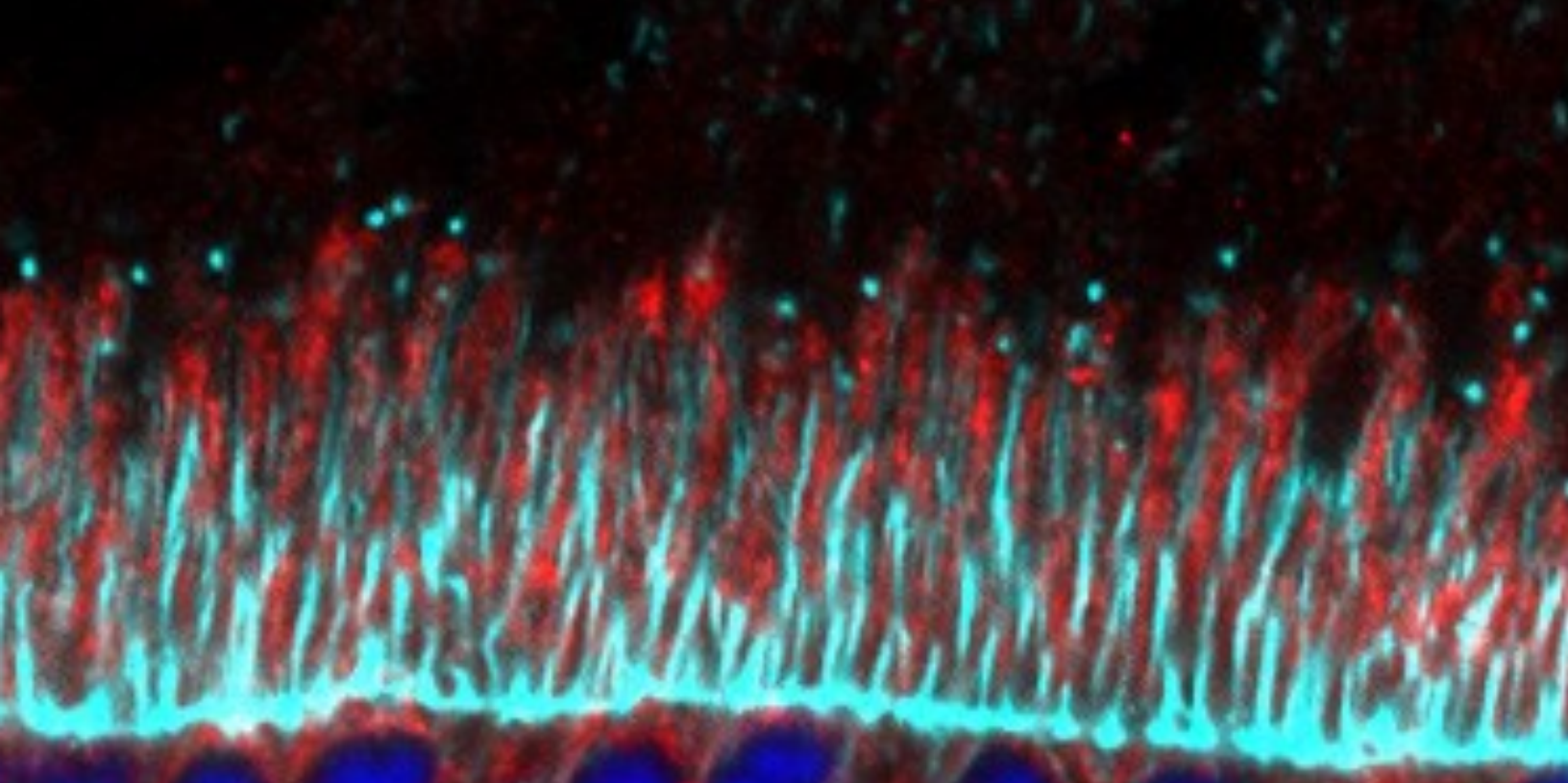

Department of Ophthalmology & Visual Sciences

ANNUAL REPORT 2023-2024

OPHTHALMOLOGY & VISUAL SCIENCES

DALHOUSIE UNIVERSITY

Cover photo courtesy of Dr. Melina Agosto

Description of photo: Cross-section of the outer retina of a mouse. The sample was labeled with markers for filamentous actin (phalloidin, cyan), endoplasmic reticulum (calnexin, red), and cell nuclei (DAPI, blue). The row of small cyan dots near the top are actin bundles in the photoreceptor connecting cilia.

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Message from Department Head

Paul Rafuse, MD, PhD, FRCSC
Head and Chief
Department of Ophthalmology & Visual Sciences
Dalhousie University & Nova Scotia Health

Dear members and friends of the Department of Ophthalmology & Visual Sciences,

It is with tremendous pride I encourage you to read our 2023-24 report. The Department has had a remarkable year with many notable achievements and milestones reached. Please note this issue reports data for education (15 months) and research (18 months) as we have realigned our reporting period to the academic year.

I would like to start by extending a special thank you to Dr Marcelo Nicolela who completed more than nine years of duty as our Head and Chief at the end of August 2023. His leadership saw the Department flourish clinically and academically on all fronts. The momentum he developed in his first term was slowed somewhat by the unprecedented and war-like conditions brought on by the COVID-19 pandemic. He never let us get defeated and guided us through with a masterful blend of resourcefulness and resilience. Thank you so much Marcelo. Also, I must thank Dr Lesya Shuba for stepping in to hold the fort for the ensuing 12 months as Interim Head and Chief. Her short tenure was marked by several searches being conducted. She was clearly a busy person. Thank you, Lesya.

Our clinical output has vastly increased with projections of more to come. The Bayers Lake Community Outpatient Clinic (BLCOC) has strikingly expanded the reach of ambulatory eye care within Central Zone, and the community offices continue to find efficiencies to enhance their offerings. The Halifax Vision Surgical Centre (HVSC) has markedly reduced wait-times for cataract surgery in metro and I'm sure it is a big part of the reason the 2024 report of the Canadian Institute for Health Information (CIHI) has Nova Scotia with 83% patients receiving cataract surgery within the national benchmark of 112 days. This put us in first place (tied with BC) in Canada! Congratulations to all who have made this a reality.

Please read about our many award winners. Drs Charles (Chuck) Maxner and Robert LaRoche both received the Canadian Medical Association Honorary Membership Awards in recognition of their distinguished careers. Dr Anu Mishra is acknowledged with the 2023 Faculty of Medicine Early Career Award for Excellence in Education and the Vision Loss Rehabilitation Canada Distinguished Community Partner Award. Dr Rishi Gupta was the most recent recipient of the Dr. GW Archibald Gold Headed Cane award in the Humanities.

Our learners, at all levels of education and training, continue to impress the judges and make us proud of their many accomplishments and recognitions. Funding from a significant number of endowments and external sources are greatly appreciated; the details of which are found herein.

You should read about our successful 33rd and 34th Annual DOVS Research Days. These engaging events get better each year. The Atlantic Eye Symposium, under the leadership of Dr Arif Samad continues to provide an eagerly anticipated educational opportunity for all eye care providers. Finally, I would be re-miss if I didn't draw your attention to the Grand Rounds schedule and impressive Visiting Professor list made possible by Dr Balwantray Chauhan and his Committee.

A great deal has been accomplished this year, and I want to thank everyone for doing all you do to make this department a leading light for academic ophthalmology and visual sciences in North America.

MISSION

The Department of Ophthalmology & Visual Sciences provides high quality ophthalmological care for the population of Nova Scotia and Atlantic Canada, delivers excellent medical education programs and conducts internationally recognized research in a collaborative and innovative environment.

VISION

To lead Canadian ophthalmology in patient care, education and research.

VALUES

- Commitment to excellence
- Transparency, accountability, fiscal and social responsibility
- Innovation and a spirit of inquiry
- Professionalism and inclusivity
- Collaboration and community engagement

Who We Are & What We Do

Where We Deliver Care

Eye Care Centre Visits	47,753
Cobequid Clinic	1,554
Bayer's Lake Clinic	3,657
IWK Ophthalmology	7,507
Total Adult Surgeries	10,597
HVSC Surgeries *included in total above	4,752
Total IWK Surgeries	231

Who Delivers Care

Ophthalmologists	24
Nursing & Technical Staff	70
Administrative Staff	30
Research Coordinators	9.5

Surgical Cases by Subspecialty

Cataracts (incl. HVSC)	7,408
Cornea	207
Glaucoma	646
Orbit/Plastics	358
Paediatrics	231
Retinal Surgery	1,820
Adult Strabismus	158

Research

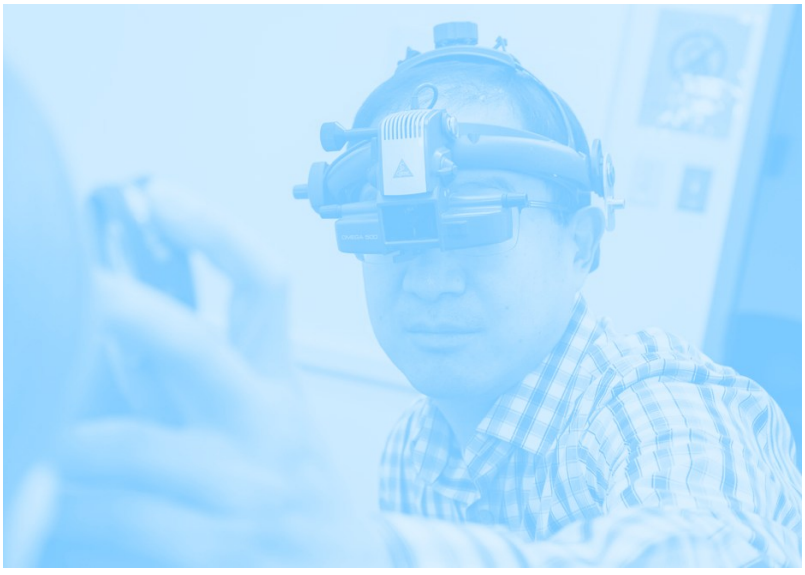
31 Invited Presentations

33 Peer Reviewed Manuscripts

$2.52M Continuing Research Grants & Contracts

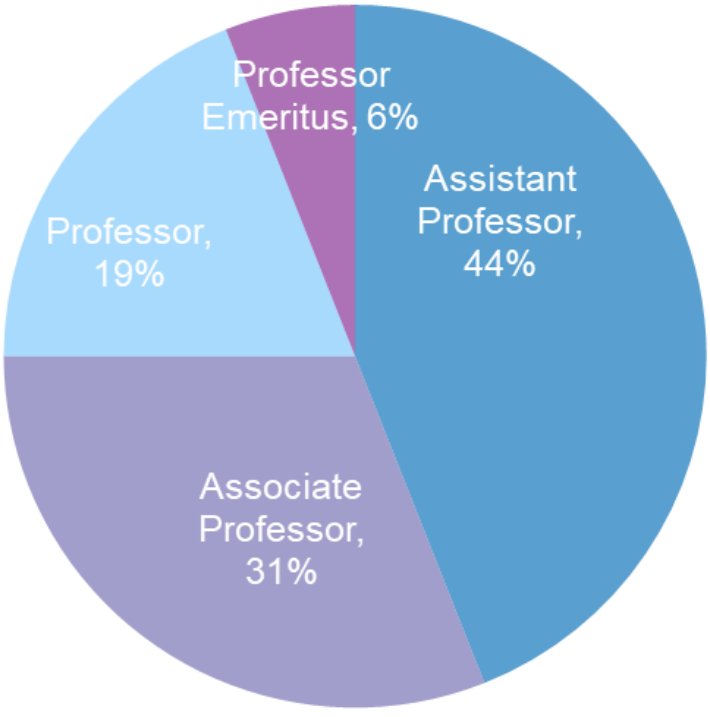
$138K New Research Grants & Contracts

$2.66M Total Research Funding



Who We Are & What We Do

Education



Postgraduate Education

Residents PGY2-5	11
Resident PGY1	2
Fellow - Clinical Glaucoma	1
Fellow - Paediatrics	1
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Undergraduate Education

MED 4 Elective students	6
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Professional Development

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Our Faculty

Dr. Curtis Archibald, Assistant Professor
Dr. Bashar Bata, Assistant Professor
Dr. Dan Belliveau, Assistant Professor
Dr. Danielle Cadieux, Assistant Professor
Dr. Wesley Chan, Assistant Professor
Dr. Balwantray Chauhan, Professor
Dr. Alan Cruess, Professor
Dr. Mishari Dahrab, Assistant Professor
Dr. John Dickinson, Associate Professor
Dr. Brennan Eadie, Assistant Professor
Dr. Carolina Francisconi, Assistant Professor
Dr. Stan George, Associate Professor
Dr. Rishi Gupta, Associate Professor
Dr. Ahsen Hussain, Associate Professor
Dr. Robert La Roche, Professor
Dr. Anu Mishra, Associate Professor
Dr. Jeremy Murphy, Assistant Professor
Dr. Marcelo Nicolela, Professor
Dr. Daniel O'Brien, Associate Professor
Dr. Andrew Orr, Associate Professor
Dr. Veronique Promelle, Assistant Professor
Dr. Paul Rafuse, Associate Professor & Head
Dr. Johane Robitaille, Professor
Dr. Arif Samad, Associate Professor
Dr. Christopher Seamone, Associate Professor
Dr. Lesya Shuba, Professor
Dr. Corey Smith, Assistant Professor
Dr. Alex Tan, Assistant Professor
Dr. Michael Thorne, Assistant Professor
Dr. Amr Zaki, Assistant Professor

Joint Appointments
Dr. Melina Agosto (Physiology and Biophysics)
Dr. William Baldridge (Anatomy & Neurobiology)

Emeritus Appointments
Dr. Raymond LeBlanc, Professor Emeritus*
Dr. Charles Maxner, Professor Emeritus

*Deceased July 2023

Cross Appointments
Dr. David Clarke (Surgery)
Dr. Patrice Cote (Biology)
Dr. Melanie Kelly (Pharmacology)
Dr. Emad Massoud (Surgery)
Dr. Sylvia Pasternak (Pathology)
Dr. David Persaud (Health Services Administration)
Dr. David Westwood (Health & Human Performance)

Distributed Learning Faculty
Dr. Zach Ashkenazy, Lecturer
Dr. William Best, Assistant Professor
Dr. Andrew Boswall, Assistant Professor
Dr. Paul Cheevers, Assistant Professor
Dr. David Comstock, Assistant Professor
Dr. Alex de Saint-Sardos, Assistant Professor
Dr. Erin Demmings, Assistant Professor
Dr. Edward Doherty, Assistant Professor
Dr. Jennifer Gao, Assistant Professor
Dr. Abbas Haider, Assistant Professor
Dr. Kenneth Hammel, Lecturer
Dr. Mustafa Kapasi, Assistant Professor
Dr. Alejandro Lichtinger, Assistant Professor
Dr. Colin Mann, Assistant Professor
Dr. Kristine Mayer, Assistant Professor
Dr. Rajender Mohandas, Assistant Professor
Dr. Mohamed Mongy, Assistant Professor
Dr. Kenneth Roberts, Assistant Professor
Dr. Robert Scott, Assistant Professor
Dr. Houfar Sekhavart, Assistant Profesor
Dr. Banakesari Shetty, Assistant Professor
Dr. Nir Shoham-Hazon, Assistant Professor
Dr. Iva Smrz, Assistant Professor
Dr. Jeffrey Steeves, Assistant Professor
Dr. J. Christopher Symonds, Assistant Professor
Dr. Vicki Taylor, Assistant Professor
Dr. Hila Zommer-Sykes, Assistant Professor

Promotions

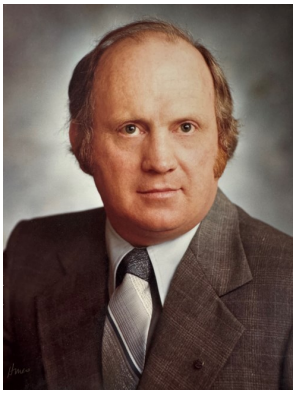
Congratulations to Dr. Anu Mishra on her promotion from Assistant Professor to Associate Professor. She submitted a strong application package to the DOVS Promotions Committee who sought reviews from four external independent referees. The DOVS Committee was unanimous in its recommendation to the Faculty of Medicine, whose review was also favorable. The Faculty of Medicine recognized Dr. Mishra as a strong contributor to Dalhousie University and the local community and as someone clearly devoted to advancing the educational mandate of the Department, the University, and at a national level. Dr. Mishra's promotion is effective July 1, 2024.

Anuradha Mishra, MD, MEd, FRCSC
Assistant Dean Skilled Clinician & Interprofessional Education
Associate Professor
Director, Undergraduate Medical Education Ophthalmology

In Memoriam

Dr. George Sapp
1940 - 2023

Dr. Raymond LeBlanc
1939 - 2023



Dr. Ed Rafuse
1935 - 2023

Retirements

Dr. Francois Tremblay

Dr. Robert La Roche

Dr. Charles Maxner

Dr. Christopher Seamone

Awards & Accolades

The Canadian Medical Association Honorary Membership Award

Dr. Charles (Chuck) Maxner received the Canadian Medical Association Honorary Membership Award for his tremendous contributions to education, research and patient care in neurology and neuro-ophthalmology. Dr. Maxner graduated in 1979 from Dalhousie Medical School and started his neuro-ophthalmology practice shortly after. He was instrumental in building the neuro-ophthalmology program into what it is today and his influence on patient care extends nationally and internationally. Dr. Maxner was also professor of Neurology and of Ophthalmology & Visual Sciences, and served in many other important roles over the years. He also held clinical administrative roles, including Head of the Division of Neurology.

Pictured above (L-R): Dr. Charles Maxner and Dr. Jean-Joseph Condé, Canadian Medical Association representative

Pictured above (L-R): Dr. Jean-Joseph Condé, Canadian Medical Association representative and Dr. Robert La Roche

Dr. Robert La Roche received the Canadian Medical Association Honorary Membership Award for his tireless contributions to education and best care practices in pediatric eye care and adult strabismus. Dr. La Roche began his practice in the early 1980s as the first full-time pediatric ophthalmologist in Atlantic Canada. Over 40 years, his leadership has transformed the IWK pediatric ophthalmology program into one of the most respected in the country. He was instrumental in creating the Dalhousie Clinical Vision Science program and a recognized pediatric ophthalmology fellowship program, training countless residents and fellows. He was Ophthalmology Residency Program Director at Dalhousie for over 12 years and established the national ethics symposium for ophthalmology residents.

Research Day Award Winners, April 5, 2023

Resident Award: Dr. Bonnie He “Risk of acute angle closure with bisphosphonate use in patients with osteoporosis”

Trainee Award: Aliénor Jamet “Characterization of adeno-associated viral vector promotor-mediated specificity to retinal ganglion cells for neuroprotective gene therapy”

Blitz Award: Dr. Douglas Iaboni “Multimodal imaging of white preretinal lesions in atypical familial exudative vitreoretinopathy: Case report and literature review”

Pictured above (L-R): Dr. Balwantray Chauhan, Dr. Akshay Thomas, Aliénor Jamet, Dr. Bonnie He, and Dr. Douglas Iaboni

2023 Faculty of Medicine Early Career Award for Excellence in Education

Dr. Anuradha Mishra is the recipient of the 2023 Dalhousie University Faculty of Medicine Early Career Award for Excellence in Education.

The *Early Career Award of Excellence in Education* recognizes a faculty member in their first seven years of their initial appointment. This award recipient has exemplified significant contributions to course development, implementation, and evaluation, has introduced educational innovations, and has contributed to the field of medical and graduate education through presentations, publications, or research in education, along with participating in professional development in education.

Vision Loss Rehabilitation Canada (VLRC) Distinguished Community Partner Award

Dr. Anu Mishra has been selected as the 2024 recipient of The Vision Loss Rehabilitation Canada (VLRC) Distinguished Community Partner Award. This Award represents the VLRC highest public recognition of the community partners for their outstanding contribution towards helping to expand access to integrated and accessible vision loss rehabilitation and health care services that enable Canadians impacted by vision loss to live the

Pictured above (L-R): Tanya Packer, Andy Filmore, Dr. Anu Mishra, and Jennifer Urosevic

Research Day Award Winners, April 10, 2024

Resident Award: Dr. Ashlyn Pinto “Gender and visible minority status on training experiences among Canadian ophthalmology residents and fellows”

Senior Trainee Award: Aliénor Jamet “Neuroprotection of retinal ganglion cells in experimental glaucoma using a novel gene therapy construct AAV2-SYN1-TrkB-2A-mBDNF”

Junior Trainee Award: Tyler Herod “Midterm follow up of glaucoma surgery outcomes: Xen gel stent versus trabeculectomy”

Blitz Award: Dr. Bonnie He “Incidence of sympathetic ophthalmia following intraocular surgery: A systematic review and meta-analysis”

Pictured above (L-R): Tyler Herod, Dr. Ashlyn Pinto, Dr.Nailyn Rasool, Dr. Bonnie He, and Aliénor Jamet

Dr. G.W. Archibald Gold headed Cane award in the Humanities

Dr. Rishi Gupta is this year’s recipient of Dr. G.W. Archibald Gold Headed Cane award in the Humanities. The recipients for this award are nominated for their notable combination of scholarly attainments in the humanities, humanism, integration of the humanities in their professional and personal life, and service as an effective role model for others in the medical humanities.

Pictured above (L-R): Dean Anderson, Dr. Rishi Gupta

Mathers Awards

Established in 2014, the Mathers Scholarships permit the Department to support students at the Undergraduate, Masters, PhD and Fellowship levels and are building our capacity year over year.

The Dr. R. Evatt and Rita Mathers Trainee Scholarships in Ophthalmology & Visual Sciences are enabled by a visionary endowment from the estate of the late Peggy St. George to honour her step parents pictured above.

2023 Recipients

The **Masters in Clinical Vision Sciences** scholarship is awarded to **Erin Ivany**, who is working under the supervision of Ms. Leah Walsh. Erin is evaluating the newer approach to stereopsis testing using "PASS III", a test utilizing objective preferential looking (eye movements) against a current clinical standard test which requires a subjective pointing or verbal response, in 2-5-year-olds. Determining an accurate measure of stereopsis in young children is important because it is routinely considered when determining the urgency of surgical management for eye misalignment and outcome predictability.

Robyn McGowan is the recipient of the **Masters in Vision Science** scholarship and is studying the retinal photoreceptor pre-synaptic protein, Pikachurin, under the direction of Dr. Melina Agosto. Pikachurin and other proteins on both sides of the photoreceptor and bipolar cell synapse are required for the proper formation and function of the synapse. Although photoreceptors have been studied extensively, little is known about how presynaptic proteins are directed to their correct location at the synapses, or how the trans-synaptic complexes are formed. Successful completion of this project will ameliorate gaps in knowledge about the structural parts of Pikachurin that are involved in its delivery to photoreceptor synapses and LRRTM4 binding.

2023 Mathers Scholarship Recipients (from the left clockwise): Aliénor Jamet, Delaney Henderson, Maja Witter, Robyn McGowan, and Erin Ivany

Dr. Delaney Henderson is the recipient of the **Research Fellowship in Ophthalmology and Visual Sciences**. Dr. Henderson, who is under the supervision of Dr. Balwantray Chauhan, is studying delivery of genes for fluorescent molecules to allow visualization of cells in the retina. This technique could be used as an imaging tool to visualize cellular function and dysfunction over time. The aim of the study is to track the functional behavior of individual RGCs before and after injury such as models of experimental glaucoma to characterize the loss of function over time in a living animal. Results of this study will increase our understanding of the properties of cellular loss of function and the safety of this technique so that it can be used as a clinical diagnostic tool in the future.

The **PhD in Vision Science** scholarship is awarded to **Aliénor Jamet**, who under the supervision of Dr. Balwantray Chauhan, is studying how to accurately monitor glaucoma disease stages by estimating retinal ganglion cell (RGC) loss from the single-cell level. This project will focus on single cell imaging of RGCs to monitor and detect the earliest alterations in their structure over time. They will subsequently use this technology to test a novel gene therapy-based treatment of glaucoma. This research will not only allow us to visualize how glaucoma compromises single RGC but also enable us to quantify the improvement that new drug treatments have at level of the individual cell *in vivo*.

Maja Witter is the recipient of the **Undergraduate** scholarship and is working with Dr. Balwantray Chauhan. Their project will develop an automated cell counting tool to handle unique features in retinal images, evaluating different methods to maximize accuracy. This will allow glaucoma research to progress faster by saving countless hours spent on manually counting cells to quantify disease progression.

Mathers Awards

2024 Recipients

2024 Mathers Scholarship Recipients (from the left clockwise): Delaney Henderson, Faiyaz Abid Ali Khan, Jeffrey Locke, Robyn McGowan, Safiya Rizwan

The Masters in Clinical Vision Sciences scholarship is awarded to Safiya Rizwan, who is working under the supervision of Dr. Kevin Duffy. Safiya is studying the involvement of microglia, an important cell type that regulates immune function, in repairing misconnections caused by monocular deprivation after the critical period of development in animal models. The goal of Safiya's research is to help understand the mechanism behind why chemically inactivating the fellow (non-deprived) eye in cats stimulates recovery of vision in the deprived eye after a critical period.

Faiyaz Abid Ali Khan is the recipient of the Undergraduate scholarship and is working with Dr. Melina Agosto to characterize how mutations from congenital stationary night blindness patients affect the function of the mGluR6 protein. He will also test whether manipulating the cells' available secretion pathways can rescue the behavior of mutant mGluR6.

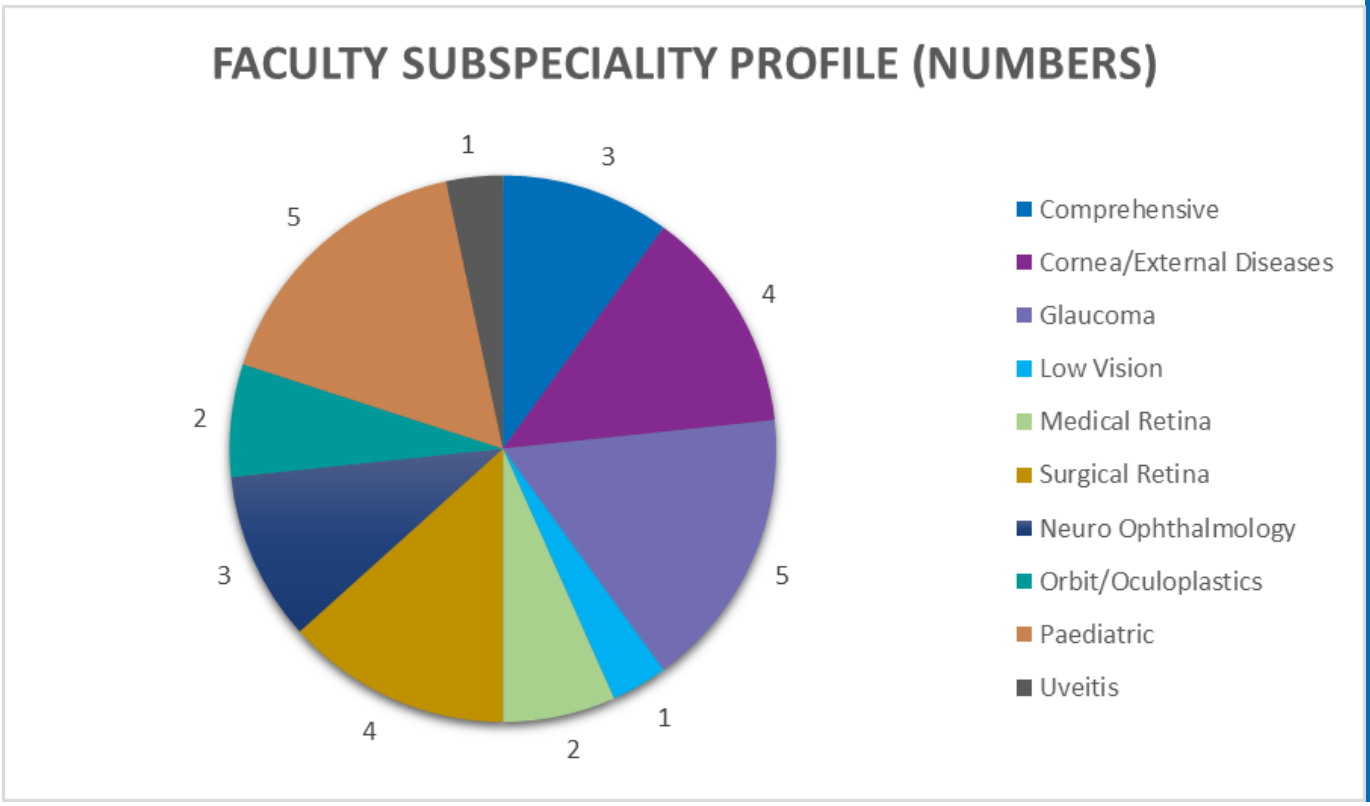
Dr. Delaney Henderson is the recipient of the Research Fellowship in Ophthalmology and Visual Sciences. Dr. Henderson, who is under the supervision of Dr. Balwantray Chauhan, is studying delivery of genes for fluorescent molecules to allow visualization of cells in the retina. This technique could be used as an imaging tool to visualize cellular function and dysfunction over time. The aim of the study is to track the functional behavior of individual RGCs before and after injury such as models of experimental glaucoma to characterize the loss of function over time in a living animal. Results of this study will increase our understanding of the properties of cellular loss of function and the safety of this technique so that it can be used as a clinical diagnostic tool in the future.

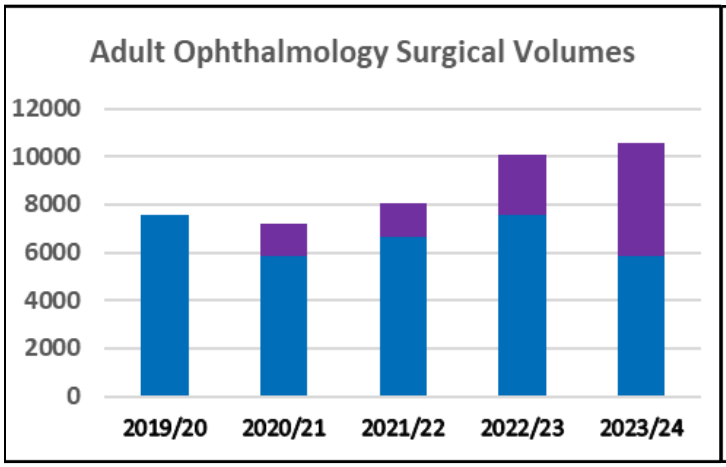
The PhD in Vision Science scholarship is awarded to Jeffrey Locke, who under the supervision of Drs. Patrice Côté and Aaron Newman. Jeff is evaluating the accuracy and speed of applying machine learning- (computers identifying patterns) algorithms to visual electrophysiology recordings of participants (humans and mouse models) to remove artifacts, identify clinical components, and determine if they are healthy or abnormal, compared to standard analysis by human observers.

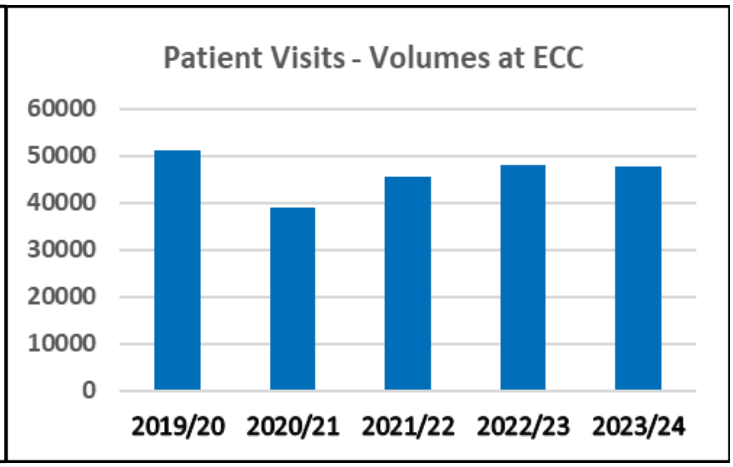
Robyn McGowan is the recipient of the Masters in Vision Science scholarship and is studying photoreceptor cell biology and the mechanisms of photoreceptor-bipolar cell signal transmission under the direction of Dr. Melina Agosto. Understanding these signal transmissions are crucial for developing therapies that target photoreceptor dysfunction. Specific proteins in both photoreceptors and bipolar cells are required at the site of signal transmission. However, little is known about how photoreceptor proteins get to the correct location, or how they interact with the bipolar cell proteins. Using a mouse model as well as experiments in cultured cells, she aims to elucidate requirements for protein trafficking and protein-protein interactions necessary for normal vision.

Patient Care

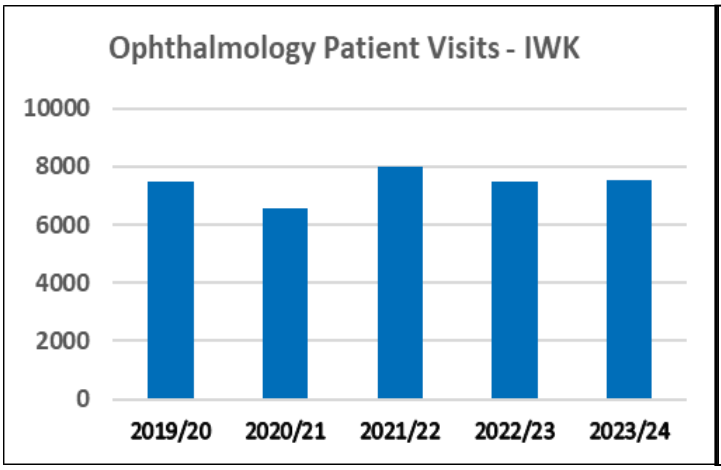
The clinical services delivered by the Department occur at the Eye Care Centre (QEII Health Sciences Centre - VG site – Nova Scotia Health) for adult ophthalmology, at the paediatric ophthalmology clinic located at the IWK Health Centre, at the ophthalmology clinic located at the Cobequid Community Centre (both adult and paediatric services), Halifax Vision Surgical Centre, and in all private offices, where community based faculty members provide most of their ambulatory clinical care. The Bayers Lake Community Outpatient Centre opened in November 2023, replacing our presence at the Cobequid Community Centre.

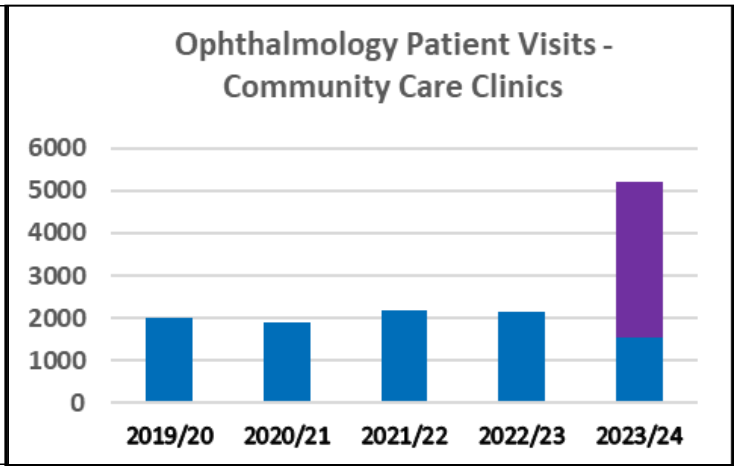




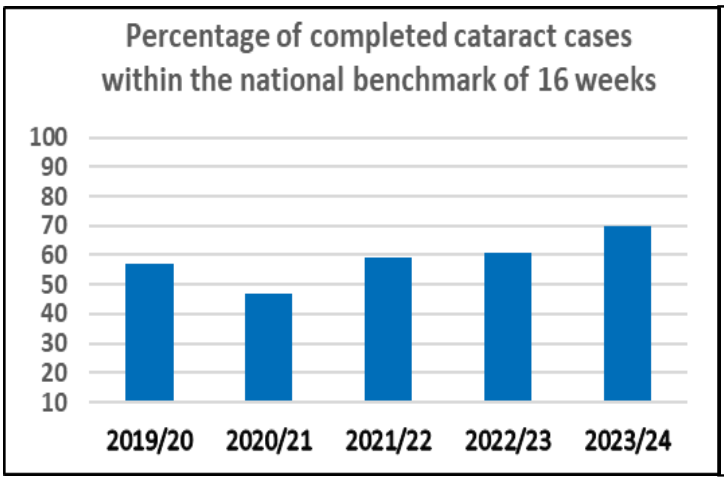


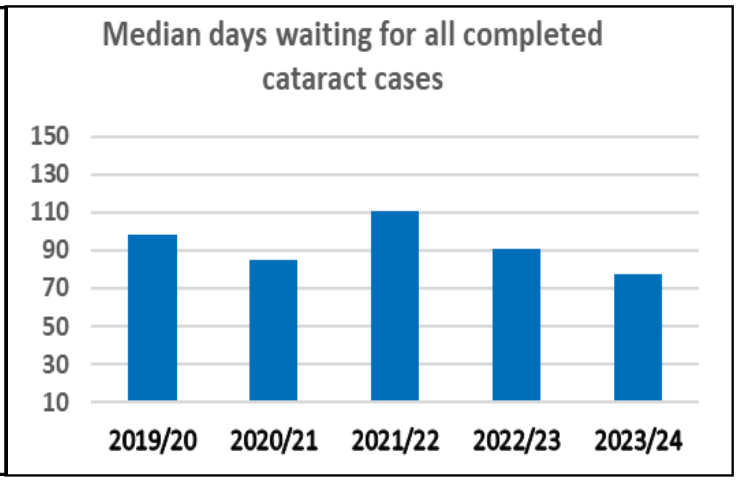
Clinical service volumes in ophthalmology for 2023-24 continue on a growing trend and have surpassed pre-COVID-19 volumes. The purple volume comprises 4,752 cataracts performed at Halifax Vision Surgical Centre.





Clinical volumes at the IWK continue to be relatively steady. Bayer's Lake Community Outpatient Centre opened in November 2023. We note a significant increase in clinical volume for 2023-24 reflective of our utilization of both Cobequid Community Centre and Bayer's Lake facilities.



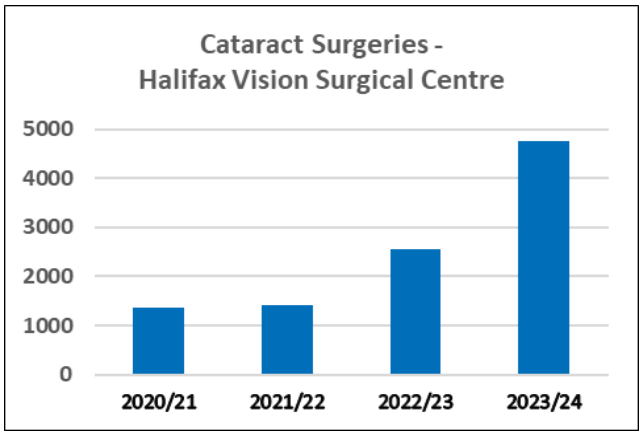


These figures represent cases completed at the Victoria General site only.

Halifax Vision Surgical Centre

Thanks to support from partners in government, Nova Scotia Health and our own faculty members, the Department was able to continue publicly funded cataract surgeries at the Halifax Vision Surgical Centre. The program launched in October 2020. Our surgeons delivered 4,752 cataract cases in 2023-24, an increase of 2,200 cases over the 2022-23 fiscal year. The program will continue and extend into fiscal 2025.

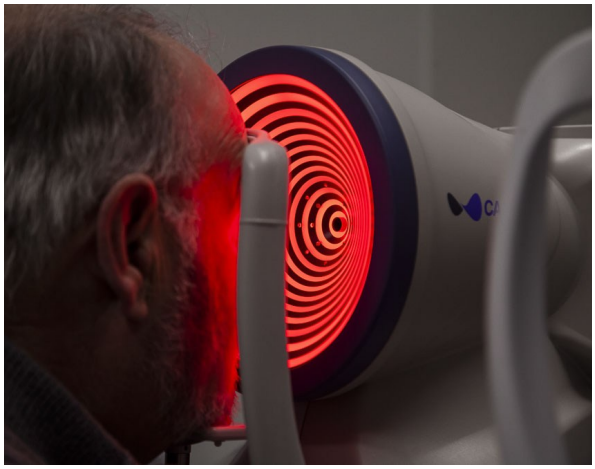
We continue to be grateful to Dr. Dan Belliveau for his dedication and resourcefulness in developing the concept and providing physical space for the facility.

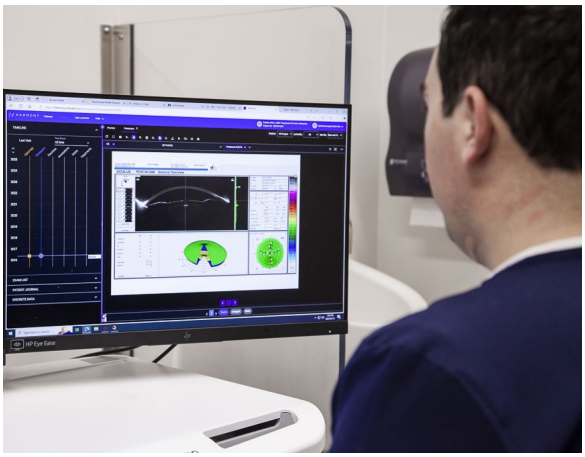


Patient Care

Bayer's Lake Community Outpatient Centre

The DOVS opened an ophthalmology clinic at the new community outpatient centre in Bayer's Lake in November 2023, replacing the smaller clinic at Cobequid Community Centre. This new clinic has state of the art examining rooms and equipment, allowing us to provide care to patients closer to home, in a facility purposely built with increased efficiency. Between November 2023 and March 2024 there were 3,657 patient visits at the Bayer's Lake clinic, this includes adult and pediatric visits.





Message from the Undergraduate Medical Education Director

Anuradha Mishra, MD, MEd, FRCSC
Assistant Dean Skilled Clinician & Interprofessional Education
Associate Professor
Director, Undergraduate Medical Education Ophthalmology

We had another great academic year with UGME. We have increased our footprint in the core curriculum and have introduced a new lecture in the Skilled Clinician Program. We had successful Med 2 Ophthalmology Evenings at both Dalhousie Medicine Nova Scotia and Dalhousie Medicine New Brunswick (DMNB). Thank you to our department members including both staff and residents who participated. We also welcomed Dr. Erin Demmings as the new ophthalmology component head for DMNB.

We continued to have a robust elective program as students from across Canada were able to resume in-person electives. This lead to a busy fall with many Dalhousie and visiting elective students coming to spend time in our department.

In the spring our department participated again in the Dalhousie Pre-Resident Exploration Program. As part of this program we ran a successful half day workshop and had 40 students come and spend a half day in our clinics and ORs over a two week period.

We continue to plan to try and grow the ophthalmology curriculum in the pre-clerkship years and planning has begun for some new initiatives. Thank you to all the staff and residents that support the undergraduate program.

Message from the Postgraduate Medical Education Directors

Mishari Dahrab, MD, PhD, FRCSC
Assistant Professor
Director, Postgraduate Medical Education
May 20219 to April 2024

Congratulations to our **2023** graduating residents: Drs. Devin Betsch, Andre Pollmann and Harry Dang. Congratulations also to our graduating fellows: Dr. Rodolfo Bonatti (Glaucoma Fellowship) and Dr. Michal Blau (Pediatric Ophthalmology Fellowship). Dr. Betsch is starting a glaucoma fellowship in Halifax, Dr. Pollmann is starting a cornea fellowship in Montreal (University of Montreal) and Dr. Dang will be starting his practice as general ophthalmologist in Newfoundland. Best wishes to them all.

2023 Incoming residents:

July 1st, 2023 marks the start of another academic year and with that we would like to welcome Drs. Alexander Deans, Isra Hussain & Mohammad Abdullah to the Residency Training Program as our new PGY 1 residents. We also look forward to welcoming Dr. Devin Betsch as our new Glaucoma Fellow, and Dr. Ghaliah Nsour will join the Pediatric Ophthalmology team at the IWK for a 1-year fellowship.

May 1, 2024, Dr. Dani Cadieux started her 5-year term as the Residency Program Director. We all know Dr. Cadieux is exactly what the program needs moving forward; Energy, Vigor, and Vision. I know Dr. Cadieux will make the transition from the Old to the New seamless. Congratulations Dr. Cadieux in your new role and I hope you embrace being the resident's compass to navigate them towards the shores of being the best ophthalmologists possible.

Pictured above (L-R): Drs. André Pollmann, Devin Betsch, Harry Dang, Bashar Bata and Michal Blau-Most, Lesya Shuba and Rodolfo Bonatti

Dani Cadieux, MD, MHPE, FRCSC
Assistant Professor
Director, Postgraduate Medical Education
May 2024 to present

Congratulations to our **2024** graduating residents, Drs. Rami Darwich, Doug Iaboni, and Syed Mohammad. Never has there been such a wonderful and dynamic trio. We celebrated their successful completion of 5 years of training and wished them well in their future endeavors. Dr. Darwich heads off to complete a Glaucoma Fellowship at Mayo Clinic. I'm sure they will learn a lot from him. Dr. Iaboni will stay a little closer to home and join Dr. Rogers in providing eye care in Truro. Nova Scotia won big with him. Dr. Mohammad joined a practice in Brockville, ON.

Congratulations as well to our graduating fellows: Dr. Devin Betsch (Glaucoma Fellowship) and Dr. Ghaliah Nsour (Pediatric Ophthalmology Fellowship). Best wishes to all our graduates.

2024 Incoming residents:

Dr. Ahmed Abdelaal will be joining the program from the University of Toronto and Dr. Sorayya Seddigh from University of British Columbia. Please join us in extending a warm welcome to both.

On July 1, 2024 we will also welcome Dr. Ellen Zhou from the University of Toronto. Dr. Zhou will join the glaucoma faculty to complete a 1-year Clinical Glaucoma Fellowship. We also welcomed a Saudi Arabian trained pediatric ophthalmologist, Dr. Ghaida AlAhmadi to our 1-year Pediatric Ophthalmology Fellowship program.

Pictured above (L-R): Drs. Rami Darwich, Syed Mohammad, Doug Iaboni, Dr. Mishari Dahrab, Ghaliah Nsour, and Dr. Devin Betsch

Award Winning Educators

Surgical Teaching Award

This annual award recognizes one staff physician's outstanding contributions to the surgical education of ophthalmology residents. This honour is determined by the ophthalmology resident group, which nominates and then chooses the recipient each year.

2023 and 2024 Recipient

Dr. Jeremy Murphy

Resident nominations highlighted Dr. Murphy's teaching excellence in several areas. Residents felt that few surgeons matched his dedication and ability to provide access to surgical cases. Dr. Murphy's encouragement during difficult cases and ability to handle complications with comfort makes performing surgery under his direction challenging and fun at the same time. His positive feedback is very encouraging for the progression of their surgical skills. Because of Dr. Murphy's surgical expertise, patience, and willingness to educate, residents at all levels of training find his surgical instructions irreplaceable.

Clinical Teaching Award

The annual Clinical Teaching Award recognizes one staff physician's outstanding contributions to the clinical education of ophthalmology residents. This honour is decided by the ophthalmology resident group, which nominates and then chooses the recipient each year. As a symbol of gratitude, Dr. Mohandas and Dr. Chan's names have been added to a commemorative plaque, which celebrates the annual winners of our ophthalmology teaching awards.

2023 Recipient

Dr. Rajender Mohandas

The residents felt that Dr. Mohandas's dedication and contribution to their clinical teaching goes above and beyond the call of duty. Dr. Mohandas's teaching is comprehensive and thoughtful, with his feedback leaving them wanting to do better.

2024 Recipient

Dr. Wesley Chan

The residents felt that Dr. Chan's dedication and contribution to their clinical teaching goes above and beyond the call of duty. Dr. Chan's teaching is comprehensive and thoughtful, with her feedback leaving them wanting to do better.

Grand Rounds 2023-2024

Apr 12, 23	Dr. Ashley Whelan	From Eye to Brain: An Overview of the Afferent Visual Pathway
Apr 19, 23	Dr. Darrell Lewis*	Cataract surgery equipment and IOLs for routine and complex cases - reflections on changes in my cataract practice
May 10, 23	Dr. Ashlyn Pinto	Putting the brakes on patient driving: An update on Nova Scotia's driving protocols
May 17, 23	Dr. Erik Bothun*	Can I do an IOL now? What Multicenter Studies Have Shown Us about Pediatric Cataract Care
May 24, 23	Dr. Rami Darwich	Global Ophthalmology: Ghana edition
May 31, 23	Dr. Rajeev Muni*	Modern Concepts and Imaging in Retinal Detachment
Jun 7, 23	Dr. Doug Iaboni	The Ocular Sahara: A guide to navigating the dry eye desert
Jun 14, 23	Dr. Michal Blau-Most	A mysterious case of acute ophthalmoplegia
Sep 13, 23	Dr. Syed Mohammad	Curse of the Contact Lenses: An Update of Acanthamoeba Keratitis
Sep 20, 23	Dr. Gaynor Watson-Creed	Institutional Betrayal and Gaslighting in Academic Medicine
Sep 27, 23	Dr. Andrew Hartwick*	Shining Light on Photophobia Associated with Traumatic Brain Injury
Oct 4, 23	Dr. Rami Darwich	Ab-Interno MIGS in warding off the evil eye
Oct 11, 23	Dr. Johane Robitaille	Long-term consequences of prematurity on the visual system
Oct 18, 23	Dr. Michal Belliveau*	Modern Dacryology
Oct 25, 23	Dr. Doug Iaboni	Stevens-Johnson's Syndrome
Nov 1, 23	Dr. Lesya Shuba	AI's Role in Glaucoma Diagnosis and Management
Nov 8, 23	Dr. Bonnie He	Medicolegal Ophthalmology
Nov 15, 23	Dr. Bashar Bata	An Update on the Current Treatments for Myopia Control
Nov 22, 23	Dr. Chryssa McAlister*	Combining insured and uninsured cataract services and the business of ophthalmology
Nov 29, 23	Dr. Gus Grant	The College and its Complaints Process
Jan 10, 24	Dr. Robert Rutledge	Ophthalmologists' Health: An update of the science of self-care
Jan 17, 24	Dr. Verina Hanna	The Gift of Sight: Ocular Tissue Donation in Nova Scotia
Jan 24, 24	Dr. Sylvia Pasternak	Intriguing cases under the microscope
Jan 31, 24	Dr. Jake Blacklaws	Unpacking the cotton wool spot
Feb 7, 24	Dr. Devin Betsch	Reading the room: Health literacy in glaucoma
Feb 14, 24	Dr. Ashlyn Pinto	Cat got your retina?: An update on neuroretinitis
Feb 21, 24	Dr. Dani Cadieux	Cataract Surgery in Patients with Fuchs' Endothelial Dystrophy
Feb 28, 24	Dr. Ashlyn Whelan	Masquerades- Unmasking the Imposters
Mar 6, 24	Dr. Melina Agosto	Sweet success of night vision
Mar 20, 24	Dr. Rishi Gupta	Secondary IOLs: Considerations, Controversies, Complications, & Catastrophes!
Mar 27, 24	Dr. Freddy Lee	Cherry Red Marks the Spot: Review and Latest Updates on Central Retinal Artery Occlusion

***Visiting Professor Program**

Grand Rounds April to June 2024

Apr 3, 24	Dr. Balwantray Chauhan	Imaging single retinal ganglion cells
Apr 17, 24	Dr. Alan Cruess	Artificial Intelligence and Fluorescein Angiography: the power of an index case
Apr 24, 24	Dr. Neetin Prabhu	Serving the raw truth: A review and case series of toxoplasmosis
May 1, 24	Dr. Andrew G. Lee*	Space flight associated Neuro-ocular Syndrome (SANS)
May 15, 24	Dr. Kamiar Mireskandari*	ROP: Laser and Anti-VEGF Comparisons
May 29, 24	Dr. Ghaliah Nsour	The future of Pediatric Ophthalmology: The Role of Artificial Intelligence
Jun 5, 24	Dr. Mohamad Jaafar*	Secondary IOLs: Considerations, Controversies, Complications, & Catastrophes!

***Visiting Professor Program**

Visiting Professor Program

Dr. Darrell Lewis

Subspecialty: Cornea

Herzig Eye Institute

"Cataract surgery equipment and IOLs for routine and complex cases - reflections on changes in my cataract practice"

Dr. Erick Bothun

Subspecialty: Pediatrics/Genetics

Mayo Clinic

"Can I do an IOL now? What Multicenter Studies Have Shown Us about Pediatric Cataract Care"

Dr. Rajeev Muni

Subspecialty: Retina

University of Toronto

Modern Concepts and Imaging in Retinal Detachment

Dr. Andrew Hartwick

College of Optometry, Ohio State University

"Shining Light on Photophobia Associated with Traumatic Brain Injury"

Dr. Michal Belliveau

Subspecialty: Oculoplastics

University of Ottawa

"Modern Dacryology"

Dr. Chryssa McAlister

Subspecialty: Cataract/Refractive Surgery

McMaster University

"Combining insured and uninsured cataract services and the business of ophthalmology"

Dr. Andrew G. Lee

Subspecialty: Neuro-Ophthalmology

Blanton Eye Institute Houston Methodist Hospital

"Space flight associated Neuro-ocular Syndrome (SANS)"

Dr. Kamiar Mireskandari

Subspecialty: Pediatrics

Hospital for Sick Children and University of Toronto

"ROP: Laser and Anti-VEGF Comparisons"

Dr. Mohamad Jaafar

Subspecialty: Pediatrics

Children's National Hospital and George Washington University

"Superior Oblique Palsy"

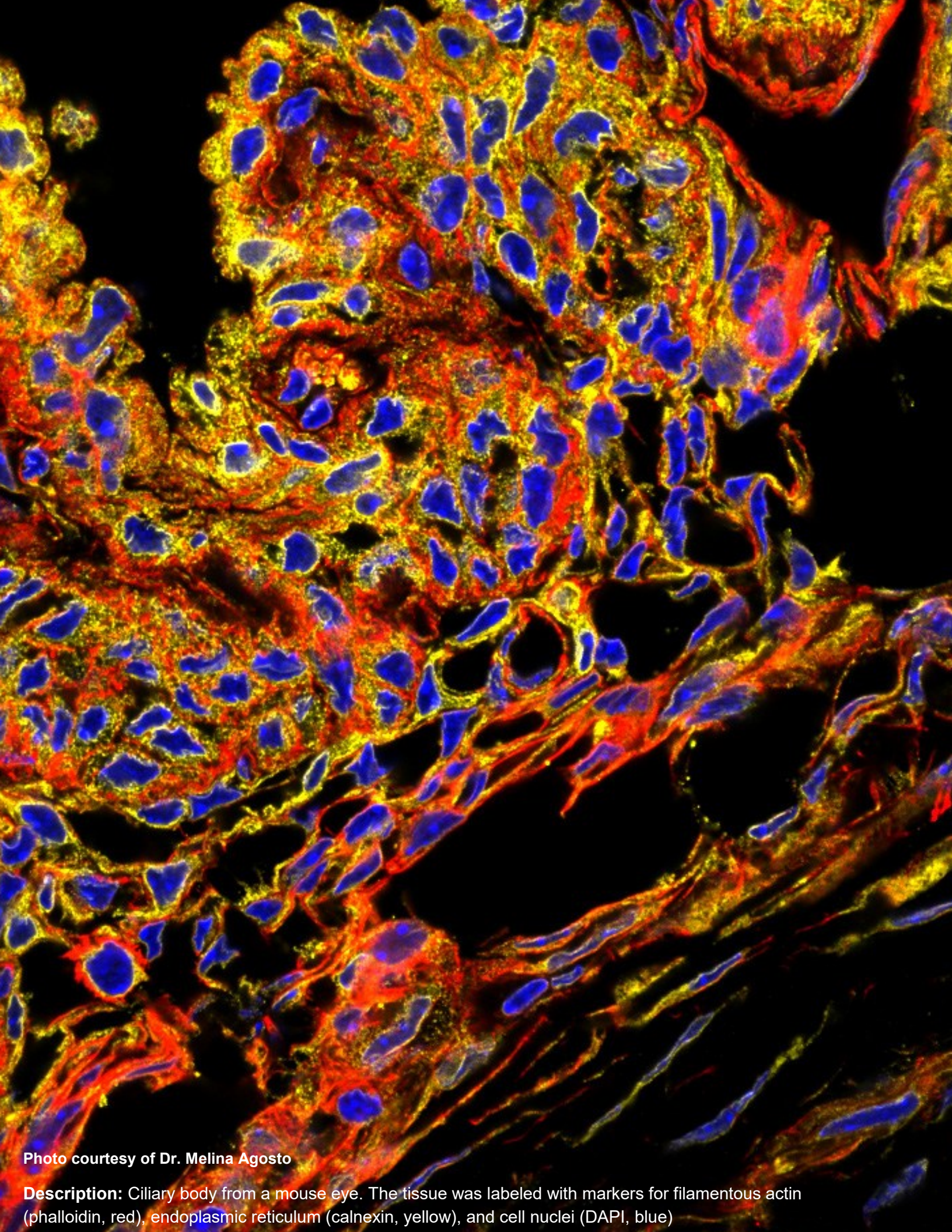


Photo courtesy of Dr. Melina Agosto

Description: Ciliary body from a mouse eye. The tissue was labeled with markers for filamentous actin (phalloidin, red), endoplasmic reticulum (calnexin, yellow), and cell nuclei (DAPI, blue)

Message from Research Director

Balwantray Chauhan, *PhD*
Research Director

I am delighted to write this short report on the research activities of the Department of Ophthalmology and Visual Sciences (DOVS). Our department continues to thrive in terms of research grants, publications, meeting presentations, and training and I invite you to look at these impressive figures outlined in this report.

Trainees are the cornerstone of our research enterprise, and I am very pleased that our department continues to be an attraction to applicants locally, nationally and internationally. Through faculty members who are joint- or cross-appointed to DOVS, we have expanded our undergraduate, graduate and post-graduate trainee numbers. Summer students continue to be attracted to vision and the eye as they seek to build experience towards more formal education as graduate or medical students. We are blessed to have the Mathers Endowment that generously provides stipends to summer students, graduate students, residents, and post-doctoral fellows.

Faculty members have attracted $2.5 million in continuing research grants and contracts from organizations such as the Canadian Foundation for Innovation, Genome Canada, Canadian Institutes of Health Research, and Fighting Blindness Canada. Our partnerships with industry are also thriving with research projects on instrument and drug development.

I am grateful to the Resident Research Directors, Drs. Johanne Robitaille and Corey Smith. I want to thank Ms. Leah Wood, our research manager, who is a key to all our research efforts. Among her many roles, she provides pragmatic support to all students and faculty embarking on research projects. She also coordinates our successful Annual Research Day which gives all our trainees a forum to share their findings. Finally, Ms. Robyn Sharpe has provided excellent administrative support.

I invite you to explore our achievements in the various research areas in this Annual Report. Please do not hesitate to contact me with any questions, queries, or comments. Our objective, as always, is to strive for better.

33rd Annual DOVS Research Day

The 33rd Annual Department of Ophthalmology and Visual Sciences Research Day took place in-person on April 5, 2023. Our keynote speakers, **Dr. Akshay Thomas** and **Dr. Jaap Bonjer** delivered superb lectures and the research presented by trainees and residents was excellent.

Presenters

Jake Blacklaws, MD
Delaney Henderson, MSc
Rodolfo Bonatti, MD
Ryan Matthews, BSc
Verina Hanna, MD
Bonnie He, MD
Aliénor Jamet, MSc
Emma-Lee Rhyno, BSc

Blitz Presenters

Ashley Whelan, MD
Ashlyn Pinto, MD, MSc
Douglas Iaboni, MD, MSc
Neetin Prabhu, MD
Syed Mohammad, MD

34th Annual DOVS Research Day

The 34th Annual Department of Ophthalmology and Visual Sciences Research Day took place in-person on April 10, 2024. Our keynote speakers, **Dr. Nailyn Rasool** and **Dr. John Marshall** delivered superb lectures and the research presented by trainees and residents was excellent.

Presenters

Ashlyn Pinto, MD, MSc
Jake Blacklaws, MD
Aliénor Jamet, MSc
Kevin Hodgson, MD
Loukman Ghouti
Tyler Herod
Jaimie Gregor
Freddy Lee, MD
Devin Betsch, MD

Blitz Presenters

Verina Hanna, MD
Joyce Li
Ashley Whelan, MD
Arjav Gupta
Mustansir Pindwarawala
Korolos Sawires
Jaide Cashin
Bonnie He, MD

13th Annual Atlantic Eye Symposium

The 13th Annual Atlantic Eye Symposium was rescheduled to November 4 & 5, 2023, due to Hurricane Lee, and was held at the Halifax Marriott Harbourfront Hotel. We had another outstanding Symposium, highlighted by an impressive list of guest speakers. During this year's event were honoured to present the third Dr. Aditya Mishra Lecture in Neuro-Ophthalmology, in memory of our beloved colleague, delivered by Dr. Vivek Patel.

Dr. Davin Johnson, Kingston Ontario, Cornea, Cataract, and Refractive Surgery

Dr. Darrell Lewis, Dalhousie University, Cornea, Cataract, and Refractive Surgery

Dr. Catherine Baril, Centre universitaire d'ophtalmologie in Quebec and Université Laval, Glaucoma

Dr. Brennan Eadie, Dalhousie University, Glaucoma

Dr. Cindy Hutnik, Schulich School of Medicine and Dentistry, Glaucoma

Dr. Paul Rafuse, Dalhousie University, Glaucoma

Dr. Jithin Yohannan, Wilmer Eye Institute, Johns Hopkins University, Glaucoma

Dr. Valerie Biousse, Emory University School of Medicine, Neuro-Ophthalmology

Dr. Nancy J. Newman, Emory University School of Medicine, Neuro-Ophthalmology

Dr. Sri Kala Gore, Great Ormond Street Hospital for Children, London, paediatric Ophthalmic and Oculoplastic

Dr. Alan Cruess, Dalhousie University, Retina

Dr. Rishi Gupta, Dalhousie University, Retina

Dr. Mostafa Hanout, Apex Eye Institute and Western Memorial Regional Hospital, Retina

Dr. Amin Kherani, University of Calgary, Calgary Retina Consultants and the Southern Alberta Eye Center, Retina

Dr. Judy E. Kim, School of Biomedical Sciences, Medical College of Wisconsin (MCW), Retina

Dr. Rishi P. Singh, Cleveland Clinic Florida, Lerner College of Medicine, Retina

Dr. Harry Dang, Dalhousie University, Department of Ophthalmology Resident

Dr. André Pollmann, Dalhousie University, Department of Ophthalmology Resident

Dr. Vivek R. Patel, is Professor of Clinical Ophthalmology and Chief of Neuro-ophthalmology at the University of California, Irvine, Gavin Herbert Eye Institute

Resident Research

Name	Year	Supervisor(s)	Project Title
Dr. Rami Darwich	PGY4	Dr. Balwantray Chauhan	Comparison analysis of optic nerve head structures using spectral-domain and swept-source optical coherence tomography
Dr. Douglas Iaboni	PGY4	Dr. Jayme Vianna	Quality of meta-analyses in therapeutic studies in glaucoma
Dr. Syed Mohammad	PGY4	Dr. Ahsen Hussain	Utility of eyedrops-facilitated taste test for the assessment of a patent nasolacrimal duct system: A pilot study
Dr. Jake Blacklaws	PGY3	Drs. Johane Robitaille and Darren Oystreck	EyeCare@Home: COVID-19 and beyond; Development and pilot study
Dr. Ashlyn Pinto	PGY3	Dr. Ahsen Hussain	Intersectionality of gender and visible minority status among Canadian ophthalmology residents
Dr. Verina Hanna	PGY3	Dr. Anurdha Mishra	Preoperative educational videos for patients undergoing cataract surgery
Dr. Bonnie He	PGY2	Dr. Brennan Eadie	Risk of glaucoma associated with calcium channel blocker use for cardiovascular disease
Dr. Bonnie He	PGY2	Dr. Brennan Eadie	Risk of angle closure glaucoma with bisphosphonates in osteoporosis patients
Dr. Ashley Whelan	PGY2	Dr. Carolina Francisconi	Choroidal thickness in treatment naïve eyes receiving unilateral intravitreal anti-VEGF injections
Dr. Ashley Whelan	PGY2	Dr. Carolina Francisconi	The relationship between contrast sensitivity and OCT imaging findings following retinal reattachment
Dr. Freddy Lee	PGY1	Dr. Brennan Eadie	Single-cell transcriptomic characterization of trabecular meshwork tissue optained in vivo from eyes with primary open angle and pseudoexfoliative glaucoma
Dr. Neetin Prabhu	PGY1	Dr. Ahsen Hussain	Factors influencing the survival of full-thickness skin grafts in the periocular region: A systematic review and meta-analysis

Trainee Research

Name	Supervisor(s)	Program	Project Title
Alex Kos	Rishi Gupta	Medical student	Retina revisited: The evolution of modern retinal surgery in Canada
Aliénor Jamet	Balwantray Chauhan	PhD	Gene therapy in experimental glaucoma
Aliénor Jamet	Balwantray Chauhan	PhD	Neuroprotective effects of BDNF/Trk B in experimental glaucoma
Andre Pollmann	Rishi Gupta	Postdoctoral fellow	Structural integrity of LuxGood intraocular lens eyelets
Andrew Rideout	Melina Agosto	MSc	Identification of determinants of mGluR6 secretory trafficking
Andrew Rideout	Melina Agosto	MSc	Secretory trafficking of metabotropic glutamate receptors
Arjav Gupta	Ahsen Hussain	Medical student	A systematic review and metanalysis of factors that affect survival of full thickness skin grafts in the periocular region
Arjav Gupta	Johane Robitaille	Medical student	Mapping the genetic causes of inherited retinal diseases in maritime Canada
Arjav Gupta	Ahsen Hussain	Medical student	Orbital compartment syndrome as a novel manifestation of VEXAS syndrome
Arjav Gupta	Ahsen Hussain	Medical student	The role of denosumab treatment in recurrent giant cell bone tumor of the orbit
Darcie Wilson	Ahsen Hussain	Medical student	A novel report of suspected prostate adenocarcinoma to orbital roof meningioma metastasis
Darcie Wilson	Rishi Gupta	Medical student	Pars plana vitrectomy for vitreomacular traction resulting in persistent loculated foveal subretinal fluid
Darcie Wilson	Anuradha Mishra	Medical student	The effect of the COVID-19 on the mental well-being of pre-clerkship medical students: During the pandemic and beyond
Delaney Henderson	Balwantray Chauhan	Postdoctoral fellow	Age effects in viral labelling of retinal ganglion cells
Delaney Henderson	Balwantray Chauhan	Postdoctoral fellow	Gene therapy in experimental glaucoma
Delaney Henderson	Balwantray Chauhan	PhD	Viral labelling of retinal ganglion cells
Devin Betsch	Marcelo Nicolela	Postdoctoral fellow	Randomized clinical trial on surgical outcomes of glaucoma bleb-forming procedures with intraoperatory periocular triamcinolone injection versus intense postoperative topical steroid use
Dominique Salh	Ahsen Hussain	Medical student	Management of upper eyelid retraction: A scoping review
Dominique Salh	Rishi Gupta & Danielle Cadieux	Medical student	Xtrafocus implant to reduce photophobia
Elizabeth Charman	Melina Agosto	Undergraduate	Characterization of night blindness mutations in mGluR6
Ellen Zhou	Johane Robitaille & Marcelo Nicolela	Postdoctoral fellow	The Canadian pediatric glaucoma consortium: Genomic profile of primary congenital glaucoma

Trainee Research

Name	Supervisor(s)	Program	Project Title
Emily Bruce	Melina Agosto	Undergraduate	Role of mGluR6 glycosylation in trafficking and function
Faiyaz Abid	Melina Agosto	Undergraduate	Localization of CASK in the retina outer plexiform layer
Faiyaz Abid Ali Khan	Melina Agosto	Undergraduate	Characterization of PDZ domain proteins in retina
Imaan Kherani	Rishi Gupta	Resident	Retina revisited: The evolution of modern retinal surgery in Canada
Jaeeun Lee	Melina Agosto	Undergraduate	Determinants of ELFN1 binding to group III mGluRs
Jaeeun Lee	Melina Agosto	Undergraduate	Sequence determinants of ELFN1 interactions with mGluR6
Jaide Cashin	Melina Agosto	Undergraduate	Measuring the immune response during retinal ganglion cell loss
Jaide Cashin	Corey Smith	Undergraduate	Trends in cataract surgery in Nova Scotia from 2010-2019
Jaide Cashin	Corey Smith	Undergraduate	Measuring the immune response during retinal ganglion cell loss
Jaimie Gregor	Balwantray Chauhan	Undergraduate	Inner plexiform layer projection of retinal ganglion cells synapses in the Thy1-YFP-H mouse
Jin Zi	Rishi Gupta	Registrar	Structural integrity of LuxGood intraocular lens eyelets
Joyce Li	Balwantray Chauhan	Undergraduate	Rates of glaucomatous visual field change in a large clinical population
Joyce Li	Balwantray Chauhan	Undergraduate	Rates of visual field progression in a large clinical population
Julia Dugandzic	Ahsen Hussain	Medical student	Corneal deterioration following cataract surgery in patients with a history of orbital radiotherapy
Julia Dugandzic	Anuradha Mishra	Medical student	Ophthalmology education in family medicine residency programs: A 2023 cross Canada consensus
Kevin Hodgson	Ahsen Hussain	Medical student	Congenital aberrant lacrimal gland ductules presenting as a Nonhealing upper eyelid lesion
Kevin Hodgson	Ahsen Hussain	Medical student	Corneal deterioration following cataract surgery in patients with a history of orbital radiotherapy
Kevin Hodgson	Ahsen Hussain	Medical student	Nasal pepsinogen and pH in primary acquired nasolacrimal duct obstruction
Kevin Hodgson	Ahsen Hussain	Medical student	Outcomes of endonasal dacryocystorhinostomy performed for functional nasolacrimal obstruction with delay on dacryoscintigraphy
Kevin Hodgson	Marcelo Nicolela	Postdoctoral fellow	Structural, functional and vascular consequences of optic disc haemorrhages in glaucoma
Korolos Sawires	Corey Smith	Medical student	Investigating Extended Dosing Intervals of Faricimab in Treatment Refractory Neovascular Age-Related Macular Degeneration (nAMD) Patients
Liam McPhee	Melina Agosto	Undergraduate	Characterization of night blindness mutations in mGluR6

Trainee Research

Name	Supervisor(s)	Program	Project Title
Liam Redden	Johane Robitaille & Rishi Gupta	Medical student	Atypical familial exudative vitreoretinopathy with white granules, multi-modal imaging and genetic study
Maja Witter	Balwantray Chauhan	Undergraduate	AI assisted retinal ganglion cell counts in experimental glaucoma
Masato Matsuo	Balwantray Chauhan	Postdoctoral fellow	RNFL changes in glaucoma and healthy aging
Mathew Palakamanil	Rishi Gupta & Lesya Shuba	Postdoctoral fellow	Nicotinic acid related CME
Michael Balas	Ahsen Hussain	Medical student	Orbital disease and artifical intelligence: Evaluating the accuracy and readability of ChatGPT
Michael Miller	Melina Agosto	Undergraduate	Alternative trafficking of mGluR6 night blindness mutants
Michael Miller	Melina Agosto	Undergraduate	Complex N-glycosylation of mGluR6 is required for trans-synaptic interaction with ELFN adhesion proteins
Mohammad Al-Qadi	Ahsen Hussain	Medical student	Influence of orbital decompression on upper eyelid retraction in Graves' orbitopathy: A systematic review and meta-analysis
Mostafa Bondok	Anuradha Mishra	Medical student	Exploring the gender gap in ophthalmology applicants: A mixed methods study
Mustansir Pindwarawala	Melina Agosto	Undergraduate	Alternative trafficking of mGluR6 night blindness mutants
Mustansir Pindwarawala	Melina Agosto	Undergraduate	Defective glycosylation and ELFN1 binding of mGluR6 congenital stationary night blindness mutants
Neetin Prabhu	Drs. Anuradha Mishra and Rishi Gupta	Medical student	The effect of gender on the Canadian ophthalmology residency match
Nigel Beecham	Melina Agosto	Undergraduate	Golgi trafficking of mGluR6 mutants
Oyesode Leye	Marcelo Nicolela	Medical student	Meta-analysis of surgical outocme of Xen implants versus trabeculectomy
Robyn McGowan	Melina Agosto	MSc	Determinants of Pikachurin axonal trafficking and complex formation in photoreceptors
Robyn McGowan	Melina Agosto	MSc	Pikachurin axonal trafficking and trans-synaptic complex formation
Ryan Matthews	Balwantray Chauhan	Undergraduate	Optical coherence tomography angiography in patients with polycythemia
Ryan Matthews	Balwantray Chauhan	MSc	Optical coherence tomography angiography in experimental ratinal artery occlusion

Trainee Research

Name	Supervisor(s)	Program	Project Title
Ryo Tomita	Balwantray Chauhan	Postdoctoral fellow	Optical coherence tomography angiography and macular ganglion cell layer changes in glaucoma
Samantha Orr	Rishi Gupta	Medical student	Risk assessment for occupational hearing damage to the vitreoretinal surgeon and staff
Sara Greenough	Melina Agosto	Undergraduate	Characterization of GPR179 post synaptic interactions with LRRTM4
Sarah van der Ende	Johane Robitaille & Christopher McMaster	PhD	Investigating candidate genes and disease mechanism for the childhood blinding disease familial exudative vitreoretinopathy
Simran Ohri	Rishi Gupta	Resident	Survey of US residency programs and ergonomics curriculum
Sorayya Seddigh	Ahsen Hussain	Medical student	ATOMS models in orbital anatomy teaching
Sorayya Seddigh	Rishi Gupta & Amr Zaki	Medical student	Serpiginous choroiditis following COVID-19 infection
Sorayya Seddigh	Ahsen Hussain	Medical student	The use of IL-2 injections in the management of advanced squamous cell cancer of the periocular region
Sunil Ruparelia	Jeremy Murphy, Marcelo Nicolela, Paul Rafuse, Brennan Eadie, Balwantray Chauhan & Lesya Shuba	Medical student	24-hour intraocular pressure fluctuation in treated glaucoma patients: A prospective comparative study
Sunil Ruparelia	Rishi Gupta	Medical student	Risk assessment for occupational hearing damage to the vitreoretinal surgeon and staff
Tyler Herod	Anuradha Mishra	Medical student	Addressing the need for better training in vision loss for medical students: a novel patient-centered interprofessional workshop
Tyler Herod	Ahsen Hussain	Medical student	Facial swelling after external dacryocystorhinostomy
Tyler Herod	Marcelo Nicolela	Medical student	Long term surgical outcome of Xen implant versus trabeculectomy
Victoria Taylor	Anuradha Mishra	Medical student	Barriers to healthcare access and delivery for individuals with sight loss: A qualitative study
Yaser Alnasery	Anuradha Mishra	PhD	Evaluating a new screening tool for referring adults to low vision rehabilitation (LVR)

Research Profile—Dr. Andrew Orr

Dr. Andrew Orr Associate Professor
Dalhousie University Department of Ophthalmology and Visual Sciences

Andrew Orr first encountered ophthalmology in a busy refraction clinic at the Mass. Eye and Ear Infirmary, where a harried resident handed him his first myopic correction. Surveying Storrow Drive afterwards on the drive home, he found it hard to believe that the world could be so clear.

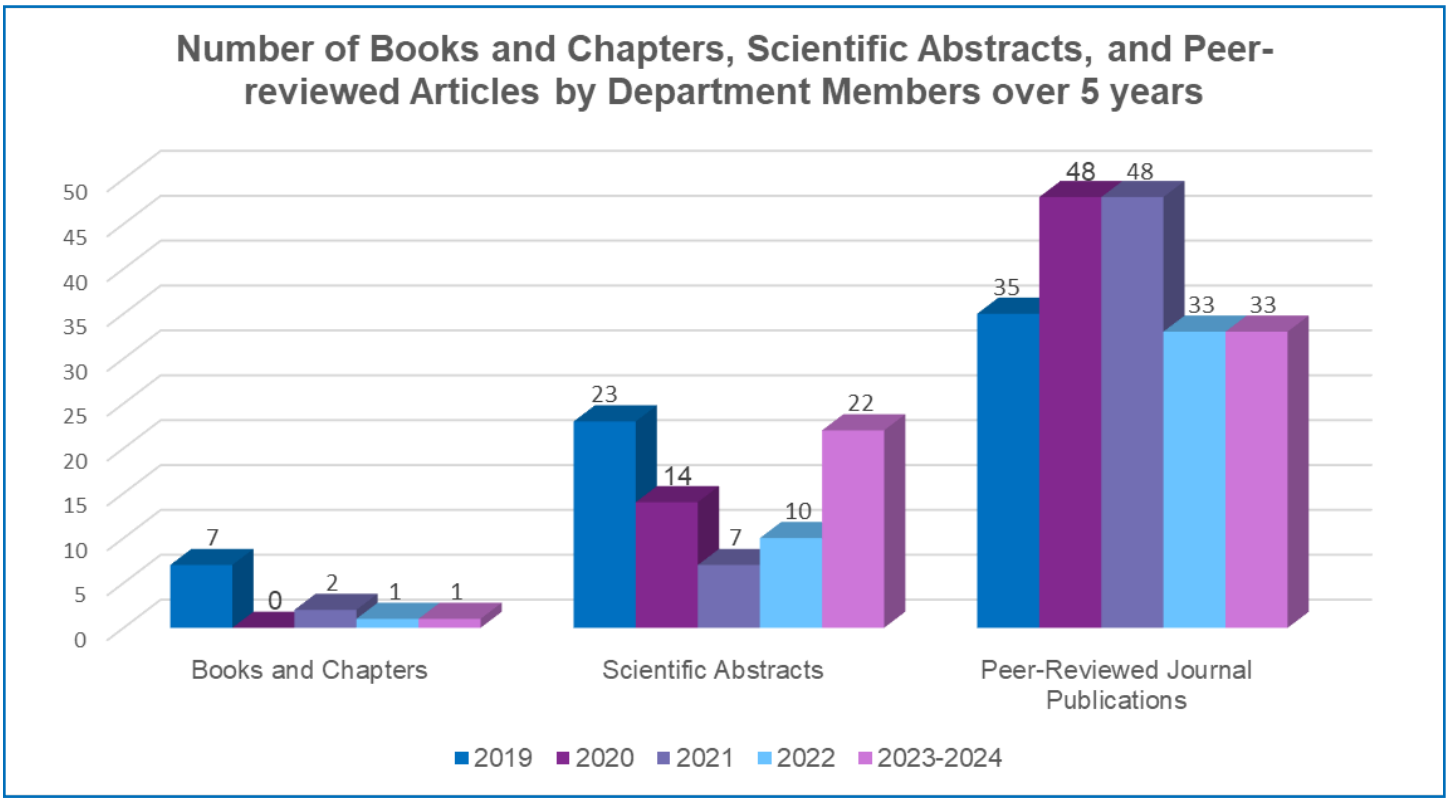
Later, Dr. Orr studied physics at the University of Bristol, followed by a year programming clinical databases in a cancer clinic, and then by medical school at Memorial University. Ophthalmology — positioned at the intersection of physics, technology, and patient care — seemed a natural fit, leading to a residency at Dalhousie and then to a glaucoma fellowship at UCSF supervised by Bob Shaffer and Jack Hetherington. Returning to Halifax, Dr. Orr settled into a distinctive practice split between the Eye Care Center and Amherst, blending academic and community elements. He started looking around for an interesting research question.

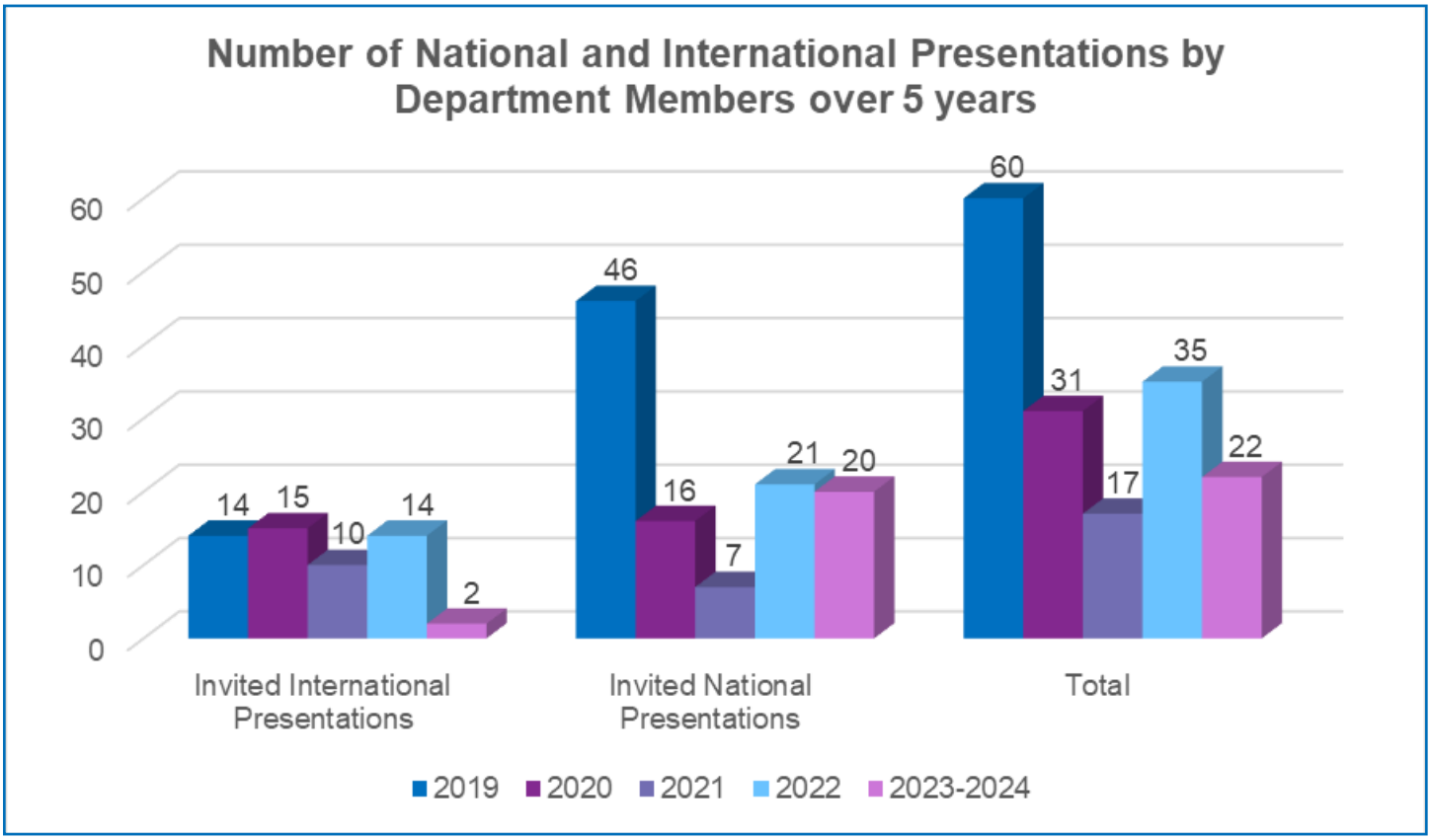
A chance encounter with a Dalhousie researcher provided the answer. Together, they identified a novel PAX6 mutation causing aniridia in a local family, an event that changed Dr. Orr's view of the world almost as much as his first refraction. "I'd considered genetics to be imprecise and descriptive, like stamp collecting", Dr. Orr recalls. "I saw instead that new genetic techniques could revolutionize our understanding of the trajectory of disease. The scale of the transformation was comparable to Newton's impact on physics." Moreover, technology was improving at an exponential rate. Better still, the Atlantic Provinces were filled with interesting puzzles to solve, especially in rural places like Amherst. Being at Dalhousie provided advantages that larger institutions couldn't match.

Since then, Dr. Orr has focused on genetic discovery, working with an interdisciplinary group of experts at Dalhousie and multiple collaborators worldwide. He was a leader of two large-scale Genome Canada projects. He discovered that UBIAD1 causes Schnyder corneal dystrophy, and that nanophthalmos arises from defects in PRSS56. He has also published a significant number of other ocular and non-ocular genetic findings in high-impact journals, the most recent of which revealed the gene underlying kidney failure in a large cohort from Cape Breton.

Dr. Orr's current projects include Fuchs' dystrophy, idiopathic intracranial hypertension, a second form of renal failure, and a rare type of intellectual disability. Cross-appointed to the Department of Pathology, his group leverages cutting-edge technologies, including advanced computational analytics, high-resolution genetic sequencing, and comprehensive normative datasets, to understand the genetic determinants of disease. In the near term, he expects these genetic data to be integrated into the day-to-day care of patients under a paradigm termed "precision medicine". Ultimately, it may be possible to address genetic defects directly through emerging genome editing methods, efforts in which ophthalmology plays a leading role. Indeed, Dr. Orr's discovery of PRSS56 represents a promising target for preventing myopia, raising the possibility that, someday, those increasingly crowded refraction clinics might become a thing of the past.

Publication Facts and Figures





Peer Reviewed Journal Publications

1. Ruparelia S, Orr S, Choudhry N, Wong R, **Smith CA**, Taylor SM, **Gupta RR** (2023). What's the Buzz? Risk of Surgical Team Hearing Loss with Vitrectomy. *Journal of VitreoRetinal Diseases*. [Published] PubMed ID: 37706085.

2. Burgoyne CF, Wang YX, Jeoung JW, Hong S, Gardiner S, Reynaud J, Fortune B, Girard MJA, Sharpe G, **Nicolela M**, **Chauhan BC**, Yang H (2023). OCT Optic Nerve Head Morphology in Myopia II: Peri-Neural Canal Scleral Bowing and Choroidal Thickness in High Myopia - An American Ophthalmological Society Thesis. *American journal of ophthalmology*. [Epub] PubMed ID: 36906092.

3. Quach J, **Sharpe GP**, Demirel S, Girkin CA, Mardin CY, Scheuerle AF, Burgoyne CF, **Chauhan BC** and **Vianna J** (2023). Asymmetry of peripapillary retinal blood vessel and retinal nerve fiber later thickness between healthy right and left eyes. *Invest. Ophthalmol. Vis. Sci.*, 64(2), 17. [Published] PubMed ID: 36790798.

4. Huh E, **Agosto MA**, Wensel TG, Lichtarge O (2023). Coevolutionary signals in metabotropic glutamate receptors capture residue contacts and long-range functional interactions. *The Journal of Biological Chemistry*, 299(4), 103030. [Published] PubMed ID: 36806686.

5. **Pollmann AS**, **Lewis DR**, **Gupta RR** (2023). Re: Double-flanged polypropylene technique: five-year results. *Journal of Cataract and Refractive Surgery*. [Letter to the Editor - Published].

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Scientific Abstracts

1. van der Ende S, Gaston D, Nightingale M, Wallace K, The FEVR Consortium, McMaster C, **Robitaille J**. Gene Variant Spectrum in Patients with Familial Exudative Vitreoretinopathy. [Poster] American College of Genetics and Genomics (ACMG) Annual Meeting (Salt Lake City, Utah, USA), March 2023.

2. Haggerty KN, Eshelman SC, Sexton LA, **Agosto M**A, Robichaux MA. Mapping rhodopsin trafficking events in mouse rod photoreceptor inner segments with super-resolution microscopy. [Poster] Association for Research in Vision and Ophthalmology annual meeting (New Orleans LA), April 2023.

3. He F, **Agosto MA**, Wensel TG. Retina-specific knockout of the gene encoding the γ isoform of the phosphatidylinositolphosphate-5-kinase. [Poster] Association for Research in Vision and Ophthalmology annual meeting (New Orleans, LA), April 2023.

4. **Hanna V**, **Talany G**, Mikhail N, Wilson D, Hanna K, **Francisconi C**, **Gupta R**, **Mishra A**. Preoperative Educational Video for Patients Undergoing Cataract Surgery: A Randomized Controlled Trial. [Podium] 33rd Annual Department of Ophthalmology and Visual Sciences Research Day (Halifax, NS), April 2023.

5. **Iaboni DSM**, Redden LD, Van der Ende S, Nightingale M, Gaston D, McMaster CR, **Gupta RR**, **Robitaille JM**. Multimodal Imaging of White Preretinal Lesions in Atypical Familial Exudative Vitreoretinopathy: Case Report and Literature Review. [Rapid Fire Podium] Dalhousie University Ophthalmology and Visual Sciences Research Day (Halifax, NS), April 2023.6.

6. Eng V, **Burns H**, McVea K, **Vianna JR**, **Eadie BD**. Neutral Density Filter to Facilitate Comparison of Visual Field Testing Systems. [Poster] ARVO (New Orleans, Louisiana, USA), April 2023

7. **Robitaille J**, van der Ende S, Gaston D, Nightingale M, Wallace K, The FEVR Consortium, McMaster C. Gene Variant Spectrum in Probands with Familial Exudative Vitreoretinopathy (FEVR). [Podium] International Society of Genetic Eye Diseases and Retinoblastoma Conference (Sao Paolo, Brazil), July 2023.

8. Matthews RC, **Hooper ML**, **Smith CA**, **Chauhan BC**. Longitudinal OCTA imaging in mice after acute retinal ischemia. [Poster] The Association for Research in Vision and Ophthalmology Annual Meeting (New Orleans, LA), April 2023.

9. Miller ML, Pindwarawala M, **Agosto MA.** Complex N-glycosylation of mGluR6 is required for trans-synaptic interaction with ELFN adhesion proteins. [Poster] CIHR New Principal Investigator Meeting (Halifax, NS), October 2023.

10. Salh D, **Dyachok O**, West M, **Sharpe G**, **Smith CA**, **Rafuse PE**, **Shuba LM**, **Nicolela M**, **Chauhan BC**. Value of 24-2 and 10-2 visual field testing for determining central glaucomatous visual field progression. [Poster] The Association for Research in Vision and Ophthalmology Annual Meeting (New Orleans, LA), April 2023.

11. Yang H, Wang YX, Jeoung JW, Hong S, Gardiner SK, Reynaud J, Fortune B, Girard MJA, **Sharpe GP, Nicolela M**, **Chauhan BC**, Burgoyne CF. Peri-Neural Canal Scleral Bowing and Choroidal Thickness in High Myopia. [Poster] ARVO Annual Meeting (New Orleans, USA), April 2023

12. van der Ende S, Gaston D, Nightingale M, Wallace K, The FEVR Consortium, McMaster C, **Robitaille J**. Gene Variant Spectrum in Patients with Familial Exudative Vitreoretinopathy. [Podium] American College of Medical Genetics and Genomics (ACMG) Annual Conference (Toronto, Ontario), March 2024.

13. van der Ende S, Gaston D, Nightingale M, Wallace K, McMaster C, The FEVR Consortium, **Robitaille J**. Gene Variant Spectrum in Patients with Familial Exudative Vitreoretinopathy. [Poster] Canadian College of Medical Geneticists Annual Conference (Winnipeg, Manitoba), June 2023

14. Adeosun AAR, **Agosto MA,** Lichtarge O, Wensel TG. Mechanisms and specificity in a mast cell-activating GPCR, MRGPRX2. [Poster] FASEB Signal Transduction in the Immune System Conference (Palm Springs CA), June 2023

15. **Pinto AM**, **Pollmann AS**, **Cadieux D**, **Seamone CD**, **George SP**, **Smith C**, **Lewis DR**. Association between rural residency and graft failure after Descemet stripping automated endothelial keratoplasty. [Poster] Canadian Ophthalmologic Society Meeting (Quebec City, QC), June 2023

16. **Robitaille J**, van der Ende S, Gaston D, Nightingale M, Wallace K, McMaster C. Gene Variant Spectrum in Patients with Familial Exudative Vitreoretinopathy. [Poster] Canadian Ophthalmology Society Conference (Quebec City, QC), June 2023

17. **Smith CA**, Rhyno E, **O'Brien DM**. Incidence of rhegmatogenous retinal detachment admissions during a 10-year period in the Maritimes. [Poster On Demand] Canadian Ophthalmological Society Annual Meeting (Quebec City, QC), June 2023

18. Miller ML, Pindwarawala M, **Agosto MA**. Complex N-glycosylation of mGluR6 is required for trans-synaptic interaction with ELFN adhesion proteins. [Poster] Association for Research in Vision and Ophthalmology annual meeting (Seattle, WA), May 2024.

19. Ruparelia S, Orr S, Choudhry N, Wong RW, **Smith CA**, Taylor SM, **Gupta RR**. Risk assessment for occupational hearing damage to the vitreoretinal surgeon and staff. [Poster] American Society of Retina Specialists' 2023 41st Annual Meeting (Seattle, Washington), July 2023.

20. Hodgson K, Palakkamanil MM, Zhang A, **Dyachok OM**, **Smith CA**, **Nicolela MT**, **Chauhan BC**, **Shuba LM**. The effect of ginkgo biloba extract on macula and peripapillary perfusion examined using optical coherence tomography angiography. [Poster On Demand] Canadian Ophthalmological Society Annual Meeting (Toronto, ON), June 2024.

21. **Nicolela MT**, Hodgson K, **Sharpe GP**, **Smith CA**, **Chauhan BC**. Structural, functional, and hemodynamic changes after optic disc haemorrhage in glaucoma. [Poster On Demand] Canadian Ophthalmological Society Annual Meeting (Toronto, ON), June 2024.

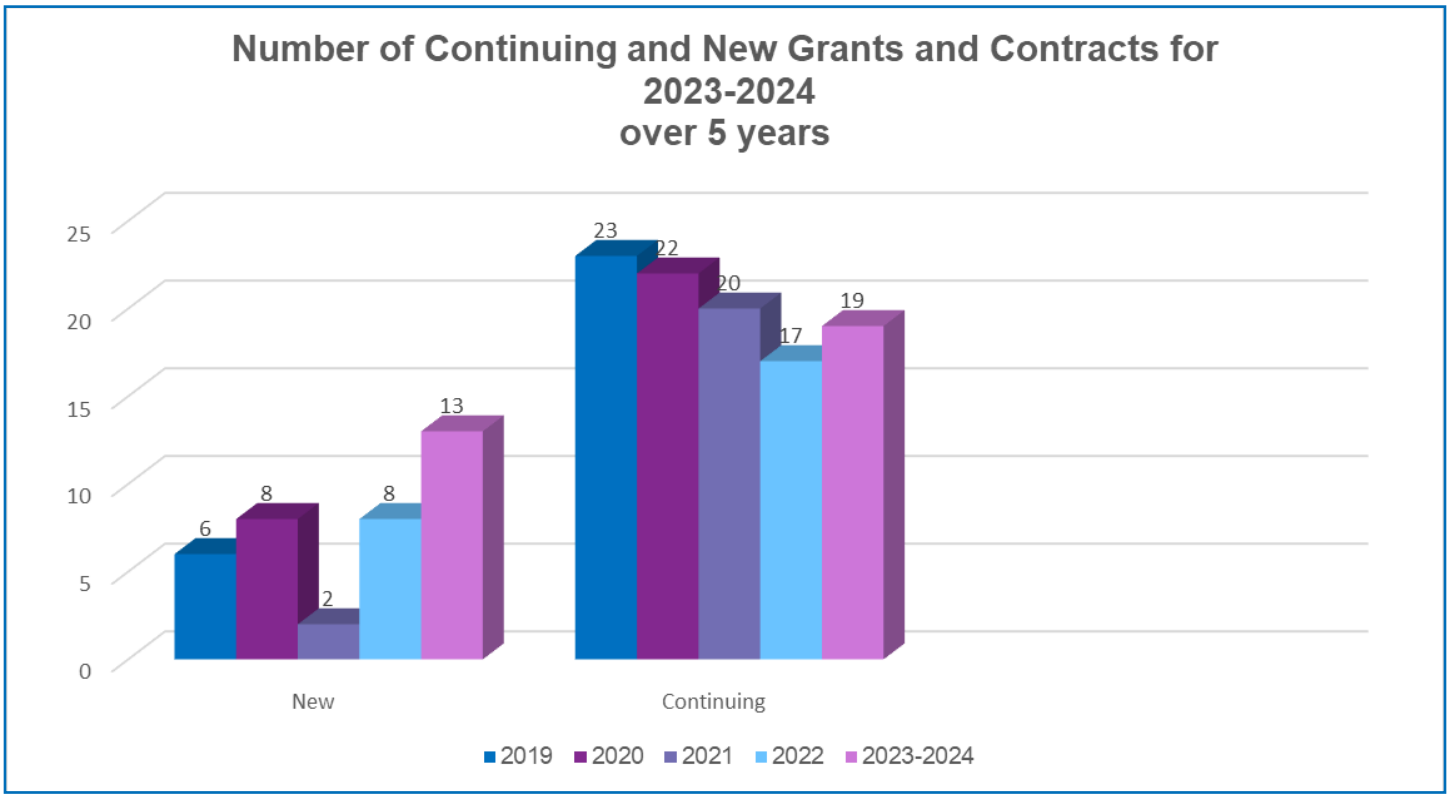
22. van der Ende S, Gaston D, Nightingale M, Wallace K, The FEVR Consortium, McMaster C, **Robitaille J**. Gene Variant Spectrum in Patients with Familial Exudative Vitreoretinopathy (poster). The Canadian College of Medical Geneticists (CCMG). [Podium] The Canadian College of Medical Geneticists (CCMG) Annual Conference (St. John's, NL), June 2024.

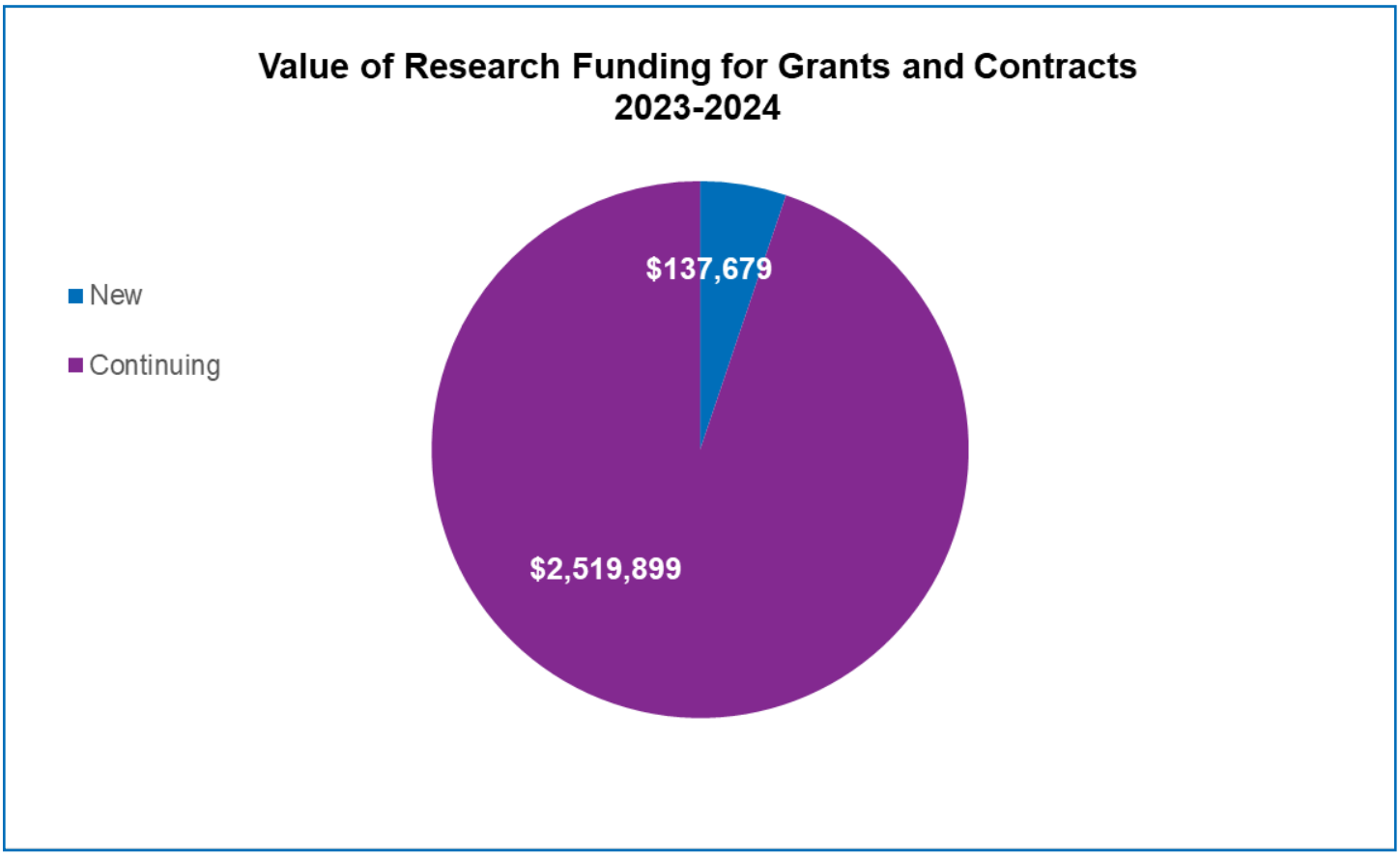
Other Publications & Books and Chapters

1. **Shuba L**, United States Department of Defense Center of Excellence for Trauma (Joint Trauma System) (2023) *Clinical practice guideline: Treatment of ocular trauma and vision-threatening conditions by deployed ophthalmologists (eye surgeons)* - Vision Center of Excellence; 2022. Canadian Ophthalmological Society Foundation (Eyes on Ukraine Initiative) and the American Society of Ophthalmic Plastic and Reconstructive Surgery, trans [Clinical Care Guidelines]

2. Giammaria S, **Chauhan BC** (2024). Evaluation of progression using OCT [Book Chapter]. In: Iester M, Schmetterer L (Eds), *Glaucoma Imaging* (pp. pp.111-119). Platform Network srl: Savona, Italy.

Research Funding Facts & Figures





New Research Grants and Contracts

1. **Smith CA**, **Chauhan BC** (2024 - 2026). Measuring the immune response during retinal ganglion cell loss [Grant] - Glaucoma Research Society of Canada - $23,000.
2. **Betsch D**, Hodgson K, **Bonatti R, Shuba L**, **Eadie B**, **Rafuse PE**, Palakkamanil M, **Nicolela M** (2024 - 2026). Safety and efficacy of sub-tenon triamcinolone injection versus a conventional steroid drops post-operative regime following glaucoma surgery [Grant] - Glaucoma Research Society of Canada - $24,423.
3. Baker A, Kabiri S, **Smith CA**, Freeman E (2024 - 2026). Exploring Enhanced Artificial Vision via Electrode Biofabrication [Grant] - New Frontiers in Research Fund – Exploration Grant - $250,000.
4. **Chauhan BC** (2024 - 2029). Functional in vivo imaging of single retinal ganglion cells in experimental glaucoma [Grant] - CIHR - $979,200.
5. **Smith CA** (2023). Non-mydriatic retinal imaging [Grant] - The Whitearn Foundation - $32,500.
6. **Bonatti R, Shuba L, Eadie B** (2023 - 2024). Gaze behavior when analyzing visual fields [Grant] - Glaucoma Research Society of Canada - $15,414.
7. **Agosto MA** (2023 - 2024). Young Investigator Grant [Grant] - Alcon Research Institute - $83,000 (USD).
8. **Jamet, AJ, Chauhan BC** (2023 - 2025). Characterization of adeno-associated viral vector promotor-mediated specificity to retinal ganglion cells [Grant] - Glaucoma Research Society of Canada - $29,940.
9. **Smith CA** (2023 - 2026). Identification of imaging biomarkers for early detection of age-related macular degeneration [Grant] - Department of Ophthalmology and Visual Sciences - $30,000.
10. Bondok M, Bondok MS, Knafo M, Law C, Nathoo N, Grimm L, **Mishra A** (2023 - 2025). Exploring the gender gap in Canadian ophthalmology: A mixed methods study [Grant] - Dalhousie - $9,494.
11. **Smith CA**, **O'Brien DM**, Button A (2023 - 2024). Understanding retinal detachment trends by combining clinical, patient, and research perspectives [Grant] - QEII Foundation - $3,000.
12. **Smith CA**, Cahill LE (2023 - 2024). Incidence of Retinal Detachment Admissions During a 10-Year Period in the Maritimes [Grant] - Dalhousie - $20,000.
13. **Chauhan, BC; Nicolela MT**; Sharpe G (2023 - 2025). Clinical evaluation of I-Care Tonometry [Industry Contract] - ICare; Finland - $104,451.

Continuing Research Grants and Contracts

1. **Agosto MA** (2022 - 2023). New faculty research grant [Grant] - DMRF & Department of Ophthalmology & Visual Sciences - $30,000.
2. **Agosto MA** (2022 - 2025). Operating grant [Grant] - Plum Foundation - $34,500 (USD).
3. **He B, Eadie BD**, Etminan M (2022 - 2024). Exploration of the association between bisphosphonates and glaucoma [Grant] - Glaucoma Research Society of Canada - $20,000.
4. **Chauhan BC** (2022 - 2024). Assessing neuroprotection in glaucoma with in vivo single retinal ganglion cell imaging [Grant] - Fighting Blindness Canada - $192,095.
5. **Agosto MA** (2022 - 2027). Formation of trans-synaptic complexes at the first visual synapse [Grant] - NSERC - $155,000.
6. **Nicolela MT, Chauhan BC**, Glaucoma Myopia Phenotyping Consortium members (2022 - 2025). Glaucoma myopia phenotyping consortium [Industry Contract] - Heidelberg Engineering, GmbH - $47,721.
7. **Darwich R,** Etminan M, **Eadie BD** (2022 - 2024). Exploration of the association between methylphenidate and glaucoma [Grant] - Glaucoma Research Society of Canada - $20,000.
8. **Agosto MA** (2022 - 2023). CFI matching funds [Grant] - NSHRF - $125,000.
9. **Agosto MA** (2022 - 2023). Molecular dissection of circuits in the visual system [Grant] - CFI - $125,000.
10. **Agosto MA** (2022 - 2023). Capital equipment grant [Grant] - Dalhousie - $30,000.
11. **Agosto MA** (2021 - 2024). New faculty startup funds [Grant] - Dalhousie - $300,000.
12. **Eadie BD**, Vianna JR (2021 - 2024). Refinement of eye movement perimetry [Grant] - Glaucoma Research Society of Canada - $19,400.
13. **Smith CA** (2021 - 2026). QEII Foundation scholar in retina research - Startup funding [Grant] - QEII Foundation - $100,000.
14. **Dickinson J, Cruess A, Gupta RR** (2021 - 2024). A multicenter, open-label extension study to evaluate the long-term safety and tolerability of faricimab in patients with diabetic macular edema (Rhone X) [Industry Contract] - Roche - $164,917.
15. Talany G, **Francisconi C, Gupta RR**, Dunsworth S and **Mishra A** (2021 - 2025). The effect of preoperative educational videos on patients undergoing cataract surgery [Grant] – NSHA TRIC - $23,000.
16. Bedard K (nominated PI), Vandersteen A, Brock J, Dyack S (co-PIs), **Robitaille J** (applicant) (2020 - 2023). Genome Canada - Genomic applications partnership program (GAPP): Implementation of clinical exomes in a pre- and peri-natal setting [Grant] - Genome Canada - $4,758,489.
17. **Chauhan BC** (2018 - 2023). Novel imaging targets for detecting early progression of glaucoma [Grant] - CIHR - $730,576 .
18. **Chauhan BC** (2018 - 2023). Optic nerve changes in glaucoma (unrestricted funding) [Grant] - Heidelberg Engineering - $650,000.
19. McMaster C, **Robitaille JM** (2016 - 2023). A treatment for the inherited childhood blinding disorder familial exudative vitreoretinopathy [Grant] - CIHR - $750,000.

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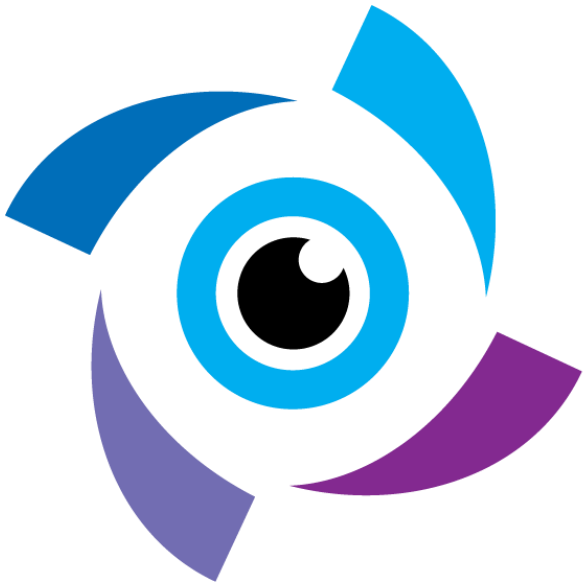

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