Name of Unit, Centre or Institute:

The New Zealand National Eye Centre

Name of Director/s:

Professor Charles McGhee

Attach:  
Annual Report for 2012  
Financial Statement - N/A

Signed by:  
Director ..........................  Date ......  

Professor Charles McGhee

Dean ..........................  Date ..........................  

Send to:  
Funding Processes Manager  
Research Office
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 Martinez, 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) 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 (HWFG) for the delivery of eye services in 2020. The HWFG 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 Umapathy, 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 Pharmaceutics 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:


Peer reviewed Publications:


### Department of Ophthalmology

**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 Jennifer Craig (Senior Lecturer)

**Clinical Research Fellows**
- Dr Kathleeya Stang-Veldhouse (Oculoplastics)
- Dr Shanu Subbiah (Cornea)
- Dr Heather Durkin (Surgical Retina)
- Dr Heather Russell (Paediatrics)
- Dr Sacha Moore (Medical Retina)

**Research Fellows**
- Dr Yi Wei Goh
- Dr Alexandra Crawford

**Post Doctoral Research Fellows**
- Dr Ilva Rupenthal
- Dr Jie Zhang
- Dr Alice Domenichini

**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)

**MD Candidates**
- Dr Catherine Wheeldon
- Dr Andrea Vincent
- Dr Jennifer Fan
- Dr Nathan Kerr
- Dr Shenton Chew
- Dr Bruce Hadden
- Dr Leo Scheck

**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

### Department of Optometry and Vision Science

**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 Anstic (Lecturer)
- Mr Andrew Collins (Senior Tutor/tutor)

**Professional Teaching Fellows**
- Wanda lam
- Bhavini Solanki
- Jorge Perez Velasco
- Tom Cossik
- Kate Vanweerd
- Melissa The
- Richard Johnson
- Melinda Calderwood
- Ken Robertson

**Clinic Tutor**
- Lisa Silver
- Katherine Sands

**Lecturer**
- Dr Jason Turuwhenua

**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)

**PhD Candidates**
- Irene Vorontsova
- Keith Pine
- Nancy Liu
- Phil Turnbull
- Cindy Guo
- Dan Spiegel
- Alice Laggs
- Martin Loertscher
- Sandy Yu
- Victor Borges
- Anika Umapathy
- Daniel Baker
- Richard Wilde

**MSc Candidates**
- Javierr Elisan
- Miriam Langeslag-Smith
- Tony Han
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<th>Role</th>
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<td>Hutokshi Chinoy – PA to HoD and Administrative Manager of NZ-NEC</td>
<td>Maree McInerney – Departmental secretary</td>
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<td>Research and Development Manager</td>
<td>Susanne Raynel – NZ-NEC Manager</td>
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<td>Clinical A/Professor Philip Polkinghorne</td>
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14