

The New Zealand National Eye Centre

Annual Report 2012

Director:

Professor Charles McGhee
Department of Ophthalmology

Deputy Director:

Professor Paul Donaldson
Department of Optometry and Vision Science

Advisory Board Members:

Professor Iain Martin (or nominee) – Chair
Professor Charles McGhee
Professor Paul Donaldson
Professor Colin Green
Mr Gordon Sanderson – External member (University of Otago)
Hon Associate Professor O Bruce Hadden – Former President Royal Australia and New Zealand College of Ophthalmologists
Geoff Sargent - President New Zealand Association of Optometrists
Associate Professor Sherwin

Management Committee:

Professor Charles McGhee
Professor Paul Donaldson
Sue Raynel – Manager NZ-NEC
Hutokshi Chinoy – Administrative Manager

Dates of meetings of the board and management committee that have taken place during the year:

Advisory Board: did not meet.

Management Committee: 4 times throughout the course of 2012.

Names and Departments of Participating members: *Refer appendix 1*

Introduction

The New Zealand National Eye Centre (NZ-NEC) was formally established in July 2008. The primary foci of NZ-NEC are to consolidate working relationships between University departments involved in Ophthalmology, Optometry, and Vision Sciences, to provide educational, clinical and research expertise and facilities of the highest level in a University of Auckland based centre for the benefit of New Zealand. The establishment of the NZ-NEC is unprecedented anywhere in Australasia, in bringing together the expertise of three major research groups, including ophthalmology and optometry, focussed on increasing the profile of translational vision sciences. By combining the resources of all the research programmes in the area, we have increased capability to answer questions of importance to the eye health of New Zealanders and worldwide. It is anticipated that the NZ-NEC will quickly be recognised as a premier eye research facility in Australasia with such extraordinarily diverse clinical, scientific, teaching and research expertise.

Briefly outline plans and objectives of Centre

Vision: to eliminate preventable blindness and reduce visual impairment

Mission: to become a foremost international vision research, clinical and teaching centre through excellence, innovation and collaboration

Goals: To develop and increase the profile of eye health, vision research and education – in New Zealand/Aotearoa and internationally by:

Laboratory research
Clinical research and Clinical Services
Application of research into practice
Innovation
Collaboration
Teaching and Learning
Community Outreach
Public Health Policy

Staff, post-graduate students involved in the Centre

Refer appendix 1

Summary major developments and plans

1. Research funding

In 2012 members of the NZ-NEC received in excess of \$6,800,000 in competitive research grants and philanthropic awards with an additional \$2,900,000 already pledged for 2013. Members were successful in getting competitive grants from a wide variety of sources including: Auckland District Health Board \$446,830, as a subcontractor on a National Institute of Health USA grant \$255,760, Faculty Research Development Fund \$147,207 Auckland Medical Research foundation \$126,521. A member of NZ-NEC is also an associate Investigator on a Health Research Council Programme grant \$4,835.194.

2. Bi-monthly NZ-NEC seminar series.

We continue to hold bi-monthly seminars as they have proved invaluable in not only disseminating current research findings and issues but also have been an avenue for generating collaboration amongst researchers who otherwise would not have had contact, due to disparate working locations/situations. The seminars have been invaluable for members of NZ-NEC and affiliates in increasing collaborative research within the UoA.

The seminars provide an opportunity, predominantly for young researchers, to present their current work, discuss potential future research and receive feedback from established vision researchers. The sessions are well attended by researchers, technical and clinical staff. Several high profile international guest lecturers have presented at NZ-NEC seminars and this has not only enabled dissemination of international vision research but also raised the profile of NZ-NEC internationally.

International Guest Lecturers:

- 1) Professor Adrian Palacios, Director of Postgraduate Neuroscience Programme, and Professor Agustin Martinex, Principle Investigator of the Connexin Group from University of Valparaiso, Chile
- 2) Associate Professor Qingjun Lu, Beijing Tong Ren Eye Centre, Capital Medical University of China
- 3) Professor Nathan Efron, Institute of Health and Biomedical Innovation in the School of Optometry and Vision Science, Queensland University, Australia

3. Collaborative Research

NZ-NEC members currently undertake collaborative research with more than 10 National and 30 International Research Centres and continue to develop further collaborations, some of the new collaborations established in 2012 are:

- 1) The Stem Cell group in the Department of Ophthalmology which has expanded its area of interest beyond adult stem cells and are now eyeing up 'induced pluripotent stem cells' or iPS cells as novel treatments. This iPS cell technology is being developed in collaboration with a research group from the Department of Molecular Medicine who have established the technology in Auckland since returning from Harvard. Initially this stem cell collaboration will target corneal dystrophies but will be easily translatable into therapies for other eye disorders should the initial attempts prove successful.
- 2) The Ocular Surface Laboratory obtained funding in 2012 to commence a project in collaboration with industry to develop a topical Manuka honey-based preparation for the management of eyelid disease. A multidisciplinary approach to this project has been adopted, with input from the disciplines of ophthalmology, optometry, pharmacy and microbiology. Industry has provided funding of \$134,798.00 for a one year period with potential further funding dependent on results.
- 3) The Visual Neuroscience Laboratory, Department of Optometry and Vision Science, have established new interdisciplinary collaborations with the Liggins Institute, the Auckland Bio-Engineering Institute and the School of Psychology relating to studies of visual development in infants born pre-term, and the effect of amblyopia on face perception.
- 4)
- 5) Dr Acosta from the Cell and Molecular Biology of the Retina Laboratory, Department of Optometry and Vision Science, was invited by the National Committee for Investigative and Technological investigation in Chile (CONICYT) to conduct research at the Interdisciplinary Centre of Neurosciences at the University of Valparaiso. As a result of this visit a new line of research has been developed in the lab that explores the neurodegenerative process that occurs in animal models of brain pathological conditions.

Several new philanthropic donations have come to fruition in 2012:

- 1) The Department of Ophthalmology and the Fred Hollows Foundation NZ have embarked on a programme of research and teaching in the Pacific. The Fred Hollows Foundation NZ have funded a project for three years with a contribution of \$50,000 pa towards the salary for a research fellow and up to \$25,000 p.a for other expenses related to the project.
- 2) The Department of Ophthalmology and the Blind and Low Education Vision Network NZ (BLENNZ) to support a paediatric research fellow to undertake a study to develop a detailed and comprehensive database of all aspects of ocular health of all children currently registered with BLENNZ. The grant is for \$70,000.
- 3) The Freemason Roskill Foundation has sponsored a PhD project in the Department of Ophthalmology for the next three years. The grant covers a PhD stipend and domestic fees and is for a total of \$100,000.
- 4) The Buchanan Research Fund have pledged \$2,400,000 to establish an Ocular Therapeutics Unit in the Department of Ophthalmology. The initial donation for \$1,200,000 will be provided early in 2013. The remaining \$1,200,000 will be provided in 2016. Professor Charles McGhee was instrumental in bringing this generous donation into the School of Medicine Foundation.
- 5) The Tom Cat Trust has pledged \$500,000 to the Department of Ophthalmology to support the appointment of post-Doctoral fellows over the next three years beginning in 2013. Professor Charles McGhee was instrumental in bringing this generous donation into the School of Medicine Foundation.

4. Achieving self sustainability

This continues to be a major goal for NZ-NEC over the next 3-5 years and two major areas that we will target are philanthropy and accessing some overhead components from external grants.

5. Application of Research into Clinical Practice

Laboratory research has been translated into clinical practice:

- a) The company the Professor Green cofounded, CoDa Therapeutics, Inc (USA), completed its Series B funding round in 2012. The company has now raised the equivalent \$NZ90M for translation of Dr Green's work into clinical trials. It has completed a successful Phase 2B venous leg ulcer trial using *Nexagon*® and has started a Phase 2 diabetic ulcer trial. *Nexagon*® is a drug that is the result of many years research into Connexins and their role in wound healing by Professor Colin Green (Department of Ophthalmology, UoA) and colleagues (University College, London).

6. Summer Students

The Department of Ophthalmology had 7 summer studentships student sponsored by UoA as well as four externally funded summer studentships in 2012 from, Tom Cat Trust, Eye Institute, Glaucoma NZ and New Zealand Association of Optometrists.

7. Public Health Policy

- a) Several members continue to be involved in the Ministry of Health Workforce Planning Group (HWFPG) for the delivery of eye services in 2020. The HWFPG is still investigating running a pilot project in collaboration with ADHB and the UoA Departments of Ophthalmology and Optometry and Vision Science (NZ-NEC) to shift selected eye services into the community.
- b) Professor Charles McGhee is a member of the Australia and NZ Ophthalmic Surveillance Unit – Phase 1 application for determining the incidence of total limbal stem cell deficiency (LSCD) in Australia and New Zealand

8. Awards/highlights

General

- Professor Colin Green was the recipient of the International Central Networks Fund (ICNF) to forge collaboration opportunities with Shanghai Jiao Tong University in drug delivery to the eye, wound healing and biodegradable implants.
- The department of Ophthalmology hosted its inaugural "Excellence in Ophthalmology and Vision Research Prize Evening" in March 2012. The event was well attended by staff, students, University faculty members and benefactors.
- Professor Paul Donaldson was appointed as Head of the School of Medical Sciences. Prior to this appointment Professor Donaldson was Head of Department of Physiology and then Head of Department of Optometry and Vision Science at the University of Auckland.
- Professor Charles McGhee was a member of the Department Staff Advisory Committee for academic promotions at the University of Auckland.
- Professor Charles McGhee is a member of the Australia and NZ Ophthalmic Surveillance Unit – Phase 1 application for determining the incidence of total limbal stem cell deficiency (LSCD) in Australia and New Zealand
- Professor Colin Green was awarded the Arthritis New Zealand National Distinguished Award by the Governor General of New Zealand, Lt Gen The Rt Hon Sir Jerry Mateparae. The award was made for Professor Green's outstanding contribution in the work of Arthritis New Zealand Research Grants Committee.
- Dr Ilva Rupenthal, Lecturer in Ophthalmology won one of the five UniServices Prizes in the SPARK Ideas Entrepreneurship Challenge. Ilva's idea was to develop an injectable implant for delivering anti-VEGF type drugs for age related macular degeneration. Dr Rupenthal's team won against 258 entries. This is the seventh time in the last 8 years in which our teams have won awards in the SPARK Challenge.
- Ehsan Vaghefi received a commemorative medallion for the best presentation at the Engineering and Physical Sciences in Medicine Conference in Gold Coast, Australia.
- The 29th Australia and New Zealand Cornea Society Meeting was hosted in Auckland in March 2012. The meeting was attended by over a 100 delegates from across Australasia and keynote speaker from the United States, Dr Mark Terry.
- CoDa Therapeutics, of which Professor Colin Green is a co-founder, raised an additional NZ\$24.5M from a Russian investment firm. This brings the company's total fund raising to \$49M in 2012.
- Professor Colin Green was the co-investigator in the only new program awarded to the University of Auckland by the Health Research Foundation in 2012. The five year program was titled "Pathogenesis, detection and treatment of perinatal brain injury". The principle investigator is Alistair Jan Gunn Head, Dept of Physiology.
- Associate Professor Qingjun Lu from Beijing Tong Ren Eye Centre, Capital Medical University of China visited the ophthalmology department for a period of two weeks in May 2012 as part of New Zealand-China Scientist Exchange Programme. His visit was sponsored by Royal Society of New Zealand
- Professor Colin Green presented the prestigious Ida Mann lecture at the Australia and New Zealand Royal College of Ophthalmologists annual conference in Melbourne.

Students

- Stuti Misra, PhD student in Ophthalmology was awarded the prize for 'best presenter' at the School of Medicine Doctoral Research Showcase in November 2012.
- Cameron Fraser, ...student supervised by Professor Colin Green and Associate Professor Trevor Sherwin, and Stuti Misra, PhD student supervised by Dr Jennifer Craig, and reached the finals of EXPOSURE 2012. EXPOSURE is organised by the School of Graduate Studies and provides opportunity for postgraduate students to showcase their work to a wider audience within the University and to gain public recognition. Stuti finished in the top 20 places of the poster section. Cameron finished in the top 8 places in the oral presentation section.
- Stuti Misra, PhD student won the best oral presentation award at the 36th annual scientific meeting of the New Zealand Society for the Study of Diabetes held in May 2012.
- Ankita Umopathy, PhD student in the Department of Optometry and Vision Science won the 2nd prize in the oral Biomedical category at the HealthX competition held at the University of Auckland.
- The Ocular Pharmaceuticals Group hosted Anneloes Stikkelman, a Masters student from Radboud University Nijmegen, The Netherlands.

Co-operative commercial activities, research with other University or Government laboratory research groups

- a) Patent for wound healing treatment was granted (US2008024631A1)
- b) Professor Green, with Professor's Helen Danesh-Meyer and Louise Nicholson took out a new patent through Auckland UniServices Ltd for a treatment of cancer which is attracting considerable interest.
- c) New work on cell reprogramming by Professor Colin Green, Associate Professor Trevor Sherwin and Carol Greene (PhD student) has opened new intellectual property potential for the treatment of diseases such as myopia and keratoconus. The team won The University of Auckland 2013 Chiasma biotechnology entrepreneurship award, the 6th time Ophthalmology has taken out this award.

Educational Activities

Post-graduate courses specific to vision science have been developed and approved and are now in the Master of Health Science, Master of Medicine and Master of Nursing programmes within the UoA. In 2012 10 students successfully completed the ophthalmic technology post graduate course.

Financial Report

NZ-NEC does not have its own cost centre. It was established in 2008 and currently our income would not sustain a 'stand alone' cost centre. However, we continue to seek a portion of external research grant overheads and explore philanthropic avenues for future sustainability.

Publications

Book Chapters:

1. Davidson JO, Green CR, Nicholson LFB, Bennet L, Drury PP, Gunn AJ. The role of gap junctions and connexin hemichannels in brain injury, *Brain injuries: New research*, Nova publishers, in Press.
2. O'Carroll SJ, Becker DL, Davidson JO, Gunn AJ, Nicholson LFB, Green CR. The use of Connexin-Based Therapeutic Approaches To Target Inflammatory Diseases. In: *Methods in Molecular Biology: Wound Healing and Regeneration*. In Press.
3. Becker DL, Cook JE, Cormie P, Green CR, Mendoza-Naranjo A, Phillips ARJ, Serrano AE, Thraivoulou C. Enhancing epithelial tissue repair and reducing inflammation by targeting connexins. In: *Connexin Cell Communication Channels: Roles on the immune system and Pathology*. Eds: E. Oviedo-Orta, W.H. Evans and B. Kwak. Taylor and Francis Group. In Press.
4. Zhang J, O'Carroll SJ, Danesh-Meyer H, Van der Heyde HC, Becker DL, Nicholson LFB, Green CR. Connexin-based therapeutic approaches to inflammation in the central nervous system. In: *Connexin Cell, Communication Channels: Roles on the immune system and Pathology*. Eds: E. Oviedo-Orta, W.H. Evans and B. Kwak. Taylor and Francis Group. In Press.
5. Hess, RF, Thompson, B. Visual Plasticity of the Adult Brain. In, *Plasticity in Sensory Systems*, Eds. M. Jenkin, J. K. E. Steeves and L. R. Harris. Cambridge University Press, Cambridge, UK. In Press.
6. Aaen-Stockdale, CA, Thompson, B.. Visual Motion: From Cortex to Percept. In, *Visual Cortex*, Ed. S. Molotchnikoff. InTech Publishing, Rijeka, Croatia.

7. McGhee, C. N., Crawford, A. Z., & Patel, D. V. Chemical and thermal injuries to the ocular surface. Holland, Mannis, & Lee (Eds.), *Ocular Surface Disease: Cornea, Conjunctiva and Tear Film*. London. Elsevier.
8. Vincent AL, Russell H. Chapter. Ocular Findings in Inflicted Injury in Roger W Byard, Kim A Collins [Editors in Chief] *Handbook of Pediatric Forensic Pathology*. In Press.
9. Nelidova D, Sherwin T. Keratoconus layer by layer – pathology and matrix metalloproteinases. S. Rumelt (Ed). *Advances in Ophthalmology*. InTech.

Peer reviewed Publications:

1. Misra S, Craig JP, McGhee CNJ, Patel DV. Inter-ocular comparison by in vivo confocal microscopy of the two-dimensional architecture of the normal human corneal sub-basal nerve plexus. *Cornea*. 2012 Dec; 31(12): 1376-80.
2. Wan CK, Shaikh SB, Green CR, Nicholson LFB. Comparison of bidirectional and bicistronic inducible systems for co-expression of connexin genes and fluorescent reporters *Analytical Biochemistry*. *Analytical Biochemistry*. 2012; 431: 90-95.
3. Guan J, Pavlovic D, Dalkie N, Waldvogel H, O'Carroll SJ, Green CR, Nicholson LFB. Vascular degeneration in Parkinson's Disease. *Brain Pathology*. 2012 Aug 16. doi: 10.1111/j.1750-3639.2012.00628.x. [Epub ahead of print]
4. Davidson JO, Green CR, Bennet L, Nicholson LFB, Danesh-Meyer H, O'Carroll SJ, Gunn AJ. Connexin hemichannel roles in spreading ischemic brain injury. *Current Drug Targets*. Review Article. *Curr Drug Targets*. 2012 Nov 19. [Epub ahead of print]
5. Davidson SJ, Green CR, Nicholson LFB, Bennet L, Gunn AJ. Deleterious Effects of High Dose Connexin 43 Mimetic Peptide Infusion After Cerebral Ischaemia in Near-term Fetal Sheep. *International Journal of Molecular Sciences*. 2012; 13: 6303-6319.
6. Ormonde S, Chou C, Goold L, Petsoglou C, Al-Taie R, Sherwin T, McGhee CNJ, Green CR. Regulation of connexin43 gap junction protein triggers vascular recovery and healing in human ocular persistent epithelial defect wounds. *Journal of Membrane Biology*. 2012; 245: 381-388.
7. Rupenthal ID, Green CR, Alany RG. Evaluation of Fluorescence Resonance Energy Transfer Approaches as a Tool to Quantify the Stability of Antisense Oligodeoxynucleotides. *Current Pharmaceutical Analysis*. In Press 2012.
8. Deva NC, Zhang J, Green CR, Danesh-Meyer H. Connexin43 Modulation Inhibits Scarring in a Rabbit Trabeculectomy Model. *Inflammation*. 2012; 35: 1276-1286.
9. Kerr NM, Johnson CS, Zhang J, Eady EK, Green CR, Danesh-Meyer H. High pressure-induced retinal ischemia reperfusion causes upregulation of gap junction protein connexin43 prior to retinal ganglion cell loss. *Experimental Neurology*. 2012; 234: 144-152.
10. Grupcheva CN, Laux WT, Rupenthal ID, McGhee J, McGhee CNJ, Green CR. Improved corneal wound healing through modulation of gap junction communication using Connexin43-specific antisense oligodeoxynucleotides. *Investigative Ophthalmology and Visual Science*. 2012; 53: 1130-1138.
11. Danesh-Meyer HV, Kerr NM, Zhang J, Eady EK, O'Carroll SJ, Nicholson LFB, Johnson CS, Green CR. Connexin43 mimetic peptide reduces vascular leak and retinal ganglion cell death following retinal ischaemia. *Brain*. 2012; 135: 506-520.

12. Davidson JO, Green CR, Nicholson LFB, O'Carroll SJ, Fraser M, Bennet L, Gunn AJ. Blocking gap junction hemichannels improves recovery of brain activity after ischemia in the near-term fetal sheep. *Annals of Neurology*. 2012; 71: 121-132.
13. Wu A, Green CR, Rupenthal ID, Moalem-Taylor G. [Role of gap junctions in chronic pain](#). *Journal of Neuroscience Research*. 2012; 90: 337-345.
14. Jacobs S, Bunt CR, Wu Z, Lehr CM, Rupenthal ID. Characterization and evaluation of β -glucan formulations as injectable implants for protein and peptide delivery, *Drug Development and Industrial Pharmacy*. 2012; 38(11), 1337-1343.
15. Thrimawithana TR, Rupenthal ID, Young SA, Alany RG. Environment sensitive polymers for ophthalmic drug delivery. *Journal of Drug Delivery Science and Technology*. 2012; 22(2), 117-124.
16. Pine, K. R., Sloan, B., & Jacobs, R. J.. Deposit buildup on prosthetic eyes and implications for conjunctival inflammation and mucoid discharge. *Clin Ophthalmol*. 2012; 6, 1755-1762. doi:10.2147/OPHTH.S37250
17. Pine, K. R., Jacobs, R. J., & Sloan, B. Biosocial profile of New Zealand prosthetic eye wearers. *New Zealand Medical Journal*. 2012; 125 (1363), 29-38.
18. Zhang, S., Moyes, S., Mclean, C., Kerse, N., Searchfield, G., Welch, D., & Jacobs, R. Self-reported hearing, vision and quality of life: Older people in New Zealand. *Australasian Journal on Ageing*. 2012; doi:10.1111/j.1741-6612.2012.00627.
19. Pine, K. R., Sloan, B., & Jacobs, R. J. The development of measurement tools for prosthetic eye research. *Clin Exp Optom*. 2012; doi:10.1111/j.1444-0938.2012.00754.
20. Pine, K., Sloan, B., & Stewart, J., Jacobs, R. J. A survey of prosthetic eye wearers to investigate mucoid discharge. *Ophthalmic Research: journal for research in experimental and clinical ophthalmology*. 2012; 6, 707-713. doi:10.2147/OPHTH.S31126
21. Leung, M., Kang, S. S., Turuwhenua, J., & Jacobs, R. Effects of illumination and observation angle on the van Herick procedure. *Clin Exp Optom*. 2012; 95 (1), 72-77. doi:10.1111/j.1444-0938.2011.00646.
22. Thompson B. The changing face of amblyopia. *The Canadian Journal of Ophthalmology*. 2012; 47(5), 391-393.
23. Li J, **Thompson B**, Ding Z, Chan LYL, Chen X, Yu M, Deng D, Hess R.F. Does Partial Occlusion Promote Normal Binocular Function? *Investigative Ophthalmology and Visual Science*. 2012; 53(11), 6818-6827.
24. Villeneuve M, Thompson B, Hess RF, Casanova C. Pattern-Motion Selective Responses in MT, MST and the Pulvinar of Humans. *European Journal of Neuroscience*. 2012; 36(6), 2849-58.
25. Spiegel D, Hansen BC, Byblow W, Thompson B. Anodal Transcranial Direct Current Stimulation Reduces Psychophysically Measured Surround Suppression in the Human Visual Cortex. *PLOS One*. 2012; 7(5): e36220.
26. Thompson B, Villeneuve M, Casanova C, Hess, R.F. Abnormal cortical processing of pattern motion in amblyopia: Evidence from fMRI. *Neuroimage*. 2012; 60(2), 1307-1315.
27. Thompson B, Mansouri B, Koski L, Hess, R.F. From motor cortex to visual cortex: the application of non-invasive brain stimulation to amblyopia. *Developmental Psychobiology*. 2012; 54(3), 263-273.

28. Black JM, Hess RF, Cooperstock J, To L, Thompson B. The measurement and treatment of suppression in amblyopia. *Journal of Visualized Experiments*, 2012; 70, e3927, doi:10.3791/3927.
29. Hess RF, Thompson B, Black JM, Maehara G, Zhang P, Bobier WR, To L, Cooperstock J. An iPod treatment for Amblyopia: an Updated Binocular Approach. *Optometry*. 2012; 83(2), 87-94.
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31. Kalloniatis M, Loh C, Acosta M L, Tomisich G, Zhu Y, Livison-Smith L, Fletcher E, Chua J, Sun D, Arunthavasothy N. Retinal amino acid neurochemistry in health and disease. *Clin Exp Optom- in Press* 2012.
32. De Souza C F, Kalloniatis M, Christie D L, Polkinghorne PJ, McGhee, CN, Acosta ML. Creatine transporter immunolocalization in aged human and detached retinas. *Invest Ophthalmol Vis Sci*. 2012; 53 (4), 1936-1945.
33. De Souza CF, Kalloniatis M, Polkinghorne PJ, McGhee CN, Acosta ML. Functional and anatomical remodeling in human retinal detachment. *Exp Eye Res*. 2012; 97 (1), 73-89. doi:10.1016/j.exer.2012.02.009
34. Patel DV, McGhee CN. Understanding keratoconus: what have we learned from the New Zealand perspective? *Clin Exp Optom*. 2012 Dec 25. Doi: 10/1111/cxo.12006. Epub ahead of print.
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38. Ho H, McGhee CN, Hunter P. Numerical analysis for the blood flow in a patient-specific ophthalmic artery. *Med Eng Phys*. 2012 Jan; 34(1):123-7.
39. Ardiles A, Ewer J, Acosta M L, Kirkwood A, Martinez A, Ebensperger LA, Palacios AG. Octodon degus (Molina 1782): A Model in Comparative Biology and Biomedicine. Review in *Cold Spring Harbor Protocols*. In Press 2012.
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41. Li B, Umapathy A, Tran LU, Donaldson PJ, Lim JC. Molecular identification and localization of GSH synthesis, uptake, efflux and degradation pathways in the rat ciliary body. *Histochemistry and Cell Biology*. In Press 2012.

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43. Gunning SJ, Chung KKH, Donaldson PJ, Webb KF. Identification of a non-selective cation channel in isolated lens fiber cells that is activated by cell shrinkage. *American Journal of Physiology - Cell Physiology* <http://ajpcell.physiology.org/content/early/2012/10/05/ajpcell.00237.2012>.
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47. Stewart S, McGhee CN, Patel DV. In vivo confocal microscopy of the cornea in Morquio syndrome. *EYE* 2012 Oct; 26(10):1394-5.
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49. Misra S, Craig JP, McGhee CN, Patel DV. Interocular comparison of the two dimensional configuration of the normal sub-basal nerve plexus. *Cornea* 2012; 31(12):1376-80.
50. CY Chou, Jordan CA, McGhee CNJ, Patel DV. Comparison of intraocular pressure measurement using four different instruments following penetrating keratoplasty *American Journal of Ophthalmology* 2012; 153(3):412-8.
51. Altaie R, Ring CP, Moraji J, Patel DV, McGhee CN. A Prospective Analysis of Visual Outcomes Using Apodized, Diffractive Multifocal Intraocular lenses Following Phacoemulsification for Cataract or Clear Lens Extraction. *Clinical and Experimental Ophthalmology* 2012; 40(2):148-54.
52. Harkin DG, Apel AJ, Di Girolamo N, Watson S, Brown K, Daniell MD, McGhee JJ, McGhee CN. Current status and future prospects for cultured limbal tissue transplants in Australia and New Zealand. *Clinical and Experimental Ophthalmology*. 2012 [Epub ahead of print].
53. Crawford AZ, McGhee CN. Management of limbal stem cell deficiency in severe ocular chemical burns. *Clinical and Experimental Ophthalmology*. 2012 Apr;40(3):227-9.
54. Cunningham WJ, Moffatt SL, Brookes NH, Twohill HC, Pendergrast DG, Stewart JM, McGhee CN. [The New Zealand National Eye Bank study: trends in the acquisition and storage of corneal tissue over the decade 2000 to 2009](#). *Cornea*. 2012 May;31(5):538-45.
55. Cunningham WJ, Brookes NH, Twohill HC, Moffatt SL, Pendergrast DG, Stewart JM, McGhee CN. Trends in the distribution of donor corneal tissue and indications for corneal transplantation: the New Zealand National Eye Bank Study 2000-2009. *Clinical and Experimental Ophthalmology*. 2012 Mar;40(2):141-7.
56. Park SJ, Brookes NH, Niederer RL, McGhee CN, Sherwin T. Early-onset Fuchs endothelial dystrophy with a novel pathological phenotype. *Clinical and Experimental Ophthalmology*. 2012 Apr;40(3):320-2.

57. Sheck L H, Wilson C J, Vincent A L. Analysis of the pre-retinal opacities in Gaucher Disease using spectral domain optical coherent tomography. *Ophthalmic Genet.* 2012; 33 (4), 253-256.
58. Lee S, Sheck L, Crowston J G, Van Bergen N J, O'Neill E.C, O'Hare, F., ... Trounce, I. A. (2012). Impaired complex-I-linked respiration and ATP synthesis in primary open-angle glaucoma patient lymphoblasts. *Invest Ophthalmol Vis Sci.* 2012; 53 (4), 2431-2437.
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60. Danesh-Meyer HV. Temporal artery biopsy: skip it at your patient's peril. *American Journal of Ophthalmology.* 2012 Oct; 154(4):617-619.
61. Papchenko T, Grainger BT, Savino PJ, Gamble GD, Danesh-Meyer HV. Macular thickness predictive of visual field sensitivity in ischaemic optic neuropathy. *Acta Ophthalmol.* 2012 Sep; 90(6).
62. Gauden AJ, Hardy T, Mack HG, Danesh-Meyer HV, Kaye AH. Orbital compartment syndrome following aneurysm surgery. *J Clin Neurosci.* 2012 Jul; 19(7):1032-6.
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Appendix 1

Department of Ophthalmology	Department of Optometry and Vision Science
Academic Staff Professor Charles McGhee (HOD) Professor Colin Green Professor Helen Danesh-Meyer Associate Professor Trevor Sherwin Associate Professor Dipika Patel Dr Susan Ormonde (Senior Lecturer) Dr Andrea Vincent (Senior Lecturer) Dr Jennifer Craig (Senior Lecturer)	Academic staff Professor Paul Donaldson (HOD) Associate Professor Robert Jacobs Dr Geraint Phillips (Senior Lecturer/Clinic Director) Dr John Phillips (Senior Lecturer) Dr Misha Vorobyev (Senior Lecturer) Dr Benjamin Thompson (Senior Lecturer) Dr Monica Acosta (Lecturer) Dr Nicola Anstice (Lecturer) Mr Andrew Collins (Senior Tutor/tutor)
Clinical Research Fellows Dr Kathleeya Stang-Veldhouse (Oculoplastics) Dr Shanu Subbiah (Cornea) Dr Shane Durkin (Surgical Retina) Dr Heather Russell (Paediatrics) Dr Sacha Moore (Medical Retina)	Professional Teaching Fellows Wanda lam Bhavini Solanki Jorge Perez Velasco Tom Cossik Kate Vanweerd Melissa The Richard Johnson Melinda Calderwood Ken Robertson
Research Fellows Dr Yi Wei Goh Dr Alexandra Crawford	Clinic Tutor Lisa Silver Katherine Sands
Post Doctoral Research Fellows Dr Ilva Rupenthal Dr Jie Zhang Dr Alice Domenichini	Lecturer Dr Jason Turuwhenua
PhD Candidates Dr James McKelvie Stuti Misra Charlotte Jordan Dr Taras Papchenko Professor Helen Danesh-Meyer Dr Clairton de Souza Carol Green Hannah Kirsten Isabella Cheung Elissa McDonald Carthur Wan (Anatomy with Radiology) John Wright (University of Queensland) Amelia van Slooten (Anatomy with Radiology)	Post Doctoral Research Fellows Dr Eshan Vaghefi (Molecular Vision Laboratory) Dr Julie Lim (Molecular Vision Laboratory) Dr Simon Gunning (Molecular Vision Laboratory) Dr Gus Grey (Molecular Vision Laboratory) Dr Jo Black (Visual Neuroscience Laboratory) Dr Simon Backhouse (Myopia Laboratory)
MD Candidates Dr Catherine Wheeldon Dr Andrea Vincent Dr Jennifer Fan Dr Nathan Kerr Dr Shenton Chew Dr Bruce Hadden Dr Leo Scheck	PhD Candidates Irene Vorontsova Keith Pine Nancy Liu Phil Turnbull Cindy Guo Dan Spiegel Alice Laggs Martin Loertscher Sandy Yu Victor Borges Anika Umaphathy Daniel Baker Richard Wilde
Research and Technical Staff Jane McGhee – senior research technician Judy Loh – Research technician Amanda Richards – research technician Salim Ismail – research technician Bryan Hay – research technician Adminstration	MSc Candidates Javierr Elisan Miriam Langeslag-Smith Tony Han

<p>Hutokshi Chinoy – PA to HoD and Administrative Manager of NZ-NEC Maree McInnerney – Departmental secretary</p> <p>Research and Development Manager Susanne Raynel – NZ-NEC Manager</p> <p>Visiting Lecturers/ Honorary Academic Clinical A/Professor Philip Polkinghorne Clinical A/Professor Hadden, Osmond Bruce Clinical A/Professor Gerrard Sutton (UNSW, Australia) Professor Paul McMenamin (Monash University, Melbourne, Australia) Professor Janet Marsden (Manchester Metropolitan University, UK) Dr Grupcheva, Hristina Nikolova Dr Koppens, Joanna Marie Dr Ahmad, Nadeem Dr Pendergrast, David Dr Gordon Coldstream Dr Sharp, Dianne Margaret Dr Gray, Trevor Buchanan Dr Niederer, Rachael Louise Dr Dai, Shuan H Dr Ring, Charles Peter Dr Ku, Yu-Fen Judy Dr Barnes, Rachel Mary Dr Bennett, Sonya Louise Dr Chen, Simon Derk Meng Dr McAllum, Penelope Jane Dr Sims, Joanne Lesley Dr Riley, Andrew Francis Cameron Dr Mora, Justin Stewart Dr Welch, Sarah Helen Dr Meyer, Derrell Graham Dr Malik, Tahira Yasmin Dr Hart, Richard Hamilton Dr Dean, Simon John Dr Murdoch, David Dr Abdul-Rahman, Anmar Mahood Dr Donaldson, Mark Liston Dr Best, Stephen James Dr Hadden, Peter William</p>	<p>Technicians Mia Trong - research Ivy Li – research Kerry Walker- research Shannon Leahy – Teaching laboratories Kerry King – IT systems</p> <p>Administration Janine Perkinson – Departmental Manager Grace Yeoh – Finance Vivina Momoka – PA to HoD Julie Bishop – Postgraduate Administrator Olive Palmiano - Scheduling</p> <p>Visiting Lecturers/ Honorary Academic Grant Watters Richard Johnson Melinda Calderwood Associate Professor Ken Robertson (Waterloo, Canada) Professor Michael Kalloniatis (UNSW, Australia)</p> <p>Collaborative Partners/Affiliated Members</p> <p>School of Pharmacy Dr Raid Alany</p> <p>New Zealand National Eye Bank Louise Moffatt Helen Twohill Nigel Brookes</p> <p>Clinical and Experimental Ophthalmology (RANZCO Journal) Victoria Cartwright</p> <p>Glaucoma New Zealand Helen Mawn Ginny Harwood Karen Farmer</p> <p>Department of Anatomy with Radiology Professor Louise Nicolson Dr Simon O’Carrol (post doctoral research fellow)</p> <p>Bio-engineering Dr Jason Tarawhenua</p>
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