

New Zealand National Eye Centre: celebrating first year successes

BY SUE RAYNEL

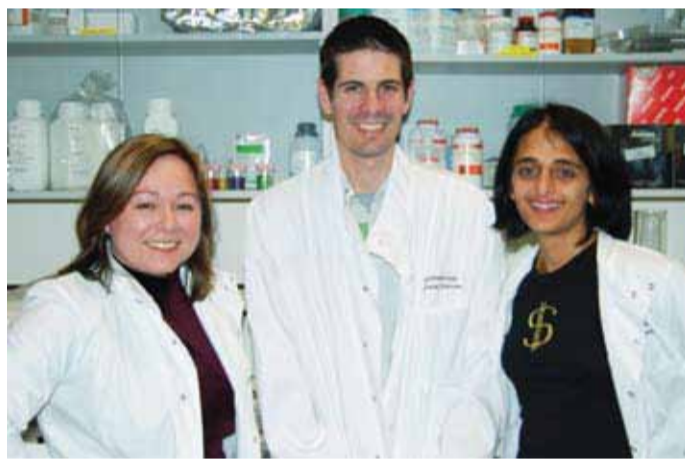
The New Zealand National Eye Centre (NZ-NEC) was established as a cross faculty research centre within the University of Auckland in early 2008. Faculty research centres were established within Auckland University in 2001 and play an important role in changing the focus of research and other academic activity, to reflect external opportunities and trends and to address interdisciplinary advances. They are also a major contributor to the overall research effort of the University. Centres can be particularly effective in promoting the academic strengths of the University, attracting high quality staff and postgraduate research students, and providing a clear means of access for outside organisations.

Now one year on from the official launch of NZ-NEC at a one day research conference in July 2008, and although still relatively early in the stages of development, the centre has been proactive in seeking research funding, publishing results of research endeavours and contributing to the future for vision research in New Zealand. Indeed, since early 2008, NZ-NEC members and collaborators have received over \$8,500,000 in competitive research grants, produced an exceptional output of top quality publications in peer reviewed journals, developed technological advances, and received several prestigious awards.

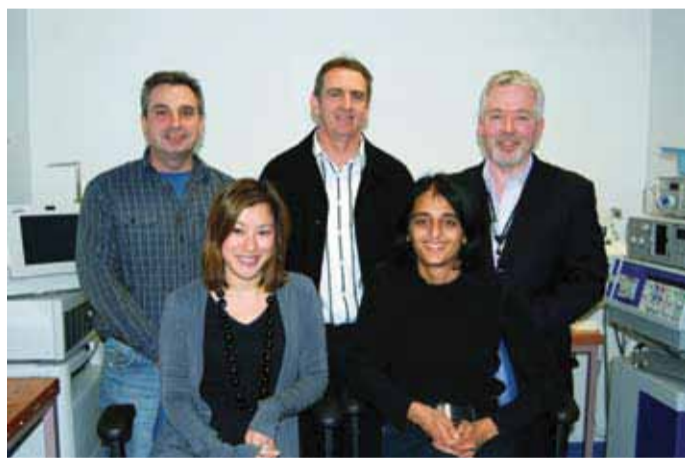
Since July 2008 NZ-NEC has held research seminars every 2 months, kindly sponsored by Alcon Laboratories, for researchers to share their current research and discuss possible future avenues of research. These have been well attended and have been particularly worthwhile as several collaborations have originated amongst participants that otherwise may not have eventuated due to the different physical locations and time constraints for many researchers.

RESEARCH FUNDING

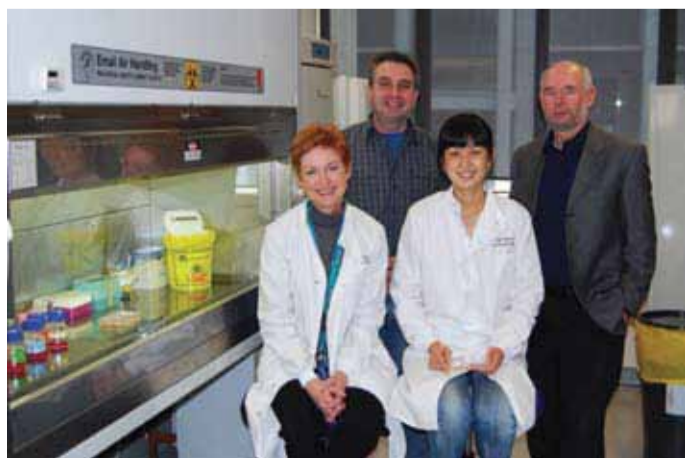
Research grants totalling \$1,900,000 were received in 2008. Two grants were of particular significance for young researchers. Dr Dipika Patel, Senior Lecturer, Department of Ophthalmology was awarded a \$300,000 research grant by the Marsden Fund Council. The Marsden Fund supports cutting-edge science, contributes to the global advancement of knowledge and has become



This year's major NZNEC research grant winners include Dr Monica Acosta, Dr Ben Thompson and Dr Dipika Patel



The cataract research team, Assoc. Professor Trevor Sherwin, Dr Julie Lim, Professor Paul Donaldson (Project leader), Dr Dipika Patel and Professor Charles McGhee



Members of the translational laboratory science group, Jane McGhee, Assoc Professor Trevor Sherwin, Dr Ally Chang and Professor Colin Green

synonymous with excellence in research in New Zealand. Dr Jennifer Fan, Lecturer and Cornea and Anterior Segment Research Fellow, also received a \$126,000 career development award from the Health Research Council (HRC). Career development awards support young promising researchers and are an important part of the HRC mission to foster the health research workforce in New Zealand.

This year, to date, NZ-NEC has greatly surpassed 2008 funding with over \$6,800,000 in research grants including \$5.1 million in hotly contested HRC grants. These include:

\$1.3 million to Professor Paul Donaldson, Dr Julie Lim, Associate Professor Trevor Sherwin, Professor Charles McGhee and Professor Kevin Schey for a novel diabetic

cataract project that builds on the internationally recognised, pioneering work of Paul Donaldson in this area; \$150,000 to Dr Ben Thompson, a recently appointed lecturer in Optometry and Vision Science, for a major amblyopia project; and \$150,000 to Dr Monica Acosta and Professor Colin Green for their project on studying eye diseases of Maori, Pacific and the elderly using animal models. Professor Colin Green is also a key member of a wider team, led by Professor Alistair Gunn, that received a formidable \$3.5 million three year extension of a current HRC programme grant!

Other significant grants to younger Scientists in 2009 include Auckland Medical Research Foundation funding for Dr Julie Lim to extend key metabolic studies on the crystalline lens (\$126,000), to Dr Acosta to fund a technical position to investigate the effects of these interventions on the retina at the cellular and molecular level (\$110,000) and to Dr Dipika Patel to further develop her endothelial cell transplantation technique (\$99,500). Auckland District Health Board has also awarded \$362,500 to Professor Charles McGhee to support five overseas clinical research fellows and CODA Therapeutics, USA (\$105,000) has funded a new junior anterior segment fellowship supervised by Dr Sue Ormonde and Professor McGhee. Professor Helen Danesh-Meyer continues to build a team of clinical and laboratory researchers and four fellows have been funded via Alcon Laboratories (\$80,000), The Sir William and Lady Stevenson Trust (\$70,000) and Allergan (\$50,000). She has also received \$95,000 from the Neurological Foundation. Dr Raid Alany and Dr Dipika Patel received \$126,000 from FRDF to investigate novel therapies for corneal nerve regeneration. Other funding has been received from the Save Sight Society (\$55,000) and University of Auckland (\$48,000).

RESEARCH PUBLICATIONS

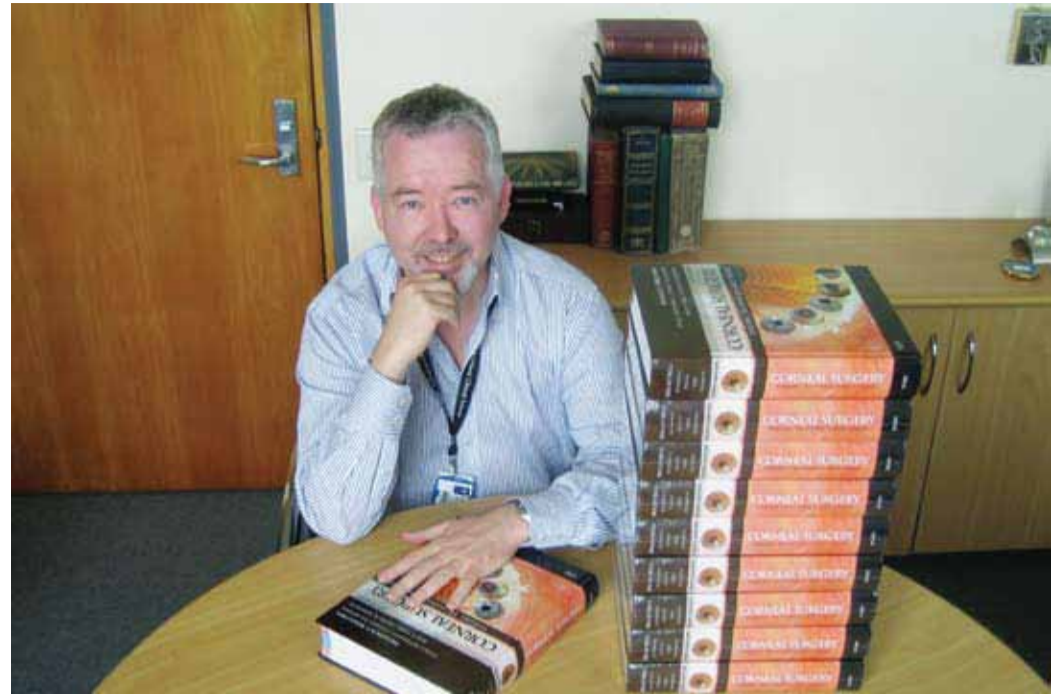
Scientific publications are the life-blood of any academic organisation and the index by which many external organisations judge success. 2008 was a very successful year for NZ-NEC with members having published a total of 90 peer reviewed publications and several book chapters (more than 80% of all vision science research emanating from New Zealand). It appears that 2009 will be another bumper year. A major international textbook on corneal surgery was edited by Charles McGhee with contributions from Trevor Sherwin and Colin Green and published early in the year – the book has already accumulated more than \$500,000 in global sales. It is also anticipated that the number of NZ-NEC peer-reviewed publications in 2009 will at least equal, if not exceed 2008 totals, confirming the centre as a major player in Australasian and International research.

TECHNOLOGICAL ADVANCES

Early in 2008 Optometry researchers signed a licensing agreement between UniServices and a major USA contact lens company to commercialize new soft contact lens technology developed by Dr John Phillips and PhD student Nicola Anstice in the Department of Optometry and Vision Science. The lens is designed to slow the rate at which children develop myopia and uses an optical method to slow the abnormal elongation of the eye which underlies myopia progression.

Nicola recently completed the first proof-of-concept clinical trial of the new Dual-Focus lens (the DIMENZ trial: Dual-focus Inhibition of Myopia Evaluation in New Zealand) to evaluate the efficacy in reducing myopia progression. DIMENZ, a randomised, controlled paired-eye comparison, cross-over trial involving 40 Auckland schoolchildren forms the basis of Nicola's PhD thesis. Dual-Focus lenses are soft contact lenses with different optical zones. Some zones correct the child's refractive error; others provide optical defocus as the 'anti-myopia' therapy. Nicola's results suggest that the lenses can reduce the abnormal eye enlargement and consequent myopia progression in children by significant and clinically useful amounts.

An Ophthalmology team consisting of Ally Chang, PhD student; Dasha Nelidova, BHB (Hons) student; Jane McGhee, Senior Laboratory Technician; Associate Professor Trevor Sherwin and



NZNEC Director, Professor Charles McGhee with the results of an early NZNEC multinational collaboration, copies of a major new textbook entitled 'Corneal Surgery'

Professor Colin Green submitted an entry for the University Entrepreneurship SPARK® Ideas Challenge under the team name CERPIS (Cellular Reprogramming In Situ). NZ-NEC believe that CERPIS is the first in the world to reprogramme cells in situ without genetic modification or the need to extract cells, revert them to stem-like or pluripotent cell form and reimplant them. CERPIS has been able to turn what appears to be the entire stromal keratocyte population into neurons in situ and are working with UniServices to patent protect and devise applications.

Interestingly, SPARK® had 375 entries this year with only 10 prizes for social ideas (but no commercial value) and 10 prizes for commercially viable ideas such as CERPIS. In addition this team



Elizabeth Eady at work on the new Olympus FV-1000 confocal laser scanning microscope in the Department of Ophthalmology



Hutokshi Chinoy (Chief Administrator) and Sue Raynel (Research and Development Manager) of the NZNEC team



Professor Helen Danesh Meyer with the optic nerve and glaucoma research team in the Department of Ophthalmology



Dr Rasha Altaie, Dr James McKelvie, Dr Jennifer Fan, Assoc Professor Trevor Sherwin and Professor Charles McGhee of the cornea and anterior segment research group in the Calvin Ring Microsurgical Laboratory



Dr Peter Ring, Jane McGhee, Stuti Misra, Alison Ring and Jasha Morarji celebrating success as part of the NZ-NEC delegation to the Asia-ARVO conference in Hyderabad, India

also entered Chiasma, the biomedical sciences entrepreneurship challenge award a single prize for best biotechnology idea. The CERPIS team won both a SPARK* Ideas Challenge Award and the Chiasma Award! This is the fourth time staff from the Department of Ophthalmology have won prizes at these awards and reflects the translational research emphasis on unique ideas.

AWARDS AND RECOGNITION

Members of NZ-NEC have been the recipients of several prestigious awards over the last 12 months;

- **Professor Paul Donaldson** received the Triennial Medal from the Physiological Society of New Zealand. The award is made every three years in recognition of distinguished physiological research published by a member of the Society in the previous five years.
- **Professor Charles McGhee** was invited to give the Sir Norman Gregg Medal lecture at the Royal Australian and New Zealand

College of Ophthalmologists (RANZCO) annual meeting in Melbourne. The Gregg lecture is the most prestigious, research-based, invited lecture that is awarded by RANZCO. Professor McGhee also received the Peter Gluckman Medal award for 2008. This award recognises distinguished academic contributions to the Faculty of Medical and Health Sciences and the University of Auckland.

- **Dr Rachael Niederer** was one of only five PhD candidates, out of the 233 PhDs successfully awarded in 2008, to receive a Vice Chancellors Prize for Best Doctoral Thesis.
- **The New Zealand National Eye Bank staff**, Louise Moffatt (Manager), Helen Twohill (Transplant Co-ordinator) and Nigel Brookes (Scientific Officer) received the Faculty of Medicine and Health Science, General Staff Award for sustained excellence.
- **Dr Simon Backhouse** was awarded the inaugural Post Doctoral Fellowship from the New Zealand Association of Optometrists (NZAO) Education and Research Fund.

POST GRADUATE DEGREES AWARDED

DOCTOR OF PHILOSOPHY

Dr Jacqueline Chua, an optometrist currently undertaking post-doctoral work in optometry was awarded her PhD in Optometry on the basis of her thesis entitled "Neurochemical development of the normal and rd/rd mouse retina".

Dr Rachel Niederer, recently appointed to the RANZCO ophthalmology training programme was awarded a PhD in Ophthalmology for her thesis "Laser scanning in vivo confocal microscopy in inherited and acquired corneal disease".

Dr Ilva Rupenthal, a scientist working in the department of ophthalmology graduated with a PhD carried out between Ophthalmology and Pharmacy. Her thesis was entitled "Ocular delivery of antisense oligonucleotides using colloidal carriers: improving wound repair after corneal surgery".

Dr Simon Backhouse, currently a tutor in the Department of Optometry and Vision Science was awarded a PhD for his thesis "Induced myopia in the guinea pig: scleral myofibroblasts and biomechanics".

DOCTOR OF MEDICINE

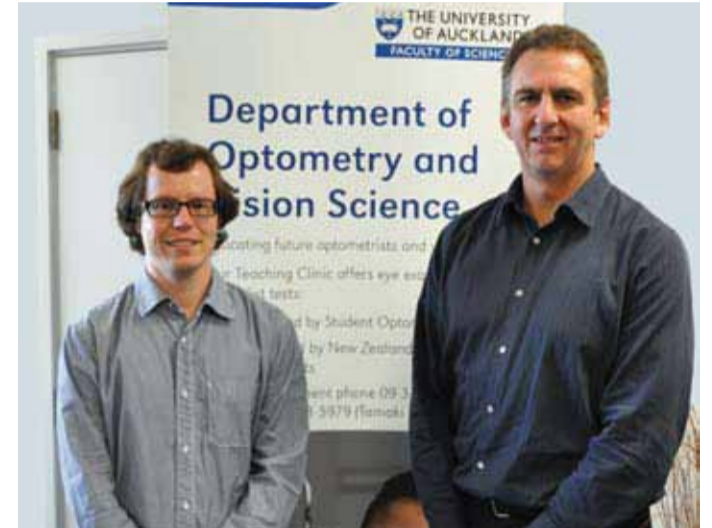
Associate Professor Philip Polkinghorne, an eminent NZ vitreo-retinal surgeon, was awarded an MD for his thesis "Rhegmatogenous Retinal Detachment: A New Zealand perspective".

THE FUTURE

The first year of NZ-NEC has been very fruitful not only in terms of competitive research grants received, the number of peer reviewed publications and new technological advances but also the awards received from the University of Auckland and 'professional' organisations acknowledging their contribution towards research, science and innovation on a broader scale. It continues to attract high calibre PhD candidates and research fellows with 7 PhD, 5 MD and several Masters students currently enrolled. All recent PhD graduates have elected to either remain within NZ-NEC to further



The NZ-NEC collagen crosslinking study group led by Professor McGhee includes Charlotte Jordan (PhD student), Dr Simon Dean (Honorary Senior Lecturer) and Dr Dipika Patel (Senior Lecturer)



Dr Simon Backhouse, the first recipient of the NZAO Post Doctoral Research Fellowship, with NZ-NEC Deputy Director and Optometry HOD, Professor Paul Donaldson

their research interests or have taken up vocational training posts.

The NZNEC's major goals for the next five years are to further cement the strong, collegial relationships between ophthalmology, optometry and other members and to become a standalone research centre/institute within the University of Auckland and a major influence on vision research within Australasia by contributing to the development of new treatment and technological modalities through publication and translational research. 📌