RESEARCH UNITS, CENTRES AND INSTITUTES

Annual Report Template

Please refer to the University of Auckland Policy on Research Units, Centres and Institutes for more information on reporting and accountability requirements (clause 2.5). A copy of this policy is available from the University Policy Register.

Section 1a - IDENTIFICATION INFORMATION:

<table>
<thead>
<tr>
<th>Title of Unit, Centre or Institute:</th>
<th>New Zealand National Eye Centre - NZ-NEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Director:</td>
<td>Professor Charles McGhee</td>
</tr>
<tr>
<td>Name of Deputy Director:</td>
<td>Professor Paul Donaldson</td>
</tr>
</tbody>
</table>

Section 1b – ENDORSEMENT OF REPORT:

<table>
<thead>
<tr>
<th>Signatures:</th>
<th>Please sign in appropriate space below</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Professor Charles McGhee - Director</strong></td>
<td></td>
</tr>
</tbody>
</table>
| (Required for all Units/Centres/Institutes) | ![Signature]
| **Professor Charles McGhee - Head of Department** |
| (Required only for Department/School Units) | ![Signature]
| **Dean** |
| (Required for Faculty/University Centres/Institutes) |
**Section 2 – ADVISORY BOARDS AND MEETING DATES:**

| Names of Oversight Advisory Board members (for Faculty and University Centres that have Oversight Boards) |
| Names of Expert Advisory Board members (for Faculty and University Centres that have Expert Advisory Boards) |
| Names of Management Committee Members (for University and Faculty Centres) |
| Professor Charles McGhee |
| Professor Paul Donaldson |
| Professor Steven Dakin |
| Sue Raynel – Manager NZ-NEC |
| Hutokshi Chinoy – Administrative Manager |

**Dates of advisory board and management committee meetings that took place during the year**

- 14th November 2017
- Plus committee members have had several informal meetings during the year.

**Section 3 – PARTICIPATING MEMBERS AND EMPLOYEES/STUDENTS:**

| Names and Departments of participating members |
| Department of Ophthalmology, Faculty of Medical and Health Sciences; School of Optometry and Vision Science; Molecular Vision Laboratory. |
| Affiliated members: New Zealand National Eye Bank; Glaucoma New Zealand; Clinical and Experimental Ophthalmology; Department of Anatomy with Radiology; University of Auckland Bio-engineering Institute |

| List names, positions, and FTEs of all staff employed and postgraduate students involved in the Unit or Centre |
| No staff are employed directly by NZ-NEC but provide assistance at discretion of the Departmental HoD’s. |
| See appendix for list of staff within NZ-NEC |
Section 4 – INTRODUCTION:

Provide here a brief introduction to the report (maximum of 300 words)

We are continuing to utilise the recommendations in the 2016 Research Centre Review report as a guide to developing NZ-NEC.

Half day seminar for all members of NZ-NEC in May. This was an opportunity for researchers to network and explore the potential for submitting HRC programme grants specific to vision. This continues to be a work in progress and it is anticipated that a programme grant application was submitted in 2017. There were also collaborations that eventuated from this seminar within the NZ-NEC team.

In 2017 members of NZ-NEC individually or collaboratively were successful in attaining research funding in excess $9,500,000.00. Grants came from a wide variety of sources including $4,919,534 from HRC for an on-going collaborative programme grant, $1,975,768.00 in MBIE grants, $1,110,000.00 in Marsden grants, $773,476.00 from ADHB (mainly in fellowship grants).

There have been 2 book chapters and 96 peer reviewed publications from members in 2017.

The Department of Ophthalmology had 5 PhD's and 1 MD completed or submitted in 2017.

Section 5 – AIMS, GOALS AND FUTURE PLANS:

<table>
<thead>
<tr>
<th>a. General Aims:</th>
<th>Vision: to eliminate preventable blindness and reduce visual impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Briefly describe the general aims (plans and objectives/goals) of the unit or centre. Identify how they address the University and Faculty Strategic Plan.</td>
<td><strong>Mission:</strong> to become a foremost international vision research, clinical and teaching centre through excellence, innovation and collaboration</td>
</tr>
</tbody>
</table>
| **Goals:** To develop and increase the profile of eye health, vision research and education – in New Zealand/Aoteoroa 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

**b. Goals for Reporting Year:**
Describe the specific goals for the reporting year.

| 1. Continue with expanding community programmes |
| 2. Increase our research collaborations within UoA, nationally and internationally |

**c. Plans for Upcoming Year:**
Outline the plans for the next year. Identify any resource implications.

| 1. Continue with expanding community programmes |
| 2. Increase our research collaborations within UoA, nationally and internationally |

### Section 6 – MAJOR ACHIEVEMENTS AND OTHER NOTABLE ACTIVITIES:

**Report against the specific goals listed in 5b above**

| 1. We continue to provide glaucoma clinics within the UoA, in partnership with ADHB, to upskill community optometrists with a view to transferring patient care to the community. There currently 2 community optometrists contracted to provide care in the community with another 4 credentialed community based optometrists. CMDHB have also expanded their glaucoma service with the addition of 4 credentialed optometrists from the UoA based glaucoma course. Also 6 of the credentialed glaucoma optometrists are staff within the School of Optometry and Vision Science who utilise skills and knowledge in their clinical teaching environment. We have a waiting list of 7 optometrists for the next course. Glaucoma New Zealand provided 6 seminars to the general public in different centres throughout the country. |

| 2. Members of NZ-NEC continue to explore collaborative research options. Current research collaborations continue with those in last years report and new collaborations established with; Massey University, Vanderbilt University, USA, Stony Brook University USA as well as many within the UoA. |

<p>| 3. We submitted an HRC programme grant this year as planned. Also investigations / collaborations within NZ-NEC continue. |</p>
<table>
<thead>
<tr>
<th>Summary of major developments and achievements. Identify how these activities contribute to the research capability of the department or faculty (beyond what would be achieved through the activities of the individual members). Please provide greater detail for anything noteworthy that may give useful publicity to the University</th>
</tr>
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<tbody>
<tr>
<td>A/P Rob Jacobs was appointed as a member of the New Zealand Order of Merit in the Queen’s Birthday Honours for his services to optometry and education.</td>
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<td>Optometrist, Erna Takazawa, was named the University of Auckland 2017 Young Alumna of the Year for her work developing optometry in Samoa and leading improvement of eye care in the Pacific.</td>
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<tr>
<td>Professor Colin Green (with A Gunn, L Bennet, J Dean and J Davidson) Shorland Medal of the New Zealand Association of Scientists 2017</td>
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<td>Professor Charles McGhee inaugurated as President of Asia Pacific Academy of Ophthalmology from 2017 to 2019.</td>
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<td>Professor Paul Donaldson in collaboration with research partners at Vanderbilt University, USA received a $305,000 NHI grant</td>
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<td>Nigel Brookes, NZ National Eye Bank, who won one of the commercial prizes at the Velocity Innovation Challenge with his entry 'endoCellMetrics'.</td>
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<td>Professor Charles McGhee was interviewed on The Project about growing contact lens problems in New Zealand.</td>
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<td>James McKelvie and Sunny-Li published in NZ Listener their article focussed on baby boomers and cataract</td>
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<td>Professor Trevor Sherwin was invited to present the prestigious Ida Mann lecture at RANZCO 2017 Perth.</td>
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<td>Dr James Slater is the recipient of an HRC Pacific Health Clinical Training Fellowship.</td>
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<td>Professor Dipika Patel, Professor Charles McGhee, in collaboration with Massey University, received an MBIE grant of $998,532.00.</td>
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<td>Salim Ismail, Jeremy Mathan, Jane McGhee, Dr Jinny Yoon, Ye Li and Professor Trevor Sherwin won both the 'best research video' and the 'best video' award in the RANZCO Congress film festival, Perth, WA for their video 'Walking with Dying Spheres or Die Another Day'</td>
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</table>
Dr Stuti Misra and Professor Trevor Sherwin were both awarded APAO achievement awards for their many contributions to the APAO Scientific program over several years.

Optometry graduate, Dr Nabin Paudel was awarded a World Council of Optometry (WCO) Teaching Fellowship to teach paediatric optometry and visual electrophysiology to the undergraduate optometry students of Nepal.

The inaugural SOVS conference was held over two days (22-23 July 2017) and consisted of a mix of clinical/research seminars and practical workshops. Seminar topics included clinical imaging, vision research, amblyopia treatment and myopia control. Workshops were held on imaging/eye-tracking, ocular prosthetics, paediatric assessment and glaucoma. There was also an opportunity for undergraduate optometry students to present the results from their summer research projects. The 2017 meeting was attended by 80 people (evenly split between community delegates, alumni and optometry students).

Promotions:
A/P Dipika Patel promoted to Professor
Dr Julie Lim promoted to Senior Lecturer
Dr Gus Grey appointed to - Director of Biomedical Imaging Research Unit

Students within NZ-NEC have had another successful year:

- Frazer Coutinho, PhD student, best image in the confocal microscopy category at the BIRU Image Competition
- Lola Mugisho ,PhD student, recipient of 2017 International Gap Junction Conference Travel Bursary
- Renita Martis, PhD student, was the recipient of H.C Russell Memorial Scholarship, HOPE Foundation for Research on Aging Scholarship and Academic career exploration scholarship
- HealthX 2017: Henry Wallace, BMedSci student, won the Non-Doctoral oral presentation category. The title of Henry’s talk was ‘Predicting Postoperative Pseudophakic Refraction’. Renita Martis 2nd runner up biomedical oral presentation category.
- Priyanka Agarwal, PhD student, placed third for her 3-minute presentation at the 2017 New Zealand-Australia Joint Workshop of the Controlled Release Society.
- Luis Knight, Hons Student, J D Sinclair Postgraduate Award for Excellence in Physiology
- Joevy Lim, BMEdSci, was one of the 15 finalists the Velocity 100k Challenge, an entrepreneurship programme run by the Centre of Innovation and Entrepreneurship at the University of Auckland. A total of 87 teams entered Velocity 100K Challenge. Joevy and her team placed first among the finalists, winning a total of $25,000 in seed capital for their venture! Joevy and her team are designing a medical device that aims to reduce the time taken in surgeries, product is likely to be commercialised in 2019.

<table>
<thead>
<tr>
<th>Comment on any co-operative commercial activities, research with other University or Government laboratories or research groups</th>
<th>Commercial Research</th>
</tr>
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<tbody>
<tr>
<td>BOTU continued a project with Novaliq, Germany, using the developed ex vivo model to evaluate the penetration of various formulations into the ocular tissues after topical application. This model allows screening of ocular formulations at an early stage of development and could reduce the cost and complexity of testing routines currently used by the pharmaceutical industry.</td>
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<td>Professor Colin Green continues to provide advice and has been appointed as Chief Scientist for Ocunexus.</td>
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<tr>
<th>Provisional Patents</th>
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<tr>
<th>Comment on any courses given or workshops and seminars held</th>
<th>NZ-NEC held an afternoon seminar for all research groups in May 2017 with a view to progressing submission of an HRC programme grant specific to vision research. This is on-going with a programme grant application submitted in 2017.</th>
</tr>
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<tbody>
<tr>
<td>We continue to hold monthly seminars for disseminating current research findings and issues. These have also been an avenue for generating collaboration amongst researchers who otherwise would not have had contact. See attached for seminar details.</td>
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</table>
Several high profile international guest lecturers have presented at NZ-NEC seminars in 2017:

1. Professor Michael Kalloniatis, - University of NSW, Australia
2. Distinguished academic visitor award recipient Professor Christian Naus The University of British Columbia, Vancouver, Canada
3. Distinguished academic visitor award recipient: Barbara Pierscinek, Kingston University
4. Dr Maria Markoulli, Senior Lecturer, SOVS, University of NSW, Sydney
5. Professor Luc Leybaert, University of Ghent, Belgium
6. Prof Roger Truscott, Senior Research Prof. Illawarra Health and Medical Research Institute, NSW
7. Professor Oliver Schmachtenberg, Professor of Neuroscience at the University of Valparaiso, Chile
8. Professor Jan Burt, Department of Physiology, University of Arizona, USA

Summer students presented their projects at the “Excellence in Ophthalmology and Vision Research Prize Evening”. Students were given guidelines for their 6 minute presentations which were judged by academics external to NZ-NEC – the judges in 2017 were Professor Alan Merry and Distinguished Professor Ian Reid

The winner of the NZ-NEC student symposium was Muthana Noori from the SOVS.

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 eg Glaucoma NZ provides 6 seminars to communities throughout New Zealand annually
### Section 7 - Reviews

<table>
<thead>
<tr>
<th>Date of last review</th>
<th>August 2016</th>
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<tr>
<th>Review Recommendations</th>
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<tbody>
<tr>
<td>List the recommendations of the review and give an update of progress on addressing the recommendations.</td>
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1. Submission of an HRC programme grant

NZ-NEC held an afternoon seminar for all research groups in July 2017 with a view to progressing submission of an HRC programme grant specific to vision research. This is on-going with a programme grant application submitted in 2017.

2. Role of Professor Steven Dakin need to be strengthened and clarified

Extensive discussion re: undergraduate and postgraduate optometry teaching, specifically glaucoma credentialing for UoA and community optometrists.

Joint appointments between departments eg Hannah Kersten

3. Increase participation of School of Optometry and Vision Science and Molecular Vision Laboratory within the Centre, to develop more collaborative research opportunities for the future

HRC grant application and the many collaborative grants received by members in NZ-NEC e.g. Dr Monica Acosta, Dr Ilva Rupenthal and Professor Colin Green (AMRF and MPPT); Dr Ilva Rupenthal, Dr Eshan Vaghefi and Dr Sachin Thakur (FRDF)
### Section 8 – FINANCIAL REPORT

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Response</th>
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<tbody>
<tr>
<td>State whether the Unit or Centre has its own Activity Centre/s and list the Activity Centre/s being used</td>
<td>NZ-NEC does not have its own cost centre</td>
</tr>
<tr>
<td>State sources of funding, for example, from research funds from outside bodies, from the Department or Faculty, or other</td>
<td>N/A</td>
</tr>
<tr>
<td>List any significant resource allocation decisions taken by the Oversight Board during this reporting year (if applicable)</td>
<td>N/A</td>
</tr>
<tr>
<td>Include a statement of financial performance (contact Faculty Accountant for assistance), or give a clear explanation of the reasons if there has been no financial activity</td>
<td>N/A</td>
</tr>
</tbody>
</table>
### Section 9 – RESEARCH OUTPUTS

<table>
<thead>
<tr>
<th>Book Chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherwin, T., Ismail, S., Ioh, I., &amp; Mcghee, J. (2016). Histopathology 9from Keratoconus Pathology to Pathogenesis). In Keratoconus Recent Advances in Diagnosis and Treatment. Springer.</td>
</tr>
</tbody>
</table>

### Peer Reviewed Journal Articles


PMID: 28387763; PubMed Central PMCID: PMC5558226.
Surg. 2017 Aug;43(8):1122-1123. doi:
24. Kim BZ, Meyer JJ, Brookes NH, Moffatt SL, Twohill HC,
Pendergast DG, Sherwin T, McGhee CNJ. New Zealand
trends in corneal transplantation over the 25 years
doi: 10.1136/bjophthalmol-2016-030920. Epub 2016
Demographic features and visual outcomes of patients
presenting to diabetic photo-screening and treated for
2017 May 18;10(5):790-795. doi:
PMID: 28546939; PubMed Central PMCID: PMC5437470.
26. Crawford AZ, McKeivie J, Craig JP, McGhee CN, Patel
DV. Corneal Transplantation in Auckland, New Zealand,
1999-2009: Indications, Patient Characteristics,
Ethnicity, Social Deprivation, and Access to Services.
Cornea. 2017 May;36(5):546-552. doi:
10.1097/ICO.0000000000001159. PubMed PMID:
28257380.
27. Misra SL, Kersten HM, Roxburgh RH, Danesh-Meyer HV,
McGhee CN. Corneal nerve microstructure in Parkinson's
PMID: 28258149.
28. AK Mayer, C Van Cauwenbergh, C Rother, B Baumann, P
Reuter, ACHM Study Group, E De Baere, B Wissinger,
SKohl (ACHM Study Group: A Farkas, A Renner, A Bajak
Canak, A Saggar, Andrea L Vincent, A Green, A Rauch,
AS. Plomp, B Varsanyi, B Käsmann-Kellner, B Leroy, B
Junkles, B Streubel, B Prager, B Milterski, B Lorenz, B
Tumiene, B Bachynski, , C Ayuso, C Vincent-Delorme, C
Poloschek, C Inglehearn, C Hamel, C Castellan, D Huhle,
D Birch, D Blain, D Zobor, D Lev, D Wand, D Sharon, E
Zrenner, E Apfelstedt-Sylla, E Traboulsi, E Heon, E
Holinski-Feder, E Levy-Lahad, F Curtis, F Munier, F
Stanzial, F P.M. Cremers, G Du Bois, GMatthijis, G
Ferrazzini, G Niemeyer, G Rudolph, H Dolfus, H Scholl, H
Jägle, H Krastel, I Gottlob; I Golovleva, Isabelle Audo, J
C Mora, J Ming, J Weinstein, J K. Heckenlively, K Strom,
K Rührer, L McGregor) CNGB3 mutation spectrum
including copy number variations in 552 achromatopsia
patients.. Human Mutation. Hum Mutat. 2017
29. Vincent AL, Abeyesekera N, van Bysterveldt KA, Oliver
VF, Ellingford JF, Barton S, Black GM. NGS Targeted
Disease panel in rod-cone retinal dystrophies in Māori
and Polynesian reveals novel changes, and a common
founder mutation. Clin Exptal Ophthal 2017 May 9. doi:
10.1111/ceo.12983. [Epub ahead of print]
30. van Bysterveldt KA, I-Kink W, AL Taie, R, Oliver VF,


64. Symptomatic intracranial hypertension during recovery from the syndrome of headache with neurologic deficits and cerebrospinal fluid lymphocytosis (HANDL). Mulroy E, Yap J, Danesh-Meyer H, Anderson N.


dominance magnitude varies with test distance. *Clinical and Experimental Optometry* 2017 (in Press).


