

Glaucoma Research Society



Glaucoma Research Society 2022

August 24-27

Halifax, Canada





Welcome Message

Dear Colleague,

It is a particularly special pleasure to welcome to you to the 2022 meeting of the Glaucoma Research Society. As you know this meeting was originally scheduled to take place in 2020, only to be postponed twice because of the COVID pandemic. Now finally, two years later, it is difficult to believe that it will happen! I know it has been a difficult period for us all, with travel being an important casualty of the pandemic. An in-person meeting is the most vital element of the GRS. As many organisations did during the pandemic, we could have resorted to an online meeting, however, the Executive was unanimously against this approach. For this reason, I am especially grateful that you have made the effort to travel from all over the world to be here.

The biennial meeting provides us with a rich and valuable environment to share ideas and form research partnerships. I am very grateful to the Program Committee, co-chaired by Janey Wiggs and Chris Leung, for putting together an innovative and diverse series of sessions. I am also grateful to all the speakers and moderators for accepting their tasks. We welcome candidate members from both 2020 and 2022, each of whom will present papers on their research. New this meeting are two Lightning Talk sessions which consist of shorter presentations on diverse topics. Finally, there are two excellent workshops that will take place on August 25.

We have arranged a Social Program that highlights many of the wonderful things that Halifax and Nova Scotia have to offer. Included in your registration is a visit to Pier 21, the gateway for immigration into Canada for almost half of the 20th Century. No visit to Nova Scotia is complete without a lobster dinner, so for our final gathering we will dine at Saint Mary's Boat Club located on the beautiful Northwest Arm. After the last session on August 27, there will be a short choral concert of Early Music at the King's College Chapel.

I hope you will enjoy the meeting. Welcome to Halifax!

Balwantray Chauhan
GRS President



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Executive Committee

President
Balwantray Chauhan

President Elect
Ki Ho Park

Treasurer
Keith Martin

Secretary
Linda Zangwill

Past President
Franz Grehn

Membership Committee Chair
David Garway-Heath

Program Committee Co-Chairs
Chris Leung
Janey Wiggs

Members-at-Large
Toru Nakazawa
Ramanjit Sihota
Hani Levkovich-Verbin



Speakers and Moderators

Makoto Aihara, Japan
Wallace L.M. Alward, USA
Tin Aung, Singapore
Donald Budenz, USA
Claude F. Burgoyne, USA
Balwantray Chauhan, Canada
Abbot Clark, USA
Francesca Cordeiro, United Kingdom
Jamie Craig, Australia
John Danias, USA
Adriana Di Polo, Canada
C. Ross Ethier, USA
John Fingert, USA
Brad Fortune, USA
David S. Friedman, USA
Stefano Gandolfi, Italy
David Garway-Heath, United Kingdom
Gus Gazzard, United Kingdom
Christopher Girkin, USA
Aiko Iwase, Japan
Henry Jampel, USA
Thomas Johnson, USA
Jae Hee Kang, USA
Anthony Khawaja, United Kingdom
Chiea Chuen Khor, Singapore
Tae-Woo Kim, South Korea
Christopher Leung, Hong Kong

Leonard Levin, Canada
Jeffrey M. Liebmann, USA
Nick Marsh-Armstrong, USA
Keith Martin, United Kingdom
Felipe Medeiros, USA
Donald Minckler, USA
Marcelo Nicolela, Canada
Gary Novack, USA
Colm O'Brien, Ireland
Ki Ho Park, South Korea
Louis R. Pasquale, USA
Lutz Pillunat, Germany
Harry Quigley, USA
Pradeep Y. Ramulu, USA
Alan Robin, USA
Ursula Schlötzer-Schrehardt, Germany
Joel S. Schuman, USA
Kuldev Singh, USA
George Spaeth, USA
Ingeborg Stalmans, Belgium
Daniel Stamer, USA
Anja Tuulonen, Finland
Monica Vetter, USA
Janey L. Wiggs, USA
Tina Wong, Singapore
Linda Zangwill, USA

Wednesday August 24

Thursday August 25

Friday August 26

Saturday August 27

	07:30 - 17:00 Registration Desk Opening	07:30 - 13:30 Registration Desk Opening	07:30 - 17:00 Registration Desk Opening
	08:00 - 08:10 Welcome	08:20 - 09:30 Session 4 Alumni Hall	08:00 - 09:40 Session 6 Alumni Hall
	08:10 - 09:50 Session 1 Alumni Hall		
	09:50 - 10:20 Break	09:40 - 10:20 Break	09:40 - 10:10 Break
	10:20 - 12:00 Session 2 Alumni Hall	10:20 - 10:50 Session 5 Goldmann Lecture Alumni Hall	10:10 - 11:50 Session 7 Alumni Hall
		10:55 - 11:55 Business Meeting Alumni Hall	
	12:00 - 13:30 Lunch Prince Hall Ground Floor	12:00 - 13:30 Lunch Prince Hall Ground Floor	11:50 - 13:00 Lunch Prince Hall Ground Floor
			13:00 - 14:00 Session 8 Alumni Hall
		13:30 - 20:30 Optional Tour	14:00 - 14:20 Break
		Visit to Grand Pre National Historic Site	14:20 - 16:00 Session 9 Alumni Hall
		Wine tasting at Benjamin Bridge	16:00 Meeting Adjourns
		Dinner between Lightfoot & Wolfville	
15:00 - 17:00 Registration Desk Opening Alumni Hall Foyer	15:00 - 15:30 Break		16:10 - 17:00 Choral Concert at King's College Chapel
	15:30 - 17:10 Session 3 Alumni Hall		
18:00 - 19:30 Welcome Reception at Citadel Hill	18:30 - 22:30 Guided visit of Pier 21 followed by Social Dinner		18:30 - 22:30 Farewell Dinner at St Mary's Boat Club



08:00 - 08:10 | Alumni Hall

Welcome
Balwantray Chauhan

08:10 - 09:50 | Alumni Hall

Session 1 - Population screening and risk stratification
Moderators: Donald Budenz, Joel Schuman

08:10 Polygenic risk scores
Anthony Khawaja

08:30 Myopia and glaucoma screening with perimetry
Aiko Iwase

08:50 Artificial Intelligence for glaucoma detection: challenges and a quest for solutions
Ingeborg Stalmans

09:10 The ZAP trial on angle closure
David Friedman

09:30 Telemedicine in glaucoma
Louis Pasquale

09:50 Break

10:20 - 12:00 | Alumni Hall

Session 2 - Detecting glaucoma progression
Moderators: Balwantray Chauhan, Ki Ho Park

10:20 Trend-based analysis of visual field data
Felipe Medeiros

10:40 Visual field and structural progression in the ADAGES
Linda Zangwill

11:00 Choroidal microvascular and progression
Tae-Woo Kim

11:20 Directional OCT and OCT-A in imaging glaucomatous optic nerve head deformation
Brad Fortune

11:40 DARC and progression
Francesca Cordeiro

12:00 - 13:30 | Prince Hall - Ground Floor

Lunch

13:30 - 15:00 | Archibald Room

Parallel Workshop I
Outcome measures for clinical trials of neuroprotection
Facilitators: David Garway-Heath and Christopher Leung

13:30 - 15:00 | KTS lecture Hall

Parallel Workshop II
Why do retinal ganglion cells die in glaucoma?
Facilitators: Adriana Di Polo and Nicolas Marsh-Armstrong

15:00 Break

15:30 - 17:10 | Alumni Hall

Session 3 - IOP and disease: causes and therapy
Moderators: Claude Burgoyne, Leonard Levin

15:30 Molecular signature of human outflow cells by single-cell transcriptomics
Daniel Stamer

15:50 Trabecular meshwork stiffness: In vivo measurement and relationship to function
C. Ross Ethier

16:10 Laser trabeculoplasty
Gus Gazzard

16:30 Application of multiphoton imaging: Insights into collagen remodelling and the future of anti-fibrotic strategies
Tina Wong

16:50 Stem cell therapy
Joel Schuman



08:20 - 09:30 | Alumni Hall

Session 4 - Lightning talks 1

Moderators: Henry Jampel, Marcelo Nicolela

08:20 What part of the clinical examination correlate with how patients feel?
George Spaeth

08:30 Patient related outcomes in the assessment of novel glaucoma surgical devices
Kuldev Singh

08:40 Patterns of physical activity in glaucoma
Pradeep Ramulu

08:50 Increased retinal venous pressures are a risk factor in glaucoma
Lutz Pillunat

09:00 Aqueous lipid mediator as a marker of chronic IOP elevation in open-angle glaucoma
Makoto Aihara

09:10 How SLT works? From bench to bedside
Stefano Gandolfi

09:20 Why aren't there more new drugs to treat glaucoma?
Gary Novack

09:40 *Break*

10:20 - 10:50 | Alumni Hall

Session 5 - Goldmann Lecture

Big data and critical thinking in the search for value

Introduction: **Balwantray Chauhan**

Speaker: **Anja Tuulonen**

10:55 - 11:55 | Alumni Hall

Business Meeting

12:00 - 13:30 | Prince Hall - Ground Floor

Lunch

08:00 - 09:40 | Alumni Hall

Session 6 - Molecular mechanisms underlying ganglion cell death

Moderators: Keith Martin, Janey Wiggs

08:00 Neurovascular coupling impairment in glaucoma
Adriana Di Polo

08:20 Glaucoma-associated OPTN mutations increase transmitography
Nicolas Marsh-Armstrong

08:40 Complement activation
Monica Vetter

09:00 Improving translational fidelity: lessons from Sigma-1 receptor neuroprotection
Leonard Levin

09:20 Nicotinamide and pyruvate for neuroenhancement in open-angle glaucoma
Jeffrey Liebmann

09:40 *Break*

10:10 - 11:50 | Alumni Hall

Session 7 - New insights into disease mechanisms

Moderators: Louis Pasquale, Ursula Schlötzer-Schrehardt

10:10 EFEMP1 and juvenile open-angle glaucoma
Janey Wiggs

10:30 APBB2 and primary open-angle glaucoma
Tin Aung

10:50 Multi-ethnic primary open-angle glaucoma GWAS
Jamie Craig

11:10 CYP39A1 rare variants and exfoliation syndrome
Chiea Chuen Khor

11:30 Metabolomic profile of exfoliation glaucoma in pre-diagnostic plasma
Jae Hee Kang

11:50 - 13:00 | Prince Hall - Ground Floor

Lunch



13:00 - 14:00 | Alumni Hall

Session 8 - Lightning talks 2

Moderators: **Wallace L. Alward, Abbot Clark**

- 13:00 APP-A4 demonstrates axonal transport block in human glaucoma
Donald Minckler
- 13:10 Lamina cribrosa astrocytes are possibly unique
Harry Quigley
- 13:20 Optic nerve head myopic alteration: conceptual and clinical implications
Claude Burgoyne
- 13:30 Lamina cribrosa tissue stiffness is a fundamental driver of glaucomatous cupping
Colm O'Brien
- 13:40 Functional genomics reveal metabolic pathways involved in pseudoexfoliation
Ursula Schlötzer-Schrehardt
- 13:50 Pseudoexfoliation: true or false
Alan Robin

14:00 *Break*

14:20 - 16:00 | Alumni Hall

Session 9 - Glaucoma models: animals and cells

Moderators: **Claude Burgoyne, Christopher Leung**

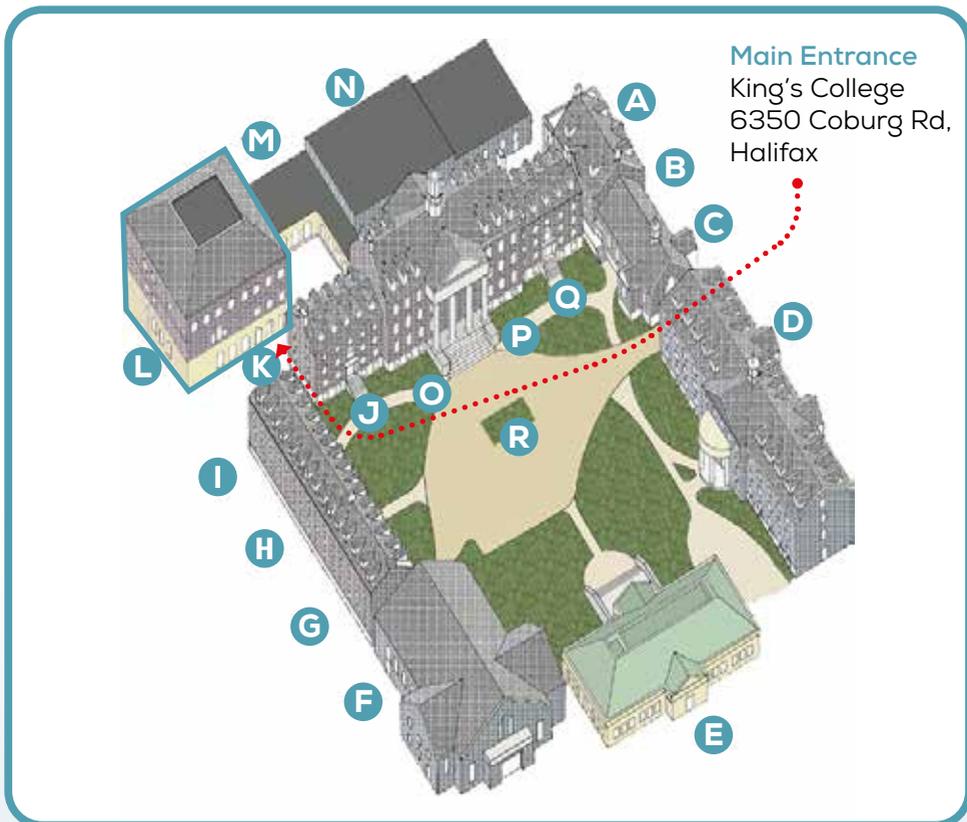
- 14:20 An ocular hypertensive model in human organ donors
Christopher Girkin
- 14:40 Tissue plasminogen activator in MYOC mutant mice
John Danias
- 15:00 Inducible rodent models of glaucoma
Abbot Clark
- 15:20 TBK1 transgenic mouse
John Fertig
- 15:40 Induced-pluripotent stem cells for ganglion cell differentiation
Thomas Johnson
- 16:00 Meeting adjourns

Halifax City Map





Meeting Venue Map



Main Entrance
King's College
6350 Coburg Rd,
Halifax

- | | | |
|-------------------------|--------------------------------|---|
| A The Lodge | G Chapel Bay | M Link |
| B The Pit | H Middle Bay | N Prince Hall |
| C The Chapel | I Radical Bay | O Arts & Administration Building |
| D Alexandra Hall | J North Pole Bay | P Wardroom |
| E Library | K New Academic Building | Q Cochran Bay |
| F Gym | L Bookstore | R Flagstaff |

General Information

Meeting Location

The **GRS 2022** meeting will be held in the campus of the University of King's College. It is located adjacent to Dalhousie University and within walking distance to the city centre.

University of King's College

6350 Coburg Road, Halifax, NS, Canada B3H 2A

Meeting Rooms

All main sessions will be held in the **Alumni Hall (Plenary Hall)**, located in the New Academic Building Main Floor, while the Workshops scheduled on Thursday, August 25 in the following rooms

Workshop I: Outcome measures for clinical trials of neuroprotection
Archibald Room - 3rd Floor

Workshop II: Why do retinal ganglion cells die in glaucoma?
KTS lecture Hall - 2nd Floor

Registration Desk

The **Organising Secretariat Desk** will be located in the New Academic Building, adjacent to Alumni Hall, and will be open for registration and information according to the following schedule:

Wednesday, August 24	15:00 – 17:00
Thursday, August 25	07:30 – 17:00
Friday, August 26	07:30 – 13:30
Saturday, August 27	07:30 – 17:00

Please collect the meeting kit at the Secretariat Desk and wear your name badge during the scientific sessions and social activities.

Certificate of Attendance

The certificate of attendance will be delivered by email to all attendees after the meeting.



General Information

Slide Preparation and Preview

You can preview your slides in the Alumni Hall, the main meeting room, at the **speaker ready corner**. Alumni Hall is equipped with a PC (for PowerPoint) and Apple Macintosh computer (for PowerPoint or Keynote). Presentations must be loaded on the central computers at least two hours prior to the start of the session. Speakers are advised to check their presentations beforehand to ensure that the presentation runs as intended. Presentations cannot be made from the speaker's own computer

Catering

Coffee breaks and buffet lunches are included in the delegate registration fee. All the delegates and registered accompanying persons are welcome to join the Social Events included in the registration fee (please see Social Events section for further information).

Dress code

The dress code will be informal for all sessions and social events.

Insurance

The organisers are not responsible for individual medical, travel or personal insurance. Registrants and accompanying persons should arrange their own coverage.

Contact Information

For assistance, please contact the Organising Secretariat:



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Social Events

Wednesday, August 24

18:00 - 19:30 | Welcome Reception - Halifax Citadel

Address: Halifax Citadel National Historic Site, 5425 Sackville St, Halifax

All registered delegates and registered accompanying persons are invited to this reception. There will be a guided tour of this National Historic site. We will be accompanied by a local piper while we enjoy local wines and delicacies. Citadel Hill is within walking distance of the Lord Nelson and Atlantica Hotels. Please be aware that reaching the Citadel involves a gentle uphill walk and therefore those with mobility issues may elect to take a taxi.

Thursday, August 25

18:30 - 22:30 | Canadian Museum of Immigration and Dinner at Pier 21

Address: Canadian Museum of Immigration and Dinner at Pier 21, 1055 Marginal Road, Halifax

All registered delegates and registered accompanying persons will visit Canada's national museum of immigration, which occupies part of Pier 21, the former ocean liner terminal and immigration shed from 1928 to 1971. Pier 21 is Canada's last remaining ocean immigration shed. After the guided tour the evening will continue with a cocktail and a dinner reception inside the Museum.

Transportation will be provided only by the two GRS suggested hotels:

18:00 Meeting point in the lobby of Atlantica Hotel

18:20 Meeting point in the lobby of Lord Nelson Hotel

Saturday, August 27

Helios Vocal Ensemble performance - "The Universal Language"

16:10 - 17:00 | King's College Chapel

Helios Vocal Ensemble is Atlantic Canada's premier vocal ensemble, performing sacred and secular music from the Renaissance and beyond. Founded in 2015, they have already appeared in many of the region's leading chamber music series, including the Indian River Festival, Cecilia Concerts, the Three Churches Festival, Musique Royale, and the Music Room Chamber Players series, as well as several festivals in Québec. Their debut recording, "An Illuminated Christmas", was nominated for Classical CD of the Year in 2018 by Music Nova Scotia. Members include Eszter Horvath (soprano), former music director at All Saints Cathedral, Halifax; Andrew Pickett (alto), former lay clerk at Manchester Cathedral; Michael van der Gaag (tenor), National Youth Choir alumnus; and Spencer Gough (bass). Dominique Saulnier (soprano) will be joining them for this performance.

Saturday, August 27

18:30 - 22:30 | Lobster Dinner at Saint Mary's Boat Club

Address: Saint Mary's Boat Club, 1641 Fairfield Rd, Halifax,

All registered delegates and registered accompanying persons are invited to Saint Mary's Boat Club and enjoy the iconic famous lobster. Built in 1905 and renovated in 1991, St. Mary's Boat Club offers a unique event venue overlooking the Northwest Arm in Halifax's South End.

Transportation will be provided only by the two GRS suggested hotels:

18:00 Meeting point in the lobby of Atlantica Hotel

18:20 Meeting point in the lobby of Lord Nelson Hotel



Optional Tour

Not included in the registration fee

Friday, August 26

Visit at Grand-Pré National Historic Site with dinner at Lightfoot & Wolfville

13:30 Meeting Point at King's College

20:30 Return to Halifax and drop-off point at Lord Nelson Hotel and Atlantica Hotel

Kilted tour guide of Grand-Pré followed by wine tasting at Benjamin Bridge and dinner at Lightfoot & Wolfville.

Accompanying Person Optional Program

We suggest the following optional tours for Accompanying Persons:

Thursday, August 25

Lunenburg & Mahone Bay Tour by Bus (10:00 - 16:00)

Friday, August 26

Harbour Hopper (10:15 - 11:10)

Saturday, August 27

Peggy's Cove (09:30 - 12:30)

To organize these tours please check details at the following web site:
www.ambassatour.com

The GRS is pleased to welcome the following guests to the 2022 meetings. Guests of GRS Members are those who are felt by the inviting member to be future GRS members. We are especially happy to welcome guests from regions underrepresented in the GRS membership and are grateful to Allergan, CenterVue, Santen and Topcon for their generous support.

Guests of GRS Members

Ryo Asaoka
Michael Boland
Crawford Downs
Sara Giammaria
Jin Wook Jeoung
Thomas Johnson
Rachel Kuchtey
Sameh Mosaed
Karin Pillunat
Ian Pitha
Aaki Shukla
Josh Stein
Michelle Tian Sun
Gadi Wollstein

Inviting GRS Member

Araie Makoto
David Friedman
Colm O'Brien
Balwantray Chauhan
Ki Ho Park
Pradeep Ramulu
Henry Jampel
Donald Minckler
Lutz Pillunat
Harry Quigley
Jeffrey M. Liebmann
Alan Robin
Kuldev Singh
John Danias

Guests of Program Committee (Invited Speakers)

Jae Hee Kang
Chiea Chuen Khor

Guests of Host Country

Brennan Eadie
Lesya Shuba
Jeremy Sivak
Jayme Vianna

Guests from Regions Underrepresented in the GRS Membership

Virna Dwi Oktariana Asrory (Indonesia)
Alina Popa Cherecheanu (Romania)

Glaucoma Research Society

