

# form & function in ocular disease

OCTOBER 24, 2026

HALIFAX, NOVA SCOTIA, CANADA

**A multi-disciplinary clinical and  
basic science symposium**

## **GUEST FACULTY**

**Connie Cepko, Harvard University**

How does the retina make so many cell types

**Simon John, Columbia University**

From degeneration to resilience: Metabolic therapies for glaucoma

**Andrew Lee, Houston Methodist**

This is not your father's optic neuritis

**Joseph Rizzo, Harvard University**

The anatomical basis of visual hallucinations

**Austin Roorda, University of Waterloo**

Hacking human vision for basic and clinical science

**Jeremy Sivak, University of Toronto**

Dysfunction follows form: How retinal architecture turns stress into disease



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## 2. Approved CE Credits

### Educationally Approved by Dalhousie University Continuing Professional Development and Medical Education

This event is an Accredited Group Learning Activity (Section 1) as defined by the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada and approved by Dalhousie University Continuing Professional Development and Medical Education. You may claim a maximum of **X.X hours** (credits are automatically calculated). Through an agreement between the Royal College of Physicians and Surgeons of Canada and the American Medical Association, physicians may convert Royal College MOC credits to AMA PRA Category 1 Credits™. Information on the process to convert Royal College MOC credit to AMA credit can be found at:

<https://edhub.ama-assn.org/pages/applications>

In keeping with CMA Guidelines, program content and selection of speakers are the responsibility of the planning committee. Support is directed toward the costs of the course and not to individual speakers through an unrestricted educational grant.



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MEDICAL EDUCATION**

### 3. Welcoming Remarks

Dear Colleagues:



It gives me great pleasure to welcome you to the 11<sup>th</sup> Form and Function in Ocular Disease meeting October 24, 2026, at Dalhousie University.

The main objective of this event is to examine and appraise diverse topics in clinical ocular disease and visual neuroscience. To that end, the Research Committee has put together an excellent program with world-renowned experts in exceptionally diverse areas spanning the visual neurosciences, the eye in health and disease, and health care delivery models.

We are grateful to our sponsors, Heidelberg Engineering, and Icare for providing generous unrestricted support for the meeting.

We are excited by the program and hope you find this meeting to be a memorable one.

Regards,

A handwritten signature in black ink, appearing to read 'Balwantray C. Chauhan'.

Balwantray C. Chauhan, PhD  
Mathers Professor

## 4. Schedule

### 2026 Form & Function Schedule

October 24, 2026 | Weldon Law Building, Dalhousie University  
6061 University Avenue, Halifax, Nova Scotia

**Moderators:** *morning:* Corye Smith and William Baldrige *afternoon:* Balwantray Chauhan and Michael Thorn

| Time           | Presenter                                   | Presentation Title                                                           |
|----------------|---------------------------------------------|------------------------------------------------------------------------------|
| 8:30 am        | Registration                                |                                                                              |
| 9:00 am        | Welcoming Remarks and Housekeeping          |                                                                              |
| 9:05–9:50 am   | Dr. Connie Cepko<br>Harvard University      | How does the retina make so many cell types                                  |
| 9:50–10:35 am  | Dr. Austin Roorda<br>University of Waterloo | Hacking human vision for basic and clinical science                          |
| 10:35–10:55 am | Break                                       |                                                                              |
| 10:55–11:40 am | Dr. Andrew Lee<br>Houston Methodist         | This is not your father's optic neuritis                                     |
| 11:40–12:00 pm | Dr. Yacine Touahri<br>Dalhousie University  | The retina's decision code: Gene programs that set identity in motion        |
| 12:00–1:00 pm  | Lunch                                       |                                                                              |
| 1:00–1:45 pm   | Dr. Joseph Rizzo<br>Harvard University      | The anatomical basis of visual hallucinations                                |
| 1:45–2:30 pm   | Dr. Jeremy Sivak<br>University of Toronto   | Dysfunction follows form: How retinal architecture turns stress into disease |
| 2:30–2:50 pm   | Break                                       |                                                                              |
| 2:50–3:10 pm   | Trainee Award #1                            | TBD                                                                          |
| 3:10–3:30 pm   | Trainee Award #2                            | TBD                                                                          |
| 3:30–4:15 pm   | Dr. Simon John<br>Columbia University       | From degeneration to resilience: Metabolic therapies for glaucoma            |
| 4:15 pm        | Adjourn                                     |                                                                              |

\*\* Please note that the final 6 minutes of each 20-minute session and the final 11 minutes of each 45-minute session are dedicated to audience Q&A and discussion.

## 5. Speaker Biographies

### Connie Cepko, PhD



Professor of Genetics and Ophthalmology, Emeritus  
Departments of Genetics and Ophthalmology,  
Blavatnik Institute  
Harvard Medical School

Dr. Cepko is the Bullard Professor of Genetics and Neuroscience at Harvard Medical School and an Investigator of the Howard Hughes Medical Institute. She received her PhD degree from MIT, working with Philip Sharp, and was a postdoctoral fellow in the laboratory of Richard Mulligan, where she developed some of the first retrovirus vectors. Her current research is focused on the development and diseases of the central nervous system, with an emphasis on the retina. Her laboratory uses molecular and cellular methods to address questions regarding the mechanisms of cell fate determination. They also have been developing gene therapy to prolong vision in genetic forms of blindness.

Dr. Cepko is a member of American Academy of Arts and Sciences and the National Academy of Sciences. She has launched and directed two PhD graduate programs and is currently serving as the Co-Director of the Leder Human Biology and Translational Medicine Program.

## Austin Roorda, PhD



Professor of Vision Science and Optometry  
University of Waterloo School of Optometry and  
Vision Science

Dr. Austin Roorda completed a joint PhD degree in Vision Science and Physics at the University of Waterloo. Throughout his 30-year academic career, he pioneered the development and use of advanced optical systems for studying human vision in healthy and diseased eyes. He was first to map the human trichromatic cone mosaic while he was a postdoc at the University of Rochester, he invented the adaptive optics scanning laser ophthalmoscope (AOSLO) in his first faculty position at the University of Houston and, over the course of 20 years at the University of California Berkeley, he developed ways to track eye motion and test human vision in healthy and diseased eyes on a microscopic scale. His latest work involves the use of his AOSLO technology to track and stimulate human cone photoreceptors in ways that expand the sensory capabilities of human vision. In July 2025, he returned to his alma mater to join the faculty at Waterloo. He is a Fellow of Optica and ARVO. Notable awards include the Glenn Fry Award from the American Academy of Optometry, a Guggenheim Fellowship, a Leverhulme Visiting Professorship from Oxford University, the 2024 Rank Prize in Optoelectronics, and recognition as one of the 33 Visionary Changemakers by National Geographic in 2026.

Andrew Lee, MD



Herb and Jean Lyman Centennial Chair of Ophthalmology  
Professor of Ophthalmology, Neurology and Neurosurgery  
Weill Cornell Medicine  
Blanton Eye Institute  
Houston Methodist Hospital

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Dr. Andrew G. Lee, M.D. is the Herb and Jean Lyman Centennial Chair in Ophthalmology and Founding Chairman of the Blanton Eye Institute at Houston Methodist Hospital. An internationally recognized neuro-ophthalmologist, educator, and researcher. He has authored over 600 peer-reviewed publications and 14 textbooks, delivered more than 500 invited lectures worldwide, and received numerous national teaching and leadership awards. Dr. Lee has served in leadership roles with the American Academy of Ophthalmology and the North American Neuro-Ophthalmology Society and was named one of Newsweek's Top 30 Ophthalmologists in the United States.

Yacine Touahri, PhD



Assistant Professor, Department of Medical Neuroscience  
Dalhousie University

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Yacine Touahri, PhD, is an Assistant Professor of Medical Neuroscience at Dalhousie University. His research examines how transcription factor combinations regulate retinal progenitor competence and cell-fate specification. Trained in Toulouse, Calgary, and Toronto, he integrates mouse models, human organoids, and single-cell genomics to uncover mechanisms driving retinal development and regeneration.

## Joseph Rizzo, MD



Simmons Lessell Professor of Ophthalmology  
Director, Neuro-Ophthalmology Service  
Mass Eye and Ear | Harvard Medical School

Dr. Rizzo is a graduate of the Louisiana State University School of Medicine (New Orleans). After internship, he completed a residency in Neurology at the Tufts New England Medical Center, then a residency in Ophthalmology at Boston University Medical Center, and a fellowship in Neuro-Ophthalmology at the Massachusetts Eye and Ear (Infirmary) / Harvard Medical School. Thereafter, he worked in the laboratory of Richard Masland, PhD at MGH under an NIH-sponsored “Physician Scientist Award”, which launched his founding of the Boston Retinal Implant Program as a novel collaboration between MIT and Harvard Medical School. Dr. Rizzo has served as Director of the Harvard Neuro-ophthalmology service for 24 years. Over his career, he has divided his time equally between patient care and translational research focusing on causes and treatments for blindness, especially of disorders that affect the retina and optic nerve. His focus over the past decade has been on developing a better understanding of the root causes of non-arteritic anterior ischemic optic neuropathy (NAION, i.e. a “stroke” of the optic nerve that is the second most common cause of optic nerve blindness among middle age and older adults). He also has been working on use of epigenetic reprogramming to treat NAION, which is currently not treatable. The FDA has approved our “first-in-human” study to use an epigenetic treatment developed by Life Biosciences, to which Dr. Rizzo is a Medical Advisor, as a treatment for NAION and glaucoma. Dr. Rizzo also eagerly teaches and mentors fellows and residents. He is married (Sarah) and has two children: Isabella (23) and Ava (19).

## Jeremy Sivak, PhD



Professor, University of Toronto  
Glaucoma Research Chair at the Donald K Johnson Eye Institute,  
University Health Network

Jeremy M Sivak, PhD is Professor in the University of Toronto School of Medicine and holds the Glaucoma Research Chair at the Donald K Johnson Eye Institute, University Health Network. Dr. Sivak completed his PhD at Tufts University/New England Medical Center, followed by a postdoctoral fellowship at the University of Cambridge. He then joined Novartis as a project lead for multidisciplinary ophthalmic drug discovery. Upon returning to academics Dr. Sivak established a research program that examines the molecular mechanisms controlling retinal injury responses and aims to design new treatment and drug delivery strategies. The success of this work is reflected in prominent publications and lectures, consistent funding from federal and non-profit granting agencies, and a broad variety of academic and industry collaborations.

Simon John, PhD



Robert L. Burch III Professor of Ophthalmic Sciences  
Columbia University

Dr. Simon John received his B.Sc. with joint honors in Zoology and Genetics from University College Cardiff, Wales, and his Ph.D. in Biology from McGill University with Drs. Charles Scriver and Rima Rozen. Following postdoctoral training with Nobel Laureate Dr. Oliver Smithies at the University of North Carolina, Chapel Hill, he joined The Jackson Laboratory, where he pioneered the use of mice for glaucoma research, developing widely adopted mouse models and adapting clinical technologies for preclinical studies. This work led to his early appointment as an Investigator of the Howard Hughes Medical Institute. In 2019, he joined Columbia University as the Robert L. Burch III Professor of Ophthalmic Sciences. His research has transformed understanding of glaucoma through fundamental discoveries in ocular development, intraocular pressure, optic nerve degeneration, and compartmentalized retinal ganglion cell degeneration. His laboratory also discovered a previously unrecognized vascular developmental program by which Schlemm's canal forms, redefining understanding of aqueous outflow development. His laboratory combines modern single-cell and spatial genomics with rigorous functional validation to define disease mechanisms. More recently, his group demonstrated that elevated intraocular pressure causes early blood-retinal barrier dysfunction that modulates glaucoma progression. His work also identified metabolic disturbances in glaucoma and established cellular resilience as a therapeutic strategy, leading to clinical trials of nicotinamide and pyruvate. Three published clinical trials from independent groups have reported promising results, with additional clinical trials ongoing worldwide. Dr. John has published extensively in leading journals, is an inventor on multiple patents, and has received a number of national and international awards, including the Sanford and Susan Greenberg Visionary Prize to End Blindness.

Trainee Award #1, MD

**Speaker and presentation title to be confirmed**

**Learning objectives to be provided following selection of the award recipient**

Trainee Award #2, MD

**Speaker and presentation title to be confirmed**

**Learning objectives to be provided following selection of the award recipient**

## 6. Learning Objectives

### Overall Learning Objectives

At the end of Form & Function 2026, participants will be able to:

1. Examine and appraise diverse topics in clinical ocular disease and visual neuroscience  
(*CanMEDS roles: Medical Expert, Scholar*)

### Connie Cepko, PhD

*How does the retina make so many cell types*

#### Objectives

1. Describe the complexity of retinal development (*CanMEDS roles: Scholar*)
2. Illustrate how intrinsic changes in mitotic progenitor cells influence the type of cell generated  
(*CanMEDS roles: Scholar*)
3. Identify the conserved mechanisms that pattern a high acuity area (*CanMEDS roles: Scholar*)

### Austin Roorda, PhD

*Hacking human vision for basic and clinical science*

#### Objectives:

1. Describe the optical limits of human vision and how adaptive optics (AO) and eye tracking can be used to overcome those limits (*CanMEDS roles: Medical Expert, Scholar*)
2. Illustrate how an AO-based retinal imager can be used to control visual inputs to the brain for advanced study of human color vision (*CanMEDS roles: Scholar*)
3. Discuss how the same platform can be used to study visual consequences of eye disease, and how these studies can inform better ways to diagnose and/or treat eye disease (*CanMEDS roles: Medical Expert, Scholar, Health Advocate*)

### Andrew Lee, MD

*This is not your father's optic neuritis*

#### Objectives

1. To define typical and atypical optic neuritis (*CanMEDS roles: Medical Expert*)
2. To describe the neuroradiologic features of different types of optic neuritis (*CanMEDS roles: Medical Expert, Collaborator*)
3. To define serologic testing including NMO and MOG antibodies (*CanMEDS roles: Medical Expert, Collaborator*)

### Yacine Touahri, PhD

*The retina's decision code: Gene programs that set identity in motion*

**Objectives:**

1. Describe how combinatorial transcription factor codes define retinal progenitor competence and constrain lineage potential (*CanMEDS roles: Scholar*)
2. Analyze how transcription factor interactions influence gene regulatory networks, chromatin accessibility, and progenitor identity during retinal development (*CanMEDS roles: Scholar*)
3. Revise the core mechanisms by which retinal progenitors interpret transcriptional inputs to drive cell-fate specification and generate diverse neuronal identities (*CanMEDS roles: Scholar*)

**Joseph Rizzo, MD**

*The anatomical basis of visual hallucinations*

**Objectives:**

1. Review basic characteristics of visual hallucinations (*CanMEDS roles: Medical Expert, Communicator*)
2. Relate visual features of visual hallucinations with specific regions of the afferent visual pathways (*CanMEDS roles: Medical Expert, Scholar*)
3. Consider which types of visual hallucinations are medically more worrisome (*CanMEDS roles: Medical Expert, Communicator, Collaborator*)

**Jeremy Sivak, PhD**

*Dysfunction follows form: How retinal architecture turns stress into disease*

**Objectives:**

1. Identify the unique structures of the human optic nerve head and how they reflect ocular health (*CanMEDS roles: Medical Expert, Scholar*)
2. Consider the use of organotypic models to investigate complex spatial and architectural questions (*CanMEDS roles: Scholar*)
3. Evaluate how elevated intraocular pressure induces neuroinflammatory signaling in specific human optic nerve head subregions (*CanMEDS roles: Medical Expert, Scholar*)

**Simon John, PhD**

*From degeneration to resilience: Metabolic therapies for glaucoma*

**Objectives:**

1. Describe the role of metabolic dysfunction and cellular resilience in retinal ganglion cell degeneration in glaucoma (*CanMEDS roles: Medical Expert, Scholar*)
2. Evaluate preclinical and clinical evidence supporting metabolism-based therapies, including nicotinamide and pyruvate, for glaucoma (*CanMEDS roles: Medical Expert, Scholar*)
3. Identify challenges and future directions for translating cellular resilience therapies into clinical practice (*CanMEDS roles: Medical Expert, Scholar*)

## Trainee Award #1

*Title*

**Objectives:**

- 1.
- 2.
- 3.

## Trainee Award, #2

*Title*

**Objectives:**

- 1.
- 2.
- 3.

## 7. Acknowledgements

The Department of Ophthalmology & Visual Sciences would like to thank our moderators for their contributions to the 2026 Form & Function in Ocular Disease Symposium:

**[Moderator Name]**

**[Title/Affiliation]**

We also acknowledge the dedication and efforts of the **Scientific Planning Committee**, whose time, expertise, and commitment were essential to the planning and development of this event.

- **Dr. Balwantray Chauhan, co-Chair**
- **Dr. Oksana Dyachok, co-Chair**
- **Robyn Sharpe**
- **Dr. Paul Rafuse**

A special thank you to **Leah Wood, Laurie Ketch** for editing this program document and **Chris Phillips** for his support and guidance with the audio-visual aspects of the event.

Finally, we acknowledge the Department of Ophthalmology & Visual Sciences Research Committee and the many individuals within the Department whose hard work and collaboration contributed to the organization of Form & Function.

Thank you.

## 8. Sponsors

This program has received an educational grant or in-kind support from:

