

Program Schedule for The Eye and The Chip 2021

Sunday, October 3, 2021

(Presentations are 20-minutes long, plus a 10-minute Q & A – Challenge period)

***All times are Eastern Standard Times**

7:55 – 8:00 a.m. Welcome & Introduction

Paul Edwards, M.D., and Philip C. Hessburg, M.D.

Session One: Retinal Prosthetics Studies

Moderator – Gregg Suaning, Ph.D., University of Sydney, Australia

8:00 - 8:30 a.m. Simulating the Effects of Persistence and Perceptual Fading in Retinal Prosthetic Vision

David Avraham, M.Sc., Schepens Eye Research Institute, Boston, Massachusetts

8:30 - 9:00 a.m. Effects of Different Subretinal Implant Designs on the Retina in Mini-pigs and Drug Induced Incomplete Outer Retinal Degeneration in Cynomolgus Monkey

Seong-Woo Kim, Ph.D., Korea Consortium for Retinal Prosthesis Development, Seoul, Korea

9:00 - 9:30 a.m. FDA Device Update

Michelle Sandrian, Ph.D., F.D.A, Silver Spring, Maryland

Elvin Ng, Assistant Director for Retinal and Diagnostic Team, F.D.A., Silver Spring, Maryland

9:30 – 9:45 a.m. BREAK

Session Two: Clinical Reports- Cortical

Moderator – Daniel Palanker, Ph.D., Stanford University, Stanford, California

9:45 - 10:15 a.m. Orion Visual Prosthesis System: Long-Term Clinical Trial Results

Jessy Dorn, Ph.D., Second Sight Medical Products, Sylmar, California

10:15 – 10:45 a.m. Visual Percepts Evoked with an Intracortical 96-Channel Microelectrode Array Inserted in Human Visual Cortex

Eduardo Fernandez, M.D., Ph.D., University of Miguel Hernandez, Elche, Spain

10:45 - 11:15 a.m. Intracortical Visual Prosthesis (ICVP): First Phase of the Clinical Trial

Philip Troyk, Ph.D., Illinois Institute of Technology, Chicago, Illinois

11:15 - 12:15 p.m. GROUP DISCUSSION

Moderators: Daniel Palanker and Gregg Suaning

12:15 - 1:15 p.m. LUNCH

Session Three: Clinical Reports - Retina

Moderator- Shelley Fried, Ph.D., Harvard Medical School, Boston, Massachusetts

1:15 – 1:45 p.m. Long Term Visual Results of Prima Chip in Patients with Geographic Atrophy
Yannick Le Mer, M.D., Foundation Ophthalmology A. de Rothschild, Paris, France

1:45 - 2:15 p.m. Effects of Intra-orbital Mechanical Forces on Subretinal Implant ALPHA:
Displacements of Subretinal Chips and Assessment of Cable Movement by
Dynamic Computer Tomography during Gaze Changes
Eberhart Zrenner, M.D., Ph.D., University of Tübingen, Tübingen, Germany

2:15 – 2:30 p.m. BREAK

Session Four: Psychophysics

Moderator: James Weiland, Ph.D., University of Michigan, Ann Arbor, Michigan

2:30 - 3:00 p.m. Variability in Relative Phosphene Mapping Techniques: Fine Tuning Local Clusters
Liancheng Yang, M.Sc., Johns Hopkins University, Baltimore, Maryland

3:00 – 3:30 p.m. Assessing Visual Acuity in Low and Ultra Low Vision Using Steady-State Visual Evoked Potentials
Leili Soo, Ph.D., CORTIVIS, Elche, Spain

3:30 - 4:00 p.m. Shape Perception via High-channel-count Neuroprosthesis in Monkey Visual Cortex
Xing Chen, Ph.D., Netherlands Institute for Neuroscience, Amsterdam, Netherlands

4:00 – 5:00 p.m. GROUP DISCUSSION
Moderators: Shelley Fried and James Weiland

5:00 – 5:15 p.m. BARTIMAEUS AWARD CEREMONY

5:15 – 6:00 p.m. UNSTRUCTURED NETWORKING

Program Schedule (*continued*)

Monday: October 4, 2021

(Presentations are 20-minutes long, plus a 10-minute Q & A – Challenge period)

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7:55 – 8:00 a.m. Welcome & Introduction

Paul Edwards, M.D., and Philip C. Hessburg, M.D.

Session Five: Retinal Stimulation Strategies

Moderator: Eduardo Fernandez, M.D., Ph.D., University Miguel Hernandez, Elche, Spain

8:00 - 8:30 a.m. Characterizing Electrical Response Properties of Retinal Ganglion Cells using Gaussian Noise Stimulus

Hamed Shabani, M.S., Tübingen Retinal Implant Group, Tübingen, Germany

8:30 - 9:00 a.m. Morphological Features of RGC's and Their Influence on Threshold to Electric Stimulation

Paul Werginz, Ph.D., Massachusetts General Hospital and Vienna, Austria

9:00 - 9:30 a.m. Mechanisms Underlying Differential RGC Responses to Low vs. high Rate Stimulation

Jae-Ik Lee, Ph.D., Massachusetts General Hospital, Harvard Medical School, Boston, Massachusetts

9:30 – 9:45 a.m. BREAK

Session Six: Retinal Stimulation Strategies

Moderator: Eberhart Zrenner, M.D., Ph.D., University of Tübingen, Tübingen, Germany

9:45 - 10:15 a.m. Electronic "Photoreceptors" Enable Prosthetic Vision with Acuity Matching the Natural Resolution in Rats

Daniel Palanker, Ph.D., Stanford University, Stanford, California

10:15 - 10:45 a.m. Toward High-acuity Prosthetic Vision Based on Optically Configurable Confinement of Electrical Field with Photovoltaic Pixels

Charles Chen, M.Sc., Stanford University, Stanford, California

10:45 – 11:15 a.m. GROUP DISCUSSION

Moderator: Eduardo Fernandez and Eberhart Zrenner

11:15 - 12:00 p.m. LUNCH

Session Seven: Utilizing Virtual Reality and Artificial Intelligence

Moderator: Daniel Rathbun, Ph.D. Henry Ford Health System, Detroit, Michigan

- 12:00 - 12:30 p.m.** Immersive Virtual Reality Simulations of Bionic Vision
Justin Kasowski, B.Sc., Bionic Vision Lab, Santa Barbara, California
- 12:30 - 1:00 p.m.** Hand-Eye Coordination in Virtual Reality Under Simulated Prosthetic Vision Conditions
Gislin Dagnelie, Ph.D., Johns Hopkins University, Baltimore, Maryland
- 1:00 - 1:30 p.m.** Towards a Smart Bionic Eye: The Emerging Role of Computer Vision and AI for Artificial Vision
Michael Beyeler, Ph.D., Bionic Vision Lab at University California, Santa Barbara, California
- 1:30 - 3:30 p.m. UNSTRUCTURED NETWORKING**

Session Eight: The Aussie Special

Moderator: Gislin Dagnelie, Ph.D., Johns Hopkins University, Baltimore, Maryland

- 3:30 - 4:00 p.m.** Vision Processing Methods to Facilitate Functional Vision in Participants Implanted with a Suprachoroidal Retinal Prosthesis: The Evidence to Date for Conditions with Poor Contrast
Nick Barnes, Ph.D., The Royal Victorian Eye & Ear Hospital, Melbourne, Australia
- 4:00 - 4:30 p.m.** Controlling Neuronal Activity of Retinal Ganglion Cells Using Dynamic Frequency Modulation
Madhuvanathi Muralidharan, M.E., University of New South Wales, Sydney, Australia
- 4:30 - 5:00 p.m.** Methods for Neural Activity Shaping in the Presence of Electrode Crosstalk
Martin Spencer, Ph.D., Bionic Vision Technologies, Melbourne, Australia
- 5:00 - 6:00 p.m. GROUP DISCUSSION**
Moderators: Daniel Rathbun and Gislin Dagnelie
- 6:00 - 9:00 p.m. POSTER SESSION – More information to follow**

Program Schedule (continued)

Tuesday, October 5, 2021

(Presentations are 20-minutes long, plus a 10-minute Q & A – Challenge period)

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7:55 – 8:00 a.m. Welcome & Introduction

Paul Edwards, M.D. and Philip C. Hessburg, M.D.

Session Nine: New Materials

Moderator: Greg Auner, Ph.D. Wayne State University, Detroit, Michigan

8:00 - 8:30 a.m. Microfabrication and Biocompatibility of Subretinal Electrode Arrays
Doug Shire, Ph.D., Bionic Eye Technologies, Ithaca, New York

8:30 - 9:00 a.m. Soft Organic Neural Interface for Recording and Stimulating the Intact Retina
Ieva Vebrate, M.Sc., Tel Aviv University, Tel Aviv, Israel

9:00 - 9:30 a.m. Light-Intensity-Controlled Stimulation of Neurons by an Organic Photovoltaic Interface
Shashi Srivastava, Ph.D., Koc University, Istanbul, Turkey

9:30 – 9:45 a.m. BREAK

Session Ten: Cortical Stimulation and Use of Eye Tracking

Moderator: Joseph Rizzo, M.D., Massachusetts Eye and Ear Infirmary - Harvard Medical School, Boston, Massachusetts

9:45 -10:15 a.m. Utility of Eye Tracking in Visual Cortical Prostheses - Preliminary Patient Testing Results
Avi Caspi, Ph.D., Jerusalem College of Technology, Jerusalem, Israel

10:15 – 10:45 a.m. Development of a Closed-loop Approach for Automatically Adjusting Thresholds in Cortical Visual Prostheses
Fabrizio Grani, M.Sc., CORTIVIS, Spain

10:45 - 11:15 a.m. Responses of Visual Cortical Neurons to Aperiodic Electrical Stimulation of the Retina
Zixen Ye, B. Sc., City University of Hong Kong, Hong Kong, China

11:15 – 11:45 a.m. BREAK

Session Eleven: Cortical Alternatives to Electrical Stimulation

Moderator: Philip Troyk, Ph.D., Illinois Institute of Technology, Chicago, Illinois

- 11:45 – 12:15 p.m.** Towards the Development of a Micro-coil Based Cortical Visual Prosthesis
Shelley Fried, Ph.D., Harvard Medical School, Boston Massachusetts
- 12:15 – 12:45 p.m.** Micro-magnetic Stimulation of Primary Visual Cortex (V1) Elicits Focal Activation of Secondary Visual Cortex (V2)
Seung Woo Lee, Ph.D., Massachusetts General Hospital, Harvard Medical School, Boston, Massachusetts
- 12:45 - 1:15 p.m.** Photochemical Damage Implications to Optogenetic Forms of Cortical Prosthesis
John Exton, M.Sc., Newcastle University, Newcastle, United Kingdom
- 1:15 – 2:15 p.m.** **GROUP DISCUSSION**
Moderators: Greg Auner, Joseph Rizzo, and Philip Troyk
- 2:15 – 2:45 p.m.** **WRAP- UP DISCUSSION – END OF MEETING**
Moderators: Philip Hessburg and Joseph Rizzo