

SIGHT MATTERS

Annual Report **FY2015/2016**

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SINGAPORE EYE RESEARCH INSTITUTE

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ABOUT US

Established in 1997, the Singapore Eye Research Institute (SERI) is Singapore's national research institute for ophthalmic and vision research. It is the research arm of the Singapore National Eye Centre, and affiliated to the National University of Singapore and the Duke-NUS Medical School. In two decades, SERI has grown from a team of 5 to over 220 staff, encompassing clinician scientists, scientists, fellows, students, support staff, as well as more than 100 distinguished adjunct faculty members to become the largest eye research institute in the Asia-Pacific region. As of Dec 2016, SERI has published 2,782 peer-reviewed papers supported by \$222 million in competitive research grants. SERI has trained more than 150 current and past graduate students; and has been conferred over 408 national & international awards and 120 patents. SERI further undertakes eye research in collaboration with local & international ophthalmic medical centres and research institutions, which has ensured a high level of research competency & skills transfer. Notably, SERI's research has translated to actual patient success stories & significant improvements in eye care delivery. Today, SERI is recognized as a pioneering center for high quality eye research in Asia, with breakthrough discoveries that has translated to significant paradigm shift in eye care delivery.

CHAIRMAN'S MESSAGE



I would like to congratulate the SERI team for another year of excellent performance. Whilst being young and lean, SERI is proud to rank among the global heavyweights in terms of research productivity. In a study published by the Peer Journal, Singapore was ranked 2nd globally and 1st in Asia-Pacific respectively, in terms of number of peer-reviewed scientific articles per capita and mean 5-year impact factor per article. The findings were based on 62,123 articles retrieved from PubMed using keyword search and classified according to the country the first author was affiliated to. Of note was the fact that approximately 90% publication were generated by SERI. Indeed, this study offers an objective assessment of the scientific impact of Singapore's eye research, both in terms of quantity and quality.

In addition, a study commissioned by NMRC to measure the internal rates of return (IRRs) generated from eye research in Singapore, showed an estimated 15% Internal Rates of Return, IRR from Singapore's investment in eye research, which would be considered to be highly favorable by most investment standards. What it essentially translates to is that for every \$1 spent in eye research funding, it brings in \$0.30 annually in perpetuity. This study concluded that eye research expenditure by the public sector in Singapore generated high economic returns.

These two reports not only serve as a testimony of SERI's academic research excellence via high quality research and high impact publications, but further underpins SERI's core mission to drive value creation and generate economic ROI.

Nonetheless, in the pursuit of excellence, SERI needs to be keenly attuned to the evolving research landscape, and pursuant to this, constantly strategize, evolve, invest and innovate in new areas of research that align with the national funding agenda, and/ or directly addresses national healthcare burden needs.

A handwritten signature in black ink, appearing to read 'Wong Tien Yin', with a long horizontal flourish extending to the right.

Professor Wong Tien Yin
Chairman

EXECUTIVE DIRECTOR'S MESSAGE



2016 has been a bountiful year for SERI: our publication numbers escalated to 307, hitting a historic high; our cumulative quantum of active grant increased by \$2.6 Million from the previous year to \$29.8 Million this year.

Two SERI teams were successful in securing the \$2M Clinical Trial Grant- one study intended to investigate the clinical effect of Atropine on the prevention and progression of Myopia, while the other was a multicenter randomized controlled trial on surgical procedures for glaucoma.

SERI was pleased to welcome Prof Leopold Schmetterer, as the new Research Head, Ocular Imaging. Prof Schmetterer, who is well known internationally for his work on ocular blood flow in humans, is additionally involved in a wide array of imaging studies in ophthalmology ranging from glaucoma, medical retina to dry eye syndrome. His other main areas of interest are ocular pharmacology and clinical trials. Professor Schmetterer had in the recent past led the MANTA study, a multi-center study in Austria that compared the effects of ranibizumab and bevacizumab for the treatment of neovascular age-related macular degeneration. Prof Schmetterer brings to SERI world-leading expertise and experience that we hope will lead to further novel and innovative healthcare solutions in Ocular Imaging.

As we congratulate ourselves on another year of excellent performance, let us also remember to thank our Board, our collaborators, our donors and supporters, all of whom play an integral role in our research success story, and to whom, we are eternally indebted to for their unwavering support. With their help, and support, SERI will continue in our strive to make a difference in Ophthalmology research, harnessing the latest know-how, therapeutics and technology to enable better outcomes for our patients!



Prof Aung Tin

Executive Director

INSTITUTIONAL REPORT

BACKGROUND

The Singapore Eye Research Institute (SERI), affiliated to the Singapore National Eye Centre, the National University of Singapore, and the Duke-NUS Medical School is a non-profit charitable organization tasked to lead and conduct research into vision and eye diseases based in Singapore and focused on Asia. It further works in collaboration with Ophthalmology departments of the various public healthcare entities and biomedical research institutions, as well as major eye centers and research institutes throughout the world. SERI has developed a world-leading reputation in broad-based clinical translational research and epidemiological programs for many eye diseases, specifically eye diseases endemic to Asia, such as myopia, angle closure glaucoma, and corneal diseases.

KEY PERFORMANCE INDICATORS *(as of December 2016)*

- SERI is one of the largest research institutes in Singapore and the largest eye research institute in the Asia-Pacific, with a faculty of 231, encompassing clinician scientists, scientists, fellows, students, and support staff.
- SERI has successfully secured external peer-reviewed competitive grant funding worth approximately S\$ 10.31 million this year, and a cumulative quantum of approximately S\$224 million.
- SERI continues its leading performance in publication, with 307 scientific papers published in 2016, and with a cumulative publication quantum of 2,782 scientific papers.
- As of December 2016, the SERI faculty has received 408 national and international awards and 120 patent applications were filed during the same period.
- Since 1997, SERI has conducted 1501 studies, encompassing the entire spectrum of eye research, from basic laboratory research, pre-clinical animal research, translational clinical research, and population health research. There are currently 459 ongoing research projects at SERI, of which approximately 70% cover clinical/translational research, 12% basic research and 18% epidemiology, imaging and health service research.
- SERI has further contributed to the training of research manpower, including over 168 Masters, PhD and post-doctoral students, many of whom are now working in hospitals, biomedical sciences industry, academic institutions and research institutes locally and overseas.

ACHIEVEMENTS & INNOVATIONS *(as of December 2016)*

• **Third National Ophthalmology Residents' Research (NORR) Day**

The 3rd National Ophthalmology Residents' Research Day (NORR) 2015 was hosted by Singapore National Eye Centre, concurrently with the Singapore Eye Research Institute. This event which is targeted at Residents, Registrars and Medical Officers within Singapore's public healthcare network aims to promote and propagate research amongst these young doctors, while concurrently serving as a networking conduit for the sharing of research ideas.

The event was attended by 125 participants with 55 abstracts submitted. It was generally felt that the NORR 2015 meeting was a success, and boosted the highest number of attendees as compared to the previous years.

- **The IES Prestigious Engineering Achievement Award 2015**

The Angle closure Glaucoma Risk assessment (AGAR) team comprising of Prof Aung Tin, Adj. A/Prof Shamira Perera & Dr Baskaran Mani, in collaboration with Dr Jimmy Liu Jiang, Dr Xu Yanwu & Dr Damon Wong from the Institute for Infocomm Research (I2R) was recently awarded the Institution of Engineers, Singapore (IES) Prestigious Engineering Achievement Award 2015 for their project entitled, “Automated Angle Closure Detection Software for Anterior Segment OCT Imaging”.

This award recognizes the outstanding achievements of engineers and is typically granted to an organization or persons responsible for an outstanding engineering project in Singapore.

It is meant to honor engineering achievements that demonstrate outstanding engineering skills, and which have made a significant contribution to the engineering progress and the quality of life in Singapore, including the wellbeing of people and communities; resourcefulness in planning and in the solution of design problems, pioneering in use of materials and methods; innovations in planning, design and construction; unusual aspects and aesthetic values.

- **Review by International Scientific Advisory Boards of Two of SERI’S Key Program Grants**

Two of SERI’s key program grants underwent on-site review by NMRC-appointed International Scientific Advisory Board (SAB) panel members.

SERI was awarded a \$25 million TCR flagship programme, Eye Surgery and Innovative Technologies (EyeSITE) that builds on the strengths of SERI’s previous TCR flagship programme, Translational Research Innovations in Ocular Surgery (TRIOS).

EyeSITE, aims to develop novel and innovative approaches to diagnose and treat corneal diseases and glaucoma (2 of the major causes of blindness worldwide), and is represented by 5 themes i.e.

- Theme 1: Antimicrobial Molecules Against Ocular Pathogens
- Theme 2: Novel Ocular Drug Delivery Systems
- Theme 3: The Bionic Cornea.
- Theme 4: Femtosecond Laser-Assisted Ocular Surgery Systems
- Theme 5: Stratified Medicine for Primary Angle-Closure Glaucoma

As EyeSITE approaches its second year in August 2015, this program will undergo an on-site review by an NMRC-appointed International Scientific Advisory Board, comprising of the following distinguished members:

1. Prof James C. Tsai
President, New York Eye and Ear Infirmary of Mount Sinai Chair,
Department of Ophthalmology, Icahn School of Medicine at Mount Sinai and the
Mount Sinai Health System
2. Prof Makoto Araie
Director, Kanto Central Hospital
3. Prof Dwight Cavanagh
Professor and Vice-Chairman The Dr. W. Maxwell Thomas Chair in Ophthalmology and Associate Dean for Clinical
Affairs The University of Texas Southwestern Medical Center

Further to this, SERI's \$18 million Centre Grant i.e. **Multi-Platform Strategy for Eye Research 2 (MASTER-2)** has passed its 2-year mark as of April 2015; and this program too will be subject to review by a panel of International Scientific Advisory Board, specifically appointed by NMRC to conduct a mid-term review of all Centre Grant awardees.

- **SERI Researchers awarded two x \$2M Clinical Trial Grants**

A/Prof Audrey Chia, in collaboration with Prof Donald Tan was awarded the \$2M Clinical Trial Grant to investigate the clinical effect of Atropine on prevention and progression of Myopia. Since the observation of the myopia epidemic in the 1990s, SERI has conducted extensive clinical trials into treatments that may prevent the development and progression of myopia.

SERI is now the first in the world to fine-tune the dosage of atropine eye drops from the 1% available in market to a new 0.01%, an optimal dose that balances between efficacy and safety. The findings of the study will importantly contribute to the prevention of the onset and progression of myopia in children and reducing the societal and healthcare costs related to myopia.

Adj A/Prof Ho Ching Lin, in collaboration with Prof Aung Tin was awarded the \$2M Clinical Trial Grant to conduct a multicenter randomized controlled trial on surgical procedures for glaucoma. In this multicenter randomized controlled trial, SERI intends to identify the most effective and safe surgical approach for glaucoma patients in Asia. This trial will compare the efficacy and safety of Ahmed Glaucoma Implants (AGI) against Trabeculectomy/ MMC over a 5-year period, and would involve 300 patients with uncontrolled glaucoma who have never had previous glaucoma surgery.

This study will elucidate the most appropriate surgery for management of glaucoma in Asians and provide valuable data on glaucoma in Asia. SERI will be the leading centre for the trial with 14 trial sites both locally and internationally.

PERFORMANCE OVER PAST SEVENTEEN YEARS (as of December 2016)

- SERI has seen a steady increase in staff strength over the years.

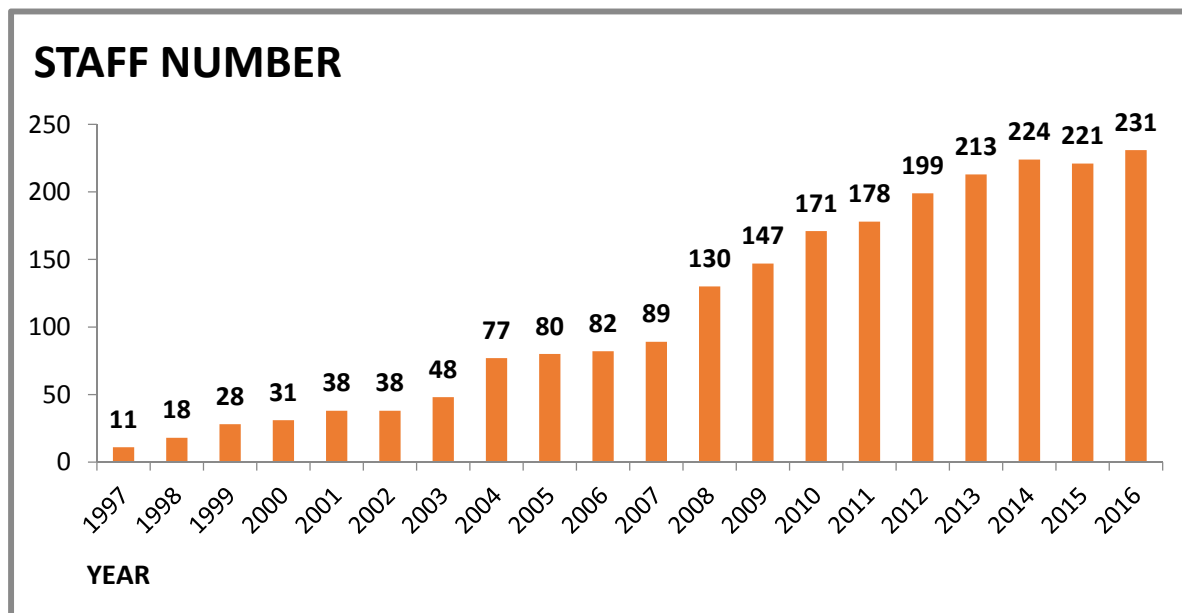


Figure 1: Number of staff members at SERI

- SERI boasts of a diverse and global faculty that serves as melting pot of ideas that propels innovation.

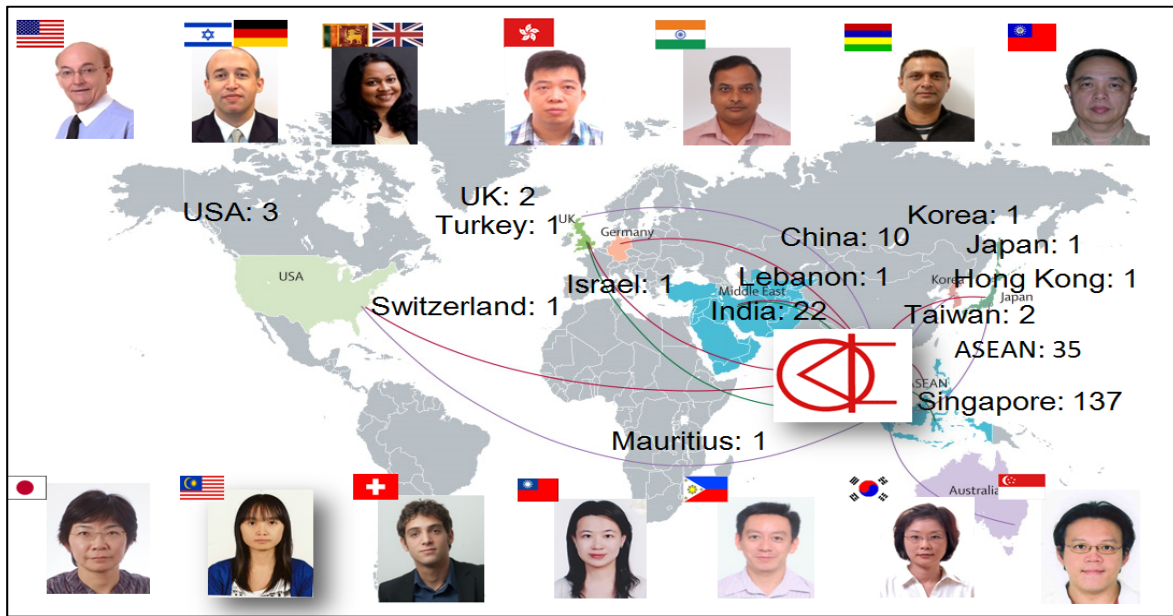


Figure 2: Nationalities of staff members at SERI

- SERI stands out as one of the most productive institutions and well holds up against global heavyweights in the field.

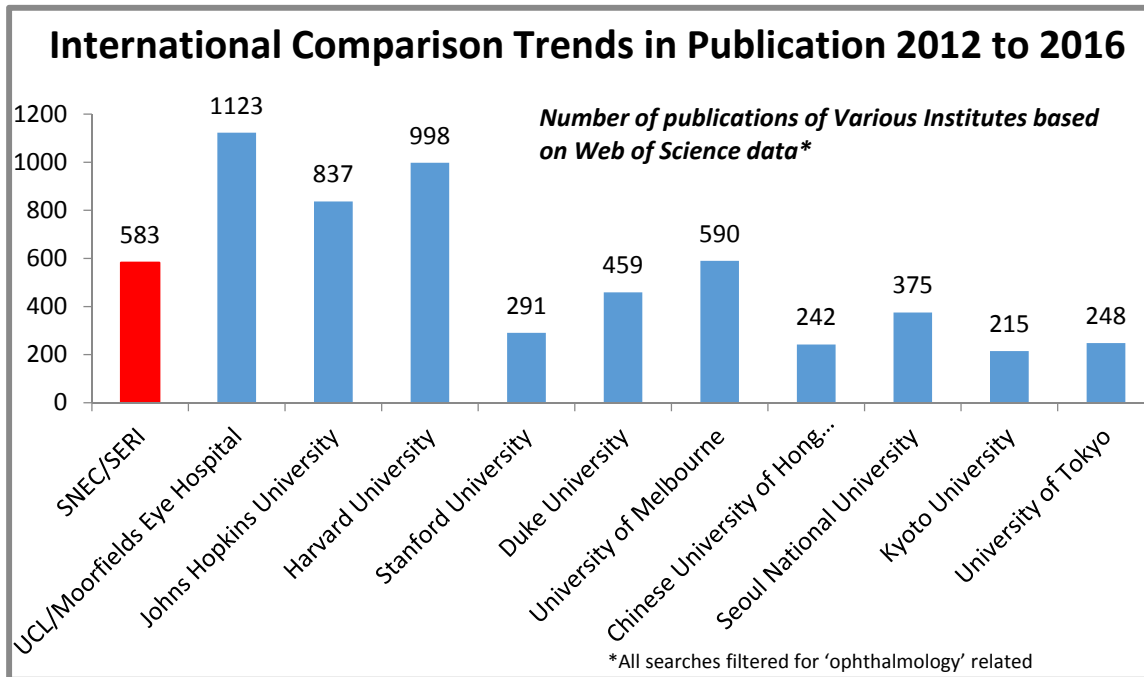


Figure 3: Number of publications by SERI and other institutions around the world, during the period of 2005-2016

- The stellar achievements of SERI have been well endorsed with numerous international and local awards.

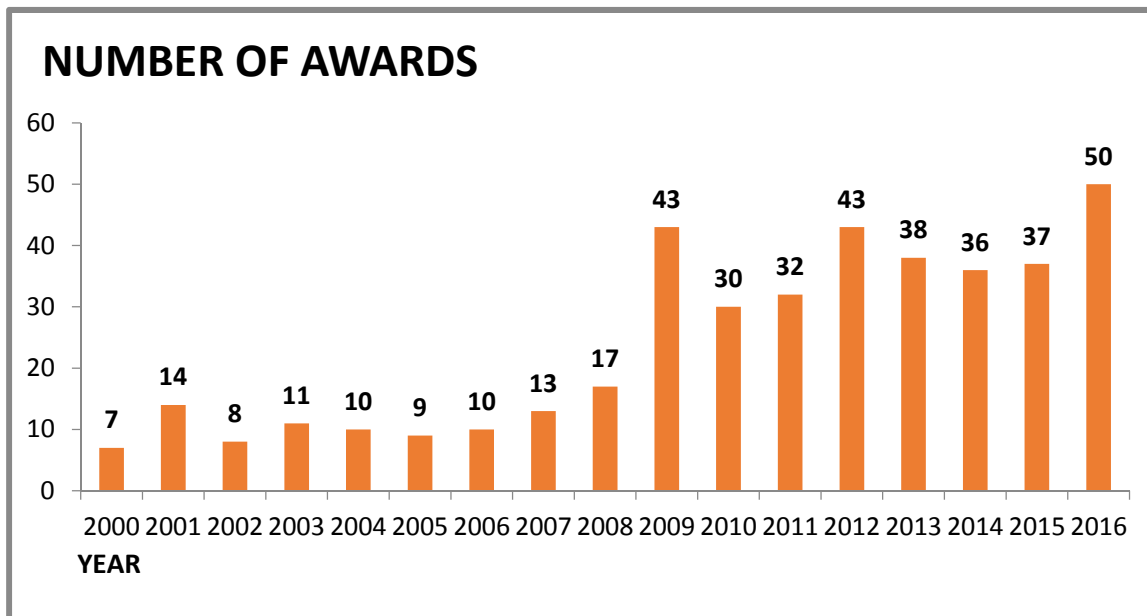


Figure 4: Number of awards received by SERI and its staff (Data from 1997-1999 are not available)

APPRECIATION & ACKNOWLEDGEMENT

SERI owes its success to its people – the honorable SERI Board of Directors, our eminent academic collaborators, the senior management, and clinicians of the Singapore National Eye Centre (SNEC), as well as, very importantly, the SERI faculty and staff members.

However, our greatest gratitude is reserved for our patients and their families. They are the driving force behind all that we do. Indeed, their journey and courage spur us on in our research endeavors and make us determined to make a positive difference to their vision and their lives.

SERI would also like to extend our appreciation to the National Medical Research Council, the Biomedical Research Council, the National Research Foundation, as well as our industry collaborators for their generous funding and support. It enables us to continue in our pursuit of impactful research with the ultimate aim to alleviate vision loss and blinding eye diseases.

OUR PEOPLE

SERI's BOARD OF DIRECTORS *(updated as of December 2017)*

SERI's Memorandum and Articles of Association stipulates that the SERI Board of Directors shall have at least one representative each from the Ministry of Health, the National University of Singapore and the Singapore National Eye Centre. Today, besides representation from the above three organizations, SERI's Board additionally has Directors from the Duke-NUS Graduate Medical School, Lee Kong Chian School of Medicine, SingHealth, National Healthcare Group as well as M C Tong Cardiothoracic Surgery Pte Ltd.



Prof Wong Tien Yin

*Medical Director,
Singapore National Eye Centre*

*Chairman,
Singapore Eye Research Institute*



Dr Lim Eng Kok

*Director, Performance & Technology Assessment,
Ministry of Health*



Prof Ang Chong Lye

*Deputy Group CEO
(Clinical Services & Informatics), SingHealth*

*CEO,
Singapore General Hospital*



Prof Soo Khee Chee

*Deputy Group CEO (Research & Education),
SingHealth*

*Director,
National Cancer Centre Singapore*



Assoc Prof Yeoh Khay Guan

*Dean, Yong Loo Lin School of Medicine,
National University of Singapore*



Ms Ooi Chee Kar

Chartered Accountant (Singapore)



Dr Geh Min

*Consultant Eye Surgeon,
M C Tong Cardiothoracic Surgery Pte Ltd*



Prof Thomas Coffman

*Dean
Duke-NUS Medical School*



Prof Wang Linfa

*Program Director,
Emerging Infectious Diseases
Duke-NUS Medical School*



Prof James Best

*Dean,
Lee Kong Chian School of Medicine*



Prof Lim Tock Han

*Deputy Group CEO (Education & Research),
National Healthcare Group*

*Senior Consultant,
NHG Institute,
Tan Tock Seng Hospital*

SERI's DIRECTORS / STRATEGIC PLANNING COMMITTEE *(updated as of December 2016)*

The SERI Directors/ Strategic Planning Committee serves as the highest governing body at SERI, working closely with the Executive Director, SERI to ensure the overall stewardship of the Institute; leading and promoting research within the Institute; ensuring sufficient funding to ensure its future viability; safeguarding overall governance and integrity of the Institute; and proactively increasing the visibility and broadening of research collaborations with national and international agencies.



Prof Aung Tin
Executive Director



Assoc Prof Jodhbir Mehta
Director, Clinical Translational Research



Prof Roger Beuerman
Senior Scientific Director



Prof Ecosse Lamoureux
Director, Population Health



Ms Sharmila Kannan
*Director, Administration,
Research Affairs & Support Services*



Dr Danny Belkin
*Director, Technology Development
& Commercialization*



Assoc Prof Eranga Vithana
Director, Laboratory Translational Research

SERI's MANAGEMENT COMMITTEE (*updated as of December 2016*)

The SERI Management Committee serves as a principle body actively engaged in the review and implementation of SERI's research policies and strategies. It further plays an integral role in conceptualizing SERI's research framework, in consultation with the SERI Senior Leadership, as the Institute moves onwards to face new challenges in its strive for continued research excellence.



Prof Aung Tin
Executive Director



Prof Wong Tien Yin
Medical Director,
Singapore National Eye Centre

Chairman,
Singapore Eye Research Institute



Prof Roger Beuerman
Senior Scientific Director



Sis Peck Chye Fong
Deputy Director, Research Clinic



Ms Sharmila Kannan
Director, Administration,
Research Affairs & Support Services



Ms Charity Wai
Chief Operating Officer,
SNEC



Assoc Prof Eranga Vithana
Director, Laboratory Translational Research



Assoc Prof Tina Wong
Head, Ocular Therapeutics and
Drug Delivery Research Group



Assoc Prof Jodhbir Mehta
Director, Clinical Translational Research



Assoc Prof Louis Tong
Head, Ocular Surface Research Group



Prof Ecosse Lamoureux
Director, Population Health



Prof Saw Seang Mei
Co-Head, Myopia Research Group

SERI's MANAGEMENT COMMITTEE *(continued)*



Dr Danny Belkin
*Director, Technology Development
& Commercialization*



Adj Assoc Prof Audrey Chia
Co-Head, Myopia Research Group



Assoc Prof Cheng Ching-Yu
Head, Ocular Epidemiology Research Group



Dr Amutha Barathi
*Head, Translational Pre-Clinical Model
Platform*



Assoc Prof Gemmy Cheung
Head, Retina Research Group



Dr Zhou Lei
Head, Proteomics Research Platform



Dr Michael Girard
*Co-Head, Bioengineering & Devices Research
Group*



Dr Rajkumar Patil
Principal Research Scientist



Prof Dan Milea
Head, Visual Neuroscience Research Group



Dr Seet Li Fong
*Assistant Director, Laboratory
Translational Research*



Prof Chee Soon Phaik
Head, Cataract Research Group



Dr Gary Yam
*Head, Experimental Microscopy
Platform*



Prof Leopold Schmetterer
Head, Ocular Imaging Research Group

SNEC's RESEARCH COMMITTEE (updated as of November 2017)

Terms of reference:

- Plays a pivotal role in the review of research budgets, as well as the evaluation and endorsement of the appropriateness of research projects, including the scientific merit of such projects.
- Oversight over the review/ approval of the SNEC HREF grants for research projects.
- Provides directions for the development of SERI's translational and clinical research capabilities.



Prof Aung Tin
Executive Director
SERI

Deputy Medical Director (Research), SNEC
Senior Consultant, Glaucoma Dept, SNEC



Assoc Prof Tina Wong
Head & Senior Consultant, Glaucoma Dept,
SNEC

Head, Ocular Therapeutics and Drug Delivery
Research Group, SERI



Adj Assoc Prof Lee Shu Yen
Deputy Head & Senior Consultant,
Surgical Retina Dept, SNEC



Assoc Prof Jodhbir Mehta
Head & Senior Consultant (Research), Cornea &
External Eye Disease Dept, SNEC

Director, Clinical Translational Research, SERI



Adj Assoc Prof Sharon Tow
Head and Senior Consultant,
Neuro-Ophthalmology Dept, SNEC

Adjunct Senior Clinician Investigator, SERI



Assoc Prof Gemmy Cheung
Deputy Head & Senior Consultant, Medical
Retina Dept, SNEC

Head, Retina Research Group, SERI



Adj Assoc Prof Audrey Chia
Head and Senior Consultant, Paediatric
Ophthalmology & Strabismus Dept, SNEC

Co-Head, Myopia Research Group, SERI



Prof Dan Milea
Senior Clinician, Neuro-Ophthalmology Dept,
SNEC

Head, Visual Neuroscience Research Group,
SERI



Adj Assoc Prof Shamira Perera
Senior Consultant, Glaucoma Dept, SNEC

Co-Head, Bioengineering & Devices Research
Group, SERI



Dr Sunny Shen
Head & Senior Consultant, Oculoplastic Dept,
SNEC



Assoc Prof Louis Tong
Senior Consultant, Cornea & External Eye Disease
Dept, SNEC

Head, Ocular Surface Research Group, , SERI



Dr Desmond Quek
Consultant, Glaucoma Dept, SNEC

TEACHING & TRAINING

SERI has been actively hosting research seminars, courses and talks which serve as a platform for information transfer and idea sharing, as well as networking conduit between the internal and external research communities. Besides serving as a fertile platform for the incubation of research ideas and generation of collaborative initiatives between the SERI faculty and external academics/ researchers, these activities further promote research-related talent development within SERI that is high value-added and knowledge-based.

The talks presented via these channels at SERI offer discourse on scientific ideas and discoveries in ophthalmology and vision research, as well as in other biomedical disciplines, including bioengineering, genomics, tissue engineering, stem cell therapy and therapeutics, etc.; blending clinical, epidemiological, translational and basic approaches within specific disciplines. These seminars have certainly led to the launch of many new projects and successful collaborative partnership between SERI and local as well as international academic/ research entities.

This initiative serves as an ideal teaching platform for our junior faculty, paving the way for immense synergies as they work together to tackle emerging challenges in the field of ophthalmology.

DATE	TOPIC	SPEAKER
16 Jul 2015	Functional optical coherence tomography	Prof Leopold Schmetterer <i>Ophthalmic Pharmacology, Department of Clinical Pharmacology, Medical University of Vienna</i>
17 Aug 2015	Emerging concepts in the pathogenesis and treatment of diabetic retinopathy	A/Prof Elia Duh <i>Associate Professor of Ophthalmology, Wilmer Eye Institute, Johns Hopkins School of Medicine</i>
9 Sep 2015	Optically transparent collagen for biomedical research in 3D	A/Prof Li Hoi Yeung <i>School of Biological Sciences, Nanyang Technological University</i>
30 Sep 2015	Making microfluidic tools available to clinical researches: Fabrication and applications	Dr Michinao Hashimoto <i>Engineering Product Development, Singapore University of Technology and Design</i>
16 Oct 2015	Wayward trafficking in RPE: Implications for age-related alteration of proteolytic activity and pathogenesis of AMD	Dr Luminita Paraoan <i>Institute of Ageing and Chronic Disease, Faculty of Health and Life Sciences, University of Liverpool, UK</i>
27 Oct 2015	Inhibition of bacterial quorum-sensing and development of an anti-microbial contact lens surface	Prof Mark Willcox <i>School of Optometry and Vision Science, Associate Dean for Research Training, University of New South Wales</i> Prof Naresh Kumar <i>Professor, School of Chemistry, University of New South Wales</i>
9 Dec 2015	Ophthalmic pharmaceuticals: From laboratory to patient	Dr Gary D Novack <i>PharmaLogic Development, Inc. (San Rafael CA USA), University of California, Davis, School of Medicine</i>
23 Dec 2015	High fat diet induced NHP diabetic metabolic disease model development and characterization	Dr Tony Wang <i>Chief Technology Officer, Kunming Biomedical International</i>

14 Jan 2016	The Joslin Medalist Study: Identification of retinal protective factor in patients with extreme duration of diabetes	Dr George L King <i>Senior Vice President, Chief Scientific Officer, and Head of the Section on Vascular Cell Biology at Joslin Diabetes Center</i>
29 Jan 2016	Ocular drug development: repurposing strategy and life cycle management	Dr Ni Jinsong <i>CEO and CSO at Cloudbreak Therapeutics, LLC</i>
23 Mar 2016	Therapeutic targeting of LRG1 in ocular disease	Prof Hugh Davson <i>Professor of Biomedical Research, Head, Department of Cell Biology, Institute of Ophthalmology, University of College London</i>
23 Mar 2016	The complement system and AMD pathogenesis	Prof Stephen Moss <i>Vice-Dean for Enterprise, Norman Ashton Professor of Biomedical Research, Department of Cell Biology, Institute of Ophthalmology, University of College London</i>

OUR COLLABORATIONS

Local Institutions

- Bioinformatics Institute
- Bioprocessing Technology Institute
- Biomedical Sciences Institute
- Changi General Hospital (Department of Ophthalmology)
- Citymed Health Associates Pte Ltd
- Community Eye Clinic
- Defense Medical & Environmental Research Institute
- DSO National Laboratories
- Duke-NUS Medical School
- Experimental Therapeutics Centre
- Genome Institute of Singapore
- Institute for Infocomm Research
- Institute of Bio-Nanotechnology
- Institute of Materials Research and Engineering
- Institute of Medical Biology
- Institute of Microelectronics
- Institute of Molecular and Cell Biology
- Khoo Teck Puat Hospital
- KK Women's and Children's Hospital (Department of Ophthalmology)
- Lions Home for the Elders
- Ministry of Health Holdings
- Nanyang Polytechnic
- Nanyang Technological University
- National Cancer Centre
- National Healthcare Group Polyclinics
- National Heart Centre
- National Neuroscience Institute
- National University Health Systems
- National University Hospital
- National University Singapore
- Ngee Ann Polytechnic
- Novena Heart Centre
- Singapore Armed Forces
- Singapore Bioimaging Consortium
- Singapore Centre on Environmental Life Sciences Engineering
- Singapore Chung Hwa Medical Institute
- Singapore General Hospital
- Singapore Immunology Network
- Singapore Institute for Clinical Sciences
- Singapore Institute of Manufacturing Technology
- Singapore National Eye Centre
- Singapore Stem Cell Consortium
- Singapore-Stanford Biodesign
- SingHealth Polyclinics
- Tan Tock Seng Hospital

Overseas Institutions (Academic)

- Aston University, UK
- Centre for Eye Research Australia, University of Melbourne, Australia
- Centre for Vision Research, University of Sydney, Australia
- Erasmus University, Netherlands
- Indiana University, School of Medicine and Rehabilitation Hospital, USA
- Institute for Aviation Psychology, Netherlands
- Johns Hopkins University, USA
- Lions Eye Institute, Australia
- Max Planck Institute for Evolutionary Anthropology, Germany
- Moorfields Eye Hospital, UK
- Oregon Health and Science University, USA
- Rotterdam Eye Hospital, Netherlands
- Save Sight Institute, Australia
- Seoul National University Bundang Hospital, South Korea
- The Institute of Endocrinology and Diabetes (IED), Australia
- University College London, UK
- University of Amsterdam, Netherlands
- University of British Columbia, Canada
- University of California, USA
- University of Melbourne, Australia
- University of Miyazaki, Japan
- University of New South Wales, Australia
- University of Sydney, Australia
- University of York, UK
- West Virginia University Eye Institute (School of Public Health), USA
- Wilmer Eye Institute, USA

Industry Collaborations

- AcuFocus
- Alcon Research Ltd
- Allergan
- Angioblast Systems Inc
- AqueSys, Inc
- Astonix Life Science (S) Pte Ltd
- AYOXXA Living Health Technologies Pte Ltd
- Bausch & Lomb
- Bayer Healthcare
- Canon
- Carl Zeiss Pte Ltd
- Ceepro Pte Ltd
- Chugai Pharmabody Research Pte Ltd
- Essilor
- Excellens
- GlaxoSmithKline
- IMS Health Asia Pte Ltd
- INC Research UK Limited
- i-Optics
- Ivantis Inc
- KEIO-NUS CUTE Centre
- Kendle Pte Ltd
- Novartis
- Ocular Therapeutix, Inc
- Project Orbis
- Quark Pharmaceuticals Inc
- Revision Optics Inc
- Roche
- Santen Pharmaceutical
- Samsung Medical Center
- Technolas Perfect Vision
- Utrecht University Enceladus Pharmaceuticals
- Welch Allyn

EVENTS

INTERNATIONAL & LOCAL ACTIVITIES

SERI staff and associates participated actively in both overseas and local conferences during the year to establish links with overseas institutes, meet up with overseas collaborators and to promote and enhance SERI's presence in the international scene. Conferences / meetings participated includes:

INTERNATIONAL ACTIVITIES		
TOPIC	DATE	VENUE
The 30th Asia-Pacific Academy of Ophthalmology Congress (APAO)	1 – 4 Apr 2015	Guangzhou, China
The 119th Annual Meeting of the Japanese Ophthalmological Society	16 – 19 Apr 2015	Sapporo, Japan
American Society of Cataract and Refractive Surgery (ASCRS) Annual Symposium	17 – 21 Apr 2015	San Diego, USA
The Biology of Regenerative Medicines	22 – 24 Apr 2015	Cambridge, UK
18th Annual International Ocular Surface Society Meeting	2 May 2015	Denver, USA
The Association for Research in Vision and Ophthalmology (ARVO) 2015	3 – 7 May 2015	Denver, USA
EMBO Conference: Chromatin and Epigenetics	6 – 10 May 2015	Heidelberg, Germany
International Society for Pharmacoeconomics and Outcomes Research (ISPOR) 20th Annual International Meeting	16 – 20 May 2015	Philadelphia, USA
6th World Glaucoma Congress 2015	6 – 9 Jun 2015	Hong Kong
European Society of Ophthalmology (SOE) Congress 2015	6 – 9 Jun 2015	Vienna, Austria
16th Tetrahedron Symposium: Challenges in Bioorganic and Organic Chemistry	16 – 19 Jun 2015	Berlin, Germany
13th Meeting of European Society of Neuro-ophthalmology (EUNOS)	21 – 24 Jun 2015	Slovenia
53rd Symposium of International Society for Clinical Electrophysiology of Vision (ISCEV)	23 – 27 Jun 2015	Slovenia
International Society of Stem Cell Research (ISSCR) Annual Meeting	24 – 27 Jun 2015	Stockholm, Sweden
The International Symposium on Ocular Pharmacology and Therapeutics (ISOPT) Clinical	9 -12 Jul 2015	Berlin, Germany
Alzheimer's Association International Conference (AAIC) 2015	18 – 23 Jul 2015	Washington, USA
17th International Conference on Nano and Biomaterials (ICNB)	29 – 30 Jul 2015	Zurich, Switzerland
9th Congress of Asia-Pacific Vitreo-Retina Society (APVRS)	31 Jul – 2 Aug 2015	Sydney, Australia
28th Asia-Pacific Association of Cataract & Refractive Surgeons (APACRS) Annual Meeting	5 – 8 Aug 2015	Kuala Lumpur, Malaysia
Joint Statistical Meeting 2015	8 – 13 Aug 2015	Seattle, USA
XXXIII Congress of the European Society of Cataract & Refractive Surgeons (ESCRS)	5 – 9 Sep 2015	Barcelona, Spain
34th Annual Meeting of European Society of Ophthalmic Plastic and Reconstructive Surgery (ESOPRS)	10 – 12 Sep 2015	Belgium
26th Annual Meeting of the Japan Glaucoma Society	11 – 13 Sep 2015	Nagoya, Japan
31st International Pupil Colloquium 2015	13 – 17 Sep 2015	Oxford, UK

ASM's Interscience Conference of Antimicrobial Agents and Chemotherapy (ICAAC) / International Congress of Chemotherapy and Infection (ICC) 2015	17 – 21 Sep 2015	San Diego, USA
The 15th International Myopia Conference	23 – 27 Sep 2015	Wenzhou, China
14th Human Proteome Organisation World Congress (HUPO)	27 – 30 Sep 2015	Vancouver, Canada
37th Meeting of the European Strabismological Association	1 – 4 Oct 2015	Venezia, Italy
24th Annual Congress of the College of Ophthalmologists of Sri Lanka	1 – 4 Oct 2015	Colombo, Sri Lanka
American Society of Human Genetics (ASHG) Annual Meeting 2015	6 – 10 Oct 2015	Baltimore, USA
The European Association for Vision and Eye Research (EVER) 2015	7 – 10 Oct 2015	Nice, France
American Academy of Optometry 2015	7 – 10 Oct 2015	New Orleans, USA
69th Annual Congress of Japan Clinical Ophthalmology	22 – 25 Oct 2015	Nagoya, Japan
7th American Society for Microbiology (ASM) Conference on Biofilms	24 – 29 Oct 2015	Chicago, USA
11th Australian Peptide Conference	25 – 30 Oct 2015	Kingscliff, Australia
Asian Eye Genetics Consortium	29 Oct 2015	Hanoi, Vietnam
2nd ASEAN Ophthalmology Society 2015	29 – 31 Oct 2015	Hanoi, Vietnam
American Society of Nephrology (ASN) Kidney Week 2015	3 – 8 Nov 2015	San Diego, USA
American Academy of Ophthalmology 2015	14 – 17 Nov 2015	Las Vegas, USA
American Society for Cell Biology (ASCB) Annual Meeting 2015	12 – 16 Dec 2015	San Diego, USA
World Ophthalmology Congress (WOC) 2016	5 – 9 Feb 2016	Mexico
The Australian and New Zealand Glaucoma Interest Group (ANZGIG) Scientific Meeting	12 – 13 Feb 2016	Auckland, New Zealand
The 2nd Asia-Australia Congress on Controversies in Ophthalmology (COPHy AA)	18 – 21 Feb 2016	Bangkok, Thailand
39th Annual Macula Society Meeting	24 – 27 Feb 2016	Florida, USA
42nd North American Neuro-Ophthalmology Society (NANOS) Annual Meeting	27 Feb – 3 Mar 2016	Tucson, USA
Gordon Research Conference: Cornea, Biology & Pathobiology of the Function of the Ocular Surface and Tear Film in Health and Disease	28 Feb – 4 Mar 2016	California, USA
31st Malaysia-Singapore Joint Ophthalmic Congress 2016	4 – 6 Mar 2016	Malaysia
The 31st Asia-Pacific Academy of Ophthalmology Congress	24 – 27 Mar 2016	Taipei, Taiwan
LOCAL ACTIVITIES		
TOPIC	DATE	VENUE
Singapore General Hospital (SGH) 21st Annual Scientific Meeting	10 – 11 Apr 2015	Singapore
EMBO Gold Medallist Symposium 2015	11 – 13 May 2015	Singapore
SNEC 25th Anniversary International Meeting	22 – 24 May 2015	Singapore
5th Molecular Materials Meeting	3 – 5 Aug 2015	Singapore
"Exploring Mechanisms in Biology: Theory and Experiment", MGMS Conference Singapore 2015	25 – 27 Nov 2015	Singapore
7th International Peptide Symposium	9 – 11 Dec 2015	Singapore

GALA FUND RAISING DINNER, THE EYE BALL 2016

The SNEC/SERI's Gala Fund-Raising dinner i.e. "The EYE Ball" intends to spread awareness of eye diseases and the fragility of vision, while concurrently raising funds for the VisionSave campaign, so that SNEC/ SERI can continue in our strive to initiate positive life-changing outcomes for our patients.

The VisionSave campaign was conceptualized to aid us in this quest to improve the lives of our patients. It serves as a bold and transformational effort to leverage on philanthropic investments to pave the way for a holistic augmentation of ophthalmology care delivery, with the ultimate goal of saving sight and transforming lives of our patients, and beyond, through innovative, cost-effective impactful eye care therapeutics, preventative and treatment strategies.

Funds garnered will go towards supporting the five causes for support/ focus areas of the VisionSave campaign:

- Financial assistance for complex, cutting-edge & novel therapies/surgeries for sight – threatening eye diseases
- Public Education/ Community Outreach/ Humanitarian
- Future-Focused Education
- Research & Innovation
- Infrastructure/ Capacity Building

In conjunction with the Visionsave campaign, the annual event was held at The St Regis, Singapore on 19 November 2016. The EYE Ball 2016 - An OP-ARTY Affair was the brainchild of our celebrity extraordinaire, Mr Dick Lee and also featured renowned jazz singer, Alemay Fernandez, talented polymath Rany Moran, as well as a brilliant master of ceremony Nikki Muller.

This year's EYE Ball 2016 also saw the inauguration of The Visionary Award, which aims to recognise individuals whose steadfast efforts have culminated in societal benefit in Singapore and beyond. SNEC/SERI was very privileged and honored to confer Professor Tommy Koh, Singapore's Ambassador-at-large, with the inaugural Visionary Award 2016.

The event also had a very special auction segment where a whole selection of mesmerizing art pieces, exquisite jewelry and relaxing lifestyle experiences were auctioned off.

A total net fund of approximately \$500,000 was raised, with a total of 32 tables and 25 seats sold.

In conclusion, the EYE Ball 2016 has played an integral role in boosting our efforts towards creating better awareness of eye diseases and vision loss. Indeed, the significant endorsement garnered for this event further underpins the value of the work that SERI does, and certainly gives us further impetus to strive on in our pursuit of eye research endeavors to benefit our patients and community as a whole.



ACHIEVEMENTS

OUR AWARDS

Local Awards

- **Singapore General Hospital (SGH) 21st Annual Scientific Meeting: Basic / Translational Research - Young Investigator Award (Third)** [Apr 2015]
Mr Andri Kartasasmita Riau, SERI
- **National Medical Research Council: Clinician Scientist Award-Senior Investigator** [Jun 2015]
“Development of a layer by layer nanoparticle sustained delivery system for nucleic acid therapeutics”
A/Prof Tina Wong, SNEC
- **ASEAN Outstanding Engineering Achievement Award / IES Prestigious Engineering Achievement Awards 2015** [Jul 2015]
“Angle closure imaging software (AGAR)”
Prof Aung Tin, Adj A/Prof Shamira Perera, Dr Baskaran Mani
- **RiSE (Residency in SingHealth Excels) Awards Ceremony: Outstanding Faculty Award** [Aug 2015]
Dr Anshu Arundhati, SNEC
- **RiSE (Residency in SingHealth Excels) Awards Ceremony: Outstanding Faculty Award** [Aug 2015]
Dr Sunny Shen, SNEC
- **RiSE (Residency in SingHealth Excels) Awards Ceremony: Outstanding Faculty Award** [Aug 2015]
Prof Wong Tien Yin, SNEC
- **RiSE (Residency in SingHealth Excels) Awards Ceremony: Outstanding Resident Award** [Aug 2015]
Dr Saadia Zohra Farooqui, SNEC
- **RiSE (Residency in SingHealth Excels) Awards Ceremony: Outstanding Resident Award** [Aug 2015]
Dr Olivia Huang, SNEC
- **RiSE (Residency in SingHealth Excels) Awards Ceremony: Faculty Appreciation Award** [Aug 2015]
Dr Daniel Su, SNEC
- **RiSE (Residency in SingHealth Excels) Awards Ceremony: Faculty Appreciation Award** [Aug 2015]
A/Prof Ian Yeo, SNEC
- **RiSE (Residency in SingHealth Excels) Awards Ceremony: Inspiring Resident-Educator Award** [Aug 2015]
Dr Daniel Ting, SNEC
- **Dean’s Appreciation for Clinical Teachers – Singapore General Hospital: Junior Doctor Teaching Award** [Oct 2015]
Dr Andrew Tsai, SNEC
- **SingHealth Publish! Award: Medical Research** [Nov 2015]
“Kidney and eye diseases: Common risk factors, etiological mechanisms, and pathways”
Dr Wong Chee Wai, SNEC
- **SingHealth Publish! Award: Outstanding** [Nov 2015]
“Common variants near ABCA1 and in PMM2 are associated with primary open-angle glaucoma”
A/Prof Eranga Vithana, SERI
- **National Medical Research Council: Transition Award** [Dec 2015]
“Clinical, mechanical and histological characterization of trabecular meshwork in ocular hypertensive primates - Exploring mechanical strain in glaucoma”
Dr Baskaran Mani, SERI

- **RiSE (Residency in SingHealth Excels) Awards Ceremony: Outstanding Resident Award** [Aug 2015]
Dr Ng Si Rui, SNEC
- **RiSE (Residency in SingHealth Excels) Awards Ceremony: Outstanding Resident Award** [Aug 2015]
Dr Daniel Ting, SNEC
- **RiSE (Residency in SingHealth Excels) Awards Ceremony: Faculty Appreciation Award** [Aug 2015]
Adj A/Prof Shamira Perera, SNEC
- **National Medical Research Council: Clinician Scientist Award** [Jan 2016]
“Analysis of oxidative stress in cultured and diseased human corneal endothelial cells”
A/Prof Jodhbir Mehta, SNEC
- **National Medical Research Council: Transition Award** [Feb 2016]
Dr Monisha Nongpiur, SERI

International Awards

- **30th Asia-Pacific Academy of Ophthalmology Congress 2015: APAO Outstanding Service in Prevention of Blindness Award** [Apr 2015]
Prof Ecosse Lamoureux, SERI
- **30th Asia-Pacific Academy of Ophthalmology Congress 2015: APAO Distinguished Service Award** [Apr 2015]
Dr Audrey Looi, SNEC
- **30th Asia-Pacific Academy of Ophthalmology Congress 2015: APAO Distinguished Service Award** [Apr 2015]
Dr Doric Wong, SNEC
- **30th Asia-Pacific Academy of Ophthalmology Congress 2015: APAO Achievement Award** [Apr 2015]
Prof Saw Seang Mei, SERI
- **30th Asia-Pacific Academy of Ophthalmology Congress 2015: APAO Achievement Award** [Apr 2015]
Prof Chee Soon Phaik, SNEC
- **The Association for Research in Vision and Ophthalmology 2015: ARVO Gold Fellow** [May 2015]
Prof Saw Seang Mei, SERI
- **The Association for Research in Vision and Ophthalmology 2015: ARVO Gold Fellow** [May 2015]
Prof Wong Tien Yin, SNEC
- **The Association for Research in Vision and Ophthalmology 2015: ARVO Travel Award** [May 2015]
Dr Fan Qiao, SERI
- **The Association for Research in Vision and Ophthalmology 2015: ARVO Travel Award** [May 2015]
Dr Henrietta Ho, SERI
- **The Association for Research in Vision and Ophthalmology 2015: ARVO MIT Outstanding Poster Award** [May 2015]
“Increased burden of vision impairment and eye diseases in patients with chronic kidney disease”
Dr Wong Chee Wai, SNEC
- **The Association for Research in Vision and Ophthalmology 2015: ARVO Travel Award** [May 2015]
Dr Wong Chee Wai, SNEC

- **XXXIII Congress of the ESCRS, Barcelona, Spain: Best Video Award** [Sep 2015]
“Femtophaco follies”
Dr Ronald Yeoh, SERI
- **American Academy of Ophthalmology 2015: Achievement Award** [Oct 2015]
Adj A/Prof Shamira Perera, SNEC
- **EMBO Young Investigator Award** [Nov 2015]
Dr Khor Chiea Chuen, SERI
- **31st Asia-Pacific Academy of Ophthalmology Congress 2016: APAO Outstanding Service in Prevention of Blindness Award** [Mar 2016]
Prof Saw Seang Mei, SERI
- **31st Asia-Pacific Academy of Ophthalmology Congress 2016: APAO Distinguished Service Award** [Mar 2016]
Dr Sonal Farzavandi, SNEC
- **31st Asia-Pacific Academy of Ophthalmology Congress 2016: APAO Distinguished Service Award** [Mar 2016]
Dr Seah Lay Leng, SNEC
- **31st Asia-Pacific Academy of Ophthalmology Congress 2016: Academy of Asia Pacific Professors of Ophthalmology** [Mar 2016]
Prof Donald Tan, SNEC
- **XXXIII Congress of the ESCRS, Barcelona, Spain: 1st Prize, Refractive Poster Award** [Sep 2015]
“Corneal wound healing and inflammatory responses after small incision lenticule extraction (SMILE): Comparison of the effects of different refractive corrections and surgical experiences”
Dr Liu Yu-Chi, SERI
- **31st Asia-Pacific Academy of Ophthalmology Congress 2016: Academy of Asia Pacific Professors of Ophthalmology** [Mar 2016]
Prof Wong Tien Yin, SNEC
- **31st Asia-Pacific Academy of Ophthalmology Congress 2016: Academy of Asia Pacific Professors of Ophthalmology** [Mar 2016]
Prof Aung Tin, SERI
- **31st Asia-Pacific Academy of Ophthalmology Congress 2016: Achievement Award** [Mar 2016]
Dr Seah Lay Leng, SNEC
- **31st Asia-Pacific Academy of Ophthalmology Congress 2016: Achievement Award** [Mar 2016]
Adj A/Prof Shamira Perera, SNEC
- **31st Asia-Pacific Academy of Ophthalmology Congress 2016: Achievement Award** [Mar 2016]
Adj A/Prof Yasuo Yanagi, SNEC

OUR GRANTS

NMRC

- **“Detection and quantitation of post-surgical fibrosis with biophotonic imaging technology”**.
A/Prof Tina Wong; S\$245,983.00
- **“Optimization of SELENA - An automated, real time detection tool for early detection of diabetic retinopathy”**.
Prof Wong Tien Yin; S\$208,000.00
- **“Analysis of oxidative stress in cultured and diseased human corneal endothelial cells”**.
A/Prof Jodhbir Mehta; S\$674,900.00
- **“Development of a layer by layer nanoparticle sustained delivery system for nucleic acid therapeutics”**.
A/Prof Tina Wong; S\$1,721,990.30
- **“The Singapore Chinese eye study 2 (SCES-2) – Prospective cohort study of 6-year incidence, risk factors, and impact of major age-related eye diseases”**.
A/Prof Cheng Ching-Yu; S\$1,499,900.00
- **“Characterizing the role of CACNA1 in exfoliation syndrome and glaucoma”**.
Prof Aung Tin; S\$1,375,720.00
- **“Whole exome sequencing to identify actionable mutations causative of primary angle closure glaucoma”**.
Prof Aung Tin; S\$1,442,100.00
- **“The clinical and economic effectiveness of extending diabetic eye screening in Singapore”**.
Prof Ecosse Lamoureux; S\$1,425,279.35
- **“Characterizing the role of iris surface features in iris sponginess and their relevance to angle-closure glaucoma”**.
A/Prof Cheng Ching-Yu; S\$744,630.26
- **“Investigating the prevalence and impact of vision impairment, hearing loss and dual sensory impairment in residential care facilities in Singapore”**.
Dr Ryan Man; S\$199,521.00
- **“The glaucoma initial treatment study: Comparing the effectiveness of selective laser trabeculoplasty with topical medication. A multi-centre, prospective and randomized controlled clinical trial”**.
Adj A/Prof Shamira Perera; S\$930,818.00
- **“The Asia primary tube versus trab (TVT) study”**.
Adj A/Prof Ho Ching Lin; S\$2,100,168.00
- **“The use of atropine 0.01% in the prevention and progression of myopia: ATOM 3”**.
Adj A/Prof Audrey Chia; S\$ 1,933,306.17
- **“Clinical, mechanical and histological characterization of trabecular meshwork in ocular hypertensive primates - Exploring mechanical strain in glaucoma”**.
Dr Baskaran Mani; S\$374,829.00
- **“Investigating the role of inflammation in primary angle closure glaucoma”**.
Dr Monisha Nongpiur; S\$374,695.00

A*Star/ Duke-NUS/ MOH/ Others

- **“Enhanced angle closure glaucoma risk assessment system (AGAR+)”**.
Prof Aung Tin; S\$625,000.00
- **“Development of a smart, thermo-sensitive and bio-degradable hydrogel as an internal tamponading agent during vitreo-retinal surgery”**.
Dr Amutha Barathi Veluchamy; S\$170,922.00
- **“Genetics of primary open angle glaucoma (POAG) in populations of African Ancestry”**.
Prof Michael Hauser; S\$300,000.00
- **“Exploring the potential diagnostic value of retinal microvascular morphology in pediatric kawasaki disease”**.
Dr Queenie Li Lingjun; S\$30,025.00
- **“Randomized controlled trial of lutein as a novel neuroprotective adjunctive therapy to improve visual outcome of rhegmatogenous retinal detachment (LUNAR Trial)”**.
Dr Ning Cheung; S\$300,000.00
- **“Continuation of ATX in glaucoma- ATX inhibitor study in Dutch belted rabbits”**.
Dr Amutha Barathi Veluchamy; S\$40,798.21
- **“Influence of severity of myopic maculopathy on efficacy of aflibercept treatment in eyes with choroidal neovascularization (mCNV) secondary to pathologic myopia”**.
A/Prof Gemmy Cheung; S\$33,375.66
- **“New ophthalmic antifungal, DE-109”**.
Prof Roger Beuerman; S\$134,710.24
- **“Myopia 1: Sustained release formulation for atropine delivery”**.
Prof Roger Beuerman; S\$51,360.00
- **“Evaluating a novel eye care model for visually impaired people in various communities in Singapore: A pilot study”**.
Dr Anna Tan; S\$20,000.00
- **“Dielectric fresnel zone plate lens: Enabling submicron resolution femtosecond laser for the next generation corneal refractive surgery”**.
A/Prof Jodhbir Mehta; S\$22,000.00

SingHealth

- **“Investigating ethnic variations of corneal rigidity in Asians and its role in glaucoma”.**
Dr Jacqueline Chua; S\$110,100.00
- **“Discrete event simulation of a primary angle closure glaucoma model in Singapore”.**
Dr Hla Myint Htoon; S\$50,000.00
- **“Evaluation of immune response and the role of TEM cells in the pathogenesis of a chronic eye model”.**
Dr Hou Ai Hua; S\$149,738.56
- **“Evaluation of corneal endothelial cell injection therapy for the treatment of Fuchs corneal endothelial dystrophy”.**
Dr Gary Peh; S\$149,950.00
- **“Evaluation of a novel treatment for presbyopia, scleral Er:YAG laser procedure, on its feasibility, optimization and wound healing profiles”.**
Dr Liu Yu-Chi; S\$50,000.00
- **“Natural phenolic compounds for durable antimicrobial contact lens wears”.**
Dr Chetna Dhand; S\$50,000.00
- **“Reduction of post-surgical fibrosis in the SPARC- and Hevin-deficient conjunctiva by interleukin-5 inhibition”.**
Dr Seet Li Fong; S\$149,998.79
- **“Engineering corneal stromal keratocytes from dental stem cells for cell replacement therapy to treat corneal opacities”.**
Dr Gary Yam; S\$150,000.00

Commercial

- **“The efficacy and safety of bimatoprost SR in patients with open-angle glaucoma or ocular hypertension”.**
Prof Aung Tin; S\$117,484.10
- **“Clinical outcomes comparison between visumax flocket and LDV pocket for implantation of the raindrop corneal inlay for the correction of presbyopia”.**
A/Prof Jodhbir Mehta; S\$59,621.58
- **“Safety and efficacy of abicipar pegol (AGN-150998) in patients with neovascular age-related macular degeneration”.**
A/Prof Ian Yeo; S\$437,752.25
- **“A two-year, randomized, double-masked, multicenter, two-arm study comparing the efficacy and safety of rth258 6 mg versus aflibercept in subjects with neovascular age-related macular degeneration”.**
A/Prof Gemmy Cheung; S\$158,263.05
- **“A multiple-center, investigator/subject masked, adaptive, multiple-ascending dose, randomized, placebo-controlled, parallel study to investigate the safety, tolerability, pharmacokinetics and pharmacodynamics of RO5093151 following 7 days administration in patients with primary open angle glaucoma or ocular hypertension”.**
Prof Aung Tin; S\$85,065.39
- **“New ophthalmic antifungal, DE-109”.**
Prof Roger Beuerman; S\$352,827.59
- **“Glaucoma HFA / OCT specificity study”.**
Prof Aung Tin; S\$46,428.21
- **“Myopia-1: Sustained release formulation for atropine delivery”.**
Prof Roger Beuerman; S\$159,175.00

OUR PUBLICATIONS

- Li J, Liu S, Koh JJ, Zou H, Lakshminarayanan R, Bai Y, Pervushin K, Zhou L, Verma C, Beuerman RW. **A novel fragment based strategy for membrane active antimicrobials against MRSA.** *Biochim Biophys Acta*. 2015 Apr;1848(4):1023-31.
- Chee SP, Yang Y, Ti SE. **Clinical outcomes in the first two years of femtosecond laser-assisted cataract surgery.** *Am J Ophthalmol*. 2015 Apr;159(4):714-719.e2
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FINANCIAL REPORT

DIRECTORS' REPORT

We are pleased to submit this annual report to the member of the Company together with the audited financial statements for the financial year ended 31 March 2016.

Directors

The directors (who are also the charity trustees) in office at the date of this report are as follows:

Associate Professor Yeoh Khay Guan

Doctor Geh Min

Professor Ang Chong Lye

Professor Wang Linfa

Doctor Lim Eng Kok

Professor Soo Kee Chee

Ms Ooi Chee Kar

Professor Donald Tan Tiang Hwee

Professor Wong Tien Yin

Associate Professor Lim Tock Han

Professor James D Best

Professor Thomas M Coffman

Directors' Interests

The Company has no share capital and its members' liability is limited by guarantee.

Neither at the end of, nor at any time during the financial year, was the Company a party to any arrangement whose objects are, or one of whose objects is, to enable the directors of the Company to acquire benefits by means of the acquisition of shares in or debentures of the Company or any other body corporate.

Share options

The Company does not have any share capital and accordingly has not issued any share options.

Auditors

The auditors, KPMG LLP, have indicated their willingness to accept re-appointment.

On behalf of the Board of Directors



Professor Wong Tien Yin
Director



Ms Ooi Chee Kar
Director

STATEMENT BY DIRECTORS

In our opinion:

- (a) the financial statements set out on pages FS1 to FS23 are drawn up so as to give a true and fair view of the financial position of the Company as at 31 March 2016 and the financial performance and cash flows of the Company for the year ended on that date in accordance with the provisions of the Singapore Companies Act, Chapter 50, the Singapore Charities Act, Chapter 37 and Singapore Financial Reporting Standards; and
- (b) at the date of this statement, there are reasonable grounds to believe that the Company will be able to pay its debts as and when they fall due.

The Board of Directors has, on the date of this statement, authorised these financial statements for issue.

On behalf of the Board of Directors



Professor Wong Tien Yin
Director



Ms Ooi Chee Kar
Director

INDEPENDENT AUDITORS' REPORT

*Member of the Company
Singapore Eye Research Institute*

Report on the financial statements

We have audited the accompanying financial statements of Singapore Eye Research Institute (the Company), which comprise the balance sheet as at 31 March 2016, the statement of comprehensive income and statement of cash flows for the year then ended, and a summary of significant accounting policies and other explanatory information, as set out on pages FS1 to FS23.

Management's responsibility for the financial statements

Management is responsible for the preparation of financial statements that give a true and fair view in accordance with the provisions of the Singapore Companies Act, Chapter 50 (the Act), the Singapore Charities Act, Chapter 37 (the Charities Act) and Singapore Financial Reporting Standards, and for devising and maintaining a system of internal accounting controls sufficient to provide a reasonable assurance that assets are safeguarded against loss from unauthorised use or disposition; and transactions are properly authorised and that they are recorded as necessary to permit the preparation of true and fair financial statements and to maintain accountability of assets.

Auditors' responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with Singapore Standards on Auditing. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation of financial statements that give a true and fair view in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statement are properly drawn up in accordance with the provisions of the Act, the Charities Act and Singapore Financial Reporting Standards so as to give a true and fair view of the financial position of the Company as at 31 March 2016 and the financial performance and cash flows of the Company for the year ended on that date.

Report on other legal and Regulatory requirements

In our opinion, the accounting and other records required by the Act to be kept by the company have been proerply kept in accorfance with the provisions of the Act.

KPMG LLP
*Public Accountants and
Chartered Accountants*

Singapore

FINANCIAL STATEMENTS

Balance sheet

As at 31 March 2016

	Note	2016 \$	2015 \$
Assets			
Property, plant and equipment	4	6,333,389	6,733,513
Intangible assets	5	497,385	460,508
		<u>6,830,774</u>	<u>7,194,021</u>
Non-current assets			
Trade and other receivables	6	20,208,974	14,467,417
Prepayments		42,326	78,297
Cash and cash equivalents	8	8,165,271	9,149,768
		<u>28,416,571</u>	<u>23,695,482</u>
Current assets		<u>28,416,571</u>	<u>23,695,482</u>
Total assets		<u>35,247,345</u>	<u>30,889,503</u>
Accumulated fund			
	9	<u>3,075,144</u>	<u>7,505,449</u>
Non-current liability			
Deferred income	10	4,387,425	4,257,067
		<u>4,387,425</u>	<u>4,257,067</u>
Current liabilities			
Trade payables	11	2,551,928	2,593,639
Other payables	12	22,621,077	13,360,408
Deferred income	10	1,931,771	2,477,586
Employee benefits	13	680,000	695,354
		<u>27,784,776</u>	<u>19,126,987</u>
Total liabilities		<u>32,172,201</u>	<u>23,384,054</u>
Total accumulated fund and liabilities		<u>35,247,345</u>	<u>30,889,503</u>

Statement of comprehensive income

Year ended 31 March 2016

	Note	2016 \$	2015 \$
Operating expenditure grants	14	27,010,926	25,857,977
Amortisation of capital grants	18	1,703,939	1,595,623
Other income	15	3,222,247	4,728,993
		<u>31,937,112</u>	<u>32,182,593</u>
Staff costs		(17,230,143)	(17,776,135)
Supplies and consumables		(5,058,010)	(5,806,233)
Depreciation of property, plant and equipment	4	(1,698,143)	(1,563,191)
Amortisation of intangible assets	5	(232,618)	(154,364)
Rental and utilities		(3,766,297)	(2,922,655)
Purchased and contracted services		(2,740,040)	(504,446)
Repairs and maintenance		(928,146)	(697,148)
Other operating expenses		(4,695,592)	(1,460,907)
Results from operating activities		<u>(4,411,877)</u>	<u>1,297,514</u>
Finance costs	16	<u>(18,428)</u>	<u>(36,835)</u>
(Deficit)/surplus before tax		<u>(4,430,305)</u>	<u>1,260,679</u>
Tax expense	17	–	–
(Deficit)/surplus for the year	18	<u>(4,430,305)</u>	<u>1,260,679</u>
Other comprehensive income for the year, net of tax		–	–
Total comprehensive income for the year		<u>(4,430,305)</u>	<u>1,260,679</u>
Accumulated fund brought forward		<u>7,505,449</u>	<u>6,244,770</u>
Accumulated fund carried forward		<u><u>3,075,144</u></u>	<u><u>7,505,449</u></u>

The Company had no other changes in accumulated fund except for deficit for the year of \$4,430,305 (2015: surplus of \$1,260,679) for the financial year ended 31 March 2016.

Statement of Cash Flows

Year ended 31 March 2016

	Note	2016 \$	2015 \$
Cash flows from operating activities			
(Deficit)/surplus for the year		(4,430,305)	1,260,679
Adjustments for:			
Depreciation of property, plant and equipment	4	1,698,143	1,563,191
Loss on disposal of property, plant and equipment	18	2,470	148,416
Amortisation of intangible assets	5	232,618	154,364
Amortisation of deferred income	18	(1,703,939)	(1,595,623)
		<u>(4,201,013)</u>	<u>1,531,027</u>
Changes in working capital:			
Trade and other receivables		(5,741,557)	(4,489,474)
Prepayments		35,971	(78,297)
Trade and other payables		9,218,958	3,243,115
Employee benefits		(15,354)	39,969
Net cash (used in)/from operating activities		<u>(702,995)</u>	<u>246,340</u>
Cash flows from investing activities			
Purchase of property, plant and equipment		(1,300,701)	(1,660,108)
Purchase of intangible assets		(269,495)	(500,411)
Proceeds from disposal of property, plant and equipment		212	97,453
Grants for capital expenditure		1,288,482	1,673,186
Net cash used in investing activities		<u>(281,502)</u>	<u>(389,880)</u>
Net decrease in cash and cash equivalents		(984,497)	(143,540)
Cash and cash equivalents at beginning of the year		9,149,768	9,293,308
Cash and cash equivalents at end of the year	8	<u><u>8,165,271</u></u>	<u><u>9,149,768</u></u>

During the year, the Company acquired property, plant and equipment and intangible assets with an aggregate cost of \$1,570,196 (2015: \$2,160,519), of which \$1,288,482 (2015: \$1,673,186) was acquired using grants received.

NOTES TO THE FINANCIAL STATEMENTS

These notes form an integral part of the financial statements.

The financial statements were authorised for issue by the Board of Directors on

1. Domicile and activities

Singapore Eye Research Institute (the Company) is incorporated in the Republic of Singapore. The address of the Company's registered office is 31 Third Hospital Avenue, #03-03 Bowyer Block, Singapore 168753.

The principal activities of the Company are to carry out eye-related medical research projects.

The immediate, intermediate holding companies and ultimate holding party during the financial year are Singapore National Eye Centre Pte Ltd, Singapore Health Services Pte Ltd and MOH Holdings Pte Ltd, and Minister for Finance respectively. These companies were incorporated in the Republic of Singapore.

The Company, limited by guarantee, has been registered as a Charity, under the Charities Act, Cap. 37 with effect from 27 November 2002.

2. Basis of preparation

2.1 Statement of compliance

The financial statements have been prepared in accordance with Singapore Financial Reporting Standards (FRS).

2.2 Basis of measurement

The financial statements have been prepared on the historical cost basis except for certain financial assets and financial liabilities which are measured at fair values.

2.3 Functional and presentation currency

The financial statements are presented in Singapore dollars, which is the Company's functional currency.

2.4 Use of estimates and judgements

The preparation of financial statements in conformity with FRSs requires management to make judgements, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised in the period in which the estimates are revised and in any future periods affected.

There are no critical judgements in applying accounting policies that have significant effect on the amount recognised in the financial statements and no assumptions and estimation uncertainties that have a significant risk of resulting in a material adjustment within the next financial year.

Measurement of fair values

A few of the Company's accounting policies and disclosures require the measurement of fair values, for both financial and non-financial assets and liabilities.

When measuring the fair value of an asset or a liability, the Company uses market observable data as far as possible. Fair values are categorised into different levels in a fair value hierarchy based on the inputs used in the valuation techniques as follows:

- Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2: inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly (i.e., as prices) or indirectly (i.e., derived from prices).
- Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

If the inputs used to measure the fair value of an asset or a liability might be categorised in different levels of the fair value hierarchy, then the fair value measurement is categorised in its entirety in the same level of the fair value hierarchy as the lowest level input that is significant to the entire measurement (with Level 3 being the lowest).

The Company recognises transfers between levels of the fair value hierarchy as of the end of the reporting period during which the change has occurred.

Further information about the assumptions made in measuring fair values is included in note 19.

3. Significant accounting policies

The accounting policies set out below have been applied consistently to all periods presented in these financial statements, and have been applied consistently by the Company.

3.1 Foreign currency

Foreign currency transactions

Transactions in foreign currencies are translated to the functional currency of the Company at exchange rates at the dates of the transactions. Monetary assets and liabilities denominated in foreign currencies at the reporting date are retranslated to the functional currency at the exchange rate at that date. The foreign currency gain or loss on monetary items is the difference between amortised cost in the functional currency at the beginning of the year, adjusted for effective interest and payments during the year, and the amortised cost in foreign currency translated at the exchange rate at the end of the year.

Non-monetary assets and liabilities denominated in foreign currencies that are measured at fair value are retranslated to the functional currency at the exchange rate at the date that the fair value was determined. Non-monetary items in a foreign currency that are measured in terms of historical cost are translated using the exchange rate at the date of the transaction. Foreign currency differences arising on retranslation are recognised in surplus or deficit.

3.2 Financial instruments

Non-derivative financial assets

The Company initially recognises loans and receivables on the date that they are originated. All other financial assets (including assets designated at fair value through profit or loss) are recognised initially on the trade date, which is the date that the Company becomes a party to the contractual provisions of the instrument.

The Company derecognises a financial asset when the contractual rights to the cash flows from the asset expire, or it transfers the rights to receive the contractual cash flows on the financial asset in a transaction in which substantially all the risks and rewards of ownership of the financial asset are transferred, or it neither transfers nor retains substantially all of the risk and rewards of ownership and does not retain control over the transferred asset. Any interest in transferred financial assets that is created or retained by the Company is recognised as a separate asset or liability.

Financial assets and liabilities are offset and the net amount presented in the balance sheet when, and only when, the Company has a legal right to offset the amounts and intends either to settle on a net basis or to realise the asset and settle the liability simultaneously.

The Company classifies non-derivative financial assets into the following categories: loans and receivables.

Loans and receivables

Loans and receivables are financial assets with fixed or determinable payments that are not quoted in an active market. Such assets are recognised initially at fair value plus any directly attributable transaction costs. Subsequent to initial recognition, loans and receivables are measured at amortised cost using the effective interest method, less any impairment losses.

Loans and receivables comprise trade and other receivables, and cash and cash equivalents.

Cash and cash equivalents comprise cash and bank balances.

Non-derivative financial liabilities

The Company initially recognises all financial liabilities on the trade date, which is the date that the Company becomes a party to the contractual provisions of the instrument.

The Company derecognises a financial liability when its contractual obligations are discharged, cancelled or expire.

Financial assets and liabilities are offset and the net amount presented in the balance sheet when, and only when, the Company has a legal right to offset the amounts and intends either to settle on a net basis or to realise the asset and settle the liability simultaneously.

The Company classifies non-derivative financial liabilities into other financial liabilities category. Such financial liabilities are recognised initially at fair value plus any directly attributable transaction costs. Subsequent to initial recognition, these financial liabilities are measured at amortised cost using the effective interest method.

Other financial liabilities comprise employee benefits, trade payables and other payables.

The Company do not have any financial assets and financial liabilities that:

- are offset in the balance sheet; or
- are subject to an enforceable master netting arrangement, irrespective of whether they are offset in the balance sheet.

3.3 Property, plant and equipment

Recognition and measurement

Items of property, plant and equipment are measured at cost less accumulated depreciation and accumulated impairment losses.

Cost includes expenditure that is directly attributable to the acquisition of the asset. The cost of self-constructed assets includes:

- the cost of materials and direct labour;
- any other costs directly attributable to bringing the asset to a working condition for its intended use;
- when the Company has an obligation to remove the asset or restore the site, an estimate of the costs of dismantling and removing the items and restoring the site on which they are located; and
- capitalised borrowing costs.

Purchased software that is integral to the functionality of the related equipment is capitalised as part of that equipment.

Low value assets costing less than \$1,000 individually are written off in the period of outlay.

When parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

The gain or loss on disposal of an item of property, plant and equipment (calculated as the difference between the net proceeds from disposal and the carrying amount of the item) is recognised in surplus or deficit.

Subsequent costs

The cost of replacing a component of an item of property, plant and equipment is recognised in the carrying amount of the item if it is probable that the future economic benefits embodied within the component will flow to the Company, and its cost can be measured reliably. The carrying amount of the replaced component is derecognised. The costs of the day-to-day servicing of property, plant and equipment are recognised in surplus or deficit as incurred.

Depreciation

Depreciation is calculated based on the cost of an asset, less its residual value. Significant components of individual assets are assessed and if a component has a useful life that is different from the remainder of that asset, that component is depreciated separately.

Depreciation is recognised as an expense in surplus or deficit on a straight-line basis over the estimated useful lives of each component of an item of property, plant and equipment, unless it is included in the carrying amount of another asset.

Depreciation is recognised from the date that the property, plant and equipment are installed and are ready for use, or in respect of internally constructed assets, from the date that the asset is completed and ready for use.

The estimated useful lives for the current and comparative years are as follows:

Building improvements	3 to 10 years
Medical and laboratory equipment	3 to 8 years
Computers	3 years
Office equipment	5 years
Furniture and fittings	8 years

Depreciation methods, useful lives and residual values are reviewed at each financial year-end and adjusted if appropriate.

3.4 Intangible assets

Computer software, which is not an integral part of the related hardware, is accounted for as an intangible asset and is stated at cost less accumulated amortisation and accumulated impairment losses.

Subsequent expenditure

Subsequent expenditure is capitalised only when it increases the future economic benefits embodied in the specific asset to which it relates. All other expenditure, including expenditure on internally generated goodwill and brands, is recognised in surplus or deficit as incurred.

Amortisation

Amortisation is calculated based on the cost of asset, less its residual value.

Amortisation of computer software is recognised in surplus or deficit on a straight-line basis over its estimated useful life of 3 to 5 years, from the date that they are available for use.

Amortisation methods, useful lives and residual values are reviewed at each financial year-end and adjusted if appropriate.

3.5 Impairment

i. Non-derivative financial assets

A financial asset not carried at fair value through profit or loss is assessed at the end of each reporting period to determine whether there is objective evidence that it is impaired. A financial asset is impaired if objective evidence indicates that a loss event(s) has occurred after the initial recognition of the asset, and that the loss event(s) had a negative effect on the estimated future cash flows of that asset that can be estimated reliably.

Objective evidence that financial assets are impaired can include default or delinquency by a debtor, restructuring of an amount due to the Company on terms that the Company would not consider otherwise, indications that a debtor or issuer will enter bankruptcy, adverse changes in the payment status of borrowers or issuers in the group, economic conditions that correlate with defaults or the disappearance of an active market for a security.

Loans and receivables

The Company considers evidence of impairment for loans and receivables at both specific asset and collective level. All individually significant loans and receivables are assessed for specific impairment. All individually significant loans and receivables found not to be specifically impaired are then collectively assessed for any impairment that has been incurred but not yet identified. Loans and receivables that are not individually significant are collectively assessed for impairment by grouping together loans and receivables with similar risk characteristics.

In assessing collective impairment, the Company uses historical trends of the probability of default, timing of recoveries and the amount of loss incurred, adjusted for management's judgement as to whether current economic and credit conditions are such that the actual losses are likely to be greater or less than suggested by historical trends.

An impairment loss in respect of a financial asset measured at amortised cost is calculated as the difference between its carrying amount and the present value of the estimated future cash flows discounted at the asset's original effective interest rate. Losses are recognised in surplus or deficit and reflected in an allowance account against loans and receivables. Interest on the impaired asset continues to be recognised. When the Company considers that there are no realistic prospects of recovery of the asset, the relevant amounts are written off. If the amount of impairment loss subsequently decreases and the decrease can be related objectively to an event occurring after the impairment was recognised, then the previously recognised impairment loss is reversed through surplus or deficit.

ii. Non-financial assets

The carrying amounts of the Company's non-financial assets are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated. An impairment loss is recognised if the carrying amount of an asset or its related cash-generating unit (CGU) exceeds its estimated recoverable amount.

The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less costs to sell. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset or CGU. For the purpose of impairment testing, assets that cannot be tested individually are grouped together into the smallest group of assets that generates cash inflows from continuing use that are largely independent of the cash inflows of other assets or CGU.

Impairment losses are recognised in surplus or deficit. Impairment losses recognised in respect of CGUs are allocated to reduce the carrying amounts of the other assets in the CGU (group of CGUs) on a *pro rata* basis.

Impairment loss recognised in prior periods is assessed at each reporting date for any indications that the loss has decreased or no longer exists. An impairment loss is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortisation, if no impairment loss had been recognised.

3.6 Employee benefits

Defined contribution plans

A defined contribution plan is a post-employment benefit plan under which an entity pays fixed contributions into a separate entity and will have no legal or constructive obligation to pay further amounts. Obligations for contributions to defined contribution pension plans are recognised as an employee benefit expense in surplus or deficit in the periods during which related services are rendered by employees.

Short-term employee benefits

Short-term employee benefit obligations are measured on an undiscounted basis and are expensed as the related service is provided. A liability is recognised for the amount expected to be paid under short-term cash bonus or profit-sharing plans if the Company has a present legal or constructive obligation to pay this amount as a result of past service provided by the employee and the obligation can be estimated reliably.

3.7 Income recognition

Grant income

Grant income designated for research purposes is recognised in surplus or deficit when the relevant qualifying costs are incurred.

Grants which are designated for property, plant and equipment, and intangible assets purchases whose individual value of more than \$1,000 is taken to deferred income in the period of receipt. The deferred income is amortised over the useful life of the property, plant and equipment and intangible assets by crediting to the surplus or deficit an amount so as to match the related depreciation and amortisation expense.

Programme fees

Programme fees relate to fees or income which the Company receives when it carries out activities through direct service provision to undertake the work that contributes to its objectives. Programme fees are recognised in surplus or deficit when the relevant milestone is achieved.

3.8 Research

Expenditure on research activities, undertaken with the prospect of gaining new scientific or technical knowledge and understanding, is recognised in surplus or deficit as incurred.

3.9 Lease payments

Payments made under operating leases are recognised in surplus or deficit on a straight-line basis over the term of the lease. Lease incentives received are recognised as an integral part of the total lease expense, over the term of the lease.

3.10 Finance income and finance costs

Finance income comprises interest income on funds invested and net foreign currency gains that are recognised in surplus or deficit. Interest income is recognised as it accrues in surplus or deficit, using the effective interest method.

Finance costs comprise net foreign currency losses that are recognised in surplus or deficit.

Foreign currency gains and losses on financial assets and financial liabilities are reported on a net basis as either finance income or finance cost depending on whether foreign currency movements are in a net gain or net loss position.

3.11 Tax

The Company has been registered as a Charity, under Charities Act, Cap. 37 with effect from 27 November 2002. No provision for taxation has been made in the financial statements as the Company is a registered charity with income tax exemption.

3.12 New standards and interpretations not adopted

A number of new standards, amendments to standards and interpretations are effective for annual periods beginning after 1 April 2015, and have not been applied in preparing these financial statements. The Company is currently assessing the potential impact of adopting these new standards and interpretations, on the financial statements of the Company.

These new standards include, among others, FRS 115 Revenue from Contracts with Customers and FRS 109 Financial Instruments which are mandatory for the adoption by the Company on 1 April 2018.

- FRS 115 establishes a comprehensive framework for determining whether, how much and when revenue is recognised. It also introduces a new cost guidance which requires certain costs of obtaining and fulfilling contracts to be recognised as separate assets when specified criteria are met. When effective, FRS 115 replaces existing revenue recognition guidance, including FRS 18 Revenue, FRS 11 Construction Contracts, INT FRS 113 Customer Loyalty Programmes, INT FRS 115 Agreements for the Construction of Real Estate, INT FRS 118 Transfers of Assets from Customers and INT FRS 31 Revenue – Barter Transactions Involving Advertising Services.
- FRS 109 replaces most of the existing guidance in FRS 39 Financial Instruments: Recognition and Measurement. It includes revised guidance on classification and measurement of financial instruments, a new expected credit loss model for calculating impairment on financial assets, and new general hedge accounting requirements.

As FRS 115 and FRS 109, when effective, will change the existing accounting standards and guidance applied by the Company in accounting for revenue and financial instruments, these standards are expected to be relevant to the Company. The Company does not plan to adopt these standards early.

4. Property, plant and equipment

	Building Improvements	Medical and laboratory equipment	Computers	Office Equipment	Furniture and fittings	Total
	\$	\$	\$	\$	\$	\$
Cost						
At 1 April 2014	1,106,235	14,821,868	1,137,682	116,487	822,134	18,004,406
Additions	–	1,381,924	215,364	1,359	61,461	1,660,108
Disposals	(59,133)	(1,327,264)	(99,742)	–	(606,150)	(2,092,289)
At 31 March 2015	1,047,102	14,876,528	1,253,304	117,846	277,445	17,572,225
Additions	–	1,242,555	56,746	–	1,400	1,300,701
Disposals	–	(125,781)	–	–	–	(125,781)
At 31 March 2016	1,047,102	15,993,302	1,310,050	117,846	278,845	18,747,145
Accumulated depreciation						
At 1 April 2014	1,060,807	8,394,321	906,071	101,849	658,893	11,121,941
Depreciation charge for the year	9,449	1,368,000	144,484	5,056	36,202	1,563,191
Disposals	(44,590)	(1,163,796)	(99,742)	–	(538,292)	(1,846,420)
At 31 March 2015	1,025,666	8,598,525	950,813	106,905	156,803	10,838,712
Depreciation charge for the year	5,261	1,500,250	161,657	5,081	25,894	1,698,143
Disposals	–	(123,099)	–	–	–	(123,099)
At 31 March 2016	1,030,927	9,975,676	1,112,470	111,986	182,697	12,413,756
Carrying amounts						
At 1 April 2014	45,428	6,427,547	231,611	14,638	163,241	6,882,465
At 31 March 2015	21,436	6,278,003	302,491	10,941	120,642	6,733,513
At 31 March 2016	16,175	6,017,626	197,580	5,860	96,148	6,333,389

5. Intangible assets

	Computer software \$
Cost	
At 1 April 2014	744,773
Additions	500,411
At 31 March 2015	<u>1,245,184</u>
Additions	269,495
At 31 March 2016	<u><u>1,514,679</u></u>
Accumulated amortisation	
At 1 April 2014	630,312
Amortisation charge for the year	154,364
At 31 March 2015	<u>784,676</u>
Amortisation charge for the year	232,618
At 31 March 2016	<u><u>1,017,294</u></u>
Carrying amounts	
At 1 April 2014	114,461
At 31 March 2015	<u>460,508</u>
At 31 March 2016	<u><u>497,385</u></u>

6. Trade and other receivables

	Note	2016 \$	2015 \$
Deposits and other receivables	7	19,264,842	13,489,578
Trade amounts due from:			
- Immediate holding company		325,778	284,877
- Intermediate holding company		581,502	277,757
- Related corporations		36,852	415,205
		<u>20,208,974</u>	<u>14,467,417</u>

Outstanding balances with related parties are unsecured. There are no allowance for doubtful debts arising from these outstanding balances.

The Company's exposure to credit and currency risks is disclosed in note 19.

7. Deposits and other receivables

	Note	2016 \$	2015 \$
Deposits		15,568	15,567
Receivables from funding bodies		18,328,717	12,074,507
Grant receivables from third parties		875,122	1,391,212
Sundry receivables		45,435	8,292
	6	<u>19,264,842</u>	<u>13,489,578</u>

Receivables from funding bodies are non-interest bearing and have no credit terms.

8. Cash and cash equivalents

	2016 \$	2015 \$
Cash at bank and in hand	<u>8,165,271</u>	<u>9,149,768</u>

9. Accumulated fund

The Company is limited by guarantee and has no share capital. In the event of a winding up of the Company, the liability of each member of the Company is limited to such amount as may be required, but not exceeding the sum of one hundred dollars (\$100). The accumulated fund represents the cumulative surplus of the Company.

The Company's reserve policy is to maintain funds at a minimum sufficient to cover budgeted operating and capital cost for the current fiscal year.

Capital management

Capital comprises the accumulated fund of the Company. The Company's operation is funded primarily from grants from various funding bodies and loan from immediate holding company. There was no change in the Company's approach to capital management during the year. The Company is not subject to externally imposed capital requirements.

10. Deferred income

	2016 \$	2015 \$
At cost	19,211,228	18,045,845
Less: Accumulated amortisation:		
At 1 April	11,311,192	11,438,659
Amortisation for the year	1,703,939	1,595,623
Disposal of assets funded by grants	(123,099)	(1,723,090)
At 31 March	12,892,032	11,311,192
	<u>6,319,196</u>	<u>6,734,653</u>
Non-current	4,387,425	4,257,067
Current	1,931,771	2,477,586
	<u>6,319,196</u>	<u>6,734,653</u>

Deferred income relates to capital expenditure grants (note 14) received for the purchase of property, plant and equipment ("PPE") and intangible assets ("IA"). Deferred income is amortised over the periods necessary to match the depreciation of the PPE and amortisation of the IA purchased with the related grants.

11. Trade payables

	2016 \$	2015 \$
Trade payables	1,650,257	1,171,400
Amounts due to:		
- Immediate holding company (trade)	382,058	891,498
- Intermediate holding company (trade)	435,258	508,940
- Related corporations (trade)	84,355	21,801
	<u>2,551,928</u>	<u>2,593,639</u>

The Company's exposure to currency and liquidity risks related to trade payables is disclosed in note 19.

12. Other payables

	2016	2015
	\$	\$
Pledged donations	3,000,000	–
Accrued operating expenses	9,885,146	5,530,290
Loans from immediate holding company	6,000,000	6,000,000
Research grants received in advance from government	1,161,613	219,633
Research grants received in advance from third parties	2,573,378	1,609,545
Refundable deposits	940	940
	<u>22,621,077</u>	<u>13,360,408</u>

Pledged donations relate to donations by the Company to Duke-NUS Medical School amounting to \$3,000,000 (2015: \$nil).

Loans from immediate holding company are unsecured, interest-free and repayable on demand.

The Company's exposure to currency and liquidity risks related to other payables is disclosed in note 19.

13. Employee benefits

	2016	2015
	\$	\$
Liability for short-term accumulating compensated absences	<u>680,000</u>	<u>695,354</u>

14. Operating / Capital expenditure grants

These grants are received mainly from National Medical Research Council, Biomedical Research Council, Singhealth Foundation, Singapore Health Services Pte Ltd, Singapore National Eye Centre Pte Ltd and SNEC Health Research Endowment Fund for research projects.

15. Other income

	2016	2015
	\$	\$
Other research grant and programme fees	2,953,904	4,447,581
Other miscellaneous income	268,343	281,412
	<u>3,222,247</u>	<u>4,728,993</u>

16. Finance costs

	2016 \$	2015 \$
Exchange loss (net)	(18,428)	(36,835)

17. Tax expense

The Company is a non-profit organisation registered with the Commissioner of Charities under the Singapore Charities Act. With effect from Year of Assessment 2008, all registered and exempt charities will enjoy automatic income tax exemption. Thus, no provision for taxation was made in the financial statements.

18. Surplus for the year

The following items have been included in arriving at surplus for the year:

	Note	2016 \$	2015 \$
Amortisation of deferred income	10	(1,703,939)	(1,595,623)
Temporary occupation licence ("TOL") and other operating lease expense		2,970,957	2,802,764
Contributions to defined contribution plan included in staff costs		1,707,359	1,917,504
Loss on disposal of property, plant and equipment		2,470	148,416
Donation expense		3,000,000	–

19. Financial risk management

Overview

The Company has exposure to the following risks from its use of financial instruments:

- credit risk
- liquidity risk
- market risk

This note presents information about the Company's exposure to each of the above risks, the Company's objectives, policies and processes for measuring and managing risk.

Risk management framework

Risk management is integral to the whole business of the Company. The Company has a system of controls in place to create an acceptable balance between cost of risks and the cost of managing the risks. The management continually monitors the Company's risk management process to ensure that an appropriate balance between risk and control is achieved. Risk management policies and systems are reviewed regularly to reflect changes in market conditions and the Company's activities.

Credit risk

Credit risk is the risk of financial loss to the Company if a customer or counterparty to a financial instrument fails to meet its contractual obligations, arises principally from the funding bodies and related parties, as and when they fall due.

The carrying amount of financial assets in the balance sheet represents the Company's respective maximum exposure to credit risk, before taking into account any collateral held. The Company does not hold any collateral in respect of its financial assets.

Cash is placed with financial institutions which are regulated.

At the reporting date, there is no significant concentration of credit risk.

	2016	2015
	\$	\$
Funding bodies	18,328,717	12,074,507
Corporations	1,880,257	2,392,910
	<u>20,208,974</u>	<u>14,467,417</u>

The funding bodies and corporations are established and reputable institutions which management regarded the associated credit risk to be minimum.

Impairment losses

The ageing of trade and other receivables that were not impaired at the reporting date was:

	2016	2015
	\$	\$
Not past due	19,839,770	14,248,000
Past due 1 – 30 days	18,628	75,101
Past due 31 – 150 days	116,729	49,476
Past due over 150 days	233,847	94,840
	<u>20,208,974</u>	<u>14,467,417</u>

Liquidity risk

Liquidity risk is the risk that the Company will encounter difficulty in meeting the obligations associated with its financial liabilities that are settled by delivering cash or another financial asset. The Company's approach to managing liquidity is to ensure, as far as possible, that it will always have sufficient liquidity to meet its liabilities when due under normal and stressed conditions without incurring unacceptable losses or risking damage to the Company's reputation.

The Company's operation is funded primarily from grants from National Medical Research Council and loans from immediate holding company. As such, the Company's exposure to liquidity risk is minimised.

The Company monitors its liquidity risk and maintains a level of cash and cash equivalents deemed adequate by management to finance the Company's operations and to mitigate the effects of fluctuations in cash flows.

The following are the contractual maturities of financial liabilities, including estimated interest payments and excluding the impact of netting agreements:

	Note	Carrying amount \$	Total contractual cash flows \$	Within 1 year \$
2016				
Non-derivative financial liabilities				
Trade payables	11	2,551,928	(2,551,928)	(2,551,928)
Other payables*	12	18,886,086	(18,886,086)	(18,886,086)
Employee benefits	13	680,000	(680,000)	(680,000)
		<u>22,118,014</u>	<u>(22,118,014)</u>	<u>(22,118,014)</u>
2015				
Non-derivative financial liabilities				
Trade payables	11	2,593,639	(2,593,639)	(2,593,639)
Other payables*	12	11,531,230	(11,531,230)	(11,531,230)
Employee benefits	13	695,354	(695,354)	(695,354)
		<u>14,820,223</u>	<u>(14,820,223)</u>	<u>(14,820,223)</u>

*Excludes research grants received in advance from government and third parties

Market risk

Market risk is the risk that changes in market prices, such as interest rates, foreign exchange rates and equity prices will affect the Company's income or the value of its holdings of financial instruments. The objective of market risk management is to manage and control market risk exposures within acceptable parameters, while optimising the return.

Interest rate risk

The Company has no significant exposure to interest rate risk.

Foreign currency risk

The financial assets and liabilities of the Company are primarily denominated in Singapore dollars.

The Company has no significant exposure to foreign currency risk.

Accounting classifications and fair values

The carrying amounts of recognized financial assets and liabilities which are not measured at fair value as shown in the balance sheet are as follows. It does not include fair value information for financial assets and financial liabilities not measured at fair value if the carrying amount is a reasonable approximation of fair value.

The carrying amounts of financial assets and liabilities with a maturity of less than one year (including trade and other receivables, cash and cash equivalents, trade payables, other payables and employee benefits) approximate their fair values because of the short period to maturity.

	Note	Loans and receivables \$	Other financial liabilities \$	Total carrying amount \$
31 March 2016				
Financial assets not measured at fair value				
Cash and cash equivalents	8	8,165,271	–	8,165,271
Trade and other receivables	6	20,208,974	–	20,208,974
		<u>28,374,245</u>	<u>–</u>	<u>28,374,245</u>

Financial liabilities not measured at fair value

Trade payables	11	–	(2,551,928)	(2,551,928)
Other payables	12	–	(22,621,077)	(22,621,077)
Employee benefits	13	–	(680,000)	(680,000)
		<u>–</u>	<u>(25,853,005)</u>	<u>(25,853,005)</u>

31 March 2015

Financial assets not measured at fair value

Cash and cash equivalents	8	9,149,768	–	9,149,768
Trade and other receivables	6	14,467,417	–	14,467,417
		<u>23,617,185</u>	<u>–</u>	<u>23,617,185</u>

Financial liabilities not measured at fair value

Trade payables	11	–	(2,593,639)	(2,593,639)
Other payables	12	–	(13,360,408)	(13,360,408)
Employee benefits	13	–	(695,354)	(695,354)
		<u>–</u>	<u>(16,649,401)</u>	<u>(16,649,401)</u>

20. Commitments

At 31 March 2016, the Company has commitments for future minimum lease payments under non-cancellable operating leases (including those under Temporary Occupation License) as follows:

	2016 \$	2015 \$
Within 1 year	2,735,810	2,738,118
After 1 year but within 5 years	10,876,774	10,905,570
	<u>13,612,584</u>	<u>13,643,688</u>

The operating lease commitments mainly relate to the lease of space and office equipment. The leases run for a period of one to five years with an option to renew the lease after that date.

21. Related parties

Collectively, but not individually significant transactions

The Company charges its immediate holding company for manpower services provided and purchases services from its intermediate holding company, immediate holding company and related corporations.

Other related party transactions

Other than disclosed elsewhere in the financial statements, the transactions with related parties are as follows:

	2016	2015
	\$	\$
Sale of manpower services		
Immediate holding company	(893,625)	(897,011)
Related corporation	–	(75,386)
Sale of other services		
Immediate holding company	(318)	(700)
Related corporation	(1,334)	(9,968)
Purchase of manpower services		
Immediate holding company	404,192	–
Related corporation	19,240	–
Purchase of other services		
Intermediate holding company	11,308	–
Immediate holding company	213,926	404,400
Related corporations	268,709	197,809
Purchase of supplies and consumables		
Intermediate holding company	1,224,051	1,112,901
Immediate holding company	8,762	2,647
Related corporations	–	187,579
Other expenses paid/payable		
Intermediate holding company	3,646,854	78,023
Immediate holding company	183,241	248,804
Related corporations	43,351	32,896

The Company occupies space at the premises of its intermediate and immediate holding companies. The current year rental of \$225,855 (2015: \$341,862) is waived by the immediate holding company.

Key management personnel remuneration

Key management personnel of the Company are those persons having the authority and responsibility for planning, directing and controlling the activities of the Company. The senior management are considered as key management personnel of the Company.

Key management personnel remuneration recognised in the statement of comprehensive income is as follows:

	2016	2015
	\$	\$
Key management personnel		
- short-term employee benefits	1,334,675	1,543,485
- contribution to defined contribution plan	49,213	64,184
	<u>1,383,888</u>	<u>1,607,669</u>

In compliance with the Code of Corporate Governance for Charities and Institutions of a Public Character - Guideline 8.3, the annual remuneration of the Company's three highest paid staff who each received remuneration exceeding \$100,000, in the following bands in the year are as follows:

	2016	2015
Number of personnel in bands:		
- \$200,001 to \$300,000	2	1
- \$300,001 to \$400,000	-	1
- \$400,001 to \$500,000	1	1
	<u>1</u>	<u>1</u>