

# International Society for Clinical Electrophysiology of Vision Annual Symposium 2022

## British Society for Clinical Electrophysiology of Vision Conference 2022

Central Teaching Hub, The University of Liverpool, Liverpool, UK

3–6 August 2022

### Scientific Programme

Wednesday 3<sup>rd</sup> August 09:00

Oral Session 1: Retina

Chairs: Dr Jason McAnany, Professor Carl Arndt

#### 09:00 O1 01 Predicting ERG group in *ABCA4*-retinopathy by machine learning and scoring of variant severity

Omar A Mahroo<sup>1,2,3</sup>, Antonio Calcagni<sup>1,2</sup>, Sophie Glinton<sup>1,2</sup>, Watjana Lilaonitkul<sup>2</sup>, Nikolas Pontikos<sup>1,2</sup>, Gongyu Zhang<sup>1,2</sup>, Sandra Vermeirsch<sup>1</sup>, Gavin Arno<sup>1,2</sup>, Michel Michaelides<sup>1,2</sup>, Siegfried Wagner<sup>1,2</sup>, Pearse A Keane<sup>1,2</sup>, Andrew R Webster<sup>1,2</sup>, Anthony G Robson<sup>1,2</sup>

<sup>1</sup>Moorfields Eye Hospital, London, United Kingdom. <sup>2</sup>University College London, London, United Kingdom. <sup>3</sup>King's College London, London, United Kingdom

#### 09:15 O1 02 ERG is specific for and correlates with severity of Pantothenate Kinase-Associated Neurodegeneration

Robert Spaul<sup>1,2</sup>, Audrey KS Soo<sup>1,2</sup>, Apostolos Papatheou<sup>1,2</sup>, Allison Gregory<sup>3</sup>, Penelope Hogarth<sup>3</sup>, Susan J Hayflick<sup>3</sup>, Manju A Kurian<sup>1,2</sup>, Dorothy A Thompson<sup>4</sup>

<sup>1</sup>Molecular Neurosciences, Developmental Neurosciences, Zayed Centre for Research into Rare Disease in Children, UCL Great Ormond Street Institute of Child Health, UCL, London, United Kingdom. <sup>2</sup>Department of Neurology, Great Ormond Street Hospital for Children, London, United Kingdom. <sup>3</sup>Departments of Molecular & Medical Genetics and Neurology, Oregon Health & Science University, Portland, Oregon, USA. <sup>4</sup>Tony Kriss Visual Electrophysiology Unit, Clinical and Academic Department of Ophthalmology, Great Ormond Hospital for Children, London, United Kingdom

#### 09:30 O1 03 Vessel density and photopic negative response changes in glaucoma

Zainab Alrikabi, Lorraine Cameron, Uma Shahani, Andrew Logan

Glasgow Caledonian University, Glasgow, United Kingdom

#### 09:45 O1 04 Bornholm eye disease; an overlooked diagnosis

Dzenita Smailhodzic<sup>1,2</sup>, Timo W.F. Mulders<sup>3</sup>, Gerard de Wit<sup>1</sup>, Lonneke Haer-Wigman<sup>4</sup>, Carel H. Hoyng<sup>3</sup>, Ingeborgh van den Born<sup>2</sup>, Jeroen B. Klevering<sup>3</sup>, Maria M. van Genderen<sup>1,5</sup>

<sup>1</sup>Bartiméus Diagnostic Center for Complex Visuals Disorders, Zeist, Netherlands. <sup>2</sup>The Eye Hospital, Rotterdam, Netherlands. <sup>3</sup>Department of Ophthalmology Radboud UMC, Nijmegen, Netherlands. <sup>4</sup>Department of Human Genetics Radboud UMC, Nijmegen, Netherlands. <sup>5</sup>Department of Ophthalmology, Utrecht Medical Center, Utrecht, Netherlands

#### 10:00 O1 05 *GUCY2D*-associated cone-rod dystrophy: Identifying best correlates for natural history studies

John R Grigg<sup>1,2</sup>, Amanda J Scopelliti<sup>1</sup>, Elizabeth H Barnes<sup>3</sup>, Elisa E Cornish<sup>1,2</sup>, Benjamin M Nash<sup>2,4</sup>, Robyn V Jamieson<sup>1,2</sup>

<sup>1</sup>Save Sight Institute, The University of Sydney, Sydney, Australia. <sup>2</sup>Eye Genetics Research Unit, Sydney Children's Hospitals Network, Save Sight Institute, Children's Medical Research Institute, The University of Sydney, Sydney, Australia. <sup>3</sup>NHMRC Clinical Trials Centre, University of Sydney, Sydney, Australia. <sup>4</sup>Sydney Genome Diagnostics, Western Sydney Genetics Program, Sydney Children's Hospitals Network, Sydney, Australia

#### 10:15 O1 06 The clinical and electrophysiological features of *CRB1*-associated retinal dystrophies

Anthony G Robson<sup>1,2</sup>, Malena Daich Varela<sup>1,2</sup>, Michalis Georgiou<sup>1,2,3</sup>, Shaheeni Khoda<sup>1</sup>, Kaoru Fujinami<sup>1,2,4</sup>, Yu Fujinami-Yokokawa<sup>2,4,5</sup>, Andrew R Webster<sup>1,2</sup>, Michel Michaelides<sup>1,2</sup>

<sup>1</sup>Moorfields Eye Hospital, London, United Kingdom. <sup>2</sup>UCL Institute of Ophthalmology, London, United Kingdom. <sup>3</sup>Jones Eye Institute, Little Rock, USA. <sup>4</sup>National Institute of Sensory Organs, National Hospital Organization Tokyo Medical Centre, Tokyo, Japan. <sup>5</sup>Keio University, Tokyo, Japan

**Wednesday 3<sup>rd</sup> August**  
**Introduction: Dr Richard Hagan**

**11:00 The William W. Dawson Memorial Lecture.** ‘Probing visual function in children using steady state sweep VEP’, Mr Arvind Chandna, Smith Kettlewell Eye Research Institute, San Francisco, USA.

**Wednesday 3<sup>rd</sup> August**  
**13:30 Poster Session 1 (odd numbered posters)**  
**Moderators: Dr Deepthy Jayakrishnan, Dr Clare Warriner**

**P1 01 Effect of nutraceutical supplementation on redox status and mfERG on retinitis pigmentosa patients**

Emilio González-García<sup>1</sup>, Lorena Olivares-González<sup>2,3</sup>, David Salom<sup>4,5</sup>, David Hervás<sup>6</sup>, Natalia Mejía-Chiqui<sup>2</sup>, Mar Melero<sup>7</sup>, Sheyla Velasco<sup>2</sup>, Bianca T Muresan<sup>8</sup>, Isabel Campillo<sup>2</sup>, Nieves Vila-Clérigues<sup>7</sup>, Eduardo López Briz<sup>7</sup>, Juan Francisco Merino-Torres<sup>9,10</sup>, Jose María Millán<sup>3,5,11</sup>, Jose Miguel Soriano Del Castillo<sup>10,12</sup>, Regina Rodrigo<sup>13,3,5</sup>

<sup>1</sup>Manises Hospital, Department of Neuroscience, Valencia, Spain. <sup>2</sup>Principe Felipe Research Center (CIPF), Valencia, Spain. <sup>3</sup>Joint Research Unit on Rare Diseases CIPF-Health Research Institute Hospital La Fe (IIS-La Fe), Valencia, Spain. <sup>4</sup>Manises Hospital. Department of Ophthalmology, Valencia, Spain. <sup>5</sup>Center for Biomedical Network Research on Rare Diseases (CIBERER), Madrid, Spain. <sup>6</sup>Universitat Politècnica de València, Department of Applied Statistics, Operations Research and Quality, Valencia, Spain. <sup>7</sup>Service of Pharmacy, La Fe University and Polytechnic Hospital, Valencia, Spain. <sup>8</sup>Service of Endocrinology and Nutrition, University General Hospital, Valencia, Spain. <sup>9</sup>Service of Endocrinology and Nutrition, La Fe University and Polytechnic Hospital, Valencia, Spain. <sup>10</sup>Joint Research Unit on Endocrinology, Nutrition and Clinical Dietetics UV-IIS La Fe, Valencia, Spain. <sup>11</sup>Molecular, Cellular and Genomic Biomedicine, IIS-La Fe, Valencia, Spain. <sup>12</sup>Food & Health Laboratory, Institute of Materials Science, University of Valencia (UV), Valencia, Spain. <sup>13</sup>Pathophysiology and Therapies for Vision Disorders, Principe Felipe Research Center (CIPF), Valencia, Spain

**P1 03 A novel approach to analyse white noise ERGs in mice**

Nina Stallwitz<sup>1,2</sup>, Annela Joachimsthaler<sup>1,2</sup>, Jan Kremers<sup>1</sup>

<sup>1</sup>University Hospital, Erlangen, Germany. <sup>2</sup>Friedrich-Alexander Universität, Erlangen-Nürnberg, Germany

**P1 05 The annual carbon footprint of a visual electrodiagnostic service**

Joanne Cowe, Julie Kempton

University Hospitals of Leicester NHS Trust, Leicester, United Kingdom

**P1 07 The effect of fixation location on full-field ERG waveforms**

David T Murray, Julie Kempton, Joanne Cowe

Medical Physics Department, University Hospitals of Leicester NHS Trust, Leicester, United Kingdom

**P1 09 Morphological and electrofunctional evaluation of ganglion cells in pre-perimetric glaucoma**

Viviana D'Alterio<sup>1</sup>, Gennaro Ambrosio<sup>1</sup>, Ciro Costagliola<sup>1</sup>, Lucia Ambrosio<sup>1,2</sup>

<sup>1</sup>Eye Clinic Department of Neuroscience, Reproductive and Odontostomatological Sciences, University of Naples Federico II, Naples, Italy. <sup>2</sup>Department of Public Health, University of Naples Federico II, Naples, Italy

**P1 11 Investigating the relationship between visual electrophysiology results, phenotype and genotype of patients assessed at an ocular-genetics service**

Clodagh Duffy<sup>1,2</sup>, Sarah Francis<sup>1,2</sup>, David F Gilmour<sup>1</sup>, Daniela T Pilz<sup>1,3</sup>, Sinead M Walker<sup>1,2</sup>

<sup>1</sup>Glasgow Centre for Ophthalmic Research, Gartnavel General Hospital, Glasgow, United Kingdom. <sup>2</sup>Medical Devices Unit, Glasgow, United Kingdom. <sup>3</sup>West of Scotland Genetics Service, Queen Elizabeth University Hospital, Glasgow, United Kingdom

**P1 13 Flicker ERG in preterm infants**

Aylin Taner<sup>1</sup>, James V.M. Hanson<sup>1</sup>, Caroline Weber<sup>2</sup>, Dirk Bassler<sup>2</sup>, Daphne L. McCulloch<sup>3</sup>, Christina Gerth-Kahlert<sup>1</sup>

<sup>1</sup>Department of Ophthalmology, University Hospital Zurich and University of Zurich, Zurich, Switzerland. <sup>2</sup>Newborn Research, Department of Neonatology, University Hospital Zurich and University of Zurich, Zurich, Switzerland. <sup>3</sup>School of Optometry and Vision Science, University of Waterloo, Waterloo, Canada

**P1 15 Unusual OCT findings in a patient with CABP4-associated retinopathy**

Jit Kai Tan<sup>1,2</sup>, Omar Mahroo<sup>3,4</sup>

<sup>1</sup>GKT School of Medical Education, London, United Kingdom. <sup>2</sup>UCL Institute of Ophthalmology, London, United Kingdom. <sup>3</sup>Guy's and St Thomas' NHS Foundation Trust, London, United Kingdom. <sup>4</sup>Moorfields Eye Hospital NHS Foundation Trust, London, United Kingdom

**P1 17 How onset VEP can help in neurosurgical decision-making in infants.**

Eszter Mikó -Baráth<sup>1,2</sup>, Valéria Gaál<sup>3</sup>, János Radó<sup>1,2</sup>, Gábor Jandó<sup>1,2</sup>

<sup>1</sup>Institute of Physiology, Medical School, University of Pécs, Pécs, Hungary. <sup>2</sup>Centre for Neuroscience, University of Pécs, Pécs, Hungary. <sup>3</sup>Department of Ophthalmology, Medical School, University of Pécs, Pécs, Hungary

**P1 19 Comparison of mfERG recordings with DTL and gold cup skin electrodes**

Khaldoon O. Al-Nosairy, Theresa Eckermann, Michael B. Hoffmann

Otto-von-Guericke, Magdeburg, Germany

**P1 21 Visual electrophysiology phenotype in children with BBS1 mutation causing Bardet-Biedl Syndrome (BBS)**

Ajeeta Patel<sup>1</sup>, Elizabeth Forsythe<sup>2</sup>, Sian E. Handley<sup>1,2</sup>, Robert Henderson<sup>2,3</sup>, William Moore<sup>3</sup>, Oliver R. Marmoy<sup>1,2</sup>, Dorothy A. Thompson<sup>1,2</sup>

<sup>1</sup>Tony Kriss Visual Electrophysiology Unit, Great Ormond Street Hospital for Children, London, United Kingdom. <sup>2</sup>UCL Great Ormond Street Institute of Child Health, University College London, London, United Kingdom. <sup>3</sup>Clinical and Academic Department of Ophthalmology, Great Ormond Street Hospital for Children, London, United Kingdom

**P1 23 Electroretinographic evaluation with skin electrodes in eyes with intraocular lymphoma**

Jun Makita, Yuji Yoshikawa, Tomoyuki Kumagai, Yuro Igawa, Shunichiro Takano, Takeshi Katsumoto, Takuhei Shoji, Masayuki Shibuya, Kei Shinoda

Department of Ophthalmology, Saitama Medical University, Iruma-Gun, Japan

**P1 25 Phenotypical variation with age in CERKL gene related retinitis pigmentosa in a single family**

Deepika C Parameswarappa

LV Prasad Eye Institute, Hyderabad, India

**P1 27 Full field electroretinogram in ocular siderosis**

Deepika C Parameswarappa

LV Prasad Eye Institute, Hyderabad, India

**P1 29 Evidence of both optic nerve and inner retinal dysfunction in patients with neuromyelitis optica**

Anisah Kalam<sup>1</sup>, Anne L Georgiou<sup>1</sup>, Magella M Neveu<sup>1,2</sup>, Antonio Calcagni<sup>1,2</sup>, Neringa Jurkute<sup>2,1</sup>, Anthony G Robson<sup>1,2</sup>

<sup>1</sup>Moorfields Eye Hospital, London, United Kingdom. <sup>2</sup>UCL Institute of Ophthalmology, London, United Kingdom

**P1 31 Macular function after pneumatic vitreolysis**

Louis Philippe Dormegnie<sup>1</sup>, Sophie Gruchociak<sup>2</sup>, Carl F Arndt<sup>1</sup>

<sup>1</sup>Reims University Hospital, Reims, France. <sup>2</sup>Pole Ophtalmologique de Champagne, Bezannes, France

**P1 33 Need for two types of visual stimulator for recording the VEP in patients with anti-seizure treatment**

Seyed Mohammad Masoud Shushtarian

Department of Biophysics and Biochemistry, Faculty of Advance Science and Technology, Tehran Medical Sciences, Islamic Azad University, Tehran, Islamic Republic of Iran

**Wednesday 3rd August**  
**Oral Session 2: Extending Techniques**  
**Chairs: Dr Jasleen Jolly, Dr Vikki McBain**

**15:00 O2 01      Effect of test flash duration on the Photopic Negative Response (PhNR)**

Suresh Viswanathan<sup>1</sup>, Behrad Garmsiri<sup>1</sup>, Ashwin Badrinath Pothiadia-Irungovel<sup>1</sup>, Sarah Gleason<sup>1</sup>, Jeffrey Farmer<sup>2</sup>

<sup>1</sup>State University of New York, New York, USA. <sup>2</sup>Diagnosys LLC, Lowell, USA

**15:15 O2 02      Correlation between OP magnitude and area under the curve of the photopic negative response**

Sara Safari<sup>1</sup>, Emanuel Boyer III<sup>1</sup>, Katherine Tsay<sup>1</sup>, Christopher Passaglia<sup>2</sup>, Jan Kremers<sup>3</sup>, Radouil Tzekov<sup>2,4</sup>

<sup>1</sup>University of South Florida, Morsani College of Medicine, Tampa, USA. <sup>2</sup>University of South Florida, Department of Medical Engineering, Tampa, USA. <sup>3</sup>University Hospital Erlangen, Section for Retinal Physiology, Erlangen, Germany. <sup>4</sup>University of South Florida, Department of Ophthalmology, Tampa, USA

**15:30 O2 03      The diagnostic accuracy of broadband versus chromatic photopic negative response stimuli**

Shaun Leo<sup>1,2</sup>, Magella M Neveu<sup>1,2</sup>, Patrick Yu-Wai-Man<sup>1,2,3</sup>, Omar A Mahroo<sup>1,2,4</sup>, Anthony G Robson<sup>1,2</sup>

<sup>1</sup>Moorfields Eye Hospital, London, United Kingdom. <sup>2</sup>Institute of Ophthalmology, University College London, London, United Kingdom. <sup>3</sup>Cambridge Centre for Brain Repair and MRC Mitochondrial Biology Unit, Department of Clinical Neurosciences, University of Cambridge, Cambridge, United Kingdom. <sup>4</sup>Department of Ophthalmology, King's College London, London, United Kingdom

**15:45 O2 04      Using dim blue flash stimuli to elicit predominantly rod driven ERGs with minimal dark adaptation**

Katrina L Prise<sup>1</sup>, Dorothy A Thompson<sup>1,2</sup>, Oliver R Marmoy<sup>1,2,3</sup>

<sup>1</sup>Tony Kriss Visual Electrophysiology Unit, Clinical and Academic Department of Ophthalmology, Great Ormond Street Hospital for Children, London, United Kingdom. <sup>2</sup>UCL-GOS Institute for Child Health, University College London, London, United Kingdom. <sup>3</sup>Manchester Metropolitan University, Manchester, United Kingdom

**16:00 O2 05      Use of a portable ERG system for ON-OFF ERGs in congenital stationary night blindness**

Mahnoor Z Malik<sup>1</sup>, Xiaofan Jiang<sup>1,2,3</sup>, Zihe Xu<sup>3</sup>, Isabelle Chow<sup>4</sup>, Christopher J. Hammond<sup>3,4</sup>, Andrew R. Webster<sup>1,2</sup>, Omar A. Mahroo<sup>1,2,3</sup>

<sup>1</sup>Institute of Ophthalmology, University College London, London, United Kingdom. <sup>2</sup>Genetics Service, Moorfields Eye Hospital, London, United Kingdom. <sup>3</sup>Section of Ophthalmology, King's College London, St Thomas' Hospital Campus, London, United Kingdom. <sup>4</sup>Department of Ophthalmology, St Thomas' Hospital, London, United Kingdom

**16:15 O2 06      The effect of sinusoidally modulating backgrounds on flash electroretinograms**

Jan Kremers, Avinash J Aher, Cord Huchzermeyer

University Hospital Erlangen, Erlangen, Germany

**16:30 O2 07      Slope between the positive and negative ERG waves in patients with open-angle glaucoma**

Maja Sustar Habjan, Barbara Cvenkel

Department of Ophthalmology, University Medical Centre Ljubljana, Ljubljana, Slovenia

**Wednesday 3rd August**

**16:45 Prizegiving for BriSCEV registrants:** Chair, Dr Dorothy Thompson, BriSCEV Chair

**Thursday 4<sup>th</sup> August**  
**Oral Session 3: What Is Normal?**  
**Chairs: Dr Tony Robson, Dr Maja Šuštar Habjan**

**09:00 O3 01 Eye diseases associated with supernormal flicker ERGs**

Mineo Kondo, Kumiko Kato, Kengo Ikesugi, Masahiko Sugimoto, Hisashi Matsubara  
Mie University, Tsu, Japan

**09:15 O3 02 Exploring longitudinal changes in flicker ERG peak times with age in an adult cohort**

Xiaofan Jiang<sup>1,2</sup>, Diana Kozareva<sup>2</sup>, Isabelle Chow<sup>2</sup>, Andrew R. Webster<sup>1,3</sup>, Pirro G. Hysi<sup>2</sup>, Christopher J. Hammond<sup>2</sup>, Omar A. Mahroo<sup>1,2,3</sup>

<sup>1</sup>UCL Institute of Ophthalmology, London, United Kingdom. <sup>2</sup>Departments of Ophthalmology and Department of Twin Research and Genetic Epidemiology, King's College London, St Thomas' Hospital Campus, London, United Kingdom. <sup>3</sup>Retinal Service, Moorfields Eye Hospital, London, United Kingdom

**09:30 O3 03 Effect of shortened dark adaptation on the ERG – findings from a patient cohort**

Jessica Concannon<sup>1</sup>, Waiel Elzamzami<sup>1</sup>, Kirsten Graham<sup>2,3</sup>, Richard Hagan<sup>1</sup>, Deepthy Jayakrishnan<sup>1</sup>, Sinead Walker<sup>2</sup>, Ruth Hamilton<sup>3,4</sup>

<sup>1</sup>Department of Medical Physics and Clinical Engineering, Royal Liverpool University Hospital, Liverpool, United Kingdom. <sup>2</sup>Glasgow Centre for Ophthalmic Research, Gartnavel General Hospital, Glasgow, United Kingdom. <sup>3</sup>Department of Clinical Physics and Bioengineering, Royal Hospital for Children, Glasgow, United Kingdom. <sup>4</sup>College of Medical, Veterinary and Life Sciences, University of Glasgow, Glasgow, United Kingdom

**09:45 O3 04 Age-related changes in ERG parameters in companion dogs**

Freya M. Mowat<sup>1,2</sup>, Wojciech K. Panek<sup>2</sup>, Gilad Fefer<sup>2</sup>, Alejandra Mondino Vero<sup>2</sup>, Hans D. Westermeyer<sup>2</sup>, Margaret E. Gruen<sup>2</sup>, Natasha J. Olby<sup>2</sup>

<sup>1</sup>University of Wisconsin-Madison, Madison, USA. <sup>2</sup>North Carolina State University, Raleigh, USA

**10:00 O3 05 Reference data for flash VEP**

Quentin Davis<sup>1</sup>, Emilia Albert<sup>2</sup>, Konstantin Kotliar<sup>2</sup>

<sup>1</sup>LKC Technologies, Inc., Gaithersburg, USA. <sup>2</sup>Aachen University of Applied Sciences, Aachen, Germany

**10:15 O3 06 Paediatric PERGs: a modified protocol and indirect reference data**

Ruth Hamilton<sup>1,2</sup>, Bruce Hudson<sup>3</sup>, Martin Shaw<sup>3</sup>

<sup>1</sup>Royal Hospital for Children, Glasgow, United Kingdom. <sup>2</sup>University of Glasgow, Glasgow, United Kingdom. <sup>3</sup>Department of Clinical Physics and Bioengineering, Glasgow, United Kingdom

**Thursday 4<sup>th</sup> August**  
**Oral Session 4: Pre-clinical Retina**  
**Chairs: Dr Suresh Viswanathan, Dr Anna Polosa**

**11:00 O4 01 Of mice and men: Retinal horizontal cell ERGs and their clinical applications**

Mary A. Johnson<sup>1</sup>, Yamato Maeda<sup>2</sup>, James C. DeMar<sup>3</sup>, Gilbert Xue<sup>1</sup>, Taro Chaya<sup>2</sup>, Mineo Kondo<sup>4</sup>, Ryotaro Tsutsumi<sup>5</sup>, Venkatasivasai S. Sajja<sup>3</sup>, Peethambaran Arun<sup>3</sup>, Andrew B. Batuure<sup>3</sup>, Takahisa Furukawa<sup>2</sup>

<sup>1</sup>University of Maryland, Baltimore, Baltimore, MD, USA. <sup>2</sup>Osaka University, Osaka, Japan. <sup>3</sup>Walter Reed Army Institute of Research, Silver Spring, MD, USA. <sup>4</sup>Mie University, Tsu, Japan. <sup>5</sup>Wakayama University, Wakayama, Japan

**11:15 O4 02 Diurnal rodent models for the study of cone pathophysiology**

Alexander Günter, Regine Mühlfriedel, Soumaya Belhadj, Mathias Seeliger

Division of Ocular Neurodegeneration, Institute for Ophthalmic Research, UKT, University of Tübingen, Tübingen, Germany

**11:30 O4 03 Effect of flicker-induced retinal stimulation on full-field electroretinography in mice**

Milan Rai<sup>1,2</sup>, Yamunadevi Lakshmanan<sup>3</sup>, Henry Ho-lung Chan<sup>1,3,4</sup>

<sup>1</sup>School of Optometry, The Hong Kong Polytechnic University, Hong Kong, China. <sup>2</sup>Laboratory of Experimental Optometry (Neuroscience), School of Optometry, The Hong Kong Polytechnic University, Hong Kong, China. <sup>3</sup>Centre for Eye and Vision Research (CEVR), 17W Hong Kong Science Park, Hong Kong, China. <sup>4</sup>Research Centre for SHARP Vision (RCSV), The Hong Kong Polytechnic University, Hong Kong, China

**11:45 O4 04 ERG responses to flashes presented upon sinewave modulation in mice**

Anneka\_Joachimsthaler<sup>1,2</sup>, Nina Stallwitz<sup>1,2</sup>, Jan Kremers<sup>1</sup>

<sup>1</sup>University Hospital, Eye Clinic, Erlangen, Germany. <sup>2</sup>Friedrich-Alexander University, Animal Physiology, Erlangen, Germany

**12:00 O4 05 Calpain as a biomarker for retinal degeneration due to phosphodiesterase 6 (PDE6) deficiency**

Soumaya Belhadj<sup>1</sup>, Regine Muehlfriedel<sup>1</sup>, Alexander Günter<sup>1</sup>, Stylianos Michalakis<sup>2</sup>, Martin Biel<sup>2</sup>, Francois Paquet-Durand<sup>3</sup>, Mathias Seeliger<sup>1</sup>

<sup>1</sup>Division of Ocular Neurodegeneration, Centre for Ophthalmology, Institute for Ophthalmic Research, Tübingen, Germany. <sup>2</sup>Center for Integrated Protein Science Munich CiPSM and Department of Pharmacy - Center for Drug Research, Ludwig-Maximilians-Universität München, Munich, Germany. <sup>3</sup>Cell Death Mechanisms Group, Centre for Ophthalmology, Institute for Ophthalmic Research, Tübingen, Germany

**12:15 O4 06 Retinal dysfunction in the rd10 mouse: A comparison of the pupillary light reflex and ERG.**

Jason C. Park, Oksana Persidina, Tara Nguyen, Xincheng Yao, J. Jason McAnany

Department of Ophthalmology and Visual Science, University of Illinois at Chicago, Chicago, USA

**Thursday 4<sup>th</sup> August**

**Oral Session 5: Genotype-Phenotype Correlations**

**Chairs: Professor Kaoru Fujinami, Professor Omar Mahroo**

**13:30 O5 01 Albinism on the outside but not on the inside: The remarkable phenotypic variability of OCA4**

Maria M. van Genderen<sup>1,2</sup>, Charlotte C. Kruijt<sup>3</sup>, Ralph J. Florijn<sup>4</sup>, Gerard C. de Wit<sup>1</sup>

<sup>1</sup>Bartimeus Diagnostic Center for Complex Visual Disorders, Zeist, Netherlands. <sup>2</sup>University Medical Center Utrecht, Utrecht, Netherlands. <sup>3</sup>Leiden University Medical Center, Leiden, Netherlands. <sup>4</sup>Amsterdam University Medical Center, Amsterdam, Netherlands

**13:45 O5 02 Pattern-reversal VEPs are degraded in patients with albinism and different types of nystagmus**

Herman Talsma<sup>1</sup>, Ashita Mohile<sup>1</sup>, Frank Hoeben<sup>1</sup>, Charlotte Kruijt<sup>1,2</sup>, Maria van Genderen<sup>1</sup>

<sup>1</sup>Bartiméus, Diagnostic Centre for Complex Visual Disorders, Zeist, Netherlands. <sup>2</sup>Leiden University Medical Center, Leiden, Netherlands

**14:00 O5 03 VSX2 variants are responsible for bipolar cell dysfunction with distinct lens alterations.**

Vasily M. Smirnov<sup>1,2</sup>, Matthieu Robert<sup>3,4</sup>, Christel Condroyer<sup>1</sup>, Jean-Michel Rozet<sup>5</sup>, José Sahel<sup>1,6</sup>, Isabelle Perrault<sup>5</sup>, Isabelle Audo<sup>1,7</sup>, Christina Zeitz<sup>1</sup>

<sup>1</sup>Sorbonne Université, INSERM, CNRS, Institut de la Vision, Paris, France. <sup>2</sup>Université de Lille, Faculté de Médecine, Lille, France. <sup>3</sup>Ophthalmology Department, Hôpital Universitaire Necker-Enfants Malades, Paris, France. <sup>4</sup>Borelli Centre, UMR 9010, CNRS-SSA-ENS Paris Saclay-Paris University, Paris, France. <sup>5</sup>Laboratory of Genetics in Ophthalmology (LGO), INSERM UMR1163, Institute of Genetic Diseases, Imagine and Paris Descartes University, Paris, France. <sup>6</sup>Department of Ophthalmology, The University of Pittsburgh School of Medicine, Pittsburgh, USA. <sup>7</sup>Centre Hospitalier National d'Ophthalmologie des Quinze-Vingts, Centre de Référence Maladies Rares REFERET and INSERM-DGOS CIC 1423, Paris, France

**14:15 O5 04 Electrically evoked responses in severe retinitis pigmentosa**

Yu Fujinami-Yokokawa<sup>1,2,3</sup>, Yasutaka Suzuki<sup>1</sup>, Hisateru Tachimori<sup>4</sup>, Hiroaki Miyata<sup>2</sup>, Jeffrey Farmer<sup>5</sup>, Kei Shinoda<sup>6</sup>, Kazushige Tsunoda<sup>7</sup>, Yozo Miyake<sup>8</sup>, Kaoru Fujinami<sup>1,3,9</sup>

<sup>1</sup>Laboratory of Visual Physiology, Division of Vision Research, National Institute of Sensory Organs, National Hospital Organization Tokyo Medical Center, Tokyo, Japan. <sup>2</sup>Department of Health Policy and Management, Keio University School of Medicine, Tokyo, Japan. <sup>3</sup>UCL Institute of Ophthalmology, London, United Kingdom. <sup>4</sup>Endowed Course for Health System Innovation, Keio University School of Medicine, Tokyo, Japan. <sup>5</sup>Diagnosys LLC, MA, USA. <sup>6</sup>Department of Ophthalmology, Saitama Medical University Faculty of Medicine, Saitama, Japan. <sup>7</sup>Division of Vision Research, National Institute of Sensory Organs, National Hospital Organization Tokyo Medical Center, Tokyo, Japan. <sup>8</sup>Next Vision, Kobe Eye Center, Kobe, Japan. <sup>9</sup>Moorfields Eye Hospital, London, United Kingdom

**14:30 O5 05      Genome-wide association study (GWAS) meta-analysis of flicker ERG peak times recorded in >1000 adult twins**

Zihe Xu<sup>1</sup>, Xiaofan Jiang<sup>2</sup>, Christopher J Hammond, Omar A Mahroo<sup>1,3</sup>, Pirro G Hysi<sup>1</sup>

<sup>1</sup>King's College London, London, United Kingdom. <sup>2</sup>University College London, London, United Kingdom. <sup>3</sup>University of Cambridge, London, United Kingdom

**14:45 O5 06      Effect of nystagmus on VEP-based objective visual acuity estimates**

Michael B. Hoffmann<sup>1</sup>, Elizabeth V. Quanz<sup>1</sup>, Juliane Reupsch<sup>1</sup>, Francie H. Kramer<sup>1</sup>, Michael Bach<sup>2,3</sup>, Sven P. Heinrich<sup>2,3</sup>, Khaldoun O. Al-Nosairy<sup>1</sup>

<sup>1</sup>Department of Ophthalmology, University Magdeburg, Magdeburg, Germany. <sup>2</sup>Eye Center, Medical Center – University of Freiburg, Freiburg, Germany. <sup>3</sup>Faculty of Medicine, University of Freiburg, Freiburg, Germany

**Friday 5th August**  
**Oral Session 6: President's Session**  
**Chairs: Dr Ruth Hamilton, Dr Dorothy Thompson**

**09:00 O6 01      FrACT – Automated assessment of behavioural acuity not only for visual electrophysiology**

Michael Bach

University Eye Center, Freiburg, Germany

**09:15 O6 02      High-quality control measures allow detection of three-year changes in a placebo group of a randomized double-blind international multicenter safety study**

Eberhart Zrenner<sup>1</sup>, Graham E. Holder<sup>2</sup>, Ulrich Schiefer<sup>3</sup>, John M Wild<sup>4</sup>

<sup>1</sup>University of Tuebingen, Tuebingen, Germany. <sup>2</sup>Moorfields Eye Hospital, London, United Kingdom. <sup>3</sup>University of Applied Sciences, Aalen, Germany. <sup>4</sup>Cardiff University, Cardiff, United Kingdom

**09:30 O6 03      ISCERG: The First Symposium of Electroretinography**

Scott Brodie<sup>1</sup>, Richard Smith<sup>2</sup>

<sup>1</sup>NY Uni Langone, New York, USA. <sup>2</sup>BriSCEV, Liverpool, United Kingdom

**09:45 O6 04      The early days of visual electrophysiology and the foundation of ISCERG/ISCEV**

Sven Erik G Nilsson

Dept. of Ophthalmology, Linkoping, Sweden

**Friday 5<sup>th</sup> August**  
**Oral Session 7: Innovations**  
**Chairs: Professor Tony Fisher, Professor Daphne McCulloch**

**11:00 O7 01      Digital Light Processing laser projectors work as visual display units in visual electrophysiology**

Oliver R. Marmoy<sup>1,2,3</sup>, Dorothy A. Thompson<sup>1,2</sup>

<sup>1</sup>Tony Kriss Visual Electrophysiology Unit, Clinical and Academic Department of Ophthalmology, Great Ormond Street Hospital, London, United Kingdom. <sup>2</sup>UCL-GOS Institute for Child Health, London, United Kingdom. <sup>3</sup>Manchester Metropolitan University, Manchester, United Kingdom

**11:15 O7 02      A scoping review of current practice in full-field stimulus threshold (FST) testing**

Linda F Shi<sup>1,2</sup>, Dorothy A Thompson<sup>1,3</sup>, Amanda Hall<sup>2</sup>

<sup>1</sup>Tony Kriss Visual Electrophysiology Unit, Clinical and Academic Department of Ophthalmology, Great Ormond Street Hospital for Children NHS Foundation Trust, London, United Kingdom. <sup>2</sup>College of Health and Life Sciences, Aston University, Birmingham, United Kingdom. <sup>3</sup>UCL-GOS Institute for Child Health, London, United Kingdom

**11:30 O7 03      Dark-adapted full-field stimulus threshold in severely affected patients with retinitis pigmentosa**

Kaoru Fujinami<sup>1,2,3</sup>, Yu Fujinami-Yokokawa<sup>1,4,5</sup>, Yasutaka Suzuki<sup>1</sup>, Jeffrey Farmer<sup>6</sup>, Kazushige Tsunoda<sup>7</sup>

<sup>1</sup>Laboratory of Visual Physiology, Division of Vision Research, National Institute of Sensory Organs, National Hospital Organization Tokyo Medical Center, Tokyo, Japan. <sup>2</sup>Department of Genetics, UCL Institute of Ophthalmology, London, United Kingdom.

<sup>3</sup>Moorfields Eye Hospital, London, United Kingdom. <sup>4</sup>Department of Genetics, UCL Institute of Ophthalmology, London, Japan.

<sup>5</sup>Department of Health Policy and Management, Keio University School of Medicine, Tokyo, Japan. <sup>6</sup>Diagnosys LLC, MA, USA.

<sup>7</sup>Division of Vision Research, National Institute of Sensory Organs, National Hospital Organization Tokyo Medical Center, Tokyo, Japan

**11:45 O7 04      Small area flexible U.Waterloo electrodes using nanoparticle chains for recording electroretinograms**

Vivek Maheshwari, Daphne McCulloch, Hua Fan, Saikiran Khamgaonkar

University of Waterloo, Waterloo, Canada

**12:00 Manufacturer Presentations and 'Open-Mike' Innovation Session**



Friday 5<sup>th</sup> August

13:30 Poster Session 2 (even numbered posters)

Moderators: Dr Gillian Ruddock, Dr Ajoy Vincent

**P2 02 Electoretinogram in night blindness due to vitamin A deficiency: A case report**

Emilio González-García<sup>1</sup>, Andrea V. Arciniegas-Villanueva<sup>1</sup>, María José Ortiz-Muñoz<sup>1</sup>, Empar Sanz-Marco<sup>2</sup>, David Salom-Alonso<sup>2</sup>

<sup>1</sup> Neuroscience Department, Manises Hospital, Valencia, Spain. <sup>2</sup> Ophthalmology Department, Manises Hospital, Valencia, Spain

**P2 04 Range of clinical and electrophysiological phenotypes in GNB3 and GNB5 related retinopathies**

Anupreet Tumber<sup>1</sup>, Heather MacDonald<sup>2</sup>, Regan Klatt<sup>2</sup>, Elise Heon<sup>1</sup>, Ajoy Vincent<sup>1</sup>

<sup>1</sup>Department of Ophthalmology and Vision Sciences, The Hospital for Sick Children, University of Toronto, Toronto, ON, Canada.

<sup>2</sup>Genetics and Genome Biology (GGB) Program, The Hospital for Sick Children Research Institute, Toronto, ON, Canada

**P2 06 Electoretinography in patients with moderate to severe multiple sclerosis**

James V. M. Hanson, Sara Single, Veronika Kana, Christina Gerth-Kahlert

University Hospital Zurich, Zurich, Switzerland

**P2 08 Atypical cases of enhanced S-cone syndrome (ESCS)?**

Anne L Georgiou<sup>1</sup>, Magella M Neveu<sup>1,2</sup>, Antonio Calcagni<sup>1,2</sup>, Andrew Webster<sup>2,3</sup>, Anthony G Robson<sup>1,2</sup>

<sup>1</sup>Electrophysiology Department, Moorfields Eye Hospital, London, United Kingdom. <sup>2</sup>Institute of Ophthalmology, University College London, London, United Kingdom. <sup>3</sup>Genetics Department, Moorfields Eye Hospital, London, United Kingdom

**P2 10 Comparison of signal-to-noise ratios for ERGs recorded with contact lens and skin electrodes**

Stephanie Choi<sup>1</sup>, Karen Holopigian<sup>2</sup>, Vivienne Greenstein<sup>1</sup>, Scott E Brodie<sup>1</sup>

<sup>1</sup>NYU Langone Health, New York, USA. <sup>2</sup>Novartis Institutes for Biomedical Research, East Hanover, NJ, USA

**P2 12 Utility of electrodiagnostic testing following suboptimal outcome post amblyopia management**

Ruth Hamilton<sup>1,2</sup>, Emily Robertson<sup>2</sup>, Eoghan Millar<sup>1</sup>

<sup>1</sup>Royal Hospital for Children, Glasgow, United Kingdom. <sup>2</sup>University of Glasgow, Glasgow, United Kingdom

**P2 14 Association of psychophysical rod/cone flicker thresholds with full-field ERG parameters**

Amithavikram R Hathibelagal<sup>1,2</sup>, Diwaakar Karthikeyan<sup>1,2</sup>, Subhadra Jalali<sup>3,4</sup>, Brijesh Takkar<sup>3,5</sup>, Deepika Parameswarappa<sup>3</sup>

<sup>1</sup>Brien Holden Institute of Optometry and Vision Sciences and <sup>2</sup>Prof. Brien Holden Eye Research Centre, L V Prasad Eye Institute, Hyderabad, India. <sup>3</sup>Srimati Kanuri Santhamma Centre for Vitreoretinal diseases, Anant Bajaj Retina Institute, L V Prasad Eye Institute, Hyderabad, India. <sup>4</sup>Jasti V Ramanamma Children's Eye Care Centre, L V Prasad Eye Institute, Hyderabad, India. <sup>5</sup>Indian Health Outcomes, Public Health, and Economics Research (IHOPE) Centre, L V Prasad Eye Institute, Hyderabad, India

**P2 16 Electoretinographic evaluation in eyes with glaucoma after filtration surgery**

Yuro Igawa<sup>1</sup>, Takuhei Shoji<sup>1</sup>, Jun Makita<sup>1</sup>, Yuji Yoshikawa<sup>2</sup>, Shunichiro Takano<sup>3</sup>, Kei Shinoda<sup>3</sup>, Yozo Miyake<sup>4</sup>

<sup>1</sup>Saitama Medical University, Iruma, Japan. <sup>2</sup>Kyorin Medical University, Mitaka, Japan. <sup>3</sup>Saitama Medical University, Saitama, Japan.

<sup>4</sup>Kobe City Eye Hospital, Kobe, Japan

**P2 18 Peak times and amplitudes of 16 and 32 Td-s flicker ERGs in over 400 adult twins**

Tsz Lun Ernest Wong<sup>1</sup>, Xiaofan Jiang<sup>1,2</sup>, Isabelle Chow<sup>1</sup>, Andrew R Webster<sup>2</sup>, Pirro G Hysi<sup>1</sup>, Christopher J Hammond<sup>1</sup>, Omar A Mahroo<sup>1,2</sup>

<sup>1</sup>Section of Ophthalmology, King's College London, St Thomas' Hospital Campus, London, UK. <sup>2</sup>NIHR Biomedical Research Centre at Moorfields Eye Hospital and the University College London Institute of Ophthalmology, London, UK

**P2 20 Assessment of macular side effects of fingolimod used in treatment of MS patients by mfERG and OCT**

Randa H.A. Abdelgawad, Abdelrahman G. Salman, Thanaa H. Mohamed, Hala K. H. Elshahed, Dina A. Zamzam

Ain Shams University, Cairo, Egypt

**P2 22 Hilbert Transform Analysis of the rodent scotopic ERG reveals distinct oscillatory potential bursts**

Anna Polosa<sup>1,2</sup>, Mercedes Gauthier<sup>1,3</sup>, Jean-Marc Lina<sup>3,4</sup>, Pierre Lachapelle<sup>1</sup>

<sup>1</sup>Department of Ophthalmology & Neurology-Neurosurgery, Research Institute of the McGill University Health Centre/Montreal Children's Hospital, Montreal, Canada. <sup>2</sup>Département d'ophtalmologie, Hôpital Maionneuve-Rosemont, CIUSSS de l'Est-de-l'Île-de-Montreal, Montreal, Canada. <sup>3</sup>Département de Génie Électrique, École de Technologie Supérieure, Montreal, Canada. <sup>4</sup>Centre de Recherches Mathématiques, Montreal, Canada

**P2 24 Photometric comparison of the LED-based ColorFlash(TM) versus xenon flashtubes (Grass and SLE)**

Oliver R. Marmoy<sup>1,2,3</sup>, Vikki A. McBain<sup>4</sup>, Bruce Hudson<sup>5</sup>, Dorothy A. Thompson<sup>1,2</sup>, Ruth Hamilton<sup>5</sup>

<sup>1</sup>Tony Kriss Visual Electrophysiology Unit, Clinical and Academic Department of Ophthalmology, Great Ormond Street Hospital for Children, London, United Kingdom. <sup>2</sup>UCL-GOS Institute for Child Health, University College London, London, United Kingdom. <sup>3</sup>Manchester Metropolitan University, Manchester, United Kingdom. <sup>4</sup>Ophthalmology Department, Aberdeen Royal Infirmary, Aberdeen, United Kingdom. <sup>5</sup>Department of Clinical Physics and Bioengineering, Royal Hospital for Children, NHS Greater Glasgow and Clyde, Glasgow, United Kingdom

**P2 26 The occurrence of crossed asymmetry in children with albinism attending an Irish paediatric hospital**

John C Maguire<sup>1</sup>, Gillian O' Mullane<sup>2</sup>

<sup>1</sup>Children's Health Ireland at Crumlin, Dublin, Ireland. <sup>2</sup>Children's Health Ireland at Temple Street, Dublin, Ireland

**P2 28 Visual function in late-onset retinal degeneration**

Stephanie Quinn, Andrew Browning, James Blake, Clare Warriner

Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle upon Tyne, United Kingdom

**P2 30 Focal chorioretinal changes in children with mucopolysaccharidosis**

Linda F Shi<sup>1,2</sup>, Dorothy A Thompson<sup>1,3</sup>, Oliver R Marmoy<sup>1,3,4</sup>

<sup>1</sup>Tony Kriss Visual Electrophysiology Unit, Clinical and Academic Department of Ophthalmology, Great Ormond Street Hospital for Children NHS Foundation Trust, London, United Kingdom. <sup>2</sup>College of Health and Life Sciences, Aston University, Birmingham, United Kingdom. <sup>3</sup>UCL-GOS Institute for Child Health, London, United Kingdom. <sup>4</sup>Manchester Metropolitan University, Manchester, United Kingdom

**Friday 5th August**

**Oral Session 8: Clinical Applications**

**Chairs: Professor Mineo Kondo, Professor Maria van Genderen**

**15:00 O8 01 Evidence of the value of the full-field ERG in staging diabetic retinopathy: A literature review**

Mitchell G Brigell

Biotech Consultant, Belmont, MA, USA

**15:15 O8 02 Rod activation and deactivation in early-stage diabetic eye disease.**

J. Jason McAnany, Jason C Park

Department of Ophthalmology and Visual Sciences, University of Illinois at Chicago, Chicago, IL, USA

**15:30 O8 03 Screening for diabetic retinopathy with a handheld ERG device performed by an advanced practice nurse**

Marine Krug, Jenny Fontaine, Céline Lukas-Croisier, Brigitte Delemer, Carl Arndt

Reims University Hospital, Reims, France

**15:45 O8 04 Clinical and electrophysiological findings in patients with post-COVID-19 related retinal complications**

D. Marwa, A. Tabl, Tarek S. Esawy, Mohamed A. Awwad, Taher K., Ahmed A. Tabl

Benha University, Benha, Egypt

**Friday 5<sup>th</sup> August**

**16:15 YSCEV / trainee forum**

**Saturday 6<sup>th</sup> August**

**Oral Session 9: Paediatrics**

**Chairs: Professor Christina Gerth-Kahlert, Dr Oliver Marmoy**

**09:00 O9 01 Separation of ERG waveforms in infants from unsteady baselines using high-pass filters**

Scott Brodie<sup>1</sup>, Karen Holopigian<sup>2</sup>

<sup>1</sup>NYU Langone Health, New York, USA. <sup>2</sup>Novartis Institutes for BioMedical Research, East Hanover, NJ, USA

**09:15 O9 02 Indications for the use of multichannel VEPs in children without nystagmus**

Joanne Cowe<sup>1,2</sup>, Oliver R. Marmoy<sup>1,3,4</sup>, Siân E. Handley<sup>1,3</sup>, Lisa Tucker<sup>1,3</sup>, Dorothy A. Thompson<sup>1,3</sup>

<sup>1</sup>Great Ormond Street Hospital for Children NHS Foundation Trust, London, United Kingdom. <sup>2</sup>University Hospitals of Leicester NHS Trust, Leicester, United Kingdom. <sup>3</sup>UCL Great Ormond Street Institute for Child Health, London, United Kingdom. <sup>4</sup>Manchester Metropolitan University, Manchester, United Kingdom

**09:30 O9 03 SsVEP in children with poor visual behavior: Additional considerations to improve test compliance**

Lucia Ambrosio<sup>1,2</sup>, Ronald M Hansen<sup>2</sup>, Anna Maria Baglieri<sup>2</sup>, Anne B Fulton<sup>2</sup>, Jeffrey D Farmer<sup>3</sup>, James D Akula<sup>2</sup>

<sup>1</sup>University of Naples Federico II, Naples, Italy. <sup>2</sup>Boston Children's Hospital, Boston, MA, USA. <sup>3</sup>Diagnosys, LLC, Lowell, MA, USA

**09:45 O9 04 Is FVEP useful in assessing infants without eye contact ?**

Marta Pawlak, Anna Gotz-Więckowska, Patrycja Pijanka, Anna Chmielarz-Czarnocińska

Department of Ophthalmology, Poznan University of Medical Sciences, Poznan, Poland

**Saturday 6<sup>th</sup> August**

**10:00 Standards Session** Chair, Dr Tony Robson, ISCEV Director of Standards

**Saturday 6<sup>th</sup> August**

**11:15 Clinical Cases Session** Chairs, Mr Richard Smith and Professor John Grigg

**Saturday 6<sup>th</sup> August**

**13:30 Membership Meeting** Chair, Dr Ruth Hamilton, ISCEV President