PRECISION
OPHTHALMOLOGY
2025

IN OUR DNA

06.14.25

COLUMBIA | OPHTHALMOLOGY

KEYNOTE SPEAKERS

The Future of Ophthalmology Research and Role of NEI

Michael F. Chiang, MD, Director of the National Eye Institute

Ulrich Ollendorff, MD Lecture

"Data Science, AI, and the Future of Ophthalmology: Perspectives from the National Eye Institute"

Artificial Intelligence in Precision Medicine

Cecilia S. Lee, MD, MS, Professor at University of Washington

George K. Smelser, PhD Lecture

"Leveraging Big Data and AI for Precision Ophthalmology"

Regenerative Biology and Medicine

Tom Reh, PhD, Professor at University of Washington

Arthur Gerard DeVoe, MD Lecture

"Stimulating Retinal Regeneration by Muller Glial Reprogramming In Vivo: Towards Clinical Applications in Retinal Disease"

Complex Genetics and Inheritance in Ophthalmology and Medicine

Janey Wiggs, MD, PhD, Vice Chair of Clinical Research at Harvard

Inaugural Lori Zabar Lecture

"Using Glaucoma Polygenic Risk Scores to Guide Risk Stratification and Therapy"

Patient-Specific Therapies

Andrea Califano, PhD, Professor at Dept. of Systems Biology at CUIMC

Donald and Barbara Jonas Lecture

"Targeting Tumor Heterogeneity One Cell at a Time"

Precision Ophthalmology™ 2025

Program Organizers

Aliaa Abdelhakim, MD, PhD
G. A. "Jack" Cioffi, MD
Jeffrey Liebmann, MD
Stephen Tsang, MD, PhD
Simon John, PhD
Irene Maumenee, MD
Xin Zhang, PhD

The Future of Ophthalmology Research & Role of NEI

Moderator: G. A. "Jack" Cioffi, MD

8:00am-8:05am *Welcome Remarks*
G. A. "Jack" Cioffi, MD & Aliaa Abdelhakim, MD, PhD

8:05am-8:35am **Ulrich Ollendorff, MD Lecture**
Data Science, AI, and the Future of Ophthalmology: Perspectives from the National Eye Institute
Michael F. Chiang, MD
Director of the National Eye Institute

8:35am-8:45am *Q&A/Discussions*

Artificial Intelligence in Precision Medicine

Moderators: Xin Zhang, PhD and Tingting Yang, PhD

8:45am-9:15am **George K. Smelser, PhD Lecture**
Leveraging Big Data and AI for Precision Ophthalmology
Cecilia S. Lee, MD, MS
University of Washington, Seattle, WA

9:15am-9:30am *Closing the Loop: How Medical-Expert Eyes Inform AI and 3D AI-Attention Mechanisms Elucidate Novel Ocular Biomarkers*
Kaveri Thakoor, PhD
Columbia University Irving Medical Center, New York, NY

9:30am-9:45am *Improving the Clinical Impact of Artificial Intelligence by Combining it with Mathematical Modeling*
Alon Harris, MD, PhD, FARVO
Icahn School of Medicine at Mount Sinai, New York, NY

9:45am-10:00am *Large-Scale Generation of Reliable Evidence*
George M. Hripcsak, MD, MS
Columbia University Irving Medical Center, New York, NY

10:00am-10:10am *Q&A/Discussions*
10:10am – 10:30am *Break*

Regenerative Biology and Medicine

Moderators: Stephen Tsang, MD, PhD and Janet Sparrow, PhD

10:30am-11:00am **Arthur Gerard DeVoe, MD Lecture**
Stimulating Retinal Regeneration by Muller Glial Reprogramming In Vivo: Towards Clinical Applications in Retinal Disease
Thomas A. Reh, PhD
University of Washington, Seattle, WA

11:00am-11:15am *Retinal Regeneration and the Hemoglobin Connection: New Frontiers in Treating Age-Related Macular Degeneration*
Tongalp H. Tezel, MD
Columbia University Irving Medical Center, New York, NY

11:15am-11:30am *Adult Human Derived RPE for AMD Cell Therapy*
Timothy A. Blenkinsop, PhD
Icahn School of Medicine at Mount Sinai, New York, NY

11:30am-11:45am *Modeling Early Differentiation, Axon Growth, and Axon Pathfinding of Human Retinal Ganglion Cells*
Wei Liu, PhD
Albert Einstein College of Medicine, New York, NY

11:45am-11:55am *Q&A/Discussions*
11:55am-1:00pm *Lunch*

MYRNA l. DANIELS AUDITORIUM | VIVIAN AND SEYMOUR MILSTEIN FAMILY HEART CENTER
173 FORT WASHINGTON AVENUE, NEW YORK, NY 10032

Complex Genetics and Inheritance in Ophthalmology and Medicine

Moderators: Simon John, PhD and Rando Allikmets, PhD

1:00pm-1:30pm ***Inaugural Lori Zabar Lecture***
Using Glaucoma Polygenic Risk Scores to Guide Risk Stratification and Therapy
Janey Wiggs, MD, PhD
Harvard School of Medicine, Boston, MA

1:30pm-1:45pm *Using Spatial Genomics to Study the Central Nervous System in Healthy Aging and Disease*
Hemali Phatnani, PhD
Columbia University Irving Medical Center, New York, NY

1:45pm-2:00pm *Single Cell Transcriptomics - A Transformative Tool for Precision Medicine in Pediatric Glaucoma*
Revathi Balasubramanian, PhD
Columbia University Irving Medical Center, New York, NY

2:00pm-2:15pm *New Genetic Insight into Kidney-Eye Syndromes*
Ali G. Gharavi, MD
Columbia University Irving Medical Center, New York, NY

2:15pm-2:25pm *Q&A/Discussions*

2:25pm-2:40pm *Break*

Patient-Specific Therapies

Moderators: Irene Maumenee, MD & Aliaa Abdelhakim, MD, PhD

2:40pm-3:10pm ***Donald and Barbara Jonas Lecture***
Targeting Tumor Heterogeneity One Cell at a Time
Andrea Califano, PhD
Columbia University Irving Medical Center, New York, NY

3:10pm-3:25pm *A Patient-Specific Mouse Model with Defective Mitochondrial Function*
Nan-Kai Wang, MD, PhD
Columbia University Irving Medical Center, New York, NY

3:25pm-3:40pm *Patient-Specific Therapies: They Require Cutting Edge Science & More*
Alison Bateman-House, PhD, MPH, MA
NYU Langone Health, New York, NY

3:40pm-3:55pm *Beyond the Canon: Rethinking Genetic Logic in Inherited Retinal Disease Diagnosis*
Winston Lee, PhD
Columbia University Irving Medical Center, New York, NY

3:55pm-4:05pm *Q&A/Discussions*

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