

Department of Ophthalmology & Visual Sciences

ANNUAL REPORT 2021-2022



OPHTHALMOLOGY
& VISUAL SCIENCES



DALHOUSIE
UNIVERSITY



Table of Contents

01	Message from Department Head
02	Mission, Vision, Values
03	Who We Are & What We Do
05	Our Faculty
06	New Faculty Members
07	New Faculty & Promotions
08	Awards & Accolades
09	Mathers Awards
12	Patient Care
15	QEII New Generation
17	Message from Postgraduate Medical Education Director
18	Message from Undergraduate Medical Education Director
19	Award Winning Educators
21	Grand Rounds
22	Visiting Professor Program
24	Message from Research Director
25	Research Profile - Balwantray Chauhan
27	Research Day
28	QEII Foundation - Scholar in Retina Research
29	Form & Function
30	Resident Research
31	Trainee Research
33	Publications Facts & Figures
34	Peer Reviewed Journal Publications
37	Scientific Abstracts
38	Other Publications
39	Research Funding Facts & Figures
40	New & Continuing Research Grants
43	Supporters



Marcelo Nicolela, MD, FRCSC

*Head and Chief
Department of Ophthalmology & Visual Sciences
Dalhousie University & Nova Scotia Health Authority*

Dear colleagues and friends of the Department of Ophthalmology & Vision Sciences,

I invite you to read the Department of Ophthalmology & Visual Sciences (DOVS) 2021-22 Annual Report. This academic year was marked by the “return to normality”, as we recovered from the worst period of the pandemic and continued with our mitigation plans to ensure that access to eye care returned to pre-pandemic levels. We are pleased to report that we have now surpassed the pre-pandemic level of adult ophthalmological surgery (page 13). This is, in large part, due to the success of the cataract program performed outside of the hospital, at the Halifax Vision Surgical Centre, a privately owned facility rented by NSH. With the current plans to expand our use of this facility, we should see an even bigger impact on surgical volumes in the years to come. We have also seen a large recovery on the number of ambulatory visits at the Eye Care Centre, Cobequid Community Centre and IWK. We should also keep in mind that these numbers do not include virtual visits, utilized in the post-pandemic era but not prior to it.

The teaching and research programs of the DOVS are alive and well, with another record year in terms of publications by members of the department, and increased number of learners involved in research. I would like to encourage you to read the Research Profile of Dr. Balwantray Chauhan (page 25), who has had in the last 30 years a huge impact in glaucoma research at a national and international level.

I want to welcome our new department members, Dr. Melina Agosto (joint appointment with the Department of Physiology and Biophysics), Dr. Veronique Promelle (paediatric ophthalmologist) and Dr. Michael Thorne (neuro-ophthalmologist, joint appointment with the Department of Medicine). I would also like to congratulate Drs. Stan George and Chris Seamone for the well-deserved surgical and clinical awards for 2021.

I want to thank all the Faculty, the clinical staff and the residents for your hard work, continued support and commitment to excellence, even in the face of significant challenges such as the pandemic.

Marcelo Nicolela

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	45,536
Cobequid Clinic	2,178
IWK Ophthalmology	8,010
Total Adult Surgeries	8,069
HVSC Surgeries <small>* included in total above</small>	1,405
Total IWK Surgeries	273

Who Delivers Care

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

Surgical Cases by Subspecialty

Cataracts (incl. HVSC)	5,646
Cornea	169
Glaucoma	498
Orbit/Plastics	226
Other	0
Paediatrics	273
Retinal Surgery	1,882
Adult Strabismus	98

Research

17 Invited Presentations

48 Peer Reviewed Manuscripts

\$2.82M Continuing Research Grants & Contracts

\$0.14M New Research Grants & Contracts

\$2.96M Total Research Funding



Who We Are & What We Do

Education



Postgraduate Education

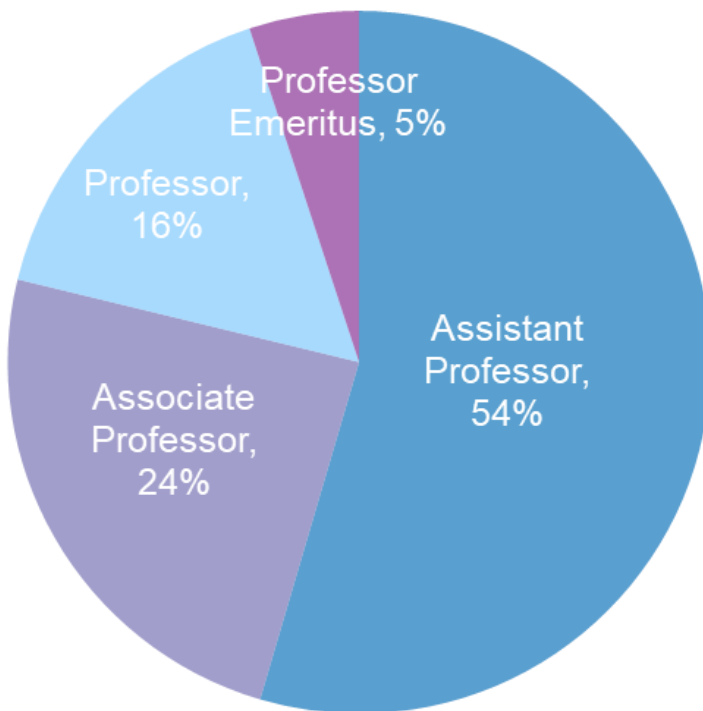
Residents PGY2-5	10
Resident PGY1	3
Fellow - Clinical Glaucoma	1
Fellow - Paediatrics	1
Postdoctoral Fellows	2
Clinical Vision Sciences	6

Undergraduate Education

MED 4 Elective students	12
Dalhousie Medical 1 & 2 student electives	11

Professional Development

Grand Rounds	31
Conferences	Cancelled
Journal Clubs	Cancelled



Our Faculty

Dr. Melina Agosto, Assistant Professor
 Dr. Curtis Archibald, Assistant Professor
 Dr. Bashar Bata, Assistant Professor
 Dr. Dan Belliveau, 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. Paul Freund, Assistant Professor
 Dr. Stan George, Associate Professor
 Dr. Rishi Gupta, Assistant Professor
 Dr. Ahsen Hussain, Associate Professor
 Dr. Hesham Lakosha, Assistant Professor
 Dr. G. Robert La Roche, Professor
 Dr. Darrell Lewis, Assistant Professor
 Dr. Anu Mishra, Assistant Professor
 Dr. Jeremy Murphy, Assistant Professor
 Dr. Marcelo Nicolela, Professor & Head
 Dr. Daniel O'Brien, Associate Professor
 Dr. Andrew Orr, Associate Professor
 Dr. Veronique Promelle, Assistant Professor
 Dr. Paul Rafuse, Associate Professor
 Dr. Johane Robitaille, Professor
 Dr. Arif Samad, Associate Professor
 Dr. Christopher Seamone, Associate Professor
 Dr. Lesya Shuba, Associate Professor
 Dr. Corey Smith, Assistant Professor
 Dr. Alex Tan, Assistant Professor
 Dr. Michael Thorne, Assistant Professor
 Dr. Francois Tremblay, Professor
 Dr. Jayme Vianna, Assistant Professor
 Dr. Amr Zaki, Assistant Professor

Joint Appointments

Dr. William Baldrige (Anatomy & Neurobiology)

Cross Appointments

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

Distributed Learning Faculty

Dr. William Best, 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. Mohammed Kapasi, Assistant Professor
 Dr. Colin Mann, Assistant Professor
 Dr. Kristine Mayer, Assistant Professor
 Dr. Rajender Mohandas, Assistant Professor
 Dr. Kenneth Roberts, Assistant Professor
 Dr. Robert Scott, Assistant Professor
 Dr. Banakesa Shetty, Assistant Professor
 Dr. Iva Smrz, Assistant Professor
 Dr. Jeff Steeves, Assistant Professor
 Dr. Christopher Symonds, Assistant Professor
 Dr. Vicki Taylor, Assistant Professor
 Dr. Hilda Zommer-Sykes, Assistant Professor

Emeritus Appointments

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

Adjunct Appointments

Dr. Dao-Yi Yu, Adjunct Professor
 Dr. Sharon Bentley, Assistant Adjunct Professor



Dr. Melina Agosto

Assistant Professor
Retina Research

Dr. Agosto joined our department as Assistant Professor with a joint appointment in the Department of Physiology and Biophysics, effective September 1, 2021.

Dr. Agosto completed undergraduate degrees in Biology and Materials Science & Engineering at the Massachusetts Institute of Technology. She then completed a Ph.D. (Microbiology and Molecular Genetics) at Harvard University followed by a postdoctoral fellowship at Baylor College of Medicine, where she worked on retinal cell biology and protein biochemistry. Dr. Agosto's expertise in neurobiology, biochemistry, and microscopy is an asset for our retina research program.

Dr. Agosto's laboratory is within the Retina and Optic Nerve Research Laboratory in the Tupper Building.

Dr. Promelle completed her medical education at the University of Amiens, France in 2009. She then went onto complete her Ophthalmology Residency in 2015. Dr. Promelle started practicing in Amiens University Hospital, France, with a focus on pediatric ophthalmology, until 2019 when she went to Vancouver to complete a first Pediatric Ophthalmology and Strabismus Fellowship at the BC Children's Hospital, University of British Columbia. Dr. Promelle completed this year a second Pediatric Ophthalmology and Strabismus fellowship at the Hospital for Sick Children, University of Toronto. In parallel, she graduated from her PhD in Biology, Health and Human Physiopathology with the University of Amiens, France in 2020.

Dr. Promelle joined our department as Assistant Professor, effective January 1, 2022.



Veronique Promelle, MD

Assistant Professor
Paediatric Ophthalmology and
Adult Strabismus

New Faculty & Promotions

Dr. Thorne joined our Department on October 4, 2021 and is cross-appointed with the division of Neurology, Department of Medicine. His clinics include Neuro-Ophthalmology at the VG Eye Care Centre, in addition to MS clinics at the NS Rehabilitation Centre and a General Neurology clinic at the Halifax Infirmary. He plans to conduct research in the fields of Neuro-Ophthalmology as it pertains to MS and other diseases affecting the afferent visual pathway.

Dr. Thorne completed all of his formal education at Dalhousie University, including an undergraduate degree in Neuroscience (2006), MSc in Pharmacology (2008), followed by undergraduate Medicine (2014). Dr. Thorne completed his Neurology residency at Dalhousie University (2019). He completed a 1-year Multiple Sclerosis (MS) Research Fellowship in the Department of Medical Neuroscience at Dalhousie (2020). He completed a 1 year Clinical Fellowship in Neuro-Ophthalmology at UBC and Dalhousie University, Department of Ophthalmology (2021).



Dr. Michael Thorne
Assistant Professor
Neuro-ophthalmology



Dr. Ahsen Hussain

Associate Professor
Ophthalmic Plastics and Reconstructive
Surgery

Dr. Ahsen Hussain Congratulations to Dr. Ahsen Hussain on his promotion to Associate Professor. The promotion will be effective July 1, 2022. The Promotions Committee was impressed with the caliber of the application, teaching dossier and documentation and it was a pleasure to support the application and forward it on for review and support at both the faculty level and provost.

DMRF New Faculty Grant Award

Congratulations to **Dr. Melina Agosto** on receiving the Department of Ophthalmology & Visual Sciences and Dalhousie Medical Research Foundation (DMRF) New Faculty Research Grant. Funding for the New Faculty Research Grant is made possible by donations through DMRF. Dr. Agosto will be overseeing a project on molecular dissection of synaptic signaling pathways in the retina.



Appointment of Dr Mishari Dahrab as the new Division Head of Pediatric Ophthalmology and Ocular Motility in the Department of Surgery at the IWK

Dr. Mishari Dahrab has been appointed as Division Head of Paediatric Ophthalmology and Ocular Motility in the Department of Surgery at the IWK. The appointment is effective July 1, 2022. This appointment follows a search for the replacement of Dr. G. Robert LaRoche who is retiring after leading the Division since its inception.

Dr. Dahrab joined the IWK after leaving a busy practice in paediatric ophthalmology in his home country of Kuwait. Dr. Dahrab completed a two year fellowship at the IWK following the completion of his residency at McGill University and his successful certification with the Royal College of Physicians and Surgeons of Canada.



Since his appointment as Assistant Professor in the Department of Ophthalmology & Visual Sciences at Dalhousie in 2017, Dr. Dahrab has been recognized for his enthusiasm for scholarly pursuits and academic excellence. He has already been given the responsibility of the Directorship of the departmental Residency Training Program. The Division of Ophthalmology at the IWK has a solid track record of excellence in clinical services, exemplary academic achievements, and active research activities. The Division is part of a comprehensive Eye Care delivery team who continue to thrive under Dr. Dahrab's leadership.

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.

2021 Winners

Dr. Saki Sultana is the recipient of the **Research Fellowship in Ophthalmology and Visual Sciences**.

Dr. Sultana, who is under the supervision of Dr. Melanie Kelly, is studying the effects of endocannabinoid signaling pathway manipulation in the pathophysiology of autoimmune uveitis. She will investigate retinal changes in a mouse model of



autoimmune uveitis and aims to determine if manipulation in the endocannabinoid system can stop the retina from becoming damaged. The knowledge obtained from this research may help in identifying new therapies for the treatment of uveitis.

The **PhD in Vision Science scholarship** is awarded to **Sara van der Ende**. **Sara van der Ende**, under the supervision of Drs.

Christopher McMaster and Johane Robitaille, will perform genetic testing using new technologies in Familial Exudative Vitreoretinopathy (FEVR) patients without a mutation in a known FEVR



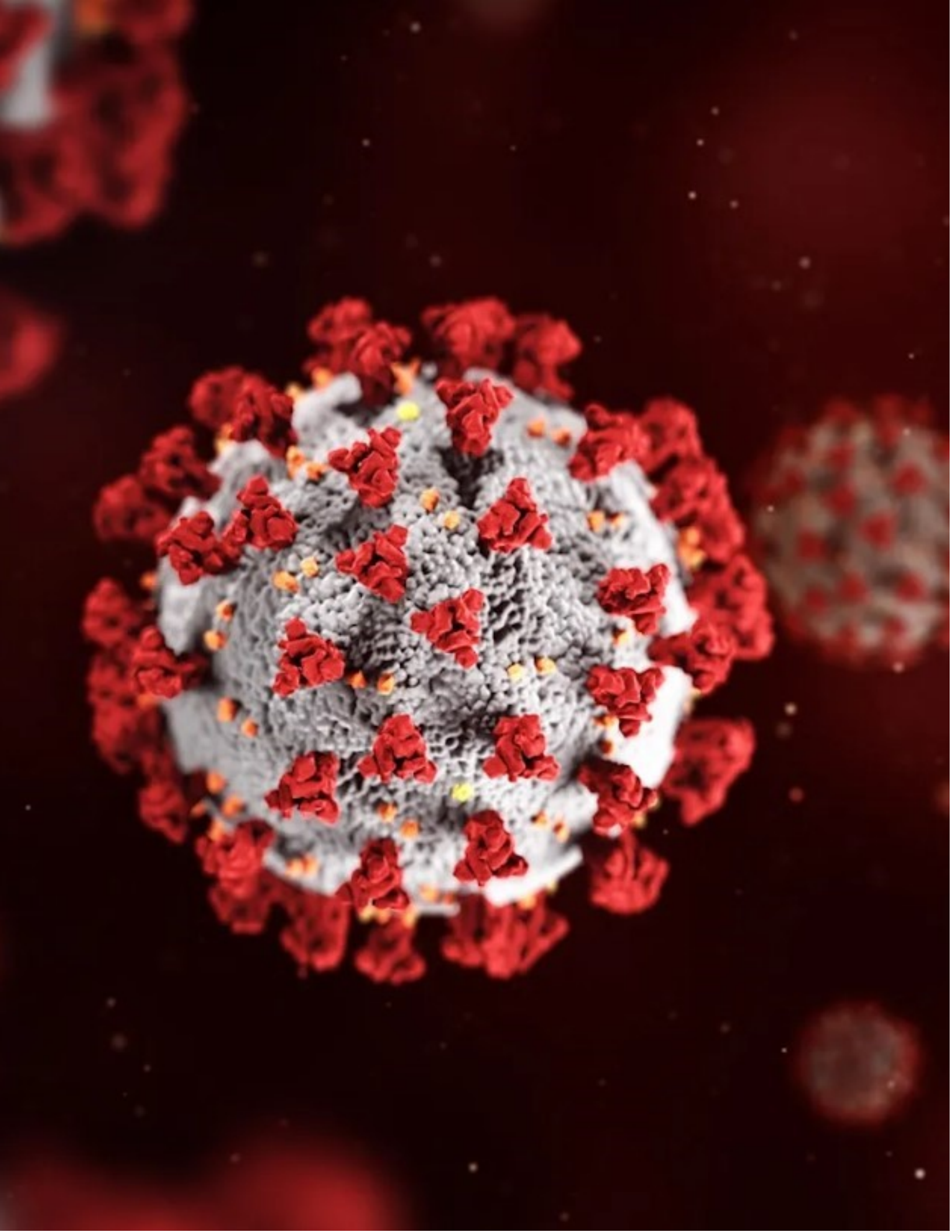
gene. She has identified new potential FEVR genes and is performing functional analyses to confirm that the mutations in these new genes cause FEVR. By expanding the list of FEVR-causing genes, more patients will receive a diagnosis earlier, leading to earlier treatment and prevention of vision loss.

The **Masters in Clinical Vision Science scholarships** are awarded to **Mairin Hogan** and **Emma Smeltzer**.

Mairin Hogan's research will be supervised by Dr. Kevin Duffy and Ms. Nadia Dicostanzo. She is studying ocular health and changes in refractive error following intraocular tetrodotoxin for the treatment of unilateral amblyopia. Previous research published by Dr. Duffy's group showed that intraocular injections of tetrodotoxin were effective in treating unilateral amblyopia in visually mature cats. Mairin will build on this research to determine the safety of intraocular tetrodotoxin determining whether these injections have any effect on the health of the retina or optic nerve and examine the refractive states of treated cats to establish whether retinal inactivation with tetrodotoxin results in refractive error changes. This research will help determine whether



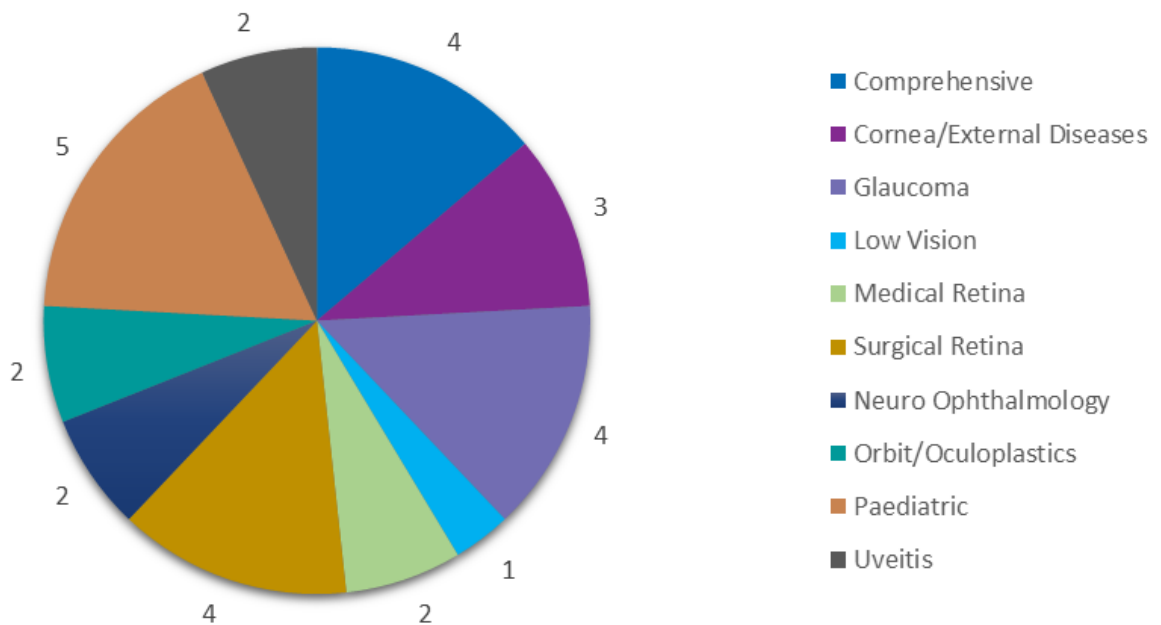
Emma Smeltzer is working under the direction of Dr. Darren Oystreck to investigate the validity of vision tests created in virtual reality (VR) to measure visual function in older children and adults. Her research uses VR to replicate common clinical tests of vision and compare them to their clinical versions in participants with normal and abnormal visual function. Validating VR as a reliable platform to assess subjective visual functioning could overcome many of the limitations of current clinical tests, thus providing more reliable information. In addition to improving information quality, the results of this research may provide additional benefits, such as improved patient engagement and decreased test time, equipment costs and space requirements.

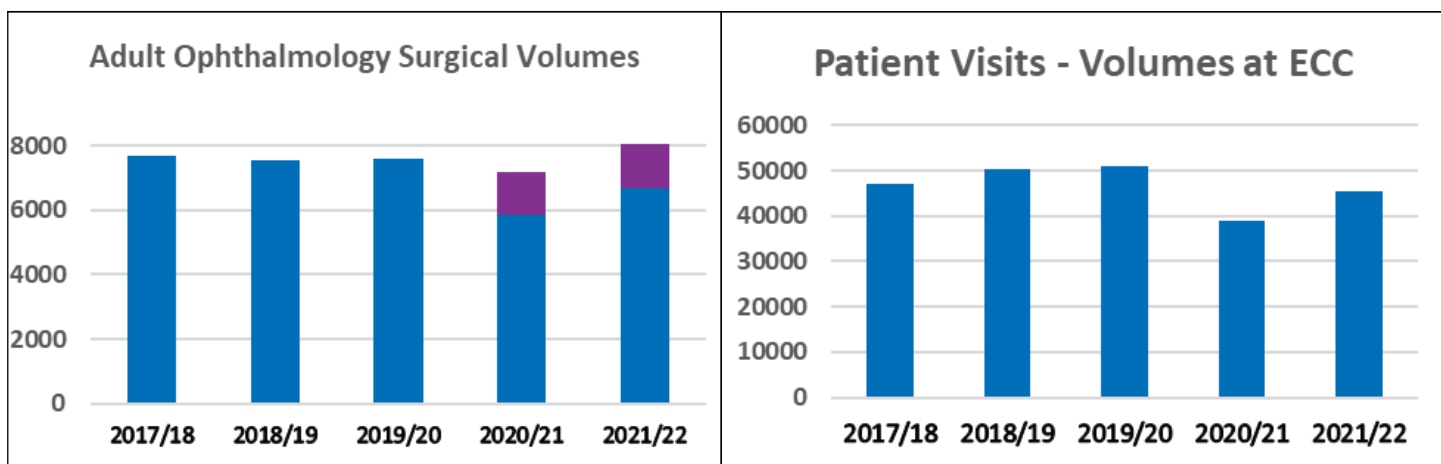


The clinical services delivered by the Department occur at the Eye Care Centre (QEII Health Sciences Centre - VG site – Nova Scotia Health Authority) for adult ophthalmology, at the paediatric ophthalmology Clinic located at the IWK Health Centre, at the ophthalmology clinic located at the Cobequid Community 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.

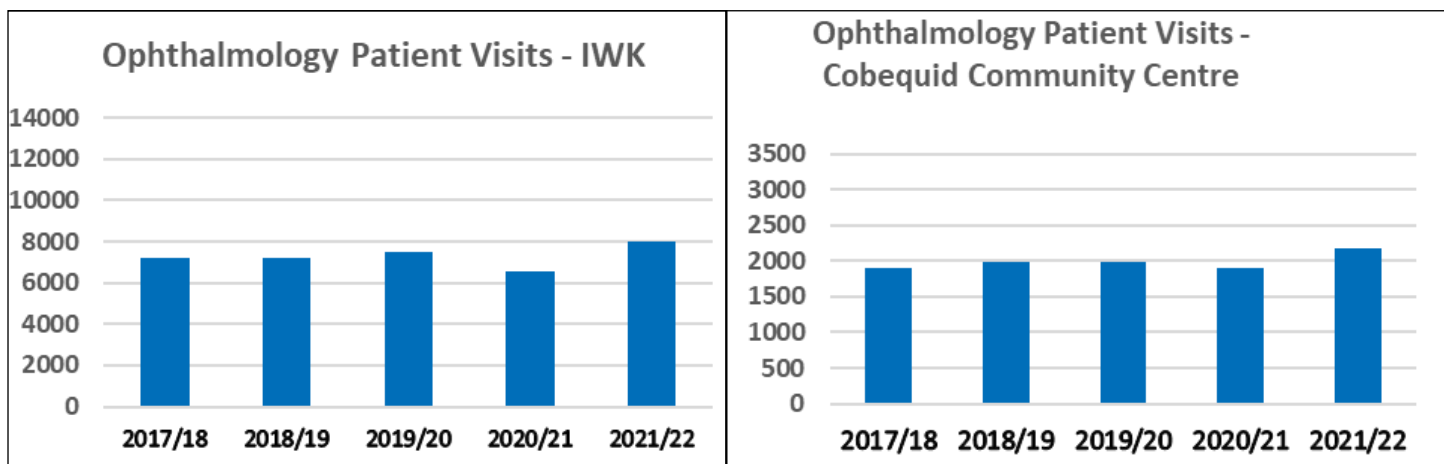


FACULTY SUBSPECIALITY PROFILE (NUMBERS)

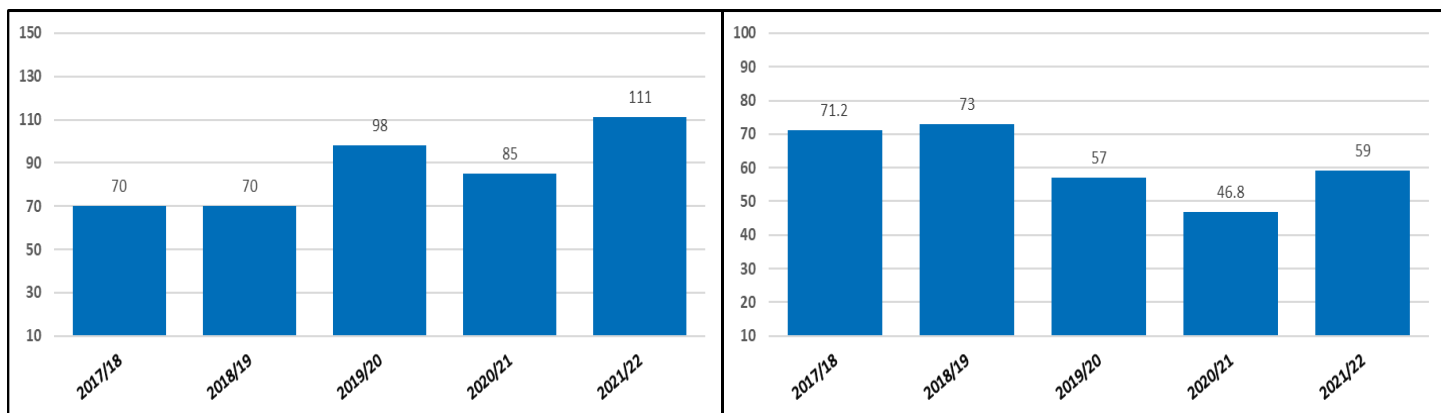




Clinical service volumes in ophthalmology for 2021-22 rebounded considerably since the start of the COVID-19 global pandemic. The purple volume comprises 1,405 cataracts performed at Halifax Vision Surgical Centre.



Clinical volumes at the IWK and Cobequid Community Centre also rebounded in 2021-22 since the start of the pandemic.



Median days waiting for all completed cases

Percentage of completed cataract cases within the national benchmark of 16 weeks

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 1405 cataract cases by end of March 2022, an increase of 55 cases over the 2020-2021 fiscal year. The program will continue and expend into fiscal 2023.

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.



Halifax Infirmary Expansion



The redevelopment of the QEII Health Sciences Centre, is a once in a generation opportunity to rethink and rebuild the way we deliver health care. It is a massive, multi-year project that’s laying out how we’ll meet the health care needs of Nova Scotians for the next 50 years. It will also allow services to be moved out of the aging Victoria General (VG) site of the QEII.

The existing Eye Care Centre at the VG will be relocated in brand new state of the art facilities in the Ambulatory building as part of the redevelopment and expansion project. The plan is to have the Eye Care Centre occupying one floor with clinical, surgical, minor surgery, and procedural laser facilities altogether, in addition to a clinical research area.



Bayer's Lake Community Outpatient Centre

The DOVS will open an ophthalmology clinic at the new community outpatient centre being built in Bayer's Lake and is on track to be occupied and operational by the end of 2023. This new clinic will have state of the art examining rooms and dynamic equipment, allowing us to provide care to patients closer to home, in a facility purposely built with increased efficiency.

QEI New Generation





Mishari Dharab, MD, PhD, FRCSC
Director, Postgraduate Medical Education

Dalhousie University Ophthalmology Residency program did not have a chance to end the 2021 academic year with an in-person graduation. We still held a wonderful virtual evening on June 18th celebrating the accomplishments of our amazing residents and fellows: Dr. Aish Sundaram, Dr. Amit Mishra, and Dr. Dani Cadieux. Dr. Sundaram headed West to British Columbia while Dr. Mishra went to London, UK for a medical retina fellowship. Dr. Cadieux headed to Australia for a corneal fellowship. We also celebrated our fellows: Dr. Elianne De Larochelliere who completed her pediatric ophthalmology fellowship and returned to practice in Quebec City; and Dr. Angela Zhang, who complete her glaucoma fellowship and headed to Toronto to practice. We wish them all a life time of success and happiness.

We are excited to welcome 3 new residents and 1 new fellow to our program:

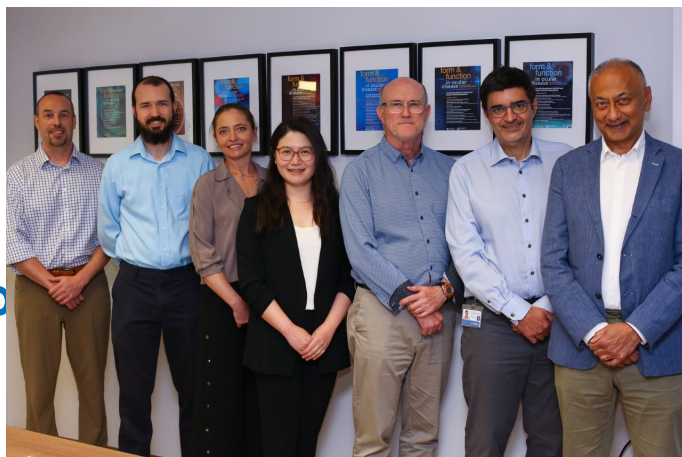
Dr. Ashley Whelan, from Dalhousie University

Dr. Lu “Bonnie” He, from the University of British Columbia

Dr. Verina Hanna, from the University of Toronto

Glaucoma Fellow, Dr. Mathew Pallakamanil from the University of Alberta

They are a welcome addition to our program.



Pictured above are the Glaucoma Faculty along with the Glaucoma Fellow, Dr. Angela Zhang.



Pictured above are the graduating residents of 2021, Drs. Aish Sundaram, Amit Mishra, & Dani Cadieux.



Dr. Anuradha Mishra
Assistant Professor
Director, Undergraduate Medical Education

We had another successful year from a UGME perspective this past year. We welcomed new committee member Veronique Promelle to the Undergraduate Medical Education Committee.

The year started off with another well received Med 2 Night. Many of our department members including both staff and residents participated and we were happy to resume to this being an in-person session again. We had a number of Dalhousie students from both Dal Nova Scotia and Dal New Brunswick Campuses come to spend time in our department for their 4th year electives.

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.

Finally a congratulations to Dr. Neetin Prabhu (PGY1) who was the recipient of the Dr. Mark J. Cohen Award and to Dr. Freddy Lee (PGY1) who was the recipient of the Dr. Harold Ross McKean Award. Both awards are given to Med 4 students who have demonstrated excellence in ophthalmology and are pursuing a postgraduate residency in ophthalmology

Award Winning Educators

Surgical Teaching Award – 2021 recipient Dr. Stan George



This annual award recognizes one staff physician's outstanding contributions to the surgical education of ophthalmology residents. This honour is decided upon by the ophthalmology resident group, which nominates and then chooses the recipient each year. As a symbol of our gratitude, your name has been added to a commemorative plaque, which celebrates the annual winners of our ophthalmology teaching awards.

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



Clinical Teaching Award – 2021
recipient Dr. Chris Seamone

This annual award recognizes one staff physician's outstanding contributions to the clinical education of ophthalmology residents. This honour is decided upon by the ophthalmology resident group, which nominates and then chooses the recipient each year. As a symbol of our gratitude, your name has been added to a commemorative plaque, which celebrates the annual winners of our ophthalmology teaching awards.

The residents feel that your dedication and contribution to our clinical teaching goes above and beyond the call of duty. Your teaching is comprehensive and thoughtful, with your feedback leaving us wanting to do better.

Grand Rounds

Apr 14, 21	Dr. Amr Zaki	Diagnostics in uveitis - current evidence and best practice
Apr 21, 21	Dr. Syed Mohammad	Masquerade syndromes: identifying the imposters
Apr 28, 21	Dr. Bashar Bata	An unusual presentation of Lyme borreliosis in a pediatric patient
May 12, 21	Dr. Douglas Iaboni	Flash Gordon's guide to photopsia (and saving the universe)
May 19, 21	Dr. Angela Zhang	What's new in the medical management of glaucoma?
May 26, 21	Dr. George Talany	Navigating social media in #Ophthalmology
Jun 2, 21	Dr. Christian Lehmann	With open eyes – collaborative research in anesthesia and ophthalmology at Dalhousie University
Jun 9, 21	Dr. Corey Smith	Current considerations and future opportunities in imaging
Sep 8, 21	D. George Talany	Ophthalmic Associations with COVID Vaccines
Sep 15, 21	Dr. Robert LaRoche	Why bother with strabismus surgery?
Sep 22, 21	Dr. Elizabeth Lock	Psychiatric issues with visual loss
Sep 29, 21	Dr. Erdit Celo	The ABCs of AIRs: Demystifying Autoimmune Retinopathies
Oct 6, 21	Dr. Michael Thorne	Neuro-ophthalmological features of CNS demyelinating disease
Oct 13, 21	Dr. Angela Cooper	Psychological safety, leadership, and wellness
Oct 20, 21	Dr. Devin Betsch	Making light work of occupational eye injuries
Oct 27, 21	Dr. André Polmann	Dropping the drops? Examining 'dropless' cataract surgery
Nov 3, 21	Dr. Arif Samad	Seeing Red: Treatment Options
Nov 10, 21	Dr. Jake Blacklaws	The Gigabyte step: new tech in ophthalmology
Nov 17, 21	Dr. Pat Croskerry	Diagnostic Error in Ophthalmology
Dec 1, 21	Dr. Marlene Durand*	Recent updates on ocular TB, ocular syphilis, Candida endophthalmitis, and other eye infections
Dec 8, 21	Dr. Bernard Hurley*	Assessment and Management of the Ruptured Globe
Jan 12, 22	Dr. Balwantray Chauhan	The importance of umbrellas in protecting against lion attacks
Jan 19, 22	Dr. Syed Mohammad	A Case of Leukocoria: Review of Retinoblastoma
Jan 26, 22	Dr. Ralph Eagle*	Retinoblastoma
Feb 2, 22	Dr. Douglas Iaboni	Confronting our Goliath: A Guide to Giant Cell Arteritis
Feb 9, 22	Dr. John Dickinson	AMD therapeutics
Feb 16, 21	Dr. Ki Ho Park*	Glaucoma in myopic eyes: cases and reviews
Mar 2, 21	Dr. Alex Tan	Presbyopia: Can a drop a day keep the glasses away?
Mar 9, 22	Dr. Ashlyn Pinto	An ophthalmologist's guide to sparing the steroids
Mar 23, 22	Dr. Brennan Eadie	Mitomycin C for Glaucoma Filtration Surgery: Past, Present, and Future
Mar 30, 22	Dr. Stan George	Corneal pathology with cataract surgery: reflections and recommendations

*Visiting Professor Program

Visiting Professor Program

Dr. Marlene Durand

Associate Professor of Medicine and Ophthalmology

Harvard Medical School
Recent updates on ocular TB, ocular syphilis, Candida endophthalmitis, and other eye infections
December 1, 2021

Dr. Bernard Hurley

Subspecialty: Retina

University of Ottawa Eye Institute
Assessment and Management of the Ruptured Globe
December 8, 2021

Dr. Ralph Eagle

Subspecialty: Ocular-pathology

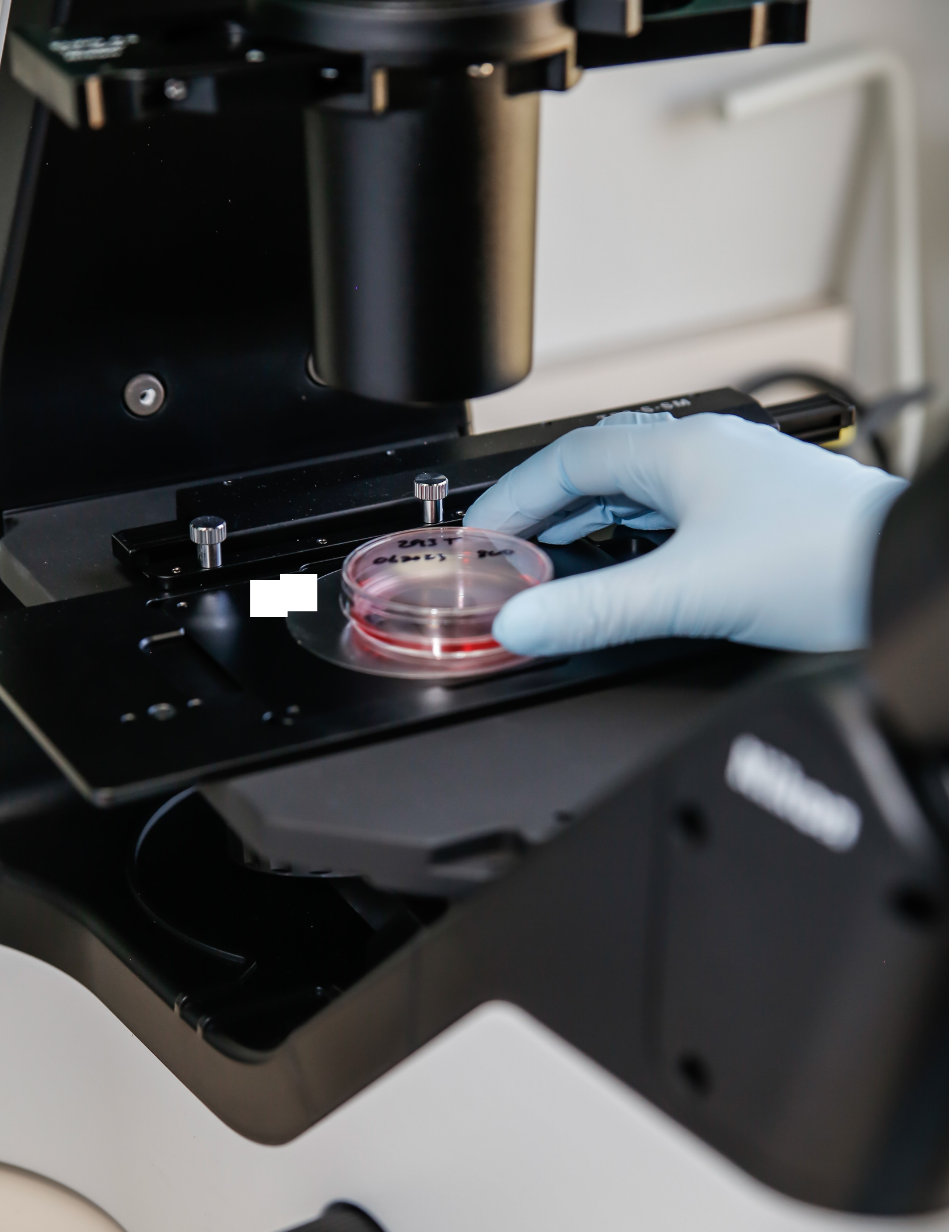
Wills Eye Hospital
Retinoblastoma
January 26, 2022

Dr. Ki Ho Park

Subspecialty: Glaucoma

Seoul National University
Glaucoma in myopic eyes: cases and reviews
February 16, 2022

Due to the COVID-19 pandemic, the Visiting Professors Program was significantly curtailed and all presentations were virtual.





Balwantray Chauhan, PhD
Research Director

The Departmental research activities continued in the best possible way we could manage in spite of the continuing effects of the pandemic. I am pleased to say that we are almost back to normal though interruptions in research patient visits and supply chain issues for our basic science research have had an impact.

Trainees are vital to our research enterprise and trainees of all backgrounds continue to be attracted to vision and ophthalmology research. We have active participation from undergraduate students, graduate students, residents, and post-doctoral fellows who enrich the diversity and scope of research projects in the department. We are in an enviable position to have excellent endowments, especially the Mathers Endowment which funds individuals from the summer student to faculty level. I am pleased to say we have strong applications in all categories of the Mathers awards, and we continue to attract the very best young minds.

Our New Faculty Research Award provides young faculty members with start-up research funding as a springboard for larger awards at the national level. I am pleased to announce that Dr. Melina Agosto, a faculty member our department and Physiology and Biophysics was the successful recipient of this award in 2022. Dr. Agosto has been remarkably successful in grant funding competitions, with funding from the National Science and Engineering Council and Canada Foundation for Innovation since her appointment less than 2 years ago.

I am grateful to the Resident Research Directors, Drs. Johanne Robitaille and Corey Smith. I want to thank Ms. Laurie Ketch, our Research Administrator who filled in for Ms. Leah Wood who was away on maternity leave. Ms. Ketch had a very steep learning curve, and I am very grateful to her for her tremendous efforts and enthusiasm. 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

Research Profile—Dr. Balwantray Chauhan



Dr. Balwantray Chauhan is the Mathers Professor and Research Director in the Dalhousie University Department of Ophthalmology and Visual Sciences with cross appointments in the Departments of Medical Neuroscience and Physiology and Biophysics. His journey through academia has covered a large geographical distance from being raised as a child in both Nairobi, Kenya and the United Kingdom to completing his Bachelor of Science in Ophthalmic Optics at the Glasgow College of Technology and PhD at the University of Wales. He then came to Canada to complete postdoctoral fellowship training at the University of British Columbia. He was on his way back to the UK after his fellowship in 1990 when the then department head, Dr. Ray LeBlanc, asked him to make a stop in Halifax to tour our Department and consider an academic position here. Over thirty years later he is still at Dalhousie University, but his research continues to have world-wide reach through many invited lectures, publications and international

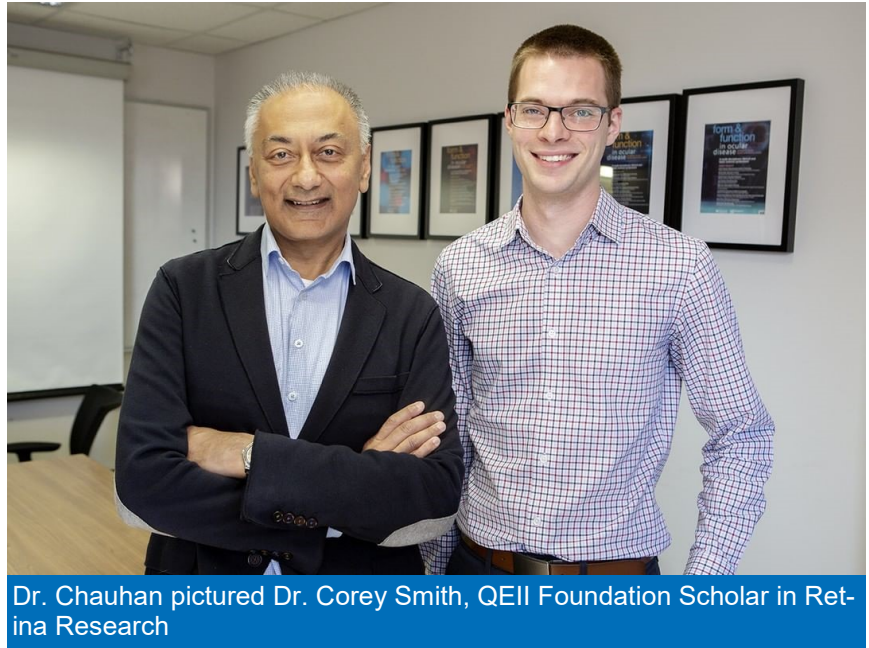
collaborations. With over 250 peer-reviewed publications, he is a leading contributor to glaucoma research.

Dr. Chauhan first became interested in research as an undergraduate student when he had the chance to present a research project at a national meeting in the UK. Since that time, he has dedicated his research efforts to clinical and experimental glaucoma with a special interest in imaging, both at the tissue and single cell level. His interest in these areas of research has grown because of the incredible explosion of technology in imaging techniques in clinical and basic neuroscience. “The eye is a unique organ that allows opportunities for imaging, functional testing as well as studying basic mechanisms in the brain. It is the only part of the brain that we can optically image without having to cut anything open”, explains Dr. Chauhan. Dr. Chauhan’s research aims to take advantage of diagnostic and therapeutic innovations to provide clinicians with tools to make the best clinical decisions both effectively and efficiently to reduce the burden of visual impairment due to glaucoma. A key contribution in this area is Topographical Change Analysis (TCA) used for identifying changes in optic nerve head topography with imaging techniques.



Left to right: Dr. Marcelo Nicoletta, Dr. Ray Le Blanc, Dr. Bal Chauhan

Dr. Chauhan's dedication to the field of glaucoma have garnered him with several accolades and distinctions over the years, most notably the Dalhousie University Dr. R. Evatt & Rita Mathers Chair in Ophthalmology & Visual Sciences in 2012 for his academic achievements, contributions to glaucoma research; and dedication to mentoring junior scientists to develop their own passion for research in ophthalmology. He was also awarded the Alcon Research Institute Senior Award in 2016 for his contributions to the field of vision research. This prestigious international award honours achievements in all areas of vision and ophthalmology.



Dr. Chauhan pictured Dr. Corey Smith, QEII Foundation Scholar in Retina Research

He was only the sixth Canadian to receive the Alcon Research Institute award since its inception in 1981.

In addition to his research, Dr. Chauhan has mentored many trainees who have gone on to have successful careers internationally. Dr. Corey Smith, the QEII Foundation Scholar in Retina Research at Dalhousie University, decided to pursue graduate training at Dalhousie University based on the reputation of Dr. Chauhan's esteemed research program and the recommendation of his previous mentor. "Dr. Chauhan's research mentorship supports and encourages trainees to develop and plan their own projects so that their interests are at the core of the work", explains Dr. Smith.

"I remain very excited about research and seeing the glint of curiosity in the eyes of my students. I feel very privileged to be in an environment that has fostered my research and hope to pass this on to others." says Dr. Chauhan.

Below are two images from Dr. Chauhan's lab.

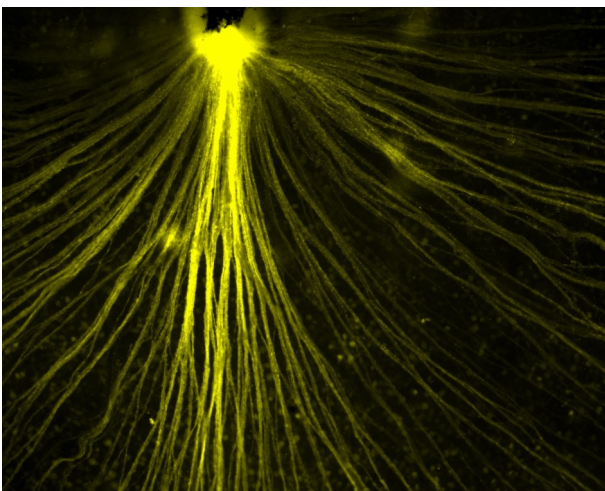
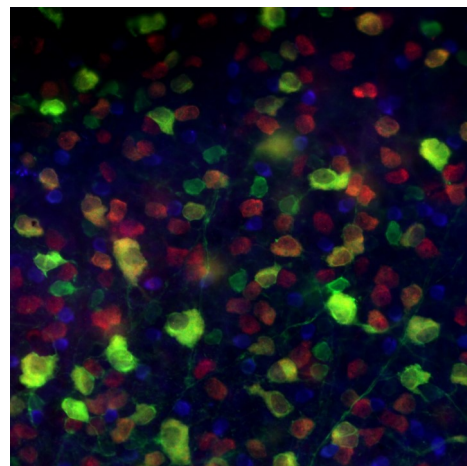


Image of a mouse optic nerve head injected with an AAV to transduce RGCs and their axons to express mCherry.



Immunohistochemistry of a mouse whole-mount retina expressing RBPMS (red) for RGCs, ChAT (blue) for displaced amacrine cells, and GFP (green) for cells transduced by an AAV



31st Annual

RESEARCH DAY

April 7, 2021 | 8am-1:30pm | Virtual Meeting



Keynote Speaker

Dr. Asim Ali

University of Toronto

"Surgical management of neurotrophic keratopathy "

Keynote Speaker

Dr. Joanne Langley

Dalhousie University

"A year like no other - the COVID-19 vaccine story"



QEII Foundation announces Scholar in Retina Research

Dr. Corey Smith, Assistant Professor at Dalhousie University and Affiliate Scientist at Nova Scotia Health, is the first QEII Foundation Scholar in Retina Research. Dr. Smith's work is supported by a \$2 million endowment, funded entirely by QEII Foundation donors.

This brand-new position will exist in perpetuity, with protected funds dedicated to retina research. The retina is the part of the eye that senses light and sends signals to the brain. While the research will encompass retinal disease broadly, the two most common retinal diseases are age-related macular degeneration and diabetic retinopathy.

Dr. Smith and team will help in the detection, investigation – and ultimately, better care of – retinal diseases, for the many individuals impacted locally. Working with patients in the QEII Eye Care Centre, Dr. Smith is excited to get started. “My interests and background are in medical imaging – so a big focus on my work will be on diagnosis, better understanding these diseases, identifying new markers, and improving ways to image the eye,” says Dr. Smith.

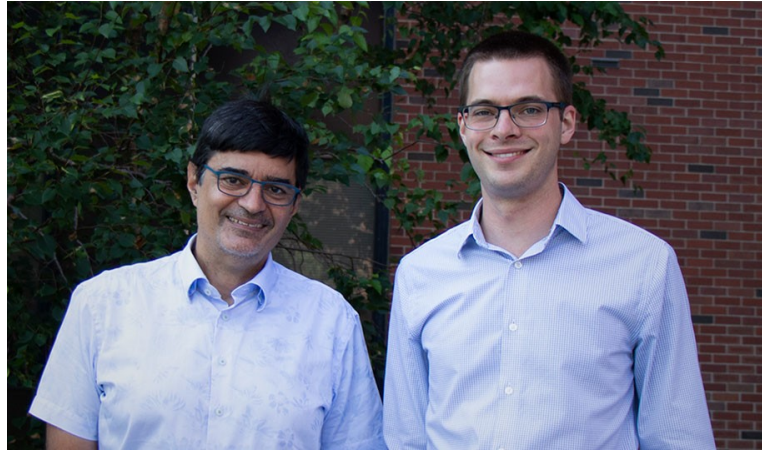
Macular degeneration is the primary cause of vision loss in older adults, says Dr. Marcelo Nicolela, department head at the QEII's Eye Care Centre. And both macular degeneration and diabetic retinopathy, if left untreated, can lead to blindness – irreversible and life-altering. The QEII Eye Care Centre is a specialized clinic, serving patients from all over the Atlantic Provinces. With more than 50 thousand patient visits per year, the clinic helps many patients with a variety of diseases affecting the retina.

“We have an aging population, so I think that speaks to the importance of this research. We also have a high prevalence of diabetes on the East Coast when compared with other provinces,” says Dr. Smith. These common conditions can result in the inability to read, drive or recognize faces, for example – dramatically impacting quality of life.

Dr. Nicolela says the department is excited to see this dedicated research role come to life. “Imaging in ophthalmology has really exploded over the past few decades,” he says. Today, a patient arrives at the clinic, sits down in front of a machine and within minutes the team has access to incredible imagery – all noninvasively. “There is no other part of the body where you can get that kind of information,” Dr. Nicolela says. And Dr. Smith's work will help maximize the use of all this information to help patients.

“Dr. Smith will have access to all the latest technologies,” he says. “The Eye Care Centre continues to receive support from QEII Foundation donors – from research opportunities to technologies in our clinics. Without donors, this work would not be possible,” he says.

Dr. Smith is most excited about being able to use new and existing technologies at the QEII to the best of their ability to improve patient care. “The collaboration between the scientists, clinicians, support staff and trainees is what will allow us to achieve that goal.”



Left to right: Dr. Marcelo Nicolela, Head, QEII Eye Care Centre and Dr. Corey Smith, QEII Foundation Scholar in Retina Research

Form & Function in Ocular Disease was postponed from 2020 to 2021 to 2022.

form & function

in ocular disease

OCTOBER 28 - 29, 2022
HALIFAX, NOVA SCOTIA, CANADA

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

GUEST FACULTY

Christine Curcio, University of Alabama at Birmingham

Why AMD affects the macula: Visual neuroscience meets drusen biology

Reza Dana, Harvard Medical School

New ways of doing old things: Corneal immune modulation and pro-regenerative treatments

Ross Ethier, Georgia Institute of Technology & Emory University School of Medicine

Under stress: The role of mechanics in ocular disease

Andrzej Grzybowski, University of Warmia and Mazury & Institute for Research in Ophthalmology

Promises and hazards of AI in ophthalmology

Jonathan Horton, Beckman Vision Centre, University of California San Francisco

Ambulatory monitoring with wearable eye trackers in exotropia

Christina Schwarz, University of Tübingen

2P or not 2P? - Two-photon ophthalmoscopy and its potential for clinical application

Val Sheffield, University of Iowa

Treatments for inherited blindness

Richard Spaide, Vitreous Retina Macula Consultants of New York

Choroidal venous overload



Resident Research

Name	Year	Supervisor	Project Title
Dr. Erdit Celo	PGY4	Dr. Melanie Kelly	Effects of cannabinoid receptor agonists on ocular inflammation in an endotoxin-induced uveitis model
Dr. Erdit Celo	PGY4	Dr. Jayme Vianna	Appraising the quality of meta-analysis in the glaucoma literature
Dr. George Talany	PGY4	Drs. Rishi Gupta, Anuradha Mishra, Carolina Francisconi	The effect of preoperative educational videos on patients undergoing cataract surgery
Dr. Devin Betsch	PGY3	Drs Rishi Gupta, Andrew Orr	A family affair: two cases of familial optic disc pits
Dr. Devin Betsch	PGY3	Dr. Ahsen Hussain	Onabotulinum toxin A to improve direct brow lift outcomes
Dr. Devin Betsch	PGY3	Dr. Paul Freund	Predicting Visual Outcomes in Patients with Tumors of the Sellar Region
Dr. André Pollmann	PGY3	Drs. Darrell Lewis, Rishi Gupta	Structural integrity of hydrophobic acrylic intraocular lens with eyelets (enVista™) in an experimental model of transscleral fixation
Dr. André Pollmann	PGY3	Dr. Darrell Lewis	Structural and functional analysis of Descemet Membrane Endothelial Keratoplasty lenticules under cold storage conditions in Optisol-GS
Dr. André Pollmann	PGY3	Dr. Darrell Lewis	Quantifying risk factors associated with Descemet stripping automated endothelial keratoplasty: a retrospective case-control study
Dr. Harry Dang	PGY3	Drs. Marcelo Nicolela and Jayme Vianna	5-year outcome of patients with normal tension glaucoma without treatment
Dr. Rami Darwich	PGY2	Dr. Carolina Francisconi	Choroidal thickness in treatment naïve eyes receiving unilateral intravitreal anti-VEGF
Dr. Douglas Iaboni	PGY2	Drs. Jayme Vianna and Marcelo Nicolela	Educational interventions for Nova Scotian optometrists in recent expansions on scope of practice
Dr. Douglas Iaboni	PGY2	Drs. Jayme Vianna and Marcelo Nicolela	Partnering for Pedagogy: Development of a Collaborative Glaucoma Practice Curriculum
Dr. Douglas Iaboni	PGY2	Dr. Jayme Vianna	Quality of Meta-Analyses in Therapeutic Studies in Glaucoma
Dr. Syed Mohammad	PGY2	Dr. Carolina Francisconi	Enface findings and contrast sensitivity changes in patients following retinal detachment
Dr. Syed Mohammad	PGY2	Dr. Ahsen Hussain	Comparison of Outcome in Conjunctival-Müller's Muscle Resection Ptosis Surgery With and Without Epinephrine in Local Anesthetic

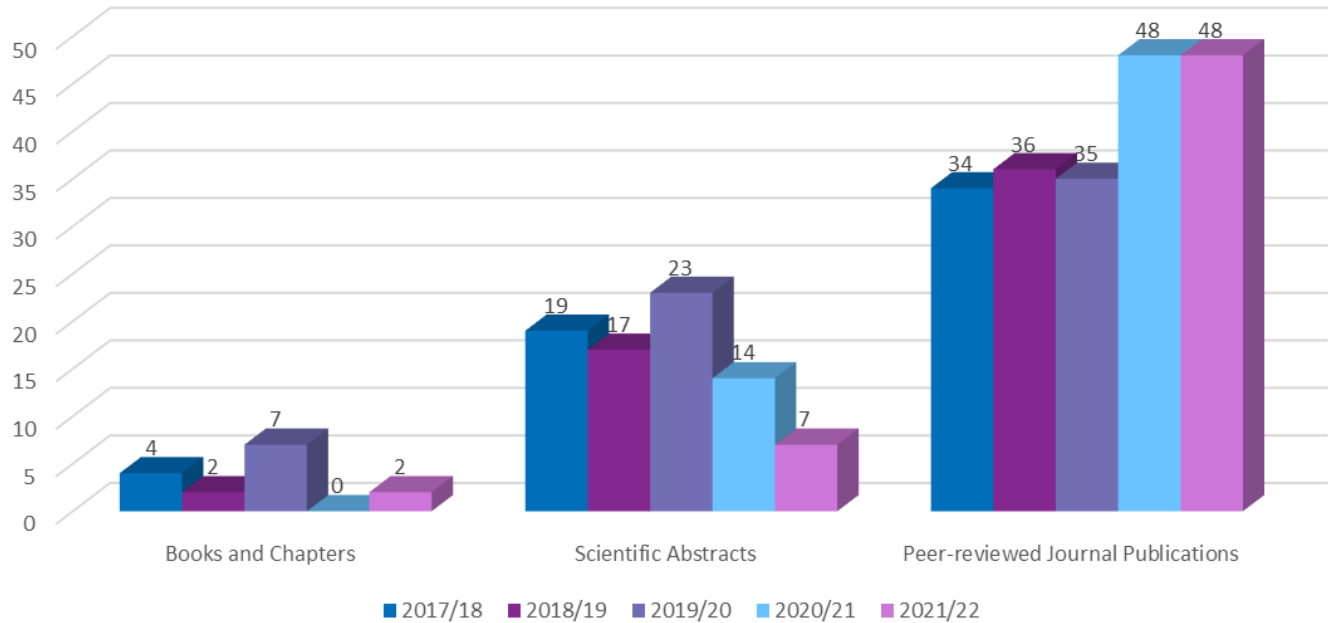
Trainee Research

Name	Program	Supervisor(s)	Project Title
Alejandro Palma	MSc candidate	Thomas Issekutz (Supervisor) and Johane Robitaille (Graduate Student Supervisory Committee member)	Investigation of B cell differentiation and the effects of genetic mutations in patients with dysregulation of antibody production to improve patient diagnosis and treatment
Aliénor Jamet	PhD	Balwantray Chauhan	Molecular signals of RGC death with imaging
Angela Zhang	Fellow	Lesya Shuba	The impact of examination-induced stress on intraocular pressure of ophthalmology residents
Angela Zhang	Fellow	Lesya Shuba	To evaluate the effect of Ginkgo Biloba Extract on optic nerve head and macula perfusion examined using OCTA
Bridgette Chan	Medical Student	Ahsen Hussain	Outcomes of endonasal DCR in DSI confirmed functional nasolacrimal duct obstruction
Clara Long	Medical Student	Ahsen Hussain	Systematic review and metanalysis of methods to improve survival of full-thickness skin grafts
Clara Long	Medical Student	Anuradha Mishra	Perspectives of Canadian medical students on ophthalmology education: A needs assessment
Darcie Wilson	Medical Student	Anuradha Mishra	The effect of the COVID-19 pandemic on pre-clerkship medical students mental well-being
Delaney Henderson	PhD	Balwantray Chauhan	Single RGC imaging in experimental glaucoma
Dominique Salh	Medical Student	Ahsen Hussain	Exploring successful treatments for upper eyelid retraction in Graves orbitopathy: a scoping review
Dominique Salh	Medical Student	Lesya Shuba	The impact of examination-induced stress on intraocular pressure of ophthalmology residents
Faisal Jarrar	Medical Student	Jayme Vianna	Comparison of optic disc photography vs optical coherence tomography in detection of glaucomatous progression
Herman Stubeda	Medical Student	Jayme Vianna	Comparing five criteria for evaluating glaucomatous visual fields
Herman Stubeda	Medical Student	Jayme Vianna	The agreement of 3 normative datasets in visual field analyses
Hirad Feridooni	Fellow	JM Robitaille/C McMaster	Development of novel therapeutics for the treatment of rare ocular developmental vascular disorders
Jack Quach	MSc	Jayme Vianna, Olga Theou (Geriatrics Department)	Association of frailty with the structure-function relationship in glaucoma
Kateryna Krazter	PhD candidate	Graham Dellaire (Supervisor) and Johane Robitaille	CRISPR safe-harbor sites
Katie MacLellan	Graduate Studies, Clinical Vision Sciences, Dalhousie U.	G. Robert LaRoche MD, Leah Walsh OC, MSc, David Westwood PhD	Importance of stereoacuity in a virtual reality model of strabismus surgery
Kevin Hodgson	Medical Student	Ahsen Hussain	Outcomes of endonasal DCR in DSI confirmed functional nasolacrimal duct obstruction

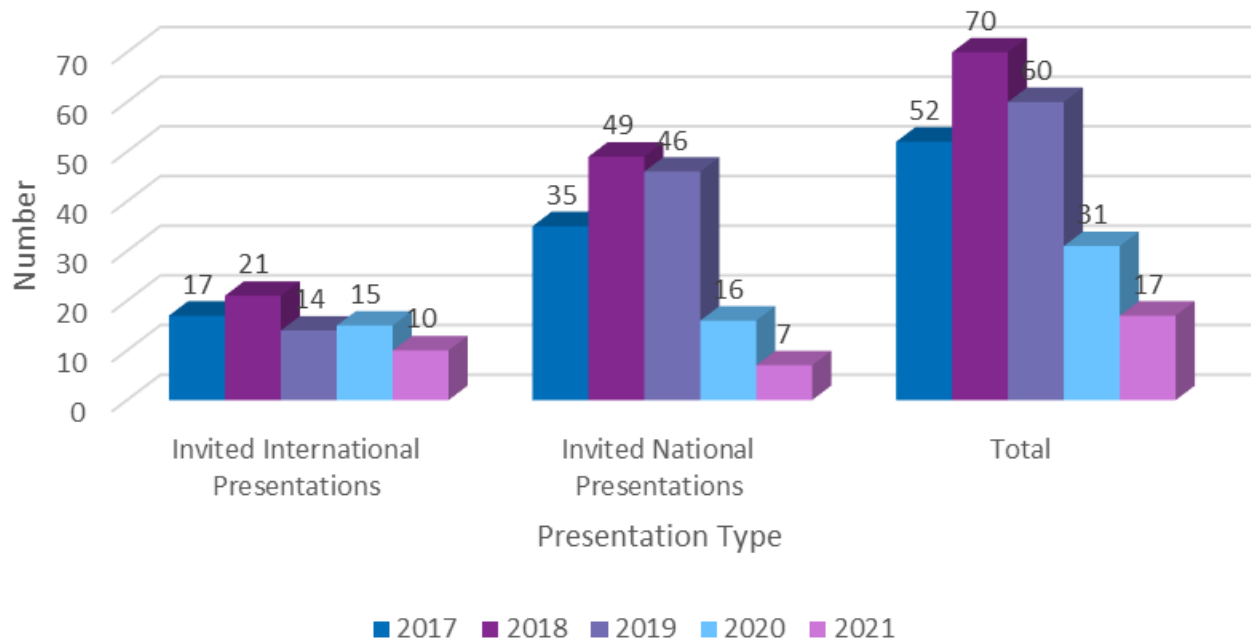
Name	Program	Supervisor(s)	Project Title
Kevin Hodgson	Medical Student	Ahsen Hussain	Congenital aberrant lacrimal gland ductules presenting as a nonhealing upper eyelid lesion
Maren Brodovsky	MSc	JM Robitaille/C McMaster	Mapping FEVR gene mutations and analysis of SNP load effect on disease severity
Maria Mullane	Undergraduate	Balwantray Chauhan	RGC quantification in experimental glaucoma
Mathew Palakkamanil	Fellow	Lesya Shuba	To evaluate the effect of Ginkgo Biloba Extract on optic nerve head and macula perfusion examined using OCTA
Michel Nader	Medical Student (RIM project completed)	JM Robitaille/C McMaster	Characterizing retinal vascular development using FEVR mouse models
Neetin Prabhu	Medical Student	Ahsen Hussain	Systematic review and metanalysis of methods to improve survival of full-thickness skin grafts
Neetin Prabhu	Medical Student	Anuradha Mishra	Building better education after COVID-19: learning lessons from the 2021 Canadian Ophthalmology Residency Match
Perrine Tami	Medical Student	Brennan Eadie	Modeling new glaucoma practices meeting current follow-up guidelines
Perrine Tami	Medical Student	Jayne Vianna, Brennan Eadie	Factors influencing appointment delays in glaucoma practices
Ryan Matthews	MSc	Balwantray Chauhan	OCT angiography in acute ischemic injury
Sara Giammaria	Fellow	Balwantray Chauhan	Macular structure-function correlations
Sarah van der Ende	PhD candidate	JM Robitaille/C McMaster	Discovering genes for familial exudative vitreoretinopathy
Shakiba Faghani	Summer Student (undergraduate)	Corey Smith, Balwantray Chauhan	Automatic retinal ganglion cell counting using APEER machine learning
Sunil Ruparelia	Medical Student	Anuradha Mishra	The effect of the COVID-19 pandemic on pre-clerkship medical students mental well-being
Sunil Ruparelia	Medical Student	Brennan Eadie	Evaluation of the efficacy and safety of Ab interno trabeculectomy revision
Sunil Ruparelia	Medical Student	Lesya Shuba	Perspectives on potential interventions to reduce barriers to vision care
Sunil Ruparelia	Medical Student	Rishi Gupta	What's the buzz? Risk of surgical team hearing loss with vitrectomy
Tareq Yousef	PhD	William Baldrige	Mechanisms of retinal horizontal cell gap junction coupling
Taryn Jakub	PhD candidate	James Kramer (Supervisor) and Johane Robitaille (Graduate Student Supervisory Committee member)	Modeling missense mutations in genes involved in intellectual disability
Vanessa Josey	Summer Student (undergraduate)	Corey Smith, Balwantray Chauhan	Measuring scan quality and perfusion density variability in longitudinal OCT-A imaging
Yong Woo Kim	Fellow	Balwantray Chauhan	OCT parameters and glaucoma severity

Publication Facts and Figures

Number of Books and Chapters, Scientific Abstracts, and Peer-reviewed Articles by Department Members over 5 years



Number of National and International Presentations by Department Members over 5 years



Peer Reviewed Journal Publications

1. Watane A, Kalavar M, **Pollmann AS**, **Lewis DR**, **Gupta RR**, Townsend J, Patel NA, Sridhar J, Yannuzzi NA (2021). Structural integrity of enVista MX60 eyelets. *Journal of Cataract and Refractive Surgery*. [Published].
2. **Mishra AV**, **Robitaille JM** (2021). Lack of evidence of association between ZNF408 variant and ROP. *Ophthalmic genetics*, 1. [Published] PubMed ID: [33491530](#).
3. Rosenbaum JT, Harrington CA, Searles RP, Fei SS, **Zaki A**, Arepalli S, Paley, MA, Hassman L, Vitale AT, Conrady CD, Keath P, Mitchell C, Watson L, Planck SR, Martin TM, Choi D (2021). Identifying RNA Biomarkers and Molecular Pathways Involved in Multiple Subtypes of Uveitis. *American Journal of Ophthalmology*. [Epub].
4. Topouzis F, Goldberg I, Bell K, Tatham AJ, Ridolfi A, Hubatsch D, **Nicolela M**, Denis P, Lerner SF (2021). Brinzolamide/brimonidine fixed-dose combination bid as an adjunct to a prostaglandin analog for open-angle glaucoma/ocular hypertension. *European journal of ophthalmology*, 31(1), 103-111. [Published] PubMed ID: [31595773](#).
5. Yu CW, Park L, Pinto A, Ma O, Lee Y, **Gupta RR**, Chaudhary V, Doumouras A, Hong D (2021). The Impact of Bariatric Surgery on Diabetic Retinopathy: A Systematic Review and Meta-Analysis. *Ophthalmology*. [Review - Published].
6. **Betsch DM**, **Mishra AV**, **Freund PR** (2021). A Case of Transient Monocular Vision Loss and Paracentral Acute Middle Maculopathy. *Journal of neuro-ophthalmology : the official journal of the North American Neuro-Ophthalmology Society*. [Published] PubMed ID: [33417419](#).
7. **Cadieux DC**, **Mishra A**, Goldszmidt MA (2021). Before the scalpel: Exploring surgical residents' preoperative preparatory strategies. *Medical Education*. [Published] PubMed ID: [33423328](#).
8. Whelan A, **Pollmann AS**, Lewis, DR (2021). Prevalence of mislabeled methods among case-control and cohort studies in the ophthalmology literature. *Clinical and Experimental Ophthalmology*. [Published].
9. Rosenbaum JT, Harrington CA, Searles RP, Fei SS, **Zaki A**, Arepalli S, Paley, MA, Hassman L, Vitale AT, Conrady CD, Keath P, Mitchell C, Watson L, Planck SR, Martin TM, Choi D (2021). Revising the Diagnosis of Idiopathic Uveitis by Peripheral Blood Transcriptomics. *American Journal of Ophthalmology*, 222, 15-23. [Published].
10. Li Z, Wang Z, Lee MC, Zenkel M, Peh E, Ozaki M, Topouzis F, Nakano S, Chan A, Chen S, Williams SEI, **Orr A**, Nakano M, Kobakhidze N, Zarnowski T, Popa-Cherecheanu A, Mizoguchi T, Manabe SI, Hayashi K, Kazama S, Inoue K, Mori Y, Miyata K, Sugiyama K, Higashide T, Chihara E, Ideta R, Ishiko S, Yoshida A, Tokumo K, Kiuchi Y, Ohashi T, Sakurai T, Sugimoto T, Chuman H, Aihara M, Inatani M, Mori K, Ikeda Y, Ueno M, Gaston D, **Rafuse P**, **Shuba L**, Saunders J, **Nicolela M**, Chichua G, Tabagari S, Founti P, Sim KS, Meah WY, Soo HM, Chen XY, Chatzikyriakidou A, Keskini C, Pappas T, Anastasopoulos E, Lambropoulos A, Panagiotou ES, Mikropoulos DG, Kosior-Jarecka E, Cheong A, Li Y, Lukasik U, Nongpiur ME, Husain R, Perera SA, Álvarez L, García M, González-Iglesias H, Cueto AFV, Cueto LFV, Martínón-Torres F, Salas A, Oguz Ç, Tamcelik N, Atalay E, Batu B, Irkeç M, Aktas D, Kasim B, Astakhov YS, Astakhov SY, Akopov EL, Giessl A, Mardin C, Hellerbrand C, Cooke Bailey JN, Igo RP, Haines JL, Edward DP, Heegaard S, Davila S, Tan P, Kang JH, Pasquale LR, Kruse FE, Reis A, Carmichael TR, Hauser M, Ramsay M, Mossböck G, Yildirim N, Tashiro K, Konstas AGP, Coca-Prados M, Foo JN, Kinoshita S, Sotozono C, Kubota T, Dubina M, Ritch R, Wiggs JL, Pasutto F, Schlötzer-Schrehardt U, Ho YS, Aung T, Tam WL, Khor CC (2021). Association of Rare CYP39A1 Variants With Exfoliation Syndrome Involving the Anterior Chamber of the Eye. *JAMA*, 325(8), 753-764. [Published] PubMed ID: [33620406](#).
11. **Mishra AV**, Whelan A, **Pollmann AS**, Dollin M, **Gupta RR** (2021). Needle-guided intraoperative iridectomy during vitreoretinal surgery. *Journal of VitreoRetinal Disease*. [Published].

12. **Bata BM**, Martin A, Connolly D, Mudhar HS, Hersey N, Salvi SM (2021). Computerized Tomography-Guided Core-Needle Biopsy of Orbital Space-Occupying Lesions: A Case Series. *Ocular oncology and pathology*, 7(1), 54-61. [Published] PubMed ID: [33796518](#).
13. Paco C, Law C, **Mishra A**, Nathoo N, Damji KF (2021). Impact of coronavirus disease 2019 (COVID-19) on the ophthalmology training of Canadian medical students. *Canadian journal of ophthalmology. Journal canadien d'ophtalmologie*. [Published] PubMed ID: [33839067](#).
14. **Pollmann AS, Mishra AV, Francisconi C** (2021). Ultra widefield imaging of peripheral vascular abnormalities in idiopathic macular telangiectasia type 1. *Journal of VitreoRetinal Diseases*. [Published].
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17. West ME, Sharpe GP, **Hutchison DM, Rafuse PE, Shuba LM, Nicoleta MT, Vianna JR, Chauhan BC** (2021). Value of 10-2 Visual Field Testing in Glaucoma Patients with Early 24-2 Visual Field Loss. *Ophthalmology*, 128(4), 545-553. [Published] PubMed ID: [32898515](#).
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19. Zhao LD, Jarrar FS, **Hussain AA**, Hyrcza MD, Harvey JT (2021). Eyelid-Cheek Junction Soft-Tissue Perineurioma: Case Report and Controversies. *Ophthalmic plastic and reconstructive surgery*. [Published] PubMed ID: [33927170](#).
20. Wang H, **Bata B**, Currie Z, Salvi S, Tan J (2021). Systemic acitretin in the management of periocular squamous cell carcinoma. *BMJ case reports*, 14(4). [Published] PubMed ID: [33883116](#).
21. **Bata BM**, Salvi SM, Mudhar HS (2021). Conjunctival Invasive Squamous Carcinoma Arising from a Dysplastic Inverted Papilloma, Both Positive for HPV16. *Canadian journal of ophthalmology. Journal canadien d'ophtalmologie*. [Published] PubMed ID: [33901465](#).
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32. Khan SA, **Hussain A**, Phelps PO (2021). Current clinical diagnosis and management of orbital cellulitis. *Expert Review of Ophthalmology*, 16(5). [Review - Published] DOI: [10.1080/17469899.2021.1941876](https://doi.org/10.1080/17469899.2021.1941876).
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45. Colyn Munn1a, Lyna Kamintsky1a, Yonatan Serlin2, **Aaron Winter3**, **Alan Cruess**, Alon Friedman1, Jaime Levy5, Oren Tomkins-Netzer6,7 (2021). Novel Algorithm for Detecting and Classifying Retinal Microaneurysms. *unknown*. [Published].
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- Iaboni DSM**, **Celo E**, **Vianna J**. Evaluation of meta-analyses in the glaucoma literature. [Rapid Fire Podium] Dalhousie Ophthalmology Research Day (Halifax, NS), April 2021.
- Herman Stubeda, Jack Quach, Jennifer Gao, **Lesya M Shuba**, **Marcelo T Nicolela**, **Balwantray C Chauhan**, **Jayme R Vianna**. The agreement of STATPAC and visualFields statistical packages in visual field analyses. [Podium] 2021 ARVO Annual Meeting. (USA), May 2021.
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- van der Ende S, Meyers BS, Capasso JE, Sa A Syndrome of Hearing Loss and FEVR in a Girl with Biallelic FZD4 variants songko M, Yonekawa Y, Pihlblad M, Huey J, Bedoukian EC, Krantz ID, Ngo NH, McMaster C, Levin AV, **Robitaille JM**. Syndrome of Hearing Loss and FEVR in a Girl with Biallelic FZD4 variants. [Podium] International Society for Genetic Eye Diseases and Retinoblastoma (Lausanne, Switzerland and virtual), September 2021.
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6. van der Ende SR, Ngo MH, Brodovsky M, Nightingale M, Gaston D, Melanson J, Muni RH, Kosar SE, Lyons C, Laliberté I, Bourgault S, **Robitaille JM**, McMaster CR. Determining the role of Frizzled pathway candidate genes in causing the rare inherited blinding disorder FEVR. [Poster] American Society of Human Genetics (Virtual due to COVID), October 2021.
7. Pinto A, Iaboni D, **Maxner C**, **Hussain A**. Visual snow unveiled after cataract surgery. [Poster] Canadian Ophthalmology Society Annual Meeting (Halifax, NS (Virtual)), June 2021.

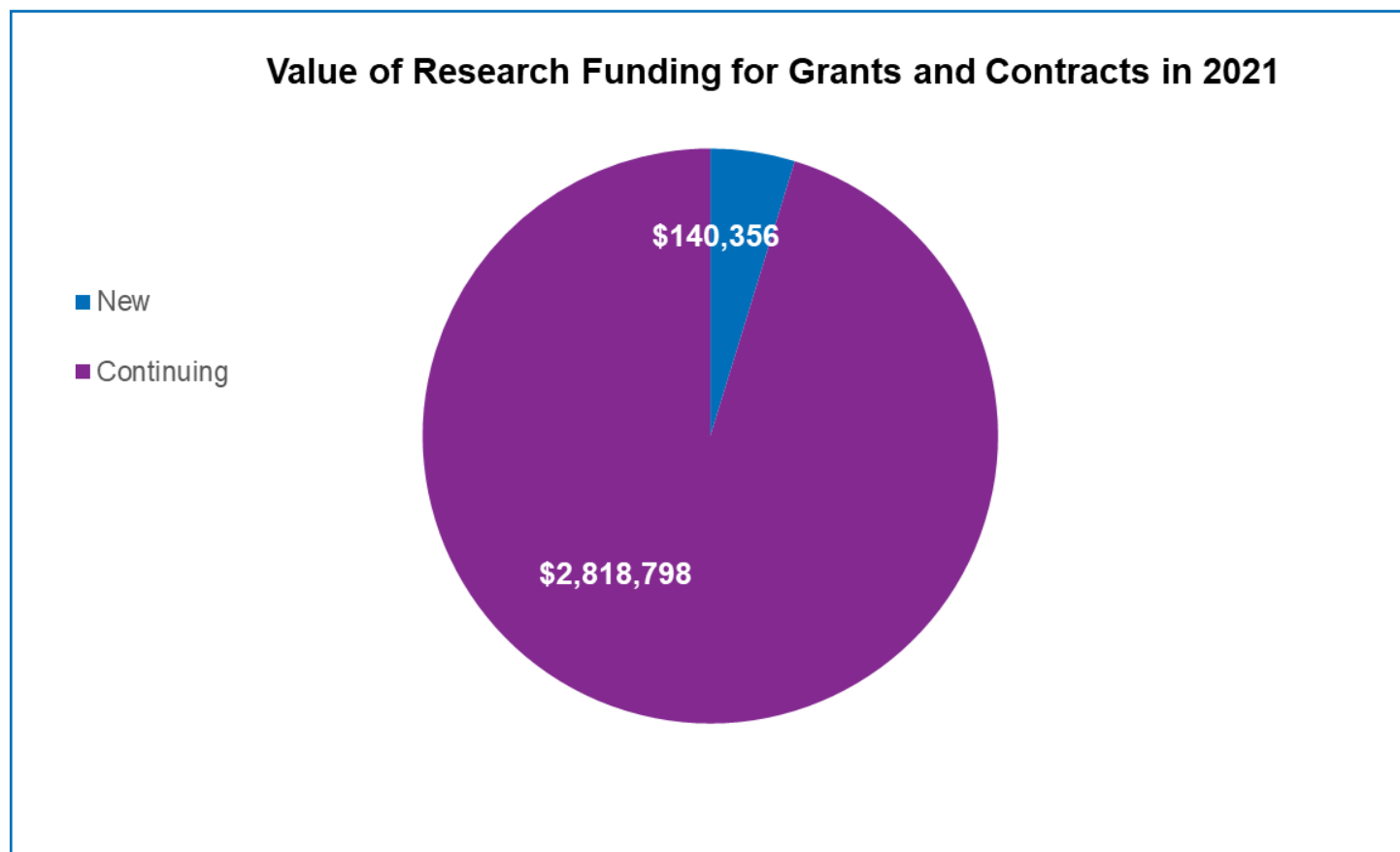
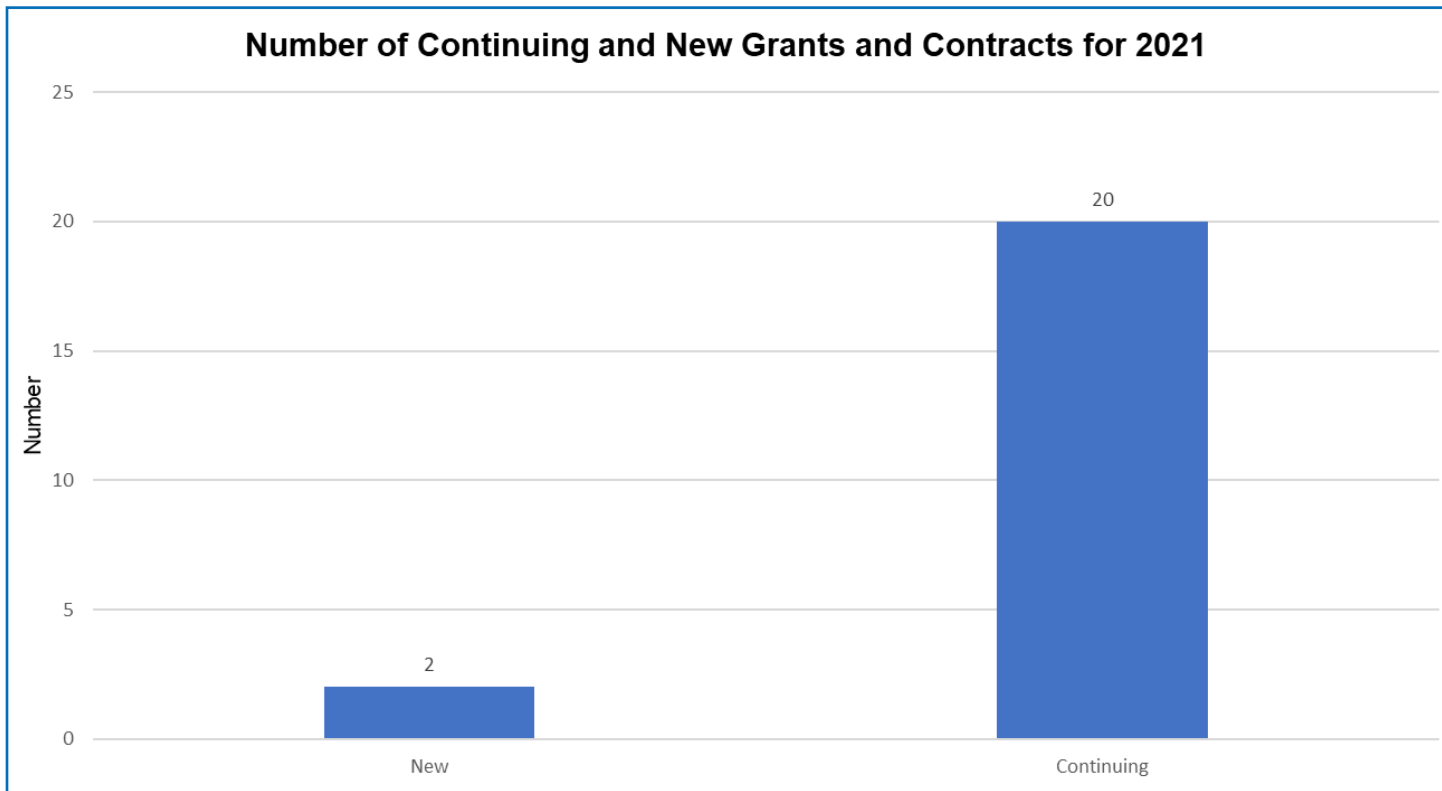
Books and Chapters

1. **Eadie BD**, Kwon YH, **Shuba LM** (2021). Glaucoma Visual Function Assessment [Book Chapter]. In: Yang Sun (Ed), *Albert and Jakobiec's Principles and Practice of Ophthalmology* (pp. Chapter 196). Springer: Baltimore, Maryland.
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Other Publications

1. **Prabhu N**, **Iaboni DSM**, **Gupta RR** (2021) *Pie in the Eye* - Canadian Retina Society [Online Resource]

Research Funding Facts & Figures



New Research Grants and Contracts

1. Kim Y-W, Sharpe GP, **Chauhan BC** (2021 - 2022). Impact of glaucoma severity on progression rates of peripapillary retinal nerve fiber layer, neuroretinal rim and macular ganglion cell layer thickness [Grant] - Glaucoma Research Society of Canada - \$19,300.
2. **Agosto MA** (2021 - 2024). New Faculty Startup Funds [Grant] - Dalhousie - \$300,000.

Continuing Research Grants and Contracts

1. **Vianna JR** (2020 - 2021). Glaucoma impairment on saccades performed during eye movement perimetry [Grant] - Dalhousie Medical Research Foundation / Department of Ophthalmology & Visual Sciences New Faculty Research Grant - \$27,106.
2. **Cadieux DC, Lewis DR** (2020 - 2021). Deep Anterior Lamellar Keratoplasty (DALK) using small and big-bubble techniques [Grant] - Department of Ophthalmology & Visual Sciences - \$750.
3. **Cadieux DC, Hussain A** (2020 - 2021). A cyst not to miss: giant reservoir formation following glaucoma filtration surgery [Grant] - Department of Ophthalmology & Visual Sciences - \$750.
4. **Vianna JR, Nicolela MT** (2020 - 2021). Canadian Pseudoexfoliation Glaucoma Study: Comparison of Phacoemulsification versus Selective Laser Trabeculoplasty as Initial Treatment for Pseudoexfoliation Glaucoma [Grant] - Canadian Glaucoma Society - \$10,000.
5. **Nicolela MT, Shuba LM, Eadie BD** (2019 - 2022). An Extension Trial to Evaluate the Long-term Safety and Efficacy of Bimatoprost SR in Patients with Open Angle Glaucoma or Ocular Hypertension [Industry Contract] - Allergan Inc. - \$100,000 (USD).
6. **Dickinson J, Cruess A, Gupta RR** (2019 - 2023). A Phase III, Multicenter, Randomized, Double-Masked, Active Comparator-Controlled Study to Evaluate the Efficacy and Safety of Faricimab in Patients with Diabetic Macular Edema (RHINE) [Industry Contract] - F. Hoffman-La Roche - \$480,083.
7. McMaster CM (PI), **Robitaille J** (applicant), Industry Partner: AGADA Biosciences (2019 - 2022). Mitacs Accelerate Grant: Scientific and Clinical Hub for Orphan Drug Development [Industry Contract] - MITACS - \$333,333.
8. **Chauhan BC** (2018 - 2023). Novel imaging targets for detecting early progression of glaucoma [Grant] - CIHR - \$730,576.
9. **Chauhan BC** (2018 - 2023). Optic nerve changes in glaucoma (unrestricted funding) [Grant] - Heidelberg Engineering - \$650,000.
10. **Baldrige WH** (2017 - 2022). Modulation of horizontal cells in the vertebrate retina [Grant] - NSERC - \$130,000.
11. **Chauhan BC** (2017 - 2022). Calcium dynamics in retinal ganglion cells [Grant] - National Science and Engineering Council - \$140,000.
12. **Cruess A, Dickinson J, Gupta RR** (2016 - 2021). Peripheral Diabetic Retinopathy (DR) Lesions on Ultrawide-field Fundus Images and Risk of DR Worsening Over Time [Industry Contract] - Jaeb Center for Health - \$124,700.
13. **Chauhan BC** (PI), **Tremblay F** (Coll) (2016 - 2021). Structural and functional changes in the retina and optic nerve in experimental glaucoma [Grant] - CIHR - \$672,760.
14. McMaster C, **Robitaille JM** (2016 - 2023). A Treatment for the Inherited Childhood Blinding Disorder Familial Exudative Vitreoretinopathy [Grant] - CIHR - \$750,000.
15. McMaster C, **Robitaille JM**, Berman J, Hoffman E, Kanneboyina Nagaraju (AGADA Biosciences Inc), Dalhousie University Industry Liaison and Innovation, the Centre for Drug Research and Development and AGADA Biosciences Inc (2016 - 2021). A Scientific and Clinical Hub for Orphan Drug Development [Grant] - Atlantic Innovation Fund - \$4,505,000.] - NSHARF - \$17,955.

16. **Pollmann AS, Lewis DR, Seamone SE, Gupta RR** (2019 - 2021). Structural integrity of hydrophobic acrylic intraocular lens with eyelets (enVista) in an experimental model of transscleral fixation [Grant] - Dalhousie - \$2,489.
17. **Chauhan BC** (2018-2023). Optic nerve changes in glaucoma (unrestricted funding) [Grant] - Heidelberg Engineering - \$650,000.
18. 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.
19. Van der Ende S (Applicant), **Robitaille J** and McMaster C (Co-supervisors) (2020 - 2021). Dr. R. Evatt And Rita Mathers Trainee Awards in Ophthalmology and Visual Sciences: PhD Vision Science Scholarship. Determining the role of Frizzled pathway candidates in causing the rare inherited childhood blinding disease FEVR [Grant] - Dalhousie - \$25,000.
20. **Vianna JR, Nicolela MT** (2020 - 2021). Canadian Pseudoexfoliation Glaucoma Study: Comparison of Phacoemulsification versus Selective Laser Trabeculoplasty as Initial Treatment for Pseudoexfoliation Glaucoma [Grant] - Glaucoma Research Society of Canada - \$20,000.



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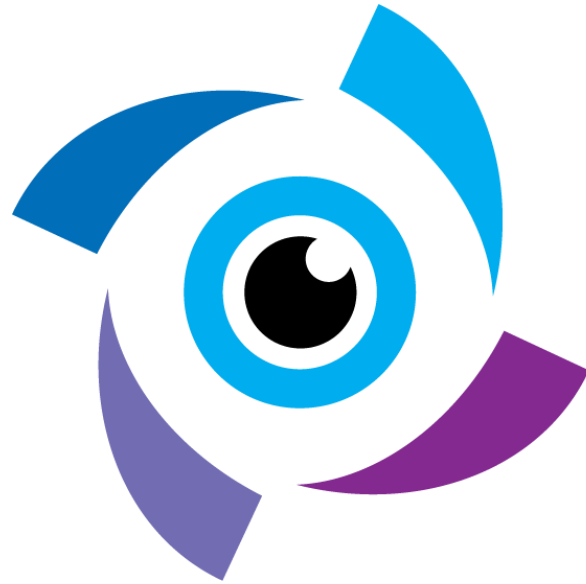
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