ANNUAL REPORT COVER SHEET

The New Zealand National Eye Centre

UNITS, CENTRES & INSTITUTES

Name of Unit, Centre or Institute:

The New Zealand National Eye Centre

Name of Director/s:

Professor Charles McGhee

Attach: Annual Report for 2013
        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 2013

Director:
Professor Charles McGhee
Department of Ophthalmology

Deputy Director:
Professor Paul Donaldson
Department of Optometry and Vision Science

Advisory Board Members:
Professor Charles McGhee – Chair
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
Professor John Fraser (or nominee)

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: 3 times throughout the course of 2013.

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 2013 members of the NZ-NEC received in excess of $9 million in competitive research grants and philanthropic awards.

   In 2013 members of NZ-NEC received more than $5.2 million in collaborative grants. Members were successful in getting competitive grants from a wide variety of sources including: Health Research Council almost $2,700,000 (this includes three $500,000 grants for emerging researchers), Marsden Fund $826,087, Faculty Research Development Fund $138,969, the Save Sight Society $75,000, NIH $65,926.

   The department of Ophthalmology also received $2,400,000 from the Buchanan Trust one of the largest individual donations received by the School of Medicine.

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 in 2013:
   1. Dr Stuart Cook – Consultant Ophthalmologist, Bristol Eye Hospital
   2. Dr Patricia McGettrick – Consultant Ophthalmologist in charge of simulator training Irish College of Ophthalmologists
   3. Professor Gordon Dutton – Emeritus Professor of Vision Science, Glasgow Caledonian University

   These seminars have been well attended by a wide range of medical and allied health personnel and has not only enabled dissemination of international vision research but also raised the profile of NZ-NEC internationally.
3. Collaborative Research
NZ-NEC members currently undertake collaborative research with more than 10 National and 35 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. A Marsden application to further this research was unsuccessful but Associate Professor Trevor Sherwin has been awarded a $28,000 research grant to explore further ‘A new vision for the future: pluripotent stem cell therapy for corneal disease’ with a view to re-submitting for Marsden funding in 2014.

2. Following successful research outcomes in 2012 The Ocular Surface Laboratory has obtained additional funding to continue their, 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 additional funding of $27,154.

3. Visual Neuroscience Laboratory, Department of Optometry and Vision Science, have established “A randomized clinical trial of a new binocular treatment for amblyopia” with a paediatric ophthalmology service at Green Lane Clinical Centre, Auckland District Health Board.

4. Dr Acosta from the Cell and Molecular Biology of the Retina Laboratory, Department of Optometry and Vision Science, continues investigating the biochemical and molecular aspects of the pathology of macular degeneration and other retina pathologies. Following from the successful collaboration established with the Interdisciplinary Centre of Neurosciences at the University of Valparaiso, Chile the investigations have expanded to include research into transgene and sporadic animal models of Alzheimer’s disease (AD) for the presence of biomarkers of the pathology in the eye. The study is currently exploring de Octodon degus and transgenic models in collaboration with researchers at the University of Otago and members of the CMBR at the University of Auckland. Funds are currently sought to further research into the neurodegenerative process that occurs in the eye in brain pathological conditions.

5. The Connexin Biology group have established new international collaborations with the University of Valparaiso Chile, Shanghai Jiao Tong University China, Harvard Medical School, University of Medicine and Density New Jersey and the University of Bonn Germany. This in addition to existing international links in China, Australia, Wales, Belgium, Canada, USA and France.

4. Philanthropic donation update:
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 Buchanan Charitable Trust has pledged $2,400,000 to establish an Ocular Therapeutics Unit in the Department of Ophthalmology – this is one of the largest single, individual donations that the School of Medicine has received. The initial donation for $1,200,000 was received in 2013. The remaining $1,200,000 will be provided in 2016. This donation was celebrated at a function attended by the donors (Drs Caroline and Trevor Gray and members of the trust); Stuart McCutcheon, VC of UoA; John Fraser Dean of the School of Medicine and staff from the Department of Ophthalmology.

3. The Tom Cat Trust donated $500,000 to the Department of Ophthalmology, via the School of Medicine Foundation to support the appointment of post-Doctoral fellows over the next three years. Two doctoral fellows have been employed to date on this grant.
5. **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.

6. **Application of Research into Clinical Practice**  
*There were no instances where laboratory research has been translated into clinical practice*

7. **Summer Students**  
The NZ-NEC summer student symposium has been incorporated into “Excellence in Ophthalmology and Vision Research Prize Evenings”. Students were given guidelines for their 10 minute presentations and these were judged on meeting set criteria by academics external to NZ-NEC – Professor Mark Barrow and Professor Louise Nicolson.

The Department of Ophthalmology had three externally funded summer studentships in 2013.

8. **Public Health Policy**  
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 – this is on-going.

9. **Awards**

- Professor Charles McGhee was awarded The Guy H Chan Medal Lecture, International Symposium of Ophthalmology, Asia Pacific Academy of Ophthalmology, Guangzhou, China
- Carol Greene (PhD student) and her supervisors Professor Colin Green and A/P Trevor Sherwin were awarded the Chiasma prize.
- Salim Ismail, Jane McGhee and A/P Trevor Sherwin were awarded the Light Microscopy award in the BIRU imaging competition
- Dr Shuan Dai, consultant ophthalmologist and honorary senior lecturer, was presented with a community award by the New Zealand Health Foundation for Asian and Ethnic Communities
- Lily Chang (supervisor Monica Acosta) won the UoA wide Three Minute Thesis competition and will compete in the Trans Tasman finals hosted by the University of Western Sydney, and have the chance to complete by video in the inaugural 3MT competition in October
- Professor Paul Donaldson was honoured by the National Foundation of Eye Research who awarded him their Cataract Research Award.
- PhD student Ankita Umapathy was awarded first place in the Fisher & Paykel Healthcare Oral Competition for her presentation: "Characterising glutathione efflux pathways in the rat lens" at the UoA Exposure competition.

10. **Highlights**

- Launch of the Buchanan Ocular Therapeutics Unit in November 2013 and the appointment of Dr Ilva Rupenthal as the Director of the Unit.
- Ten PhD’s or MD’s graduated or were completed and one Doctor of Science (by Thesis) was submitted in 2013.
- The CatWalk Spinal Research Facility within the Centre for Brain Research has a further $300,000 of new funding pending, with a focus on taking connexin peptides towards clinical application.
- Cancer therapy patents formed the basis for a business school commercialisation project and the group is now working with Auckland UniServices Ltd to also move this towards clinical application.
- Professor Charles McGhee was the Keynote/Invited speaker at the Oman Ophthalmology Society Meeting, Oman; Invited Lecture at the State Key Laboratory of Ophthalmology (SKLO), Asia Pacific Academy of Ophthalmology, Guangzhou, China; British Society of Refractive Surgeons meeting, Belfast, Ireland; Royal Australian College of Surgeons, Auckland, New Zealand; European Society of Ophthalmology (SOE), Copenhagen, Denmark. He also gave another 22 presentations at national and international conferences during 2013.
• Professor Green gave 12 Research Seminars with four being Keynote Lectures. Also 9 were at international venues (Australia, France, Chile, USA and China) and all were invited presentations.

• Visit to the Department from the Maurice and Phyllis Paykel Trust board

• Visit to the Department from the family of Sir Lindo Ferguson – a major contributor of instrumentation to the ophthalmology museum in the Department

• Professor Danesh-Meyer was invited to speak at Harvard University

• Sachini Jayaratne (Masters Student supervisor Julie Lim) came second in the UoA wide Three Minute Thesis competition

• Ankita Umapathy was also selected by the Royal Society of New Zealand to be part of a delegation to attend the 6th HOPE meeting with Nobel Laureates in Japan in March 2014.

• Professor Charles McGhee was appointed as Member of the International Advisory Board for C-MER (Shenzhen) Dennis Lam Eye Hospital in Shenzen, China.

• Professor Charles McGhee is a visiting Professor of Ophthalmology (2013-2015) at the Sun Yat-Sen University, China

• Professor Charles McGhee was elected Vice President of Academy of Asia Pacific Professors of Ophthalmology (AAPPO)

• Professor Charles McGhee was appointed Advisor on the Health and Disability expert advisory panel (for cornea and anterior segment)

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

**Patents**


**Educational Activities**

Members of NZ-NEC participate in the MBChB, optometry undergraduate and the optometry ocular therapeutics programmes as well as vocational training for the Royal Australian and New Zealand College of Ophthalmology vocational scheme. They also provide education to ophthalmic nurses, health facilities and community organisations.

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. Insufficient enrolments meant that no courses were run in 2013.

**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:


23. Ali NQ, Patel DV, Lockington D, McGhee CN. Citation analysis of keratoconus 1900-2013: the most influential publications, authors, institutions and journals. Asia Pacific Journal of Ophthalmology (Epub ahead of print)


33. Patel DV, McGhee CN. Understanding keratoconus: what have we learned from the New Zealand perspective? Clinical and Experimental Optometry 2013;96(2):183-7


97. Vaghefi, E., Liu, N. Donaldson, P.J A computer model of lens structure and function predicts experimental changes to steady state properties and circulating currents *BioMedical Engineering OnLine* in press


### 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 Andrea Vincent (Senior Lecturer)
- Dr Jennifer Craig (Senior Lecturer)
- Dr Ilva Rupenthal (Senior Lecturer)
- Dr Hussain Patel (Senior Lecturer)
- Dr Rasha AlTaie (Senior Lecturer)

**Clinical Research Fellows**
- Dr Kathleeya Stang-Veldhouse (Oculoplastics)
- Dr Jay Meyer (Cornea)
- Dr Ramasamy Balasubramanian (Surgical Retina)
- Dr Brenda Breidenstein (Paediatrics)
- Dr Scott McClintic (Medical Retina)
- Dr Son Ho (Oculoplastics)

**Research Fellows**
- Dr Kaliopy Matheos (Optic Nerve)
- Dr Thiaga Krishnan (Maurice & Phyllis Paykel)
- Dr Riyaz Bhikoo (Fred Hollows)

**Post Doctoral Research Fellows**
- Dr Jie Zhang
- Dr Stuti Misra

**PhD Candidates**
- Professor Helen Danesh-Meyer
- Stuti Misra
- Carol Green
- Hannah Kirsten
- Elissa McDonald
- Yeri Kim
- Akilesh Gokul
- Naveed Yasim
- Isabella Cheung
- Erika Chen
- Prachi Dimish
- Amelia van Slooten (Anatomy with Radiology)

**MD Candidates**
- Dr Catherine Wheelon
- Dr Jennifer Fan
- Dr Bruce Haddon
- Dr Alexandra Crawford
- Dr Andrea Vincent
- Dr Leo Sheck

**Research and Technical Staff**
- Jane McGhee – senior research technician
- Judy Loh – research technician
- Salim Ismail – research technician
- Katherine van Bysterveldt – research technician

### Department of Optometry and Vision Science

**Academic staff**
- Associate Professor Robert Jacobs (Acting Hod)
- 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)
- Dr Jason Turuwhenua (Lecturer)
- Dr Jo Black (Lecture)
- Dr Ehsan Vaghefi (Lecture)

**Professional Teaching Fellows**
- Wanda lam
- Bhavini Solanki
- Jorge Perez-Velasco
- Thomas Cossick
- Kate Vanweerd
- Richard Johnson
- Melinda Calderwood
- Ken Robertson
- Jonathan Payne
- Lisa Silva
- Kathryn Sands
- Kerry Atkinson
- Melinda Calderwood

**PhD Candidates**
- Dr Julie Lim (Molecular Vision Laboratory)
- Dr Gus Grey (Molecular Vision Laboratory)
- Dr Simon Backhouse (Myopia Laboratory)
- Dr Keith Pine
- Dr Irene Vorontsova

**PhD Candidates – STILL CHECKING THE DETAIL**
- Phil Turnbull
- Cindy Guo
- Alice Lagas
- Martin Loertscher
- Sandy Yu
- Victor Borges
- Ankita Umaphathy
- Daniel Baker
- Richard Wilde
- Arjit Chakraboka
- Nabin Paudel
- Myra Leung
- Lisa Hamm
- Rosica Petrova
- Tanya Poppe
- Mitchell Nye-Wood

**MSc Candidates**
- Sechi Jayaratne
Adminstration
Hutokshi Chinoy – PA to HoD and Administrative Manager of NZ-NEC
Maree McInerney – Departmental secretary

Research and Development Manager
Susanne Raynel – NZ-NEC Manager

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

Collaborative Partners/Affiliated Members

New Zealand National Eye Bank
Louise Moffatt
Helen Twohill
Nigel Brookes

Clinical and Experimental Ophthalmology
(RANZCO Journal)
Victoria Cartwright

Glaucoma New Zealand
Helen Mawn
Ginny Harwood
Karen Farmer

Department of Anatomy with Radiology
Professor Louise Nicolson
Dr Simon O’Carrol (post doctoral research fellow)

Bio-engineering
Dr Jason Tarawhenua