Safety Officer, Lions Eye Institute

Member, Australian Medical Association

Member, Asia Pacific Vitreo Retinal Society

Member, The American Society of Retinal Specialists

Member, Association for Research in Vision and Ophthalmology

Member, Australasian Society for Stem Cell Research

AWARDS

NHMRC Early Career Fellowship

Ms Annette Clayfield- Hoskin

APPOINTMENTS

Standards Australia:

Committee Member, MS024 Spectacles

Committee Member SF006 Eye and Face Protection

Chair, Joint working group of SF006 and MS024 Measurement of Optical Power in As Worn Position

Nominated Expert, ISO/TC 172/SC7 for the revision of ISO 8980 Parts 1 and 2 and ISO 21976

Professor Ian Constable

APPOINTMENTS

Professor of Ophthalmology, The University of Western Australia

Consultant Ophthalmologist, Sir Charles Gairdner Hospital

Consultant Ophthalmologist, Princess Margaret Hospital

President, Asia Pacific Vitreoretinal Society

Council Member & Regional Secretary, Asia Pacific Academy of Ophthalmology

Member, Academia Ophthalmologica Internationalis

Member, State Health Research Advisory Committee

Member, Scientific Advisory Board Western Australia Institute of Medical Research

Board Member, Loewe Medical Foundation

Member, Executive Committee and Scientific Advisory Committee, International Macular Telangiectasia project

Doctor Jerome Coudert

APPOINTMENTS

Research Fellow, Lions Eye Institute

Research Officer, The University of Western Australia

Member, Australasian Society for Immunology

Member, Society for Natural Immunity

AWARDS

NH&MRC Project Grant

Harvard Club of Australia Foundation Fellowship

Professor Geoffrey Crawford**APPOINTMENTS**

Professor of Ophthalmology, The University of Western Australia

Consultant Ophthalmic Surgeon, Royal Perth Hospital

Consultant Ophthalmic Surgeon, Princess Margaret Hospital

Director of Surgical Services; Director, Laser Vision Centre, Lions Eye Institute Limited

Board Member, Lions Save-Sight Foundation

Executive Committee Member, Australian Society of Cataract and Refractive Surgeons

Executive Committee member, Royal Australian and New Zealand College of Ophthalmologists (WA Branch)

Executive Committee Member, Australian and New Zealand Cornea Society

AWARDS

Visiting Professor, National University of Singapore and Singapore National Eye Centre

Professor Mariapia Degli-Esposti**APPOINTMENTS**

Division Head, Experimental Immunology, Centre for Ophthalmology and Visual Science, The University of Western Australia

Director of Research, Lions Eye Institute Limited

Member, Research Committee, Raine Medical Research Foundation

Member, Strategic Research Advisory Group, Faculty of Medicine, Dentistry & Health Sciences, The University of Western Australia

Member, National Health & Medical Research Council Assigners Academy

Member, International Scientific

Committee for 13th Meeting of the Society for Natural Immunity

Member, National Advisory Committee, Lorne Infection and Immunity Conference

Associate Professor Adam Gajdatsy**APPOINTMENTS**

Associate Professor; Teaching Coordinator, Ophthalmology; Postgraduate Anatomy Lecturer, The University of Western Australia

Executive Board Member, ANZSOPS

Fellow, Australian and New Zealand Society of Ophthalmic Plastic Surgeons

Honorary Consultant Ophthalmologist, Princess Margaret Hospital

RANZCO training supervisor, Consultant Ophthalmic Surgeon, Sir Charles Gairdner Hospital

Director of Training WA network; Fellow; State Councillor, Royal Australian and New Zealand College of Ophthalmologists

International Member, American Academy of Ophthalmology

Member, Royal College of Physicians of the UK

Dr Tim Isaacs**APPOINTMENTS**

Fellow, Royal Australian and New Zealand College of Ophthalmologists

Consultant Ophthalmologist, Royal Perth Hospital

Fellow, The Royal College of Ophthalmologists (UK)

Professor Ian McAllister**APPOINTMENTS**

Board member, Asia Pacific Vitreo-retinal Society

Board member; Director, Clinical Services; Consultant Ophthalmologist, Lions Eye Institute Limited

Director, Australian Foundation for the Prevention of Blindness

Professor of Ophthalmology, Centre of Ophthalmology and Visual Science, The University of Western Australia

Fellow, Royal Australian & New Zealand College of Ophthalmologists

Member, Royal Australian College of Surgeons

Visiting Consultant Ophthalmologist, Cocos Keeling Islands & Christmas Island, Indian Ocean

Consultant Ophthalmologist, Royal Perth Hospital

Consultant Ophthalmologist, Sir Charles Gairdner Hospital

Member, American Academy of Ophthalmology

Member, Australian Medical Association

Member, Cleveland Ophthalmological Society

Member, Northern Greece Ophthalmological Society

Member, Oceanic Retina Association

Member, Retina Society

Winthrop Professor David Mackey**APPOINTMENTS**

Chair of Ophthalmology, The University of Western Australia

Director, Centre for Ophthalmology

and Visual Science, The University of Western Australia

Managing Director Lions Eye Institute Limited

Board Member, Lions Eye Institute Limited

Member, National Health & Medical Research Council Human Genetics Advisory Committee

State Director of Eye Services, Western Australian Department of Health

Member of WA State Government Neurosciences & The Senses Health Network eye health advisory group

President, International Society for Genetic Eye Disease and Retinoblastoma

State Chair, Western Australian branch, Royal Australian and New Zealand College of Ophthalmologists

Fellow, Royal Australian and New Zealand College of Ophthalmologists

Examiner (Genetics), Royal Australian & New Zealand College of Ophthalmologists

Member of Basic and Clinical Science Course (BCSC) Sect. 2 Subcommittee, Fundamentals and Principles of Ophthalmology, American Academy of Ophthalmology

Professor William Morgan**APPOINTMENTS**

Board Member, Australian New Zealand Glaucoma Interest Group

Honorary Ophthalmic Consultant to the Board of Directors, Association for the Blind of Western Australia

Fellow, Royal Australian and New Zealand College of Ophthalmologists

Consultant Ophthalmologist, Lions Eye Institute Limited

Head of Department of Ophthalmology, Consultant Ophthalmologist,

Royal Perth Hospital
 Consultant Ophthalmologist,
 Princess Margaret Hospital
 Professor, The University of
 Western Australia
 Associate Professor, Curtin University
 Member Assessment Panel,
 Training Awards Committee
 NHMRC Fellowship review panel member

**Winthrop Professor
 Piroska Rakoczy**

APPOINTMENTS
 Member, NHMRC Fellowship Committee
 Member, WA Animal Resources Centre Board
 GRP Panel Member, NHMRC Neuroscience
 Member, Council for the International
 Society for Eye Research
 Member, Organising Committee, International
 Society for Ophthalmology and Cell Biology
 Member, Organising Committee,
 International Society for Eye Research
 Member, Asia-ARVO International
 Advisory Committee
 Editor, Journal of Gene Vaccines and Therapy
 Scientific Editor, Clinical and
 Experimental Ophthalmology
 Editor, Gene and Cell Based Treatment
 Strategies for the Eye (Springer)

**Associate Professor Mei-
 Ling Tay-Kearney**

AWARDS
 2013 Trainer of Excellence (Western
 Australia), Royal Australian & New
 Zealand College of Ophthalmologists

Associate Professor Angus Turner

APPOINTMENTS
 Consultant Ophthalmologist,
 Fremantle Hospital
 Associate Professor, The University
 of Western Australia

Dr Sarojini Vijayasekaran

APPOINTMENTS
 Associate Professor (Adjunct), The
 University of Western Australia

**Associate Professor
 Steven Wiffen**

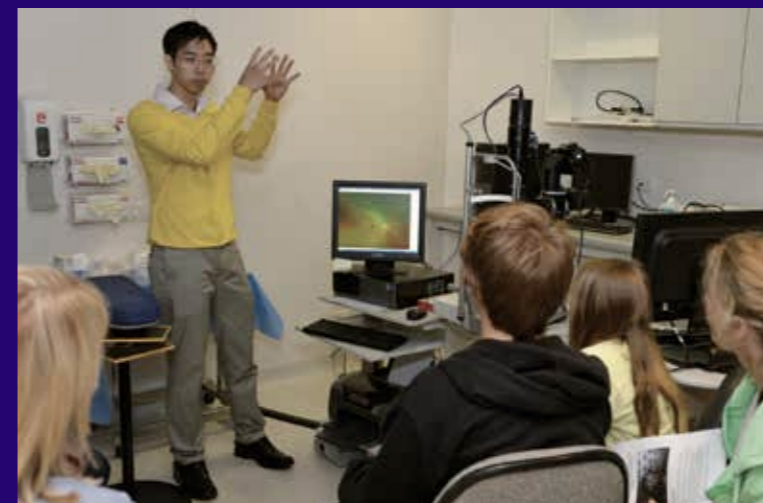
APPOINTMENTS
 Director, Lions Eye Bank of Western Australia
 Consultant Ophthalmologist,
 Fremantle Hospital
 Associate Professor, The University
 of Western Australia

**Assistant Professor
 Matthew Wikstrom**

APPOINTMENTS
 Assistant Professor, The University
 of Western Australia

AWARDS
 PDG Brian King Post-Doctoral Fellowship

**open day
 opens minds**



**An important aim
 of the Lions Eye
 Institute is to engage
 the wider community
 in the work we do.**

For the past two years we have held annual open days – giving a curious public an opportunity to meet key staff and learn more about our research, clinical and surgical services.

On October 5, 2013, we ran a series of tours – including a series of special tours for the Retired Engineers Group – that were informative and interesting. Professor Geoffrey Crawford’s seminars on Lasik were widely popular.

The LEI remains committed to retaining the Open Day as one way to engage the community on the vital role of scientific research in the social and economic fabric of our State.

collaborators and visitors

Population and Health Genetics

VISITORS

Associate Professor Padma Paul – Christian Medical College, Vellore, India, visit funded through an Australia-India Council Grant

Professor Andrew McNaught, Gloucestershire Hospitals NHS Foundation Trust, UK

Professor Stephanie Watson, Clinical Professor, University of Sydney Medical School, Lions Eye Institute Visiting Professor

Professor Elizabeth Engle, Professor of Neurology and Ophthalmology, Harvard Medical School and Investigator at Howard Hughes Medical Institute, University of Western Australia Raine Visiting Professor

COLLABORATORS

Dr Kathryn Burdon, Flinders University, Adelaide

Professor Minas Coroneo, University of Sydney, Sydney

Associate Professor Jamie Craig, Flinders University, Adelaide

Professor Jonathan Crowston, Centre for Eye Research Australia, University of Melbourne, Royal Victorian Eye and Ear Hospital, Melbourne

Dr Elizabeth Engle, Howard Hughes Medical Institute, Engle Laboratory and Centre for Strabismus Research, Children's Hospital, Boston USA

Dr Jeremy (Jez) Guggenheim, University of Cardiff, UK

Professor Chris Hammond, King's College, London School of Medicine, London UK

Dr Alison Hardcastle, UCL Institute of Ophthalmology, London UK

Professor Mingguang He, Zhongshan Ophthalmic Centre, Sun Yat-sen University, Guangzhou China

Dr Alex Hewitt, Centre for Eye Research Australia, University of Melbourne, Royal Victorian Eye and Ear Hospital, Melbourne

Dr Simon John, The Jackson Laboratory, Bar Harbor, Maine USA

Associate Professor Geoff Lam, Princess Margaret Hospital, Perth

Dr Stuart Macgregor, Queensland Institute of Medical Research, Brisbane

Professor Nick Martin, Queensland Institute of Medical Research, Brisbane

Professor Paul Mitchell, Centre for Vision Research, Department of Ophthalmology and Westmead Millennium Institute, University of Sydney, Sydney

Professor Grant Montgomery, Queensland Institute of Medical Research, Brisbane

Professor Anthony (Tony) Moore, Institute of Ophthalmology, University College, London UK

Associate Professor Craig Pennell, School of Women's and Infants' Health, University of Western Australia, Perth

Professor Carmel Toomes, Leeds Institute of Molecular Medicine, Leeds University, Leeds UK

Professor Ian Trounce, Centre for Eye Research Australia, University of Melbourne, Royal Victorian Eye and Ear Hospital, Melbourne

Dr Rohit Varma, Doheny Eye Centre, Los Angeles, California USA

Dr Cathy Williams, University of Bristol, UK

Dr Mary Wirtz, Oregon Health & Science University, Portland, Oregon USA

Professor Tien Wong, Singapore Eye Research Institute, Singapore

Dr Terri Young, Duke University Medical Centre, Durham, North Carolina USA

Centre for Experimental Immunology

VISITORS

Professor Alan Stitt, McCauley Chair of Experimental Ophthalmology, Queen's University, Belfast

Collaborators

Professor Matt Brown, Diamantina Institute, University of Queensland, Brisbane

Professor Chris Goodnow, College of Medicine, Biology and Environment, Australian National University, Canberra

Professor Geoff Hill, Bone Marrow Transplant Laboratory, Queensland Institute of Medical Research, Brisbane

Dr David Huang, Molecular Genetics of Cancer Division, The Walker and Eliza Hall Institute of Medical Research, Melbourne

Professor Wallace Langdon, School of Pathology and Laboratory Medicine, University of Western Australia, Perth

Professor Paul McMenamin, Department of Anatomy and Developmental Biology, Monash University, Melbourne

Emeritus Professor John Papadimitriou, School of Pathology and Laboratory Medicine, The University of Western Australia, Perth

Professor Mark Smyth, Cancer Immunology Program, Peter MacCallum Cancer Centre, Melbourne

Professor Joseph Trapani, Cancer Immunology Program, Peter MacCallum Centre, Melbourne

Professor Ranjeny Thomas, Diamantina Institute, University of Queensland, Brisbane

Professor George Yeoh, School of Chemistry and Biochemistry, The University of Western Australia, Perth

Professor Laurence Zitvogel, Institut Gustave Roussy, Villejuif France

Molecular Ophthalmology

VISITORS

Professor Jesus Ruberte, Department of Animal Health and Anatomy, School of Veterinary Medicine, Universidad Autonoma de Barcelona, Spain

COLLABORATORS

Professor Chong-Lye Ang, Singapore Eye Research Institute, Singapore

Dr Lee Shu Yen, Singapore Eye Research Institute, Singapore

Dr Nigel Barnett, Vision, Touch & Hearing Research Centre, School of Biomedical Sciences, University of Queensland, Brisbane

Professor Miranda Grounds, School of Anatomy and Human Biology, The University of Western Australia, Perth

Professor Paul McMenamin, Department of Anatomy & Developmental Biology, Monash University, Melbourne

Professor Kristina Narfstrom, College of Veterinary Medicine, University of Missouri, Columbia USA

Professor Luis Serrano, Centre for Genomic Research, Barcelona Spain

Physiology and Pharmacology

COLLABORATORS

Professor Balawantray Chauhan, Dalhousie University, Nova Scotia Canada

Professor Tom Gardner, Penn State University, Pennsylvania USA

Professor Wenyi Guo, Fudan University, Shanghai China

Professor Mark Humayun, Doheny Eye Institute, Los Angeles California USA

Professor Trevor Lamb, Australian National University, Canberra

Professor Jonathon Stone, Sydney University, Sydney

Professor Jan Provis, Australian National University, Canberra

Professor Xinghua Sun, Fudan University, Shanghai China

Dr Xiaobo Yu, Fudan University, Shanghai China

Dr Gerhard Zinser, Heidelberg Engineering, Germany

Aquesys, USA

Ocular Tissue Engineering

VISITORS

Associate Professor Damien Harkin, School of Biomedical Sciences, Faculty of Health, QUT and Queensland Eye Institute

Professor Robyn Guymer, Centre for Eye Research Australia, University of Melbourne

Dr Alice Pébay, Senior Research Fellow, Department of Ophthalmology, University of Melbourne

Professor Alan Stitt, McCauley Chair of Experimental Ophthalmology, Queen's University Belfast

COLLABORATORS

Professor Rod Dilley, Ear Sciences Centre, School of Surgery, The University of Western Australia

Professor Grant Morahan, Centre for Diabetes Research, Western Australian Institute of Medical Research

Professor Robyn Guymer, Centre for Eye Research Australia, University of Melbourne

Assistant Professor Mårten Brelén,

Department of Ophthalmology and Visual Science, The Chinese University of Hong Kong

Associate Professor Aron Chakera, Department of Nephrology, Sir Charles Gairdner Hospital, Perth

Associate Professor Damien Harkin, School of Biomedical Sciences, Faculty of Health, QUT and Queensland Eye Institute

Dr Michael Edel, Research Institute of Hospital Val d Hebron, Barcelona, Spain

Dr Robert Johnston, Cheltenham General Hospital, Cheltenham, UK

Dr Lyndon Da Cruz, Moorfields Eye Hospital, London UK

Dr Nandor Jaroos, Vision Eye Institute, Melbourne

Clinical Researchers

COLLABORATORS

Professor Ian Constable

Professor Mark Blumenkranz, Chairman Ophthalmology, Byers Eye Institute at Stanford University

Professor Steven Schwartz, Head Vitreoretinal Surgery, Jules Stein Eye Institute, University of California

Professor Richard Samulski – Professor of Molecular Biology, University of North Carolina

Dr Jean-Louis de Sousa

Dr Dini Dharmawidari, John Fawcett Foundation

Professor Ian McAllister

Professor Mark Gillies, Sydney Eye Hospital

Professor Paul Mitchell, Westmead Hospital

Professor Tien Wong, Singapore National Eye Centre

Associate Professor Mei-Ling Tay-Kearney

Dr Yogesan Kanagasigam, Research Director CSIRO

conferences and invited lectures

JANUARY

Mackey DA. Outdoor activity, genetics and myopia. Invited speaker. 2013 Ski Eyecare Conference, Aspen USA, January 16.

Mackey DA. Genetics of keratoconus and corneal thickness. Invited speaker. 2013 Ski Eyecare Conference, Aspen USA, January 17.

Barrett G. Cataract Surgery – telling it like it is. Honorary Lecturer, Florida USA, January 16-20.

FEBRUARY

Franchina M, Ward-Graham M, Mackey DM, Hewitt AW. iDG profiler: A tool for personalised glaucoma-gene risk profiling. Abstract presentation, Australian & New Zealand Glaucoma Interest Group (ANZGIG) Scientific Meeting, Hobart Tasmania, February 1-2.

Franchina M, Yazar S, Cox K, Hewitt AW, Mackey DM. Frequent swimming goggle wear associated with thinning of the retinal nerve fibre layer: Preliminary results of The Western Australian Eye Protection Study. Abstract presentation, Australian & New Zealand Glaucoma Interest Group (ANZGIG) Scientific Meeting, Hobart Tasmania, February 1-2.

Barrett G. Conference attendance at The International Intra-Ocular Implant Club meeting, Quebec Canada, February 8-13.

Constable, IJ. Wet macular degeneration, Bali International Ophthalmology Retreat. Bali Indonesia.

MARCH

Crawford G. Conference attendance, Australian and New Zealand Cornea Society, Adelaide, South Australia, March 7-8.

De Sousa J-L. Oculoplastics and orbital trauma. Invited speaker, RANZCO WA Branch Meeting, March 24.

Franchina M. Self-inflicted eye injuries. Invited speaker. RANZCO WA Branch Meeting, March 24.

Philip S. Children's eye protection. Invited speaker. RANZCO WA Branch Meeting, March 24.

Crawford G. Conference attendance, RANZCO WA Branch Meeting, March 23-24.

Yu D-Y. Link between experimental and clinical research. Invited speaker, 13th International Congress of Ophthalmology and Optometry, Shanghai China, March 28-31.

APRIL

McLenachan S. Personalised cell therapy for curing macular degeneration. Oral presentation, Centre for Cell Therapy and Regenerative Medicine Symposium, Perth, Western Australia.

Barrett G. Contrast sensitivity and spherical aberration with extended depth of focus IOL. Invited speaker, American Society of Cataract & Refractive Surgery conference, San Francisco USA, April 19-23.

Barrett G. Single formula method vs averaged multiple formula for calculating IOL power after refractive surgery. Winner of best paper presentation, American Society of Cataract & Refractive Surgery conference, San Francisco USA, April 19-23.

Barrett G. Moderator: Intraocular surgery Monofocal IOLs. American Society of Cataract & Refractive Surgery conference, San Francisco USA, April 19-23.

Crawford G. Delegate, American Society of Cataract & Refractive Surgeons, San Francisco USA, April 19-23.

MAY

Lai CM. Results from a Phase I/II clinical trial on anti-vascular endothelial growth factor gene therapy in patients with exudative age-related macular degeneration. Invited speaker, Australasian Gene Therapy Society Meeting, Sydney New South Wales, May 8-10.

Constable IJ. The human trial of gene therapy for wet macular degeneration. Oral presentation. Association for Research in Vision & Ophthalmology, Seattle USA.

Constable IJ, Pierce CM, Samasandaram SK, Lai CM, Chalberg TW, Blumenkranz MS, Samulski RJ, Rakoczy EP. Anti-VEGF gene therapy for wet AMD: Safety and tolerability of sub-retinal delivery in Phase I/II clinical trial. Poster presentation, Association for Research in Vision & Ophthalmology, Seattle USA.

McLenachan S, Zhang D, Chen FK. Retinal pigment epithelial differentiation in primary human limbal neurosphere cultures. Poster presentation, Association for Research in Vision & Ophthalmology, Seattle USA.

Mackey DA, Yazar S, Hewitt AW, Forward H, McKnight CM, Tan A, Mountain JA. Monochromatic aberrations, vision and refractive error in healthy young adults. Poster presentation, Association for Research in Vision & Ophthalmology, Seattle USA.

Morgan WH. Open Perimetry Initiative special interest group: Investigations with large sets of visual field data. Invited speaker, Association for Research in Vision & Ophthalmology, Seattle USA.

Morgan W, Hazelton M, Betz-Stablein B, House P, Yu D-Y. Change in intraocular pressure is a major determinant of retinal vein pulsation properties. Poster presentation, Association for Research in Vision & Ophthalmology, Seattle USA.

Rakoczy EP, CM Lai, C Pierce, A Magno, RJ Samulski, TW Chalberg, MS Blumenkranz, IJ Constable. Anti-VEGF gene therapy for wet AMD: Phase I/II safety and pharmacology results. Poster presentation. Association for Research in Vision & Ophthalmology, Seattle USA.

Magno A, Lai CM, Pierce C, Davern K, Wikstrom M, Constable IJ, Rakoczy E. Development and implementation of an ELISA to detect "anti- Ranibizumab" immunity. Poster presentation, Association for Research in Vision & Ophthalmology, Seattle USA.

Wong EN, Constable IC, Chen FK. Test-retest variability of microperimetry in patients with type 2 idiopathic macular telangiectasia. Poster presentation, Association for Research in Vision & Ophthalmology, Seattle USA, May 5-9.

Chen FK, Constable IC, Wong EN. A comparison of microperimetry parameters derived from the CenterVue MAIA and Nidek MP-1S instruments in patients with type 2 idiopathic macular telangiectasia. Poster presentation, Association for Research in Vision & Ophthalmology, Seattle USA, May 5-9.

Swamy BN, Wong EN, Degli-Esposti S, Keane PA, Crossland M, Sim DA, Tufail A, Chen FK. Rod and cone function and its relationship to OCT sub-structural changes in age-related macular degeneration. Poster presentation, Association for Research in Vision & Ophthalmology, Seattle USA, May 5-9.

Constable IJ. Gene therapy for wet macular degeneration and other retinal conditions. Invited lecture. American Society for Gene and Cell Therapy. Utah USA.

Rakoczy EP, CM Lai, C Pierce, AL Magno, RJ Samulski, D Dismuke, J Grieger, TW

Chalberg, MS Blumenkranz, M French, IJ Constable. Gene therapy for wet-AMD: Progress report on a Phase I/II Clinical Trial. American Society of Gene and Cell Therapy Meeting, Utah USA.

Crawford G. The differential diagnosis of a corneal dendriform lesion. Oral presentation, Optomax Optometric Conference, Perth Western Australia, May 25-26.

Crawford G. Recurrent corneal erosions syndrome. Oral presentation, Optomax Optometric Conference, Perth Western Australia, May 25-26.

De Sousa J-L. Oculoplastics. Oral presentation, Optomax Optometric Conference, Perth Western Australia, May 25-26.

JUNE

Mackey DA. Outdoor activity: genetics and myopia. Invited speaker. Specsavers Clinical Conference, Sydney Australia, June 16.

JULY

Barrett G. Conference attendance, Australasian Society of Cataract & Refractive Surgeons, Ayers Rock, July 3-6.

Crawford G. Conference attendance, Australasian Society of Cataract & Refractive Surgeons, Ayers Rock, July 4-8.

Mackey DA. Outdoor activity: genetics and myopia. Invited speaker. Queensland Institute of Medical Research, Brisbane, July 8.

Mackey DA. Outdoor activity: genetics and myopia. Invited speaker. Diamantina Institute, Brisbane, July 10.

Ang A. Corneal surgical approaches in keratoconus. Invited speaker, Asia-Pacific Association of Cataract & Refractive Surgeons, Singapore, July 11-14.

Barrett G. The role of the posterior capsule in predicting refractive outcome - effective lens position. Invited speaker, Asia-Pacific Association of Cataract & Refractive Surgeons, Singapore, July 11-14.

Crawford G. Conference attendance, Asia-Pacific Association of Cataract & Refractive Surgeons, Singapore, July 11-14.

Mackey DA. Moderator, Session: Identification of genes responsible for ocular quantitative traits as risk factors for GL. World Glaucoma Congress, Vancouver Canada, July 18.

Mackey DA. Moderator, Symposium: Genetics (research, clinical applications). World Glaucoma Congress, Vancouver Canada, July 18.

Mackey DA. The association between LOXL1 and exfoliation syndrome worldwide: an update. Invited Speaker. World Glaucoma Congress, Vancouver Canada, July 19.

AUGUST

De Sousa J-L. Eyelid reconstruction. Invited speaker, WA Branch Australian Ophthalmic Nurses Association, Perth, August 3.

Franchina M, Vote BJ, Craig JE, Saffery R, Mackey DA, Hewitt AW. IL17RC is not differentially methylated in age-related macular degeneration. Abstract presentation, International Society for Genetic Eye Diseases & Retinoblastoma Meeting, Ghent Belgium, August 22-24.

Mackey DA. Ophthalmic success with Genome Wide Association Studies (GWAS). Invited speaker. International Society for Genetic Eye Diseases & Retinoblastoma ISGEDR, Ghent, Belgium, August 23.

SEPTEMBER

Coudert J. NK cells fight off an MCMV strain that target inhibitory receptors by cis-masking. Poster presentation Society for Natural Immunity, 14th meeting "NK2013", Heidelberg Germany.

De Sousa J-L. Conference attendance, Skin cancer conference, Bali, September 19-22.

OCTOBER

Barrett G. What is the best solution for presbyopic cataract or RLE eyes. Invited speaker, European Society for Cataract & Refractive Surgeons. Amsterdam Holland, October 5-9.

Barrett G. Clear lens extraction for Presbyopia: have we gone mad? Invited speaker, European Society for Cataract & Refractive Surgeons. Amsterdam Holland, October 5-9.

Barrett, G. Refractive lens exchange for high hyperopia: benefits and potential complications. Invited speaker, European Society for Cataract & Refractive Surgeons. Amsterdam Holland, October 5-9.

Barrett G. Extended depth of focus IOL: spherical aberration and contrast sensitivity. Paper presentation, European Society for Cataract & Refractive Surgeons. Amsterdam Holland, October 5-9.

Coudert J. NK cells fight off an MCMV strain that target inhibitory receptors by cis-masking. Oral presentation, Australasian Society for Immunology, Perth Immunology Group Symposium, Perth Western Australia.

McLenachan S, Zhang D, Chen FK. Retinal pigment epithelial differentiation in primary human limbal neurosphere cultures. Poster presentation, Combined BioSciences Meeting, Perth Western Australia.

Zhang D, McLenachan S, Chen FK. Transfection of neurospheres with mRNA. Poster presentation, Combined BioSciences Meeting, Perth Western Australia.

Zhang D, McLenachan S, Chen FK. Electroporation of human embryonic stem cell derived neurospheres. Poster presentation, Beijing Institute of Technology 6th Annual World Congress of Regenerative Medicine and Stem Cells, Dalian, China.

NOVEMBER

Wong EN, Constable IJ, Chen FK. Test-retest variability of microperimetry in patients with type 2 idiopathic macular telangiectasia. Oral presentation, The Australasian Ophthalmic and Visual Sciences Meeting, Hobart Tasmania, November 2-6.

Mackey DA. Ophthalmic success with Genome Wide Association Studies (GWAS). Invited speaker. Australian Ophthalmic Nurses Association. Hobart Tasmania.

Ang A. Conference attendance, RANZCO 45th Annual Scientific Conference, Hobart, Tasmania, November 2-6.

De Sousa, J-L. Conference attendance, RANZCO 45th Annual Scientific Conference, Hobart, Tasmania, November 2-6.

Franchina M, Yazar S, Hunter M, Gajdatsy A, Desousa J-L, Hewitt AW, Mackey DA. Myopia and skin cancer are inversely correlated: Results of the Busselton Healthy Ageing Study. Abstract presentation, RANZCO 45th Annual Scientific Conference. Hobart Tasmania, November 2-6.

Hoskin A. Spectacle related ocular injuries. Abstract presentation. RANZCO 45th Annual Scientific Conference, Hobart Tasmania, November 2-6.

Philip S. Children's eye protection - a review. Abstract presentation. RANZCO 45th Annual Scientific Conference, Hobart Tasmania, November 2-6.

Rakoczy EP. From mice to humans. Invited speaker, RANZCO 45th Annual Scientific Conference. Hobart Tasmania, November 2-6.

Wong EN, Khoo YJ, Chen FK. Microperimetry in a range of macular pathology. Oral presentation RANZCO 45th Annual Scientific Conference, Hobart Tasmania November 2-6.

Hoskin, A. Children's eye injuries and eye protection. Invited speaker, Australasian Injury Prevention and Safety Promotion Conference. Sydney New South Wales.

Constable IJ. Gene therapy and the eye. Invited lecture. 8th annual meeting ISO. Guangzhou China.

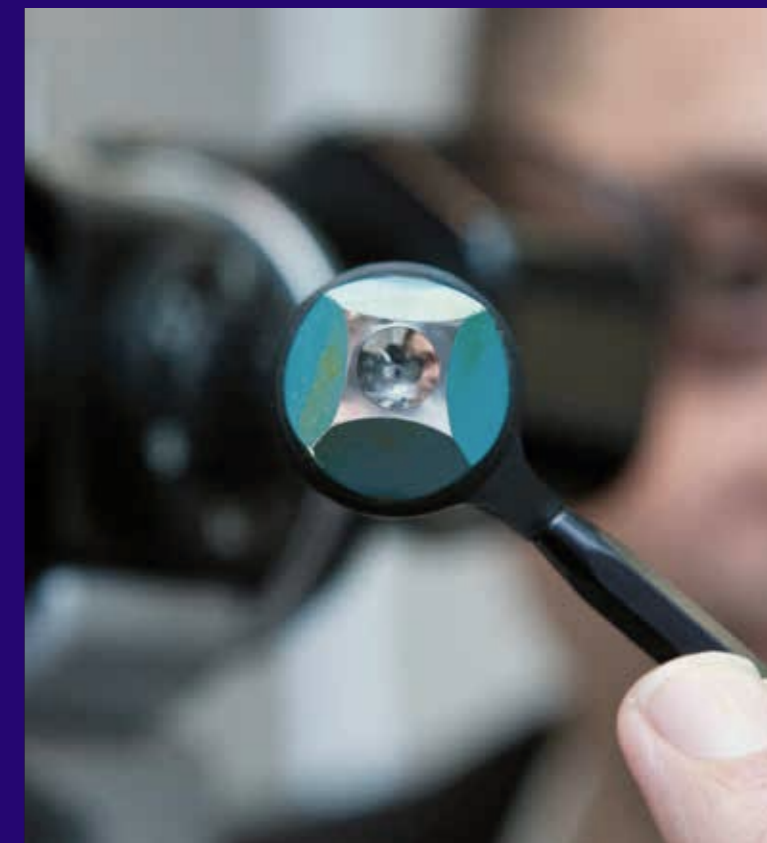
Ang A. Course instructor: Endothelial keratoplasty techniques. American Academy of Ophthalmology, New Orleans, November 15-19.

Ang A. Course instructor: Surgery for severe corneal and ocular surface disease. American Academy of Ophthalmology, New Orleans, November 15-19.

DECEMBER

Constable IJ. Progress in gene therapy in the eye. Invited lecture, the Tano Lecture. Asia Pacific Vitreoretinal Society, Nagoya Japan.

Wong EN, Chen FK. Repeatability of retinal sensitivity measurement on MAIA microperimetry in patients with early age-related macular degeneration. Poster presentation, 11th Asia Pacific Vitreoretinal Society Annual Meeting, Nagoya Japan.



forging partnerships



The LEI continued to build partnerships with an outstanding array of scientists from the Lions Eye Institute (LEI) Australia and the world during 2013.

In April, the LEI hosted Elizabeth Engle, Professor of Neurology and Ophthalmology at Harvard Medical School, Investigator at Howard Hughes Medical Institute and Raine Visiting Professor at The University of Western Australia.

Professor Engle's research combines clinical, genetic and molecular biological approaches to the study of strabismus – misaligned eyes or squint – and ocular motor neuron and axon development.

Her laboratory at Harvard University has successfully identified several genes associated with strabismus and she has collaborated with the LEI Managing Director Professor David Mackey's strabismus inheritance genetic studies over many years.

While in Perth, she delivered a Raine Lecture on congenital cranial dysinnervation disorders.

Also in April, the LEI hosted a Pfizer Visiting Professor, Stephanie Watson.

Professor Watson is a specialist in corneal surgery at the Sydney Eye Hospital, Sydney Children's Hospital and Prince of Wales Hospital.

She completed sub-speciality training at Moorfields Eye Hospital in London and was awarded a PhD for the development of a new dry eye therapy.

Professor Watson also teaches corneal and cataract surgery to ophthalmology registrars as a trainer for the Royal Australian and New

Zealand College of Ophthalmologists and was bought to Perth by the LEI to deliver lectures to staff, clinicians and eye registrars.

Dr Alice Pébay, a Senior Research Fellow at the University of Melbourne's Department of Ophthalmology, visited the LEI in August.

Dr Pébay is also head of the Neurogeneration Unit at the Centre for Eye Research Australia and one of her research areas is the generation of iPSCs (induced pluripotent stem cells) for the study of ocular diseases.

She met with Associate Professor Fred Chen and gave the talk: Can stem cells model neurotrauma?

The Institute also hosted Associate Professor Damien Harkin, a research scientist at Queensland University of Technology's School of Biomedical Sciences.

Associate Professor Harkin teaches histological techniques to medical laboratory science students and while visiting the LEI, gave a well-attended lecture to clinical and research staff on the challenges and opportunities for ocular cell therapies in Australia.

Other visitors in 2013 included Professor Robyn Guymer, from the Centre for Eye Research Australia and University of Melbourne. She visited in November as part of the LEAD trial initiation.

Professor Alan Stitt, who holds the McCauley Chair of Experimental Ophthalmology at Queen's University, Belfast, delivered a well-attended lecture at the LEI in December titled: *Can we use vascular stem cells to regenerate the ischaemic retina?*



Top: David Mackey, Elizabeth Engle. **Bottom left:** David Mackey, Robyn Guymer and Fred Chen visit the new lab. **Bottom centre:** David Mackey, Jesus Ruberte, John Forrester. **Bottom right:** Fred Chen and Alice Pébay.

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bionic eye looks promising



During 2013, Lions Eye Institute (LEI) researchers published results from the outcome of a trial of the Argus II epiretinal prosthesis system – also known as the bionic eye.

The Argus II system is designed to help people with degenerative retinal diseases like retinitis pigmentosa by using electrical stimulation to bypass defective photoreceptors and stimulate remaining viable retinal cells.

Image data from an external camera are wirelessly transmitted to the implant, which stimulates electrodes in an array on the retina to produce formed vision.

The Argus II allows letter and word reading and long-term function in patients with profound vision loss.

In the Argus II Study Group's trial, 28 patients with light perception vision received a retinal implant and controlled, closed-group, forced-choice letter identification tests were conducted, as well as open-choice two-, three- and four-letter word identification tests.

The trial concluded that multiple blind subjects fitted with the Argus II system consistently identified letters and words using the device, indicating reproducible spatial resolution.

This, in combination with stable, long-term function, represents significant progress in the evolution of artificial sight.

grants

Grant	Chief Investigators
AUSTRALIAN COMPETITIVE GRANTS	
NHMRC Senior Principal Research Fellowship	Degli-Esposti, M
NHMRC Program Grant Immunological therapies for cancer, chronic infection and autoimmunity	Degli-Esposti, M
NHMRC Centre of Research Excellence Translation of genetic eye research integrating education, counselling and testing with gene discovery and gene based therapies for eye disease	Mackey, D Hewitt, A Burdon, K Craig, J
NHMRC Project Grant Genome-wide association study (GWAS) for juvenile onset myopia and its component measures to identify molecular pathways to prevent myopia	Mackey, D Pennell, C Hewitt, A Young, T Hammond, C Coroneo, M
NHMRC Project Grant Genetic etiologies of congenital esotropia	Mackey, D Engle, E Hewitt, A Macgregor, S
NHMRC Project Grant Developing a new glaucoma surgery using precision ablation of the trabecular meshwork	Yu, D-Y Morgan, W Cringle, S
NHMRC Project Grant Imaging the human fundus to simultaneously generate an oxygenation and blood flow map	Yu, D-Y Cringle, S McAllister, I
NHMRC Project Grant Non-invasive retinal vein pulsation pressure measurement: A new assessment of glaucoma treatment	Morgan, William Yu, Dao-Yi
NHMRC Project Grant Long-term human response following subretinal injection of recombinant adenoassociated virus-sFlt-1 vector	Rakoczy, P
NHMRC Project Grant The balance of signals received by NK cells is modulated by viruses as a mean of immune escape	Coudert, J
NHMRC Project Grant Improving inner retinal oxygenation: developing a new form of retinal laser photocoagulation therapy	Cringle, S Yu, D-Y
NHMRC Project Grant Pathogenic role of changes in the extracellular environment of retinal ganglion cells in glaucoma	Yu, D-Y Morgan, W Cringle, S

NHMRC Development Grant Developing a prototype laser system for intraocular surgery	Yu, D-Y McAllister, I Cringle, S
NHMRC Scholarship Grant	Kang, M
NHMRC Early Career Fellowship	Chen, F
ARC Centre of Excellence Centre of Excellence in Vision Science	Yu, D
Ophthalmic Research Institute of Australia Comparative study of two automated microperimeters	Chen, F
GOVERNMENT GRANTS	
Government of Western Australia Department of Health Round 16 MHRIF	
WA Country Health Service COAG Co-ordination	Turner, A
Other Grants	
Channel 7 Telethon Trust Outdoor Environment and Vision	Mackey, D
Novartis Equipment	Turner, A
McCusker Charitable Foundation Remote Eye Health	Turner, A
Raine Medical Research Foundation Visiting Professor Lecture Series	Mackey, D
University of Western Australia AA Saw Scholarship	McKnight, C
University of Western Australia AA Saw Scholarship	Tan, A
University of Western Australia AA Saw Scholarship	Tan, P
University of Western Australia AA Saw Scholarship Top up	Kang, M
University of Western Australia Alvina King Living Allowance	Yazar, S
University of Western Australia Alvina King Living Allowance	Tan, P
University of Western Australia ECR Fellowship Support	Chen, F
University of Western Australia Centre for Ophthalmology and Visual Science Infrastructure Funding	
Lions Save-Sight Foundation Research Support	
TOTAL GRANTS 2013	\$4,256,000

board of directors

Mr David Eiszele Non-executive Chairman

FAICD



Mr David Eiszele joined the Board in 2003 and was appointed Chairman on 31 December 2004. He holds a Diploma of Civil Engineering and a Masters of Business Degree. He is a Fellow of the Australian Institute of Company Directors. Mr Eiszele was the Chairman of PearlStreet Limited and a former Managing Director of Western Power Corporation - a major government trading entity. Mr Eiszele has considerable experience in effecting commercial, strategic and cultural change within a large corporation. He has held national leadership roles as member of the Business Council of Australia and past Chairman of ESAA. Mr Eiszele is Chairman of Verve Energy, Director of Torrens Energy Limited, Past Fellow of the Institution of Engineers Australia, and Australian Institute of Management.

Professor David Mackey Managing Director

MBBS, MD, FRANZCO, FRACS, AAICD



Professor David Mackey was appointed Managing Director of the Lions Eye Institute and Professor of Ophthalmology at The University of Western Australia in March 2009. He heads UWA's Centre for Ophthalmology and Visual Science. Professor Mackey is a member of the Board's Investment Committee.

Professor Mackey studied medicine at the University of Tasmania and trained in ophthalmology at the Royal Victorian Eye and Ear Hospital in Melbourne, subsequently doing a fellowship in paediatric and genetic eye diseases at the Royal Children's Hospital in Melbourne. After fellowships at the Johns Hopkins Centre for Hereditary Eye Diseases in Baltimore and Moorfields Eye Hospital and the Great Ormond St Hospital for Sick Children in London, he returned to Australia to specialise in genetic eye diseases.

He is president of the International Society for Genetic Eye Disease and Retinoblastoma, a member of the Board of the Ophthalmic Research Institute of Australia and Chair of the Western Australian Branch of the Royal Australian and New Zealand College of Ophthalmologists.

Dr Stephanie Allen Non-executive director

BA Hons, MSc, DPhil, GAICD



Dr Stephanie Allen is a Partner at PwC. She leads the health and government practices for PwC in Western Australia and has a national role around healthcare productivity. She holds a PhD, MSc and BA Joint Honours degrees from the University of Oxford. Stephanie has over 15 years experience in healthcare consulting both in Australia and the UK. She has led a number of high profile projects for WA including sustainable cost improvement programs across the public and private healthcare system. Stephanie has also worked extensively with the primary, aged care and disabilities sector – typically supporting organisations to develop robust business cases for the diversification or rationalisation of services as demand and funding changes.

Mr Rudolf Brunovs
Non-executive director

FAICD



Mr Rudolf Brunovs joined the Board in 2005. He is a Fellow of the Institute of Chartered Accountants, CPA Australia and the Australian Institute of Company Directors, and holds a Masters of Business Administration. Mr Brunovs retired as a partner of the chartered accounting firm Ernst & Young after 27 years as a partner in a number of their offices. He is currently a Director and the Principal of Mainstay Consulting Pty Ltd and a Director of Deep Yellow Limited.

Mr Tony Joyner
Non-executive director

B Juris (Hons), LLB



Mr Tony Joyner joined the Board in 2013. He has over 25 years of experience as a commercial and corporate lawyer and is currently the Managing Partner of the Perth office at Herbert Smith Freehills. Tony heads the Western Australia corporate technology and intellectual property group, and is a senior member of the projects team in Perth. Tony has an honours Bachelor of Jurisprudence and Bachelor of Laws degree from UWA. He sits on several committees, including the WA Chamber of Commerce Business Policy Forum, Services Committee and Telecommunications and Innovation sub-committees.

Professor Ian McAllister
Non-executive director

MBBS, FRANZCO, FRACS



Professor Ian McAllister joined the Board in 2010. He studied medicine at the University of Western Australia, completed his ophthalmological training in Western Australia and a fellowship in vitreoretinal disorders at the Cleveland Clinic Foundation in Cleveland, Ohio. A further one year staff position in vitreoretinal disorders was also completed at Cleveland before returning to Perth. He has been with the Institute since 1988 providing vitreoretinal services to metropolitan hospitals and has also been involved in research into disorders affecting the retina. He has held ten NH&MRC grants as well as numerous minor grants and has published over one hundred papers in scientific journals. Professor McAllister is the Director of Clinical Services at the Institute and has extensive experience in research and eye health care.

Mr Stephen Pearce
Non-executive director

B Bus, FCA, Grad Dip, MAICD, AGIA



Mr Stephen Pearce joined the Board in 2012. He is Chief Financial Officer of Fortescue Metals Group Limited and has nearly 30 years of experience in senior management roles in the mining, oil and gas and utilities industries. Prior to joining Fortescue, Mr. Pearce served as Managing Director and Chief Executive Officer of Southern Cross Electrical Engineering Limited and Chief Financial Officer of Alinta Limited. Mr. Pearce has previously served as Chairman of Amadeus Energy Ltd., and Chairman of Surtron Technologies Pty Ltd. Mr Pearce served as a member of the Western Australian Business and Industry Committee for the Salvation Army for 7 years.

Mr Pearce received a Bachelor of Business from RMIT and a Graduate Diploma in Company Secretarial Practice. Mr. Pearce is a Fellow of the Institute of Chartered Accountants, a Chartered Secretary and Member of the Australian Institute of Company Directors.

Sir James Cruthers AO Patron



Sir James Cruthers AO has been a long standing patron of the Lions Eye Institute. He had a long career in the media and entertainment industry, receiving his knighthood for service to commerce, the community and the arts. After war service he was appointed a journalist with the Perth Daily News. In 1958 he became founding General Manager of TVW Channel 7 and later Chairman. Past chairmanships include the Australian Film Commission and News American Publishing Inc where he was personal adviser to Mr Rupert Murdoch. Sir James is a philanthropist who established TVW Telethon and the WA annual Christmas Pageant. He actively supports many charitable groups.

Governance

In meeting its obligations to the community the Institute adheres to high standards of corporate governance as a limited liability company with not-for-profit and Tax Exempt Gift Recipient status.

Audit governance

The Institute engages Grant Thornton Audit Pty Ltd as an external audit team to independently review its financial reports and uphold the integrity of the reporting process.

Executive Committee

Our Executive Committee consisting of senior management personnel meet regularly to discuss key budgetary, operational and strategic activities.

financial statements

Australian Foundation for the Prevention of Blindness Trust

The following summary financial report reflects the financial position of the AFPB Trust for the year ended 31 December 2013.

	2013 \$	2012 \$
INCOME		
Donations and subscriptions	850	850
Imputation credit	28,723	33,370
Interest and investment income	49,667	58,876
Dividends and trust distributions	66,232	52,828
Fair value adjustment of investment to market value	414,128	301,771
TOTAL INCOME	559,600	447,695
LESS EXPENDITURE		
Donations	50,000	-
Administration Expenses	5,428	5,410
TOTAL EXPENDITURE	55,428	5,410
NET PROFIT FOR THE YEAR	504,172	442,285
Accumulated funds at the beginning of year	2,924,849	2,482,564
ACCUMULATED FUNDS AT THE END OF THE YEAR	3,429,021	2,924,849
Represented by		
CURRENT ASSETS		
Cash at bank	1,164,938	1,139,598
Other Assets	9,686	10,749
	1,174,624	1,150,347
NON-CURRENT ASSETS		
Investments	2,257,285	1,777,252
TOTAL ASSETS	3,431,909	2,927,599
CURRENT LIABILITIES		
Other Creditors	2,888	2,750
NET ASSETS	3,429,021	2,924,849

Lions Eye Institute Limited

Income Statement

For the year ended 31 December

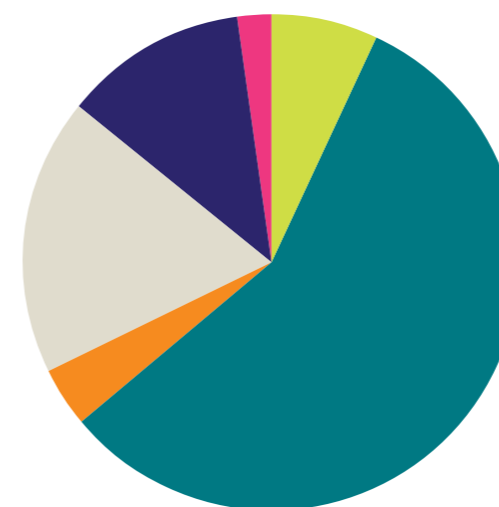
	2013 \$	2012 \$
Total income including research grants	21,474,249	20,395,495
Total expenditure including research expenses	(19,921,786)	(17,201,118)
Operating profit before significant items	1,552,463	3,194,377
Significant item (Fair value)	1,287,635	1,176,253
Operating (loss)/profit after significant items	2,840,098	4,370,630
Accumulated profit at the beginning of the year	29,109,847	24,739,217
ACCUMULATED PROFIT AT THE END OF THE YEAR	31,949,945	29,109,847
Significant Item		
Comprised of:		
Fair value adjustment of investments to market value Total	1,287,635	1,176,253
TOTAL	1,287,635	1,176,253
General Available Cash and Bequest Funds		
Research grant funds not yet spent	9,605,633	8,354,581
Endowment Fund	19,773,310	12,186,055
Joyce Henderson Bequest - Restricted Cash	3,323,707	3,180,578
Capital Fundraising Campaign - Restricted cash	2,000,418	1,413,802
General cash reserves	216,980	4,718,107
CASH AT BANK AND BEQUEST FUNDS	34,920,048	29,853,123

Balance Sheet

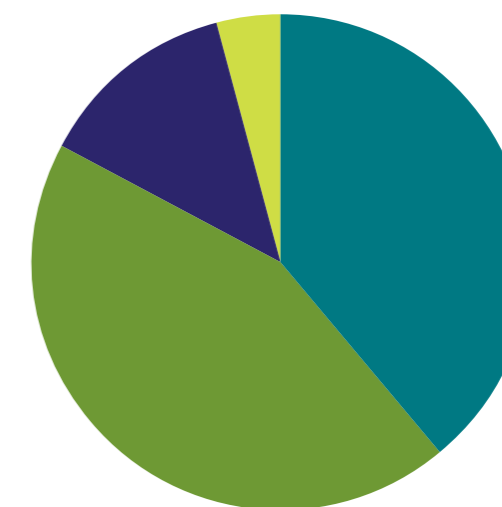
As at 31 December

	2013 \$	2012 \$
TOTAL FUNDS	31,949,945	29,109,847
Represented by		
Cash assets	18,855,137	18,136,163
Other assets	1,647,489	1,761,406
Other financial assets	16,064,911	11,716,960
Property, plant and equipment	7,743,145	8,052,039
TOTAL ASSETS	44,310,682	39,666,568
Payables	1,645,992	1,341,330
Research grant funds not yet spent	9,605,633	8,354,581
Provision for employee entitlements	1,109,112	860,810
TOTAL LIABILITIES	12,360,737	10,556,721
NET ASSETS	31,949,945	29,109,847

Income 2013



Expense 2013



Statistical Summary

	2013 \$	2012 \$	2011 \$	2010 \$	2009 \$
Total income	21,474,249	20,395,495	19,444,853	14,357,478	15,978,757
Total expenditure	(19,921,786)	(17,201,118)	(15,700,861)	(13,655,814)	(12,011,172)
Net assets	31,949,945	29,109,847	24,739,217	20,995,225	20,293,561
Property, plant and equipment (net)	7,743,145	8,052,039	7,141,125	7,595,237	6,995,570
AVERAGE NO. OF FTE STAFF	115	93	85	82	82

one team, one dream: saving sight



LEI staff on the stairs outside the new laboratories in the Perkins Institute of Medical Research building



Contact Information

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