# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

# MONDAY, JANUARY 9

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| 8:00-9:00 | **INTRODUCTION**<br>  <br>Ronald Silverman, PhD<br>Columbia University, New York, USA<br>Professor of Ophthalmic Sciences<br>Director, BSCO<br><br>Dr. Silverman has directed the BSCO since 2012 and is pleased to welcome you to BSCO 2023. This introduction will serve to give an overview of the course and, for visitors to New York City, an orientation of the neighborhood and the city. |
| 9:00-11:00 | **Surgical Anatomy of the Globe**<br>  <br>Hermann Schubert, MD<br>Columbia University, New York, USA<br>Professor of Clinical Ophthalmology and Pathology<br>Director of Ophthalmic Pathology, New York-Presbyterian Hospital<br><br>Dr. Schubert is an attending physician at NewYork-Presbyterian Hospital, specializing in ophthalmic pathology, diabetic eye disease, retinal disease, and AMD. Dr. Schubert is director of the Ocular Anatomy Section for the Lancaster Course in Ophthalmology. He is the author, co-author and editor of over 50 publications, 15 books chapters and one book. He is a co-editor of Survey of Ophthalmology and has been a writing committee member and Retina and Vitreous section chair of the American Academy of Ophthalmology for seven years. |
| 11:00-12:00 | **Retinal Ganglion Cell Development**<br>  <br>Carol Mason, PhD<br>Columbia University, New York, USA<br>Professor of Ophthalmic Sciences and Neuroscience<br>Member, Mortimer B. Zuckerman Mind Brain Behavior Institute<br>Chair of Interschool Planning<br>Co-Director, Doctoral Program in Neurobiology & Behavior<br><br>Dr. Mason is a member of the National Academy of Sciences (USA) and one of the leading experts in neural development. Dr. Mason's research focuses on the development of the projection from the eye to the brain. She aims to identify molecular regulators of axon-targeting and retinal ganglion cell axon arbor morphogenesis, and to analyze the interplay of molecular factors and neural activity in the targeting and refinement of eye-specific projections. |
| 12:00 – 1:00 | **LUNCH** |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

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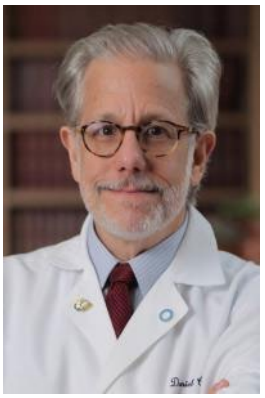
| 1:00-2:00 | **Epidemiology of Eye Diseases**<br>Louis Pizzarello, MD, MPH<br>Columbia University, New York, USA<br>Clinical Professor in Ophthalmology & Health Management<br><br>  <br>Dr. Pizzarello is a recognized expert in the fields of public health and ophthalmology. He has worked in blindness prevention programs in 40 countries. His particular interest has been in cataract programs, nutritional and childhood blindness, and the prevention of eye injuries. He has authored numerous scientific papers in the field and has served on a number of advisory boards and committees. He has received the Honor Award of the American Academy of Ophthalmology and the Spirit of Helen Keller Award from Helen Keller Worldwide. Dr. Pizzarello is the chairman for the North American region of the International Agency for the Prevention of Blindness (IAPB). |
| 2:00-3:00 | **Glaucoma: Deriving Molecular insights and therapeutic strategies from genomic research**<br>Simon John, PhD<br>Columbia University Dept of Ophthalmology<br><br>Robert L. Burch III Professor of Ophthalmic Sciences (in Ophthalmology)<br><br>  <br>Dr. John graduated with high honors in Zoology and Genetics, from University College Cardiff, Wales. He earned his Ph.D. in Biology and Human Genetics at McGill University, Montreal, Canada.<br>Dr. John's first independent position was as Assistant Professor at The Jackson Laboratory, Bar Harbor, Maine. At this time, Dr. John switched his attention to ocular diseases and glaucoma. Dr. John pioneered the use of mice for glaucoma research - including adapting tools from the human clinic to mice and the development of novel tools and models. He made rapid progress, providing a wealth of new mechanistic information. |
| 3:00-4:00 | **Orbital Anatomy**<br>Daniel Casper, MD, PhD<br>Columbia University, New York, USA<br>Naomi Berrie Diabetes Center<br>Professor of Ophthalmology at CUMC<br><br>  <br>Special interests in comprehensive ophthalmology, ophthalmic imaging and medical informatics and retinopathy prevention and screening. Dr. Casper is also a specialist in medical and scientific art, and is senior author and illustrator of the text "Orbital Disease: Imaging and Analysis". He received his MD degree from Albany Medical College and his PhD in Anatomy from Tufts University, and completed a research fellowship in experimental retinal pathology at Harvard Medical School. He did his ophthalmology training at the ES Harkness Eye Institute at Columbia |

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| | University Medical Center, including a fellowship in Orbital and Oculoplastic Surgery. He is currently Director of Ophthalmology at the Naomi Berrie Diabetes Center at CUMC. |
| 4:00-5:00 | **Retinal Pigment Epithelial Cell and Fundus Autofluorescence**<br>Janet Sparrow, PhD<br>Columbia University, New York, USA<br>Professor of Ophthalmic Sciences<br>  <br>Dr. Sparrow's laboratory research is directed toward understanding the composition of RPE lipofuscin in retinal degenerative disorders, the properties of the constituents of this material, mechanisms by which they form and the adverse effects of these compounds on retina. Dr. Sparrow's laboratory has shown that the adverse effects of RPE lipofuscin pigments are attributable, at least in part, to their detergent-like structure and their photo-sensitive properties. Therapeutic strategies her laboratory investigates to target bisretinoids include antioxidants, inhibitors of complement activation, small molecules that inhibit their formation and gene-based therapy. |
| 5:30 - 7:30 | **MIXER – Faculty Club P&S 4th floor** |

# TUESDAY, JANUARY 10

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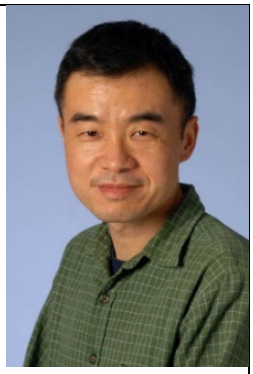
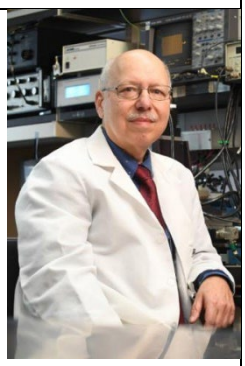
| 9:00-10:00 | **Molecular Regulation of Eye Development**<br>Xin Zhang, PhD<br>Columbia University, New York, USA<br>Herbert and Florence Irving Professor of Ophthalmic Science (in Ophthalmology and in Pathology and Cell Biology)<br><br>  <br>Dr. Zhang holds an undergraduate degree in Physics from Beijing University and a Ph.D. from Johns Hopkins University. The main focus of Dr. Zhang's research is mechanisms of cell signaling during eye development. Using genetic approaches, he dissects signaling pathways that are not only essential for embryonic development but are also functionally important. His long-term goal is to combine mouse genetics with biochemical approaches to determine how intracellular signaling is received and interpreted in eye development and homeostasis. |
| 10:00-1:00 | **Pediatric Cataracts & Glaucoma**<br>Steven Kane, MD<br>Columbia University, New York, USA<br>Associate Clinical Professor of Ophthalmology<br>Co-Director, Pediatric Glaucoma Clinic<br><br>  <br>Dr. Steven Kane attended Miami University where he received undergraduate and graduate school degrees in physics. He then attended the Medical Scientist Training Program at Washington University in St. Louis where he received doctoral degrees in Medicine and in Neural Sciences. Following training as a Heed Fellow in pediatric and neuro-ophthalmology, Dr. Kane joined the faculties of the Edward S. Harkness Eye Institute and the Columbia University College of Physicians and Surgeons in 1995. He then pursued additional training in pediatric glaucoma at the Massachusetts Eye and Ear Infirmary in Boston. Dr. Kane's clinical practice emphasizes pediatric neuro-ophthalmology, the diagnosis of genetic and metabolic diseases, and the care of children with pediatric glaucoma and cataract. His research interests include retinopathy of prematurity, mitochondrial disorders, and pediatric glaucoma. |
| 1:00-2:00 | **LUNCH** |
| 2:00-3:00 | **Ultrasound Imaging of the Eye**<br>Ronald Silverman, PhD<br>Professor of Ophthalmic Science<br>Columbia University Medical Center<br><br>  <br>Dr. Silverman has been involved in ultrasound research in ophthalmology for over 30 years. His research includes development of high-resolution imaging systems, studies of ultrasound safety and bioeffects, high-intensity ultrasound, blood-flow imaging, photoacoustics, and tissue characterization by use of signal- |

processing. He applies these techniques for studies of ocular disease in animal models and for clinical examinations.

Dr. Silverman is currently Principal Investigator on an NIH-sponsored project whose goal is development of a novel ultrasonic imaging technique, ultrafast plane-wave imaging, which enables acquisition of up to 10,000 images per second. Computer-analysis of the data allows visualization and measurement of blood-flow throughout the eye and orbit.

Dr. Silverman is a Fellow of the Association for Research in Vision and Ophthalmology (FARVO), the American Institute of Ultrasound in Medicine (FAIUM), the American Institute of Medical and Biological Engineers (FAIMBE) and is a Senior Member of the IEEE.

3:00-4:00

## Color Vision Deficiencies, Classification Schemes and Color Vision Tests

Vivienne C. Greenstein, PhD
Columbia University, New York, USA
Special Research Scientist in the Department of Ophthalmology

The long-term objectives of Dr. Greenstein's research are to understand the mechanisms involved in diseases affecting the retina and optic nerve and to improve methods for detecting retinal and optic nerve damage caused by these diseases. A variety of structural and functional measures (e.g. visual fields, microperimetry, color vision, multifocal ERG and VEP) are used to test specific hypotheses about the sites and mechanisms of diseases affecting the retina and optic nerve. Dr. Greenstein is currently examining the relationship between local measures of visual function and underlying retinal structure in patients with Stargardt disease and retinitis pigmentosa.

4:00-5:00

## ERG

Scott E. Brodie, MD, PhD
Columbia University, New York, USA
Instructor in Clinical Ophthalmology (part time) and Attending Ophthalmologist
Department of Ophthalmology

Dr. Scott Brodie specializes in Medical Retina and Clinical Electrophysiology. With expansive backgrounds in mathematics, biophysics, and genetics, he brings a unique perspective to the study of inherited, metabolic, and degenerative diseases of the retina in his clinical practice and research.

Dr. Brodie received his Ph.D. in biophysics from The Rockefeller University and his M.D. from Cornell University Medical College. After his residency at The New York Hospital, he received his fellowship in medical retina at New York University Medical Center where he held the John Kluge Fellowship from the National

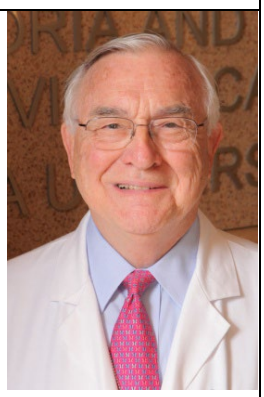
Retinitis Pigmentosa Foundation. Dr. Brodie is a Diplomate of the American Board of Ophthalmology.

Brodie's research centers on improving methodologies for electrophysiologic testing and inherited and metabolic retinal disorders.

Dr. Brodie has published extensively on electrophysiology and retinal disorders. He has a particular interest in clinical optics and has served as Chair of the Editorial committee for the American Academy of Ophthalmology's Basic and Clinical Science Course on Clinical Optics for the past eight years.

5:00-5:30

## Accommodation



D. Jackson Coleman, MD
Columbia University, New York, USA
Professor of Ophthalmology

D. Jackson Coleman, M.D., F.A.C.S., F.A.R.V.O is an internationally renowned vitreoretinal surgeon and researcher. His clinical interests include disorders of the retina and ophthalmic ultrasound.

After completing his residency at the Edward S. Harkness Eye Institute, Dr. Coleman remained on staff at Columbia until 1979, when he was appointed Chairman of the Ophthalmology Department at The New York Hospital and John Milton McLean Professor of Ophthalmology at Cornell University Medical College.

Dr. Coleman's strong interest in physics led him to the forefront of developing new ultrasound technologies to examine and treat the eye. Together with Frederic L. Lizzi, EngScD, he created the first commercially available B-scan ultrasound equipment for the eye. His numerous patents include those for an ultrasonically vibrated surgical knife and ultrasonic diagnostic and therapeutic transducer assembly and method of use, a system of therapeutic ultrasound and real-time ultrasonic scanning, and an ultrasound system for corneal biometry.

Dr. Coleman has authored over 200 peer-reviewed papers and numerous chapters in ophthalmology textbooks and has recently published the second edition of his seminal text, Ultrasonography of the Eye and Orbit. He specialized in vitreoretinal surgery and has had a career long interest in imaging research.

For his research he has received many prestigious awards including the Mildred Weisenfeld Award for Excellence in Ophthalmology from the Association for Research in Vision and Ophthalmology, the Herman Wacker Award of Club Jules Gonin, the Award of Merit in Retinal Research from the Retina Society and an honorary degree from the University of Ferrara in Ferrara, Italy. Additionally, Dr. Coleman was the 2001 recipient of the Greenberg Award of NewYork-Presbyterian Hospital-Weill Medical College of Cornell University.

# WEDNESDAY, JANUARY 11

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| 8:00-9:00 | **Basics of Cornea and Anterior Segment Imaging**<br>Leejee Suh, MD<br>Miranda Wong Tang Associate Professor of Ophthalmology at the Columbia University Medical Center<br><br>  <br><br>Leejee H. Suh, M.D. is the Director of the Cornea Service at Columbia University's Edward S. Harkness Eye Institute. She also heads the Cornea Fellowship Program and the Laser Vision Center. Her surgical specialties include femtosecond laser-assisted cataract surgery, phacoemulsification cataract surgery, LASIK (Laser Assisted In-Situ Keratomileusis), PRK (Photorefractive Keratectomy), PTK (Phototherapeutic Keratectomy), and full and partialcorneal transplantation.<br><br>She received her undergraduate degree from the Massachusetts Institute of Technology (M.I.T.) and her medical degree from the New York University (N.Y.U.) School of Medicine. She completed her ophthalmology residency at the Wilmer Eye Institute at the Johns Hopkins Medical Center and received her fellowship training at the Bascom Palmer Eye Institute at the University of Miami Hospitals, where she was a faculty member in the Division of Cornea and Refractive Surgery.<br><br>She has authored numerous peer-reviewed articles and book chapters on corneal conditions and is active in clinical research. Her clinical research interests are in keratoconus research and treatments, namely Corneal Collagen Crosslinking. She was instrumental in the early studies of Descemet's Stripping Automated Endothelial Keratoplasty (DSAEK) and Descemet's Membrane Endothelial Keratoplasty (DMEK), both of which have dramatically changed the face of surgical treatments for corneal diseases. |
| 9:00-10:00 | **Genome Engineering based therapeutics in Ophthamology**<br>Peter Quinn, PhD<br>Associate Research Scientist in the Department of Ophthalmology<br><br>  <br><br>Dr.Quinn received a Bachelor Degree in Biology from the University of Manchester and a Master's Degree in Molecular Medicine and Cancer Research at Brunel University. He received his PhD from the Faculty of Medicine at Leiden University. And completed a Postdoctoral Fellowship with Stephen Tsang at the Edward S. Harkness Eye Institute, Columbia University. |

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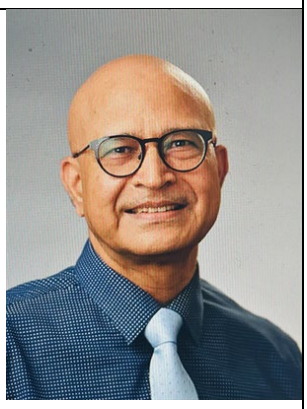
| | His research is focused on iPSC-derived retinal organoid-based approaches for the understanding and treatment of retinal degenerative diseases. He is currently developing gene augmentation and prime editing therapeutics for the amelioration of the phenotypic, histopathological, and molecular changes in inherited retinal disease (IRD) iPSC-derived retinal organoid models. |
| 10:00-11:00 | **How to approach a patient with rhegmatogenous retinal detachment and how to manage it**<br>Tarun Sharma, MD<br>Assistant Professor of Ophthalmology at CUMC<br>  <br>Dr. Sharma is a retina specialist and an expert in treating medical and surgical vitreoretinal diseases. In addition to providing clinical care, Dr. Sharma continues to pursue his research investigations in treating inherited retinal diseases, diabetic retinopathy, and age-related macular degeneration and collaborates closely with many of our clinician-scientists in the Department.<br><br>Prior to joining Columbia. Dr. Sharma was on faculty for over three decades at the Tamilnadu Dr. MGR Medical University in India, where he was a leading expert in medical and surgical vitreoretinal diseases. During his tenure, Dr. Sharma served as the Professor of ophthalmology, Director of Vitreoretinal Services, and the Program Director of the retina fellowship at the tertiary eye care institute – Sankara Nethralaya, Chennai, India. Dr. Sharma was also an accomplished researcher and was the principal investigator of several clinical and epidemiological studies. |
| 11:00-12:00 | **Keeping the Head Down, or Not?**<br>Jason Horowitz, MD<br>Columbia University, New York, USA<br>Associate Professor of Ophthalmology<br>  <br>Dr. Horowitz is currently Medical Director of the Residents' Eye Clinic at the Edward S. Harkness Eye Institute. Dr. Horowitz has assumed the role of performing essential evaluations for retinopathy of prematurity in the infant patients of the world famous neonatal intensive care unit at Columbia's Morgan Stanley Children's Hospital of New York. In yet another realm, Dr. Horowitz manages complex retinal and macular disorders in adults. |
| 12:00-1:00 | **Lunch** |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

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| 1:00-2:00 | **Stargardt**<br>Rando Allikmets, PhD<br>Columbia University, New York, USA<br>Professor of Ophthalmic Sciences<br>Director of Research, Edward S. Harkness Eye Institute<br><br>  <br><br>Dr. Allikmets heads the Laboratory of Molecular Genetics, which implements a three-step translational, "from bench to bedside", program consisting of discovering the genetic causes of retinal diseases, developing advanced methods for molecular diagnostics, and finding efficient treatment options for precisely diagnosed patients. Some genes/loci discovered in the laboratory include the gene responsible for Stargardt disease and cone-rod dystrophy, ABCA4 (ABCR), and susceptibility loci for age-related macular degeneration containing genes involved in complement response, factor H (CFH), factor B (CFB), and complement component 2 (C2). Diagnostic screening technologies developed in the laboratory include microarray-based "gene chips" and "disease chips", and next-generation sequencing based gene and disease panels, where all variants from all genes responsible for all known retinal diseases are screened in one step. Therapeutic approaches include lentiviral gene therapy for Stargardt macular dystrophy and other retinal diseases and modulating the visual cycle by small molecule compounds. |
| 2:00-4:00 | **Interpretation of Visual Fields**<br><br>**Functional Neuro-Ophthalmology**<br><br>Jonathan D. Trobe, MD<br>Professor, Ophthalmology and Visual Sciences<br>Professor, Department of Neurology<br>Section Leader, Neuro-ophthalmology<br>Kellogg Eye Center, University of Michigan<br><br>  <br><br>Dr. Trobe was trained at the Wills Eye Hospital/Jefferson Medical College in Philadelphia. and completed a fellowship in neuro-ophthalmology at the University of Miami. He accepted a faculty position in that specialty at the University of Florida (in Gainesville)., but then entered a residency program in neurology at the University of Miami (Florida) and subsequenty came to the University of Michigan.<br><br>He was appointed editor of the Journal of Neuro-Ophthalmology, the leading journal in the field, serving until 2009. He has written and taught widely around the world and authored nearly 200 peer-reviewed scholarly articles. He authored of a 2-day case-based interactive course in neuro-ophthalmology that has been conducted in many teaching ophthalmology programs. It was later certified as an official course offering of the European Neuro-Ophthalmology Society (EUNOS). |

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| 4:00-5:00 | **Care for individuals with retinal degeneration**<br>  <br>Stephen Tsang, MD, PhD<br>Columbia University, New York, USA<br>Professor of Ophthalmology<br>Department of Ophthalmology,<br>Department of Pathology & Cell Biology<br><br>Dr. Tsang is one of the leading experts in genetics of retinal degenerative disorders. He leads the Genome Engineering Laboratory, which is engaged in tackling neurodegenerative disorders by probing the role of phosphodiesterase (PDE) signaling in neurodegeneration, developing stem cell-based therapies for photoreceptor degeneration, and correlating the genotypes of various human retinal degenerations with the phenotypes revealed in live metabolic imaging. Dr. Tsang is also currently focused on genome engineering/CRISRP approaches to reprogamming metabolome in photoreceptor to promote cell survival, which may be broadly applicable to retinal degenerative diseases, regardless of the mutation. To translate this metabolomic therapy to humans, Dr. Tsang's laboratory is developing "genetic sunglasses" to promote a constant dark-adapted metabolic state in photoreceptor neurons while maintaining a normal light-dark circadian environment. |

# THURSDAY, JANUARY 12

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| 9:00-10:00 | **Update on Diabetic Retinopathy Treatment**<br>Srilaxmi Bearelly, MD<br>Columbia University, New York, USA<br>Associate Professor of Ophthalmology<br><br>  <br><br>Dr. Srilaxmi Bearelly specializes in macular degeneration, diabetic retinopathy, retinal vascular occlusions, choroidal neovascularization and macular disorders. Her research interests include retinal imaging of age-related macular degeneration and diabetic retinopathy.<br>Dr. Bearelly graduated from Northwestern University with a B.A. in Biology, received her M.D. from Northwestern University Medical School, as well as a Masters of Health Sciences from Duke University School of Medicine. Following her ophthalmology training at Northwestern University, she completed her fellowship training in diseases of the retina and vitreous at Duke University Eye Center. |
| 10:00 – 11:00 | **Using OCT to Improve the Outcomes of Macular Surgery**<br>Stanley Chang, MD<br>K. Tse and Ku Teh Ying Professor of Ophthalmology<br>CUIMC<br><br>  <br><br>Stanley Chang, M.D., is the former Edward S. Harkness Professor and Chairman of the Department of Ophthalmology at Columbia University Medical Center. He is also the K.K. Tse and Ku Teh Ying Professor of Ophthalmology. He is a specialist in vitreoretinal disorders and surgery and pioneered many of the surgical techniques currently used in this field.<br><br>Dr. Chang received a baccalaureate degree from the Massachusetts Institute of Technology, a Masters degree from the University of Pennsylvania, and completed his medical education at the College of Physicians & Surgeons of Columbia University. After fellowship, Dr. Chang joined the faculty of Department of Ophthalmology at Cornell University Medical School, where he became Professor of Ophthalmology. Appointed the Edward S. Harkness Professor and Chairman of the Department of Ophthalmology in 1995, he served as director of the Edward S. Harkness Eye Institute until 2012.<br><br>Dr. Chang has developed and pioneered several revolutionary surgical approaches to treat complicated forms of retinal detachment, improving outcomes for patients worldwide. He was the first to use perfluoropropane gas in the management of retinal detachments. He developed perfluorocarbon liquids and the related surgical techniques for vitreoretinal surgery. In collaboration with Avi Grinblat, he developed a panoramic viewing system and led in the worldwide adaptation by retina surgeons to this technique.<br><br>He is the recipient of several honors including the Hermann Wacker Prize from the Club Jules Gonin, Helmerich Prize from the American Society of Retinal Specialists, the Lifetime Achievement Award and the Secretariat Award from the American Academy of Ophthalmology, the Jackson Lecture and the Alcon Research Institute Award. |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

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| 11:00-12:00 | **Eyelid tumors, reconstruction and malpositions**<br>Lora Dagi-Glass, MD<br>Associate Professor of Ophthalmology, CUMC<br><br>BS: Harvard College<br>MD, Mount Sinai School of Medicine<br>Internship: Memorial Sloan-Kettering Cancer Center<br>Residency: NewYork-Presbyterian Hospital/Columbia University Medical Center<br>Fellowship: Massachusetts Eye and Ear Infirmary Harvard<br><br>Dr. Glass specializes in disorders of the eyelids, eyebrows, tear production and drainage systems, and orbital tissues surrounding the eyes in both children and adults.<br><br>Dr. Glass is an active contributor to the field of ophthalmic plastic and reconstructive surgery. She has written over 80 articles and chapters, and frequently presents at scientific and professional conferences both nationally and abroad.  |
| 12:00-1:00 | **LUNCH** |
| 1:00-2:00 | **Facial rejuvenation, botulinum & fillers**<br>Lora Dagi-Glass, MD<br>Associate Professor of Ophthalmology, CUMC  |
| 2:00-3:00 | **Common congenital anomolies of the eye**<br>Irene Maumenee, MD<br>Professor of Ophthalmology at CUIMC<br>Director of Ophthalmic Genetics  <br>MD: University of Göttingen, Medical School<br>Continued postdoctoral training in medicine, medical genetics and ophthalmology at the University of Geneva, the University of Hawaii and the Wilmer Eye Institute at Johns Hopkins University. While on the Wilmer faculty, she founded and directed the Johns Hopkins Center for Hereditary Eye Diseases. She is the co-founder of the International Society for Genetic Eye Diseases.<br>Her clinical and research interests are the classification and management of hereditary ocular diseases, population genetics and molecular genetics. Dr. Maumenee has published more than 300 journal articles. She is the recipient of awards from the National Marfan Foundation, Women in Ophthalmology, the International Society for Genetic Eye Diseases & Retinoblastoma and in 2017 the lifetime achievement award from the American Academy of Ophthalmology. |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

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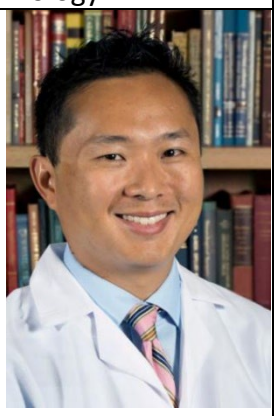
| 3:00-4:00 | **Genetic testing in ophthalmology**<br>Megan Soucy, MS<br>Lecturer in Genetic Counseling (in Pathology and Cell Biology and in Ophthalmology) at CUMC<br><br>  <br>Megan completed her genetic counseling graduate education at Sarah Lawrence College. She is an ABGC board-certified genetic counselor and part of the Interdepartmental Genetic Counseling Program at Columbia, bridging the Ophthalmology Department and the Precision Genomics Laboratory. She is the genetic counselor for Applied Genetics at Columbia Ophthalmology. |
| 4:00-5:00 | **Multimodal imaging in uveitis**<br>Royce W.S. Chen, MD<br>Associate Professor of Ophthalmology at Columbia University Medical Center<br><br>  <br>Royce Chen, MD, is an Associate Professor of Ophthalmology and Residency Program Director at Columbia University Medical Center and an Attending Ophthalmologist at the New York-Presbyterian Hospital who specializes in surgical and medical management of vitreoretinal disease and uveitis. Dr. Chen also serves as the Associate Residency Program Director for the Department of Ophthalmology at Columbia.<br><br>Dr. Chen received his M.D. from Tufts University School of Medicine. He then performed his ophthalmology residency at Columbia University, where he served as Chief Resident. This was followed by a 2-year vitreoretinal surgical fellowship at the Bascom Palmer Eye Institute at the University of Miami, where he served as a Clinical Instructor in Ophthalmology.<br><br>Dr. Chen has a wide range of research interests, ranging from retinal imaging, to artificial intelligence, to innovation in clinical and surgical education. In addition to his roles at Columbia, Dr. Chen also serves on the Board of Trustees and as Vice President of Trainee Mentorship for the Vit Buckle Society and as Planning Group Member for the National Eye Institute Health Education Program. |

# FRIDAY, JANUARY 13

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| 9:00-12:00 | **Functional Anatomy of the Extraocular Muscle Apparatus Orbital Connective Tissues in Diagnosis and Treatment of Strabismus**<br>  <br>Joseph Demer, MD, PhD<br>Professor, Ophthalmology<br>Professor, Neurology<br>Director, Ocular Motility Laboratory<br>Jules Stein Eye Institute, UCLA<br><br>MD, Ph.D., Biomedical Engineering, Johns Hopkins University School of Medicine, 1983<br>Residency, Baylor College of Medicine, 1984-87<br>Fellowship, Texas Children's Hospital, 1987-88<br><br>Joseph L. Demer, MD, PhD, is the Arthur L. Rosenbaum Professor of Pediatric Ophthalmology, Professor of Neurology, Chief, Pediatric Ophthalmology & Strabismus Division, Director, Fellowship in Pediatric Ophthalmology & Strabismus, Director, Ocular Motility Laboratories, Chair, EyeSTAR Residency-PhD/PostDoc Program in Ophthalmology and Visual Science.<br><br>He has 300 pubications and has received many awards and honors, including the ARVO Friedenwald Award, and has been principal investigator on National Eye Institute research grants without interruption for the past 25 years. His scientific contributions range from pivotal studies on vestibulo-ocular interaction, optokinetic nystagmus, and visual adaptation to spectacle magnifiers in patients with low vision. His most recent studies of orbital mechanics with magnetic resonance imaging, especially his discovery, in collaboration with Dr. Joel Miller, of muscle pulleys for the rectus muscles and their possible functional significance in normal persons and in patients with strabismus, have received world-wide attention from his peers. |
| 12:00-1:00 | **Lunch** |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

1:00-3:00

## Infantile onset dystrophies

## Congenital abnormalities of retina and RPE

## Pediatric retinovascular disorders

Anthony Moore, MD, MA FRCS FRCOphth FMedSci

Professor Emeritus, Ophthalmology
University of California San Francisco

Dr. Anthony Moore specializes in pediatric ophthalmology as well as strabismus and inherited eye diseases, particularly those affecting the retina, in adults.

Moore served as the Duke-Elder Chair of Ophthalmology at the UCL Institute of Ophthalmology in London. He was also head of the inherited eye disease service, as well as director of the pediatric ophthalmology service, at Moorfields Eye Hospital in London.

Moore's research work focuses on identifying the genetic changes underlying inherited retinal disease, particularly those affecting children, and in investigating how these changes affect the structure and function of the retina. He is also involved with clinical trials of new therapies for inherited retinal disease. The long-term aim of this research is to develop new therapies for these currently untreatable disorders.

Previously, Moore has served as president of the European Pediatric Ophthalmology Society and vice president of the Royal College of Ophthalmologists. He was also the U.K. National Institute of Health Research national theme lead for rare inherited eye disorders. He was elected to the U.K. Academy of Medical Sciences in 2005. He sits on the scientific advisory board of the non-profit organization, Research to Prevent Blindness.

Moore is the recipient of numerous awards, including the Franceschetti Medal International Society of Genetic Eye Disease (2003); the Claffy Memorial Medal University of Sydney (2003); the Duke-Elder Medal Royal College of Ophthalmologists (2009); Alcon Award (2010); and the Doyne Medal (2011). He has published two books, more than 40 book chapters and over 300 peer reviewed scientific papers.

3:00-4:00

## Human Amniotic Membrane Grafting for Large and Persistent Macular Holes

Tongalp H. Tezel, MD

Chang Family Professor of Ophthalmology,
Director of the Vitreoretinal Division
Director of the Vitreoretinal Fellowship Program
CUIMC

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| | Tongalp H. Tezel, MD is the Chang Family Endowed Professor of Ophthalmology and the Director of the Vitreoretinal Service and Fellowship Program at the Department of Ophthalmology.<br><br>Dr. Tezel is an internationally known clinician-scientist and a leader in the management of vitreoretinal diseases.<br><br>Dr. Tezel received his medical degree and initial ophthalmology training in Turkey and Denmark before completing his ophthalmology residency at Washington University School of Medicine. He later trained under Dr. Stanley Chang and received his fellowship in vitreoretinal surgery here at Columbia University.<br><br>Dr. Tongalp now leads the retina service at the Department of Ophthalmology.<br><br>Dr. Tezel's research laboratory focuses on investigating the molecular mechanisms of various retinal diseases. His main research interests include retinal cell transplantation, angiogenesis, pharmacologic vitreolysis, tissue engineering and drug development for the treatment of age-related macular degeneration, and has developed several techniques used for tissue engineering and retinal cell replacement therapies. |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

# MONDAY, JANUARY 16

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| 9:00 – 12:00 | **Intensive Review of Eye Pathology**<br>Ralph C. Eagle, Jr., MD<br>Wills Eye Hospital, Philadelphia, USA<br>Professor of Ophthalmology and Pathology<br>Chief of the Pathology Service, Wills Eye Hospital<br>  <br>Dr. Eagle graduated from the University of Pennsylvania School of Medicine in 1970, interned at Temple University Hospital and was an ophthalmology resident at University of Pennsylvania Ophthalmic Pathology training. He also completed a two-year NEI fellowship at the Armed Forces Institute of Pathology. He was certified by the American Board of Ophthalmology in 1976. He was named the Noel T. and Sara L. Simmonds Professor of Ophthalmic Pathology at Wills Eye Hospital in 1999. Dr. Eagle's research interests include the histopathologic characterization of ocular disease using light and electron microscopy. Dr. Eagle's honors include the AOS, the Zimmerman Medal of the American Association of Oncologists and Ophthalmic Pathologists, the Macula Society's W. Richard Green Lecture, the ISOP's inaugural Gordon K. Klintworth Lecture and the ISOO's Henry B. Stallard Medal and Lecture. He has served as President of the American Association of Oncologists and Ophthalmic Pathologists and was a member of Executive Board of the American Registry of Pathology. He is Director of Continuing Medical Education and chair of the IRB committee at Wills Eye Hospital. A dedicated teacher, he has taught eye pathology to hundreds of ophthalmology residents and has lectured on five continents. He directs the eye pathology section of the Lancaster Course and is sole author and illustrator of a popular atlas and textbook of Eye Pathology. An avid photographer, he is noted for the quality of his gross photos and photomicrographs of eye disease. |
| 12:00-1:00 | **LUNCH** |
| 1:00-5:00 | **Intensive Review of Eye Pathology, continued**<br>Ralph C. Eagle, Jr., MD<br>  |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

## Tuesday, JANUARY 17

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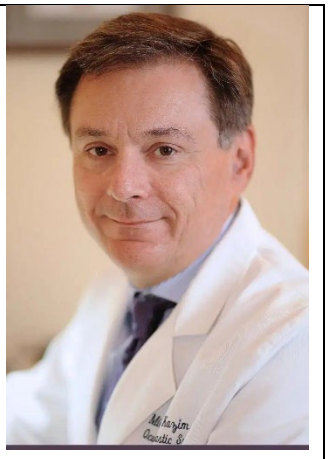
| 9:00-11:00 | **Thyroid Eye Disease – Surgical Management**<br>**Adult orbital tumors**<br>Michael Kazim, MD<br>  <br>Oculoplastic and Orbital Surgeon Specialist in Orbital Tumors and Thyroid Eye Disease<br>Clinical Professor of Ophthalmology and Surgery<br>Columbia University, College of Physicians and Surgeons<br>1976-80 B.A. Columbia College (Biology-Magna Cum Laude)<br>1980-1984 M.D. College of Physicians and Surgeons Columbia University<br>Dr. Kazim has been in practice for over 20 years, specializing in Oculoplastic and Orbital Surgery , especially Orbital Tumors, and Thyroid Eye Disease. Dr Kazim trains both US and International Fellows in the subspecialty of Oculoplastic and Orbital Surgery, a highly competitive fellowship program. |
| 11:00 - 1:00 | **Pathophysiology of Ocular Tumors**<br>Brian Marr, MD<br>  <br>Professor of Ophthalmology, CUIMC<br>MD, Temple University School of Medicine<br>Internship: Crozer-Chester Medical Center<br>Residency: New York Eye and Ear Infirmary<br>Fellowship: Wills Eye Hospital<br>Brian Marr, MD heads the Ophthalmic Oncology Service at the Harkness Eye Institute. He has comprehensive experience in the diagnosis, treatment, and management of ocular tumors including intraocular tumor resection, laser, radiation, and chemotherapy procedures.<br>His experience in ophthalmic oncology began during an eight-year tenure in the Ocular Oncology Service at the Wills Eye Hospital in Philadelphia.<br>Next, Dr. Marr moved on to Memorial Sloan Kettering Cancer Center, where he remained for nine years, starting in 2008, joining our group at Columbia in 2016. |
| 1:00-2:00 | **Lunch** |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

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| 2:00-4:00 | **Corneal Infections and Keratoprostheis**<br>Danielle Trief MD, MSc<br>Associate professor of Ophthalmology<br>Columbia University Medical Center<br>  <br>Dr. Trief specializes in the medical and surgical management of cornea, pediatric cornea, cataract, and external diseases. Her surgical expertise includes corneal transplantation, cataract surgery, secondary intraocular lens placement, anterior segment reconstruction, and laser vision correction. Dr. Trief established a clinic dedicated to children with corneal diseases.<br>Dr. Trief received her undergraduate degree from the University of Pennsylvania, where she graduated Summa Cum Laude and was elected Phi Beta Kappa. She was awarded a Thoroun Fellowship to pursue a Masters of Neuroscience at Oxford University, where she graduated with honors. She completed medical school at Columbia University College of Physicians and Surgeons, where she was elected into the Alpha Omega Alpha medical honor society. She completed her ophthalmology residency at Harvard Medical School/Massachusetts Eye and Ear infirmary and subsequently pursued a cornea and refractive surgery fellowship at the New York Eye and Ear Infirmary. |
| 4:00-5:00 | **Pearls for the Novice Phaco Surgeon**<br>Grace Sun, MD<br>  <br>Director of the Ophthalmology Clinical Practice at Weill Cornell Medicine - Lower Manhattan Assistant Professor of Ophthalmology at Weill Cornell Medicine Associate Designated Institutional Official, New York-Presbyterian Hospital, Graduate Medical Education<br>Dr. Sun graduated from Stanford University, with Honors. She later received her M.D. from Weill Medical College of Cornell University, where she was awarded the Edward Norton Prize in Ophthalmology. She completed her ophthalmology residency at the New York Presbyterian Hospital/ Weill Medical College of Cornell University.<br>Dr. Sun has a strong interest in global health and education. She served as a Peace Corps volunteer in Nicaragua from 1999-2001. She served as an associate staff ophthalmologist with ORBIS International, a non-profit organization whose mission is to eliminate avoidable blindness in developing countries. She leads Weill Cornell Ophthalmology's international collaboration with Bugando Medical College in Tanzania.<br>Dr. Sun is director of the advanced cataract surgical skills section of the national Surgical Curriculum for Ophthalmology Residents (SCOR). She is also current President of Women In Ophthalmology. |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

# Wednesday, JANUARY 18

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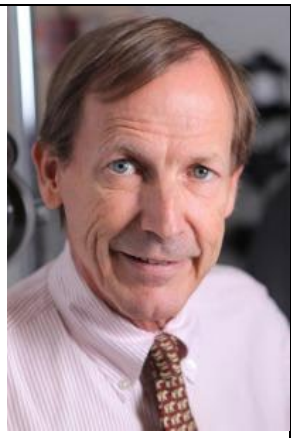
| 9:00-5:00 | **Phako Lab, Room 415 Research Annex**<br>James Auran, MD<br>Professor of Ophthalmology, CUIMC<br><br>  <br>Dr. Auran graduated with honors from Harvard College with a B.A. in Biology and received his M.D. degree from Cornell University Medical College. He performed his ophthalmology residency training at the Manhattan Eye, Ear & Throat Hospital (MEETH), followed by fellowship training in Cornea and Anterior Segment Surgery with Richard Gibralter, M.D. at MEETH and Anthony Donn, M.D. at Columbia University.<br>Dr. Auran is listed in Castle Connolly's Top Doctors in the New York Metro Area, New York Super Doctors, and Best Doctors in America. He received the Alfred Markowitz Service Award from the Society of Practitioners of the Columbia Presbyterian Medical Center in 2004, the American Academy of Ophthalmology Achievement Award in 2004, and the Columbia University Department of Ophthalmology Resident Teaching Award (in recognition of teaching advanced cataract surgical techniques) in 2008. |

# Thursday, JANUARY 19

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| 9:00-10:00 | **Amblyopia: diagnosis, classification, pathogenesis**<br><br>  <br>Pamela Frances G Gallin, M.D., F.A.C.S.<br>Clinical Professor of Ophthalmology (in Pediatrics)<br><br>Pamela Gallin is Director Emeritus of Pediatric Ophthalmology at the Harkness Eye Institute and at the Morgan Stanley Children's Hospital NY Presbyterian Medical Center.<br><br>She is Director Emeritus of Pediatric Ophthalmology and Adult Strabismus and the Fight For Sight Children's Eye Clinic. She is the author of "Pediatric Ophthalmology", a textbook used internationally by Ophthalmologists, Pediatricians and Medical Students. Dr. Gallin graduated from Washington University in St. Louis with BA in Biology, and BS in Applied Math and Computer Science. She obtained her MD from The Washington University School of Medicine where she won the Lange Award in Medicine. Her Ophthalmology residency was at the Mt. Sinai Medical Center. Dr. Gallin was one of only a few recipients of a Heed Foundation Fellowship and studied Pediatric Ophthalmology at the Children's National Medical Center and Columbia University Medical Center. She also studied with Dr. David Guyton and Dr. Irene Maumenee at the Wilmer Eye Institute of Johns Hopkins. Dr. Gallin has been listed for many years in America's Top Doctors, Best Doctors in America as well as Best Ophthalmologists in America. She is in New York Magazine Best Doctors, the regional Castle Connolly Best Doctors Lists, and The New York Times SuperDocs. Dr. Gallin has also been an examiner for the American Board of Ophthalmology Oral Examination for over 20 years. Dr. Gallin was on the Board of the National Organization |

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| | of Rare Diseases, the National Association for the Visually Handicapped and the Board of Fight For Sight. United Cerebral Palsy honored her with the Luella Bennack Award as "A Woman Who Cares" in May, 2010. |
| 10:00-12:00 | **Corneal dystrophies and corneal transplantation**<br>  <br>George J. Florakis, MD<br>George J. Florakis, M.D., is the Malcolm P. Aldrich Professor of Ophthalmology at CUMC and Director of Columbia Ophthalmology in Westchester.<br>Dr. Florakis received his undergraduate and medical degrees from Columbia University. Following his ophthalmology residency training at Columbia's Edward S. Harkness Eye Institute, Dr. Florakis completed a fellowship in corneal and external eye diseases under the preceptorship of Jay Krachmer, MD, at the University of Iowa.<br>Dr. Florakis is an expert in corneal surgery and consultation. He specializes in management techniques for corneal transplants, endothelial keratoplasty (DMEK, DSAEK), corneal dystrophies, and anterior segment trauma and reconstruction.<br>A national leader in corneal diseases, Dr. Florakis is a Fellow of the American Academy of Ophthalmology, a member of the National Eye Bank Association of America, a longtime member of the medical advisory board of the Eye-Bank for Sight Restoration in New York, the New York Ophthalmological Society, New York State Medical Society, and the Northeast Cornea Society, as well as many other professional organizations. Dr. Florakis has authored many book chapters and peer-reviewed articles, and lectures extensively both nationally and internationally. |
| 12:00-1:00 | **LUNCH** |
| 1:00-2:00 | **Glaucoma Risk Factors**<br>  <br>Qing Wang, MD, PhD<br>Qing Wang, MD, PhD, is Assistant Professor of Ophthalmology and a clinician-scientist specializing in the medical and surgical management of glaucoma. Her surgical expertise includes cataract and both minimally invasive and traditional glaucoma surgeries. Her research focus is on understanding why retinal ganglion cells are lost in glaucoma and developing new treatments to protect and restore these cells.<br>Dr. Wang graduated from Yale University with a BS and MS in Molecular Biophysicis and Biochemistry. She subsequently came to Columbia University where she earned her MD and PhD through the Medical Scientist |

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| | Training Program. Her doctoral dissertation was on the molecular programs that distinguish different subpopulations of retinal ganglion cells during development. She went on to complete her ophthalmology residency and postdoctoral research fellowship on optic nerve regeneration at the Stein Eye Institute at the University of California, Los Angeles. Before returning to Columbia, she completed a glaucoma clinical fellowship at Wilmer Eye Institute at Johns Hopkins University.<br><br>Dr. Wang is a rising star in glaucoma research and has won many awards throughout her training. Clinically, she is dedicated to addressing the needs of each individual patient to protect their vision and maximize their quality of life. |
| 2:00-3:00 | **Clinical Trials**<br><br>Qing Wang, MD, PhD |
| 3:00-4:00 | **CDC Study**<br><br>**Manhattan Vision Screening Follow-up Study**<br><br>Lisa Hark, PhD, MBA<br>Professor of Ophthalmic Sciences (in Ophthalmology)<br>Administrative Director, Jonas Children Vision Care<br>Director, Clinical Trials Unit<br><br>  <br><br>Lisa Hark, PhD, MBA graduated from Drexel University with a Bachelor of Science in nutrition and biology and completed a dietetic internship at Emory University School of Medicine. She obtained her Master's of Science degree from the Institute of Human Nutrition at Columbia College of Physicians and Surgeons and a Doctoral degree in education from the University of Pennsylvania Graduate School of Education. Dr. Hark graduated from Columbia Business School with a Master in Business Administration (MBA). |

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| 4:00-5:00 | **Artificial Intelligence in Ophthalmology**<br>Kaveri Thakoor, PhD<br>Assistant Professor of Ophthalmic Science (in Ophthalmology)<br>  <br>Kaveri Thakoor, Ph.D., is an Assistant Professor of Ophthalmic Science (in Ophthalmology) in the Department of Ophthalmology at the Columbia University Irving Medical Center. Dr. Thakoor earned her Ph.D. in Biomedical Engineering from Columbia University in the City of New York as a National Science Foundation Graduate Research Fellowship recipient. Prior to that, she earned her B.S. with Honors in Chemistry from Stanford University and her M.S. in Computer Science from the University of Southern California. Dr. Thakoor worked for two years as a research staff member on the Earthquake Early Warning algorithm development team at the California Institute of Technology Seismological Laboratory before joining Columbia. She was awarded the 2022 Morton B. Friedman Memorial Prize for Doctoral Excellence by Columbia Engineering, and she received the 2022 Young Scientist Award for Graduate Students/Postdocs at the Northeast Bioengineering Conference. |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

# FRIDAY JANUARY 20

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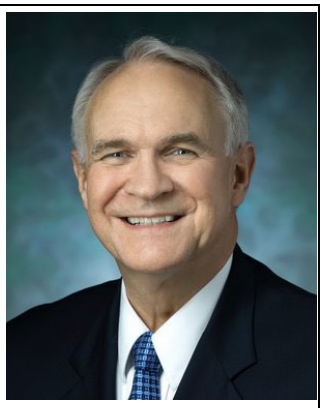
| 9:00 – 5:00 | **OPTICS**<br><br>**David Guyton, MD**<br><br>Krieger Professor of Ophthalmology, Johns Hopkins University<br><br>The Krieger Children's Eye Center at the Wilmer Institute<br><br>He graduated from Harvard Medical School in 1969. After his residency in ophthalmology at Johns Hopkins' Wilmer Eye Institute and a Fellowship in Strabismus with Gunter von Noorden, he returned to Johns Hopkins as the Director of Strabismus and Pediatric Ophthalmology, where he continues to serve as the Krieger Professor of Ophthalmology.<br><br>Dr. Guyton's contributions to clinical optics and strabismus have achieved international recognition. For more than 25 years Dr. Guyton has been the foremost teacher of ophthalmic optics and clinical refraction in the United States. He is a Fellow of the Optical Society of America and has served on the Board of Directors, and as President, of both AAPOS and ARVO.<br><br>**Kristina Irsch, PhD**<br><br>Dr. Irsch came to Johns Hopkins in 2005 as a visiting graduate student from the University of Heidelberg in Germany. Following completion of her PhD in Physics, she completed a post-doctoral research fellowship at Johns Hopkins, before joining the faculty in 2010.<br><br>Much of her research interest has focused on ophthalmic instrument development, including development of a pediatric vision screening device to detect lazy eye (which causes decreased vision) in children at a very early and still easily curable stage, as well as on disorders of ocular motility.<br><br>Dr. Irsch has won several awards throughout her training, including the Young Investigator Award from the Knights Templar Eye Foundation, as well as NASA Tech Briefs magazine's "Create the Future" Design Contest Medical Innovation Award. |



# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

# MONDAY JANUARY 23

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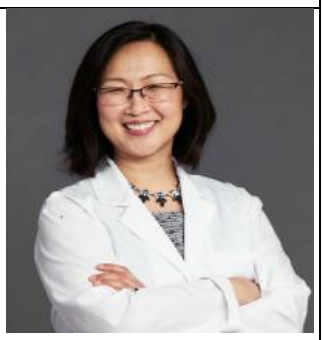
| 8:00-9:00 | **Fundamentals of Perimetry**<br>  <br>George Cioffi, MD<br>Columbia University, New York, USA<br>Edward S. Harkness Professor; Jean and Richard Deems Professor<br>Chair, Department of Ophthalmology<br><br>Dr. Cioffi graduated from the University of Vermont and received MD degree from the University of South Carolina. He completed a residency at the University of Maryland and a fellowship at the Devers Eye Institute. Dr. Cioffi is an internationally recognized glaucoma researcher and clinician. He published more than 200 resrach articles. He is currently the editor in chief of the Journal of Glaucoma and chairman of the Scientific Advisory Committee for the Glaucoma Research Foundation. Dr. Cioffi has received numerous honors, including the Clinician-Scientist Award from the American Glaucoma Society, the Senior Achievement Award from the American Academy of Ophthalmology, and the Shaffer-Hetherington-Hoskins award from the Glaucoma Research Foundation in San Francisco. |
| 9:00-12:00 | **Cataract Lecture Series:**<br>  <br>• **Biometry & IOL calculations [Lisa Park / Jim Auran]**<br>• **Phacodynamics (Fluidics & Energy modulation) [Lisa Park / Jim Auran]**<br>• **Ophthalmic Viscosurgical Devices [Lisa Park]**<br>• **IOLs / Advanced technologies & optimizing refractive outcomes**<br>• **Femtosecond Laser Assisted Cataract Surgery (FLACS) – [Leejee Suh]**<br>• **Toric IOLS / ORA intraoperative aberrometry – [Danielle Trief]**<br>• **Presbyopia correcting IOLs – [Gabriel Rand]**<br><br>Lisa Park, MD<br>Columbia University, New York, USA<br>Associate Professor of Ophthalmology at CUIMC<br><br>Dr. Park received her undergraduate degree from Harvard University and her medical degree from Yale School of Medicine. She completed her ophthalmology residency at NYU and a fellowship in cataract and refractive surgery at the Manhattan Eye, Ear & Throat Hospital. Dr. Park does a lot of work internationally by teaching cataract surgery through ORBIS International and serving as a volunteer surgeon with the Hospital de La Familia Foundation in Guatemala. She serves on the International Foundation of the American Society of Cataract and Refractive Surgery and on the board of Vision Care USA, dedicated to teaching modern surgical techniques in Addis Ababa, Ethiopia. |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

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| 12:00-1:00 | **LUNCH** |
| 1:00-2:00 | Disorders of the corneal epithelium<br>Gabriel Moss Rand, MD<br><br>  <br><br>Gabriel Rand, MD, is Assistant Professor of Ophthalmology at CUMC, and a board-certified cornea expert specializing in the medical and surgical management of cornea, anterior segment, and refractive conditions.<br><br>Dr. Rand received his fellowship training in cornea, anterior segment, and refractive surgery at Columbia University Irving Medical Center. He has an undergraduate degree from the School of Engineering at Cornell University and completed his medical school and ophthalmology residency at the Albert Einstein College of Medicine. During his residency, Dr. Rand was awarded the Ronald M. Burde Award for Excellence in Research for his work in the application of advanced statistical methods with eye bank data. |
| 2:00-3:00 | **Drug discovery in atrophic AMD and Stargardt disease**<br>Konstantin Petrukhin, PhD<br>Columbia University, New York, USA<br>Professor of Ophthalmic Sciences<br><br>  <br><br>Dr. Petrukhin's research interests revolve around identification of small molecule treatments for dry AMD by reducing accumulation of toxic pyridinium bisretinoids in the RPE, stimulating photoreceptor survival, and inhibiting reactive gliosis in retinal Muller cells. Dr. Petrukhin's lab is working on optimization of a non-retinoid lead compound that acts as an inhibitor of bisretinoid formation in the retina. He also conducts evaluation of novel drug targets for pharmacological inhibition of retinal lipofuscinogenesis and performs the screen for synthetic NR2E3 ligands that may potentially become a treatment for atrophic AMD. |
| 3:00-4:00 | Bestrophins: structure, function and diseases<br><br>Tingting Yang, PhD<br><br>  <br><br>Columbia University, New York, USA<br>Associate Professor of Ophthalmic Sciences<br><br>Dr. Yang primarily studies disease-associated ion channels in the eye. Dr. Yang research is focused on the structure and function of ion channels in the eye, and the pathological mechanisms and treatment of their associated diseases. To tackle these challenges, Dr. Yang's laboratory |

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| | employs a multidisciplinary platform empowered by cryo-EM/X-ray crystallography, electrophysiology, CRISPR/Cas9-mediated genome editing and stem cell reprogramming. Dr. Yang's previous accomplishments include solving the first structure of a bestrophin homolog, elucidating the physiological function and molecular mechanism of human BEST1, and establishing an iPSC-RPE cell based "disease-in-a-dish" model for BEST1 mutations. She has recently expanded her studies to Bestrophin2 (BEST2), another chloride channel involved in intraocular pressure control and a potential drug target for the treatment of glaucoma, and to the gene therapy of Best disease. |
| 4:00-5:00 | **From Basic Clinical Science to a Clinical Application: A case study in translational research**<br>Donald C. Hood, PhD<br>James F. Bender Professor Emeritus in Psychology and Professor of Ophthalmic Science (in Ophthalmology) ; Special Research Scientist in the Department of Psychology<br>  <br>Dr. Hood has been a member of the Columbia faculty since 1969. He holds a B.A. from Harpur College of the State University of New York at Binghamton, MS and PhD degrees from Brown University and an honorary degree from Smith College. He served as Vice President for the Arts and Sciences at Columbia University from 1982 to 1987. Many of his more than 200 publications deal with issues of the basic neuroscience of vision while others, in collaboration with ophthalmologists, concern diseases of retina and optic nerve. His current interests include studying the relationship between structural and functional measures of damage due to eye diseases, which include glaucoma, diabetic retinopathy, retinitis pigmentosa, and optic neuritis/multiple sclerosis. |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

# TUESDAY, JANUARY 24

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| 8:00-9:00 | **Periocular (Eyelid and Orbital) Trauma**<br>Gary Lelli, MD<br>Weill Cornell Medicine, New York, USA<br>Associate Attending Ophthalmologist - NewYork-Presbyterian HospitalAssociate<br>Vice Chair of Ophthalmology<br>Professor of Ophthalmology Weill Cornell Medical College<br>  <br>Dr. Lelli is an ophthalmologist specializing in oculoplastic surgery. He obtained his Medical Doctor dgree from Mount Sinai School of Medicine and completed residency at the University of Michigan Medical Center, W.K. Kellogg Eye Center. He is an author of numerous papers and textbook chapters and routinely presents at national meetings. He is an active member of the Volunteer Health Program, Ltd., a non-profit volunteer organization focusing on providing eye care to rural areas of the Dominican Republic. |
| 9:00-10:00 | **Origins of Clinical Refractive Technology**<br>Stephen Trokel, MD,<br>Professor of Ophthalmology, CUIMC<br>  <br>Dr. Trokel graduated from Cornell University with a degree in physics and subsequently received his master's degree in radiation biology. He received his Doctor of Medicine degree from the University of Rochester, New York. After completing his residency at Columbia University's College of Physicians and Surgeons and fellowships at the NIH and at Columbia's Edward Harkness Eye Institute, Dr. Trokel received a Doctor of Medical Science degree in Ophthalmology-Physiology, also from Columbia.<br>Widely regarded as the first ophthalmologist to recognize the significance of the excimer laser for use in corneal refractive surgery, Dr. Stephen Trokel's vision and exhaustive research has made laser vision correction a realistic alternative to glasses and contacts for millions worldwide. Today, he remains an innovator working closely with VISX, Inc. to further develop and implement new technology. |
| 10:00-11:00 | **Refractive Surgery Overview and Complications**<br>Chris E. Starr, MD<br>Associate Professor of Ophthalmology,<br>Weill Cornell Medical College<br>  <br>Dr. Starr currently serves as the Director of Ophthalmic Education and Director of the Fellowship Program in Cornea, Cataract & Laser Vision Correction Surgery at Weill Cornell College, NewYork-Presbyterian Hospital. He was the Director of the Residency Program in Ophthalmology from 2006 to 2012. He is a graduate of Brown University (undergraduate), Weill Cornell University Medical College (medical school), Harvard University (residency), and Johns Hopkins University (fellowship). His research interests include dry eye disease treatment and diagnostics, keratoprostheses, innovative cataract surgical techniques, refractive surface ablation techniques and corneal ectasia screening. He has published 6 textbook chapters as well as numerous peer-reviewed papers and scientific presentations. |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

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| 11:00-12:00 | **Laser in Glaucoma**<br>Aakriti Garg Shukla, MD<br>Leonard A. Lauder Assistant Professor of Ophthalmology at CUMC and Attending Ophthalmologist at the New York Presbyterian Hospital<br><br>  <br><br>Dr. Shukla completed her undergraduate studies as a Trustee and Renaissance Scholar at the University of Southern California. She received her medical degree at Columbia University College of Physicians and Surgeons in New York City, where she was awarded a Doris Duke Clinical Research Fellowship and earned the Edith and Denton McKane Memorial Award for Outstanding Research in Ophthalmology. She completed her training as an ophthalmology resident and served as chief resident at Columbia University's Harkness Eye Institute. She pursued further glaucoma subspecialty training at the Wilmer Eye Institute at Johns Hopkins University in Baltimore, MD. Prior to her appointment at Columbia University, she served as glaucoma faculty at the Wills Eye Hospital in Philadelphia, PA.<br><br>Dr. Shukla has published numerous peer-reviewed articles, book chapters, and has been invited to speak nationally and internationally on her patient care and research. She serves on the Editorial Board of Ophthalmology Glaucoma. Her work has earned several awards and research grants including the American Glaucoma Society (AGS) Mentoring for Advancement of Physician Scientists Grant and the American Academy of Ophthalmology (AAO) Best Paper Award. She was awarded the American Society of Cataract and Refractive Surgery (ASCRS) International Service Grant for her involvement in global health initiatives in India, Guatemala, Mexico, Honduras, and other countries. Her main research interests include early detection of glaucoma, glaucoma progression, surgical outcomes, and healthcare disparities in glaucoma. |
| 12:00- 1:00 | **LUNCH** |
| 1:00-3:00 | **Optics**<br>Mark E. Wilkinson, OD, FAAO<br>Clinical Professor of Ophthalmology and Visual Sciences<br><br>  <br><br>Dr. Wilkinson's research interests are in two general areas; inherited eye diseases and driving with a reduction in visual functioning. Dr. Wilkinson works with Dr. Edwin Stone and the other researchers in the Iowa Institute for Vision Research (IVR) to evaluate and quantify the phenotypic differences in visual functioning of individuals with inherited eye diseases. In the area of driving with a reduction in visual functioning, Dr. Wilkinson has worked with the FDA's Ophthalmic Device Division to evaluate how contrast sensitivity loss affects driving performance under mesopic lighting conditions. Driving performance was evaluated at the University of Iowa National Advanced Driving Simulator and Simulation Center (NADS). Additional studies Dr. Wilkinson was involved with include a |

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| | study that looked at the driving behaviors of individuals who have experienced a permanent reduction in their visual fields from conditions such as retinitis pigmentosa and stroke. Another study evaluated an advanced optics aspheric intraocular lens under night driving conditions. Another study evaluated the benefits of an advanced optics aspheric contact lens while driving. Finally, a study is currently being developed that will look at automation as it related to driver's safety when driving with a visual impairment. |
| 3:00-5:00 | **Antibiotics, Antifungals and Antivirals: Pharmacokinetics and Pharmacodynamics**<br>Michael J. Weiss, MD<br>Clinical Professor of Ophthalmology, CUIMC<br><br>**Education/Training**<br>**Medical School - Columbia University College of Physicians & Surgeons**<br>**Residency - Columbia Presbyterian Medical Center, NY**<br>**Fellowship - Columbia Presbyterian Medical Center, NY**<br>Areas of expertise: Diabetic Eye Disease, Retinal Disease, Laser Surgery, Uveitis, Cataract, Retinal Surgery |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

## Wednesday, JANUARY 25

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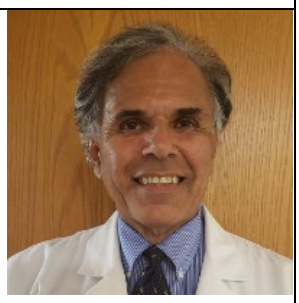
| 9:00-12pm | **Glaucoma Dry Lab**<br>  <br>Noga Harizman, MD<br>Associate Professor, CUIMC<br><br>Dr. Harizman is a leader in minimally invasive glaucoma surgery techniques, both as a teacher and practitioner. She also specializes in management techniques for corneal ulcers, endophthalmitis, and endothelial keratoplasty. Prior to joining Columbia, Dr. Harizman was the Director of Glaucoma services at the New York Eye and Ear Infirmary of Mount Sinai, and served as an attending physician and preceptor for resident glaucoma clinics. She was deeply involved in creating the glaucoma surgical curriculum and supervising resident and laser surgical cases. For her outstanding educational leadership, she received the New York Eye and Ear Infirmary Teaching Award in 2011.<br><br>She is a graduate of Tel Aviv University Medical School. Immediately upon graduating from ophthalmology residency, she began teaching and tutoring medical students on ocular anatomy and disease as a Clinical Instructor in Ophthalmology, at the Sackler Faculty of Medicine at Tel Aviv University. She then completed sequential fellowships in glaucoma and cornea at The New York Eye and Ear Infirmary, where she joined the full-time faculty in 2008. |
| 12:00-1:00 | **Stereoscopic Examination of the Peripheral Retina**<br>  <br>Robert Lopez, MD<br>Clinical Professor of Ophthalmology, CUIMC<br><br>Medical School - Harvard Medical School<br>Residency - Columbia Presbyterian Medical Center, NY<br>Fellowship - New York Hospital-Cornell Medical Center<br><br>Dr. Robert Lopez is a pediatric retinal surgeon and treats many pediatric retinal diseases, including retinopathy of prematurity, pediatric retinal detachment, ocular trauma, and other diseases. His ability to treat complicated pediatric eye diseases is facilitated by the world-class pediatric anesthesia team at the Morgan Stanley Children's Hospital of New York (CHONY), as well as the state-of-the-art NICU and PICU at CHONY. He also treats adult retinal disease such as age-related macular degeneration, diabetic retinopathy, and other adult surgical diseases, such as retinal detachment and macular hole. He is the head of the retina service at Nassau University Medical Center. |
| 1:00 – 2:00 | **LUNCH** |
| 2:00-3:00 | ***Peaking through Keyholes at Cellular Secrets:*** |

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| | **Peaking through Keyholes at Cellular Secrets:Hi-Res Enface Imaging using Dynamic OCT and Adaptive Optics SLO**<br>  <br>Richard B. Rosen, MD<br>Icahn School of Medicine at Mount Sinai, New York, USA<br>Professor of Ophthalmology<br><br>Dr. Richard Rosen came to New York Eye and Ear Infirmary of Mount Sinai (NYEE) in July 1986, as an Ophthalmology resident. He had previous training as a professional photographer and ophthalmic photographer for Dr. Morton Rosenthal and is a long time member of the Ophthalmic Photographers Society achieving Certified Retinal Angiographer status. He completed his residency in 1989 and his retinal fellowship, under Dr. Muldoon at the Infirmary in 1991 prior to joining the staff. During his fellowship, Dr. Rosen served as Director of Medical Student Education and went on to serve as Program Director for the Department of Ophthalmology from 1992 – 2002. In 2002 he was named Vice-Chair of the Department and Director of Research and Surgeon-Director, Ophthalmology. Dr. Rosen has maintained a wide interest in vision and has been involved in basic science, translational and clinical projects. He has numerous grants especially in Retinal Imaging where he has achieved a well-deserved international reputation. He has authored over 100 peer-reviewed publications, numerous abstracts and lectures extensively locally, nationally and internationally. |
| 3:00 - 400 | **Sixth Sense**<br>  <br>Jeffrey Odel, MD<br>Columbia University, New York, USA<br>Professor of Ophthalmology<br><br>Dr. Odel is specializing in Neuro-Ophthalmology. He is active in both clinical and research arenas. His present research interest is in developing efficient clinical tools to distinguish vision loss and visual field loss of optic nerve origin from that of retinal origin. |
| 4:00 – 5:00 | **AZOOR: definition and long term prognosis**<br>  <br>Lawrence Yannuzzi, MD<br>Dr. Yannuzzi is the founder of VRMNY Retina Centers In New York as well as vice-chairman and director of the LuEsther T. Mertz Retinal Research Center of the Manhattan Eye, Ear & Throat Hospital. He is also founder and president of The Macula Foundation, Inc<br><br>Dr. Yannuzzi is a world-renowned retinal specialist who has published more than 600 scientific papers and 14 textbooks, with a particular interest in diseases of the macula, such as Diabetic Retinopathy and Age-Related Macular Degeneration. He has also been given numerous awards and distinctions in his field for contributions on retinal imaging, drug development, ophthalmic lasers, and the diagnosis and treatment of macular and retinal diseases. Most recently, he was given an honorary doctorate at the University of Ancona, |

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| | the Michelson Award for Retinal Vascular Disease, the Alcon Research Institution Award, a lifetime achievement award by the American Academy of Ophthalmology, the Hermann Wacker award of the Club Jules Gonin and the Gass Award of the Retina Society. Dr. Yannuzzi's new book, The Retinal Atlas, was the largest selling text in the ophthalmic field, and it was translated into 7 languages. The book brings together the most complete retinal atlas ever with over 5,000 illustrations of the latest imaging and research findings essential for effective diagnosis of retinal disorders. |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

# Thursday, JANUARY 26

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| 9:00-12:00 | **Refraction Workshop**<br>  <br>Suzanne Walter Sherman, OD<br>Assistant Professor of Optometric Sciences (in Ophthalmology) at the Columbia University Medical Center<br><br>Suzanne Walter Sherman specializes in complex and medically necessary contact lens fittings, anterior segment disease and primary care.<br><br>She received her undergraduate degree from the University of Michigan with a degree in Brain, Behavior and Cognitive Science. Dr. Sherman graduated from SUNY College of Optometry and elected to the Beta Sigma Kappa International Optometric Honors Society. She completed her optometric residency in Ocular Disease and Primary Care at Bronx Lebanon Hospital Center. |
| 12:00-1:00 | **LUNCH** |
| 1:00-3:00 | **Electrophyiology of Vision – ERG, EOG, PERG, mfERG and VEP**<br>  <br>Nan- Kai Wang, MD, PhD<br>Assistant Professor of Ophthalmic Sciences (in Ophthalmology)<br>Dr. Wang's research interest focuses on mitochondria function, which is involved in cellular metabolism and apoptosis. His overall research goal is to develop therapies for retinitis pigmentosa and retinal ganglion cell (RGC) degeneration through mitochondrial reprogramming.<br><br>He received his M.D. at National Taiwan University. After completing his residency in Ophthalmology and vitreoretinal fellowship at Chang Gung Memorial Hospital in Taiwan, Dr. Wang was invited to join as a faculty member of the Vitreoretinal team in the same institute, where he established himself as an independent physician-scientist.<br><br>Dr. Wang first came to Columbia University as a postdoctoral fellow under Stephen H. Tsang, M.D., Ph.D. During his two-year fellowship (2007-2009), he became an expert in the field of genetics, inherited retinal dystrophies, mouse and human electrophysiology, and embryonic stem cells.<br><br>In clinical myopia research, Dr. Wang was the first to propose using choroidal thickness to classify myopic maculopathy in 2012. He found that macular choroidal thickness is a better indicator of dry type myopic maculopathy than refractive error and axial length.<br><br>`Dr. Wang has published over 130 peer-reviewed publications and is currently an editorial board member in Scientific Reports and Ophthalmic Genetics. He has authored seven book chapters in inherited retinal dystrophies, myopia, and surgical retina. |

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| | Dr. Wang's laboratory is funded by the National Institutes of Health (NIH). Since his recent transition back to the U.S. in 2017, Dr. Wang has expanded his research skill set to include genome engineering using CRISPR/Cas9. He is developing research programs using mouse models to study the role of mitochondria in inherited retinal dystrophies, which include a unique patient-specific *Opa1* knock-in mouse model and conditional overexpression knock-in mouse models. His models may have significant utility in testing therapeutic strategies to preserve vision in inherited retinal dystrophies. |
| 3:00-4:00 | ?<br>  <br>**Irene A. Barbazetto, M.D.**<br>Clinical Instructor of Ophthalmology, Columbia University Clinical Instructor of Ophthalmology, NYU<br><br>Dr. Barbazetto is a graduate of Hamburg University, Germany, Dr. Barbazetto's doctoral thesis investigated a newly developed vision-screening test (H-Test) for pre-school children and was awarded cum laude. She completed her ophthalmology residency in Lübeck, Germany, where she participated in the development of photodynamic therapy for the treatment of macular degeneration. In 2000, she came to New York for a research fellowship with Dr. Stanley Chang at Columbia University, focusing on the role of oxygen in the development of cataract after vitreoretinal surgery.<br><br>She is an internationally recognized expert in the treatment of macular degeneration, retinal vascular disease, retinal vein occlusion, hereditary retinal disease, and diabetes. |
| 4pm - 5pm | **Retinoblastoma Management**<br>**Jasmine Francis, MD FACS** |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

## Friday, JANUARY 27

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| 8:00-9:00 | **Vitreous anatomy and pearls for the practitioner of Ophthalmology**<br>Michael Engelbert, MD, PhD<br>Clinical Professor, Department of Ophthalmology at NYU Grossman School of Medicine<br><br>  <br>Michael Engelbert joined Vitreous-Retina-Macula Consultants of New York in 2010. He is a vitreoretinal surgeon and macular disease specialist, with a special interest in AMD and retinal detachment surgery, as well as sight-threatening infections of the eye.<br>He received his medical degree from Ludwig-Maximilians-University in Munich, after which he did several years of endophthalmitis research. He earned a Ph.D. for this work and is considered a leader in this field.<br>Residency at Columbia. Following his residency, did medical and surgical vitreoretinal fellowship at Manhattan Eye, Ear & Throat Hospital and Columbia University.<br>He is a Research Assistant Professor at New York University and Clinical Instructor at NYU and New York Eye and Ear Infirmary, where he is actively involved in instructing residents and fellows in the art of medical retina and retinal surgery. 2010. He is a vitreoretinal surgeon and macular disease specialist, with a special interest in AMD and retinal detachment surgery, as well as sight-threatening infections of the eye. |
| 9:00-10:00 | **Pandemic Uveitis**<br>Thomas Flynn, MD<br>Assistant Clinical Professor of Ophthalmology<br>Title<br><br>  <br>Dr. Thomas E Flynn, MD, graduated from George Washington University School Of Medicine in 1986, having over 36 years of diverse experience in Ophthalmology. He is affiliated with Eastern Maine Medical Center, Maine Coast Memorial Hospital, Maine general Medical Center, Sebasticook Valley Hospital. Dr. Thomas E Flynn also cooperates with other doctors and physicians in medical groups including Columbia University. |
| 10:00-1:00 | **Pupil cases: when to worry, when to watch**<br>Andrew Lee, MD<br>Chair, Ophthalmology<br>Houston Methodist Eye Associates<br><br>  <br>**Andrew G. Lee, M.D.** completed medical school at the University of Virginia (Alpha Omega Alpha); ophthalmology residency (chief resident) at Baylor College of Medicine (BCM), and neuro-ophthalmology fellowship at the Johns |

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| | Hopkins Hospital. He is chair of the Blanton Eye Institute at Houston Methodist Hospital and Professor of Ophthalmology, Neurology, and Neurosurgery (*Weill Cornell Medicine)*; Adjunct Professor; University of Iowa; Baylor College of Medicine and Texas A and M; Clinical Professor at UTMB (Galveston), UT MD Anderson Cancer Center, and University of Buffalo, SUNY.<br><br>Dr Lee has served on the Editorial Board of 25 journals including JAMA Ophthalmology, AJO, *CJO, JJO, APJO, JNO, Survey of Ophthalmology* and *Eye.* He has published over 400 peer-reviewed publications, 40 book chapters, and nine full textbooks; has been the invited speaker at over 400 national and international eye meetings; and has given 13 named lectureships. He has received the AAO honor, senior honor, secretariat, and life honor achievement awards. Dr. Lee has received the resident teaching award seven times at five different academic institutions.<br><br>**Perilous Pupils**<br><br>Hilary A. Beaver, MD<br><br>Associate Professor of Clinical Ophthalmology, Academic Institute<br>Associate Clinical Member, Research Institute<br>Houston Methodist<br>Weill Cornell Medical College<br><br>  <br><br>Dr. Beaver graduated with an M.D. from the University of Virginia in 1991. She completed her internship and residency in Ophthalmology at Baylor College of Medicine and The Cullen Eye Institute in Houston, Texas. She was an Associate Professor of Ophthalmology and the Director of Medical Student Education in Ophthalmology at The University of Iowa Department of Ophthalmology and Visual Sciences in Iowa City, Iowa before joining The Methodist Hospital Physicians Organization in 2009. Dr. Beaver is currently an Associate Professor of Clinical Ophthalmology with Weill Cornell Medical College, and holds an adjunct faculty appointment in the Department of Ophthalmology at The University of Texas in Galveston. Dr. Beaver has an interest in medical student and resident education. She was a founding Vice President of the Association of University Professors Consortium of Medical Student Educators. She joined The Methodist Hospital Research Institute in 2010. |
| **1:00-2:00** | **LUNCH** |

**2:00-3:00**

## Modeling retina ischemia and edema in mice to identify new therapeutic targets

Carol M. Troy, MD, PhD

Professor of Pathology and Cell Biology and Neurology (in the Taub Institute for Research on Alzheimer's Disease and the Aging Brain) at CUMC

- MD, PhD, 1984 Pharmacology, Medicine, New York Univ School of Medicine
- Internship: 1985 Bellevue & New York University Medical Center, NY
- Residency: 1988 Neurological Institute of the Columbia-Presbyterian Hospital
- Fellowship: 1989 Columbia College of Physicians & Surgeons

The work in her laboratory stems from my long-standing interest in understanding the molecular specificity of cell death pathways. Throughout the body there is homeostasis of life and death at the cellular level. In disease where death is dysregulated in particular cells there is alteration in the affected cells but not throughout the body. Thus we need to identify specific targets that are altered in the disease state but are not required for normal cellular homeostasis. In our lab we focus on the regulation and function of the caspase family of proteases in the mature nervous system. Best known as the executors of cell death, there is increasing appreciation that some caspases may also have non-apoptotic functions. Individual caspases cleave specific substrates at one or two cleavage sites. Cleavage can result in inactivation of a substrate, a change in the substrates activity, or target the substrate for ubiquitination and degradation. However, caspase cleavage of a substrate on its own does not degrade the cellular proteins. This positions aberrant caspase activity as a potential therapeutic target. We are utilizing novel approaches to inhibit specific family members to dissect the function of each in the normal nervous system and in disease. We utilize in vivo and in vitro models to study both molecular pathways and therapeutic interventions.

**3:00-4:00**

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Golnaz Moazami, MD

Associate Clinical Professor of Ophthalmology

Dr. Moazami’s career in medicine began in 1991, when she graduated with an MD from the Columbia Univ Coll of Physicians and Surgeons, New York Ny . After medical school, Dr. Moazami M.D. completed residency at NY & Presby Hp-Columbia Campus, Ophthalmology;

# Saturday, JANUARY 28

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| 9:00 – 12:00 | **Refractive Surgery: Worldwide perspective**<br>Dan Z. Reinstein, MD<br>Professor<br>London Vision Clinic, London, UK<br><br>  <br><br>Dr. Reinstein is the Medical Director of London Vision Clinic, London, UK. He also holds positions as Adjunct Professor of Ophthalmology at Columbia University Medical Center, Visiting Professor at Ulster University, and Professeur Associe en Ophtalmologie at the Centre Hospitalier National d'Ophthalmologie des Quinzes Vingts. He is lead Refractive Surgery consultant for Carl Zeiss Meditec. He produced Carl Zeiss PRESBYOND Laser Blended Vision treatment module for presbyopia, and was a key investigator in developing SMILE. Dr. Reinstein was the first to bring epithelial mapping to keratoconus screening and the extensive applications in Therapeutic Refractive Surgery. Dr. Reinstein performed over 30,000 refractive surgical procedures and a recognized authority in this field. He is a US Board Certified Ophthalmologist, Fellow of the Royal College of Physicians and Surgeons (Canada), Fellow of the Royal College of Ophthalmologists (UK), and Diplomat of the European Board of Ophthalmology. Dr Reinstein's research focuses on applications of VHF digital ultrasound technology to improve corneal and phakic intraocular refractive surgery with a particular focus on measurement and analysis of corneal epithelial changes for applications such as keratoconus screening and therapeutic corneal refractive surgery.<br><br>He has published 187 articles in peer-reviewed medical journals.<br>Written a textbook on SMILE.<br>Contributed or written 52 book chapters / published proceedings.<br>He was awarded the Waring Medal in 2006 and received the Kritzinger Award in 2013. He holds over 10 patents in the field of laser eye surgery, ultrasound diagnostic imaging and signal processing. |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

## Monday, JANUARY 30

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| 9:00-12:00 | **Refraction Workshop** |
| 12:00-1:00 | **LUNCH** |
| 1:00-5:00 | **Ultrasound Lab**<br><br>**Ronald Silverman, PhD**<br><br>  |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

## Tuesday, JANUARY 31

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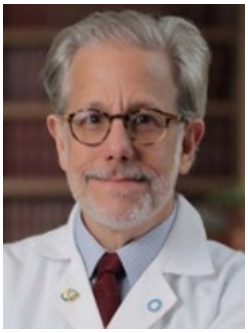
| **9:00-4:30** | **Dissection lab I**<br><br>John Merriam, MD<br>Columbia University, New York, USA<br>Professor of Ophthalmology<br><br>Daniel Casper, MD<br>Columbia University, New York, USA<br>Professor of Ophthalmology<br><br>Lora Rabin Dagi Glass, MD<br>Associate Professor of Ophthalmology at CUMC<br><br>  <br>  <br>  |
| **5:00-6:00** | ?<br>Jeffrey Liebmann, MD<br>Shirlee & Bernard Brown Professor of Ophthalmology<br>Glaucoma Service Director<br>Vice-Chair of the Department of Ophthalmology<br>Columbia University Medical Center<br><br>  <br>Dr. Jeffrey M. Liebmann graduated from Boston University School of Medicine, completed his ophthalmology residency at the State University of New York/Downstate Medical Center, and his glaucoma fellowship at the New York Eye and Ear Infirmary. Dr. Liebmann serves as Shirlee and Bernard Brown Professor, Vice-Chair, and Director of the Glaucoma Division of the Department Ophthalmology at Columbia University Medical Center. He is a fellow of the American Academy of Ophthalmology, Association for Research in Vision and Ophthalmology and American College of Surgeons. Dr. Liebmann is currently Editor-in-Chief of Journal of Glaucoma, a member of the Board of Governors of the World Glaucoma Association and Board of Directors of The Glaucoma Foundation and Secretary-Treasurer of the New York Glaucoma Society. Dr. Liebmann is a past-President of the World Glaucoma Association, American |

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| | Glaucoma Society, and the New York Society for Clinical Ophthalmology and was co-founder of the New York Glaucoma Research Institute, the American Glaucoma Society Foundation and ASCRS Glaucoma Day.<br><br>In addition to maintaining a busy tertiary-care referral practice in New York City, Dr. Liebmann is Principal Investigator for the NIH African Descent and Glaucoma Evaluation Study (ADAGES) and Ocular Hypertension Treatment Study (OHTS III) at Columbia University and is the author and/or co-author of more than 1000 medical and scientific papers, book chapters, and abstracts. He has lectured widely in the United States and abroad on glaucoma diagnosis and management. His current main areas of research interest include the causes of glaucoma, glaucoma progression, glaucoma surgery, ocular imaging, and neuroprotection. |

# Wednesday, February 1

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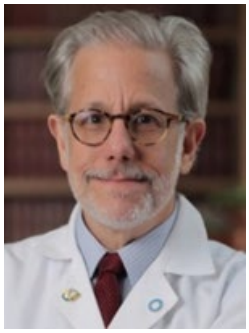
| **9:00-5:00** | **Dissection lab II**<br><br>John Merriam, MD<br>Columbia University, New York, USA<br>Professor of Ophthalmology<br><br>Daniel Casper, MD<br>Columbia University, New York, USA<br>Professor of Ophthalmology<br><br>Lora Rabin Dagi Glass, MD<br>Associate Professor of Ophthalmology at CUMC |



# Thursday, February 2

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| **8:00-9:00** | **Introduction to Strabismus Surgery**<br>Steven Rosenberg, MD<br><br>Anne S. Cohen Associate Professor of Pediatric Ophthalmology (in Ophthalmology) at CUMC<br><br>Steven E. Rosenberg, MD, is an expert in the field of strabismus and pediatric ophthalmology. He is the Anne S. Cohen Endowed Professor of Pediatric Ophthalmology and the Chief of Columbia's Pediatric Ophthalmology and Strabismus division. Dr. Rosenberg has more than 25 years of experience specializing in all facets of pediatric ophthalmology and strabismus, including pediatric cataract surgery and complex adult and pediatric strabismus. He previously co-directed the Pediatric |

Ophthalmology and Adult Strabismus Service at New York Eye and Ear Infirmary of Mount Sinai.

Dr. Rosenberg received his undergraduate education at Harvard University and his medical degree from Columbia University College of Physicians & Surgeons. After his ophthalmology residency at Manhattan Eye, Ear & Throat Hospital, he completed his postdoctoral training with a fellowship in Pediatric Ophthalmology and Strabismus with Zane Pollard, M.D., at the James Hall Eye Center, Scottish Rite Children's Medical Center. In addition to his clinical work, Dr. Rosenberg has dedicated his career to education and has received numerous teaching awards, including the John S. Hermann, M.D. Memorial Award for Excellence in Teaching.

**9:00-11:00**

## Phacotechnique
## Post-op management

Aakriti Garg Shukla, MD

Leonard A. Lauder Assistant Professor of Ophthalmology at CUMC

Dr. Shukla specializes in the medical and surgical management of glaucoma and cataracts. Her surgical expertise includes minimally invasive glaucoma surgery, traditional glaucoma surgery, glaucoma laser surgery, and cataract surgery.

Dr. Shukla completed her undergraduate studies as a Trustee and Renaissance Scholar at the University of Southern California. She received her medical degree at Columbia University College of Physicians and Surgeons in New York City, where she was awarded a Doris Duke Clinical Research Fellowship and earned the Edith and Denton McKane Memorial Award for Outstanding Research in Ophthalmology. She completed her training as an ophthalmology resident and served as chief resident at Columbia University's Harkness Eye Institute. She pursued further glaucoma subspecialty training at the Wilmer Eye Institute at Johns Hopkins University in Baltimore, MD. Prior to her appointment at Columbia University, she served as glaucoma faculty at the Wills Eye Hospital in Philadelphia, PA.

Dr. Shukla has published numerous peer-reviewed articles, book chapters, and has been invited to speak nationally and internationally on her patient care and research. She serves on the Editorial Board of Ophthalmology Glaucoma. Her work has earned several awards and research grants including the American Glaucoma Society (AGS) Mentoring for Advancement of Physician Scientists Grant and the American Academy of Ophthalmology (AAO) Best Paper Award. She was awarded the American Society of Cataract and Refractive Surgery (ASCRS) International Service Grant for her involvement in global health initiatives in India, Guatemala, Mexico, Honduras, and other countries.

Her main research interests include early detection of glaucoma, glaucoma progression, surgical outcomes, and healthcare disparities in glaucoma. She is continually inspired by her patients and aims to improve their quality of life while treating their glaucoma.

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

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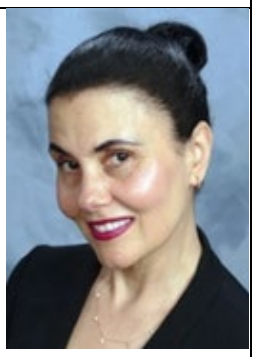
| 11:00-12:00 | ?<br>Michael Goldberg, MD<br>Columbia University, New York, USA<br>David Mahoney Professor of Brain and Behavior (in Neuroscience)<br>Professor of Neurology (in Psychiatry and Ophthalmology)<br><br>  <br>Dr. Goldberg is the Director of the Mahoney Center for Mind and Brain at Columbia University. He is known internationally for his groundbreaking contributions to understanding mechanisms of cognitive processes in the brain, including the basis of visual attention, the perception of space and the generation of movement. For his outstanding contributions to the field of neuroscience, Dr. Goldberg was elected to the USA National Academy of Science and received numerous awards. |
| 12:00-1:00 | LUNCH |
| 1:00-2:00 | **Neuroinflammation in Glaucoma**<br>Gülgün Tezel, MD<br>Columbia University, New York, USA<br>Professor of Ophthalmic Sciences<br><br>  <br>Dr. Tezel is a scientist in the field of glaucoma with laboratory research experience and clinical experience. Her translational research aims to better understand the cellular and molecular mechanisms of glaucomatous neurodegeneration to develop new strategies for treatment. Through the studies of in vitro and in vivo experimental models of glaucoma and studies in humans, Dr. Tezel's research has provided important insights in signaling pathways of retinal ganglion cell death, neuron-glia interactions, and immune/inflammatory responses in glaucoma. Ongoing studies in her laboratory focus on inflammation signaling and oxidative stress. She also studies cell type-specific proteomic alterations by functional testing which include pharmacological and transgenic strategies. Dr. Tezel's current work also includes the analysis of molecular and imaging-based biomarkers to test the relevance of recent experimental data to human disease and improve the clinical diagnosis of glaucoma. |
| 2:00-3:00 | **Esotropia**<br>Lauren B. Yeager, MD<br>Assistant Professor of Ophthalmology at CUMC<br><br>Lauren Yeager, MD graduated Phi Beta Kappa from the Honors College at the University of Michigan with a degree in Biopsychology and Cognitive Science. She received her medical degree from Boston University School of Medicine and then completed an internal medicine internship at Mount Sinai Hospital in New York, New York. She completed a general ophthalmology residency at State University of New York (SUNY) Downstate Medical Center and then went on to complete a fellowship in pediatric ophthalmology and strabismus at Children's National Medical Center in Washington, DC. |

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| | Dr. Yeager specializes in pediatric and adult strabismus, as well as the treatment of all childhood eye conditions. She is fellowship trained to perform a wide variety of pediatric ophthalmic surgeries, including pediatric cataract surgery, anterior segment surgery, lacrimal system surgery, and eyelid surgery. Dr. Yeager is interested in international health care and has participated in multiple medical and surgical mission trips to the Dominican Republic. She has also presented at numerous national meetings, including the Association for Research in Vision and Ophthalmology, the Constenbader Society, and the American Society of Ophthalmic Plastic and Reconstructive Surgery. |

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

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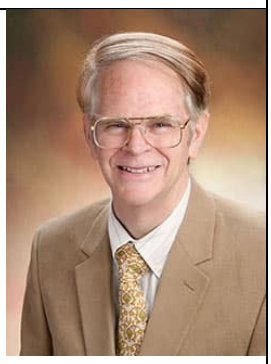
| 3:00-4:00 | **Introduction to Strabismus: classification, sensory and motor testing**<br>  <br>Sonali Dalal Talsania, MD<br>Assistant Professor of Ophthalmology at CUMC<br><br>Sonali D. Talsania, MD specializes in the ophthalmologic care of children and the surgical treatment of strabismus in both children and adults. She conducts general pediatric ophthalmologic exams and provides surgical and medical care for a variety of pediatric ophthalmologic conditions, including blocked tear ducts, amblyopia, childhood cataracts, dermoid cyst removal, and eyelid droop repair.<br><br>She graduated summa cum laude from Harvard College with a degree in Biology (focus: Neurobiology) and was elected to the Phi Beta Kappa Society. She received her medical degree from Harvard Medical School and completed an internship at Cambridge Health Alliance, a Harvard training hospital. She then did her residency at Boston Medical Center, affiliated with Boston University. During residency, she was recognized for her work teaching medical students and received an award for her research in orbital cellulitis in children. She completed a fellowship in pediatric ophthalmology and strabismus at the Duke Eye Center and practiced for several years in South Florida before joining Columbia.<br><br>Dr. Talsania is a member of the American Academy of Ophthalmology, as well as the American Association for Pediatric Ophthalmology and Strabismus. She has published in the field of pediatric ophthalmology on the topics of strabismus following glaucoma drainage device implantation and pediatric corneal cross-linking for keratoconus. She was selected as the Jonas Scholar for her work in pediatric ophthalmology at Columbia. She focuses on providing thoughtful care to patients of all ages, and is also dedicated to teaching residents, for which she was honored with the John Wheeler Martin Memorial Teaching Award. |
| 4:00-5:00 | ?<br>  <br>Douglas C. Wallace, PhD<br>Director of the Center for Mitochondrial and Epigen omic Medicine at Children's Hospital of Philadelphia.<br>Michael and Charles Barnett Endowed Chair in Pediatric Mitochondrial Medicine and Metabolic Diseases.<br><br>More than 35 years ago, Dr. Wallace and his colleagues founded the field of human mitochondrial genetics. The mitochondria are the cellular power plants, organelles that generate most of the cell's energy. The mitochondria also contain their own DNA, the mitochondrial DNA (mtDNA), which encodes the wiring diagram for the cell's power plants. Dr. Wallace showed that the mtDNA is inherited exclusively from the mother and that genetic alterations in the mtDNA can result is a wide range of metabolic and degenerative diseases as well as being important in cancer and aging. |

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| | One of his seminal contributions has been to use mtDNA variation to reconstruct the origin and ancient migrations of women. These studies revealed that humans arose in Africa approximately 200,000 years ago, that women left Africa about 65,000 years ago to colonize Eurasia, and from Siberia, they crossed the Bering land bridge to populate the Americas. Studies on the paternally-inherited Y chromosome showed that men went along too. |

# Friday, February 3

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| 9:00-12:00 | **Genetics of common age-related eye diseases**<br>Chris Hammond, MD<br>Professor at King's College London<br>United Kingdom<br><br>  <br><br>Professor Chris Hammond is a highly experienced ophthalmologist based in London who has over 20 years of experience. He treats ophthalmological diseases like squint, myopia, and cataracts in both adults and children. In addition, Professor Hammond is one of the leading international researchers into the genetic epidemiology of common eye diseases, including cataracts, glaucoma, myopia (short sight), dry eye disease and age-related macular degeneration.<br><br>He's won several fellowships and awards, including the prestigious NIHR Senior Research Fellowship in 2008 for his innovative and groundbreaking research. Professor Hammond currently serves as frost chair of ophthalmology at King's College London and can be found at his private clinic or St. Thomas' Hospital. He has been the frost professor of ophthalmology at King's College London and a consultant at Guy's and St Thomas' since 2011.<br><br>He was a senior registrar at St Thomas' and completed his paediatric ophthalmology and strabismus fellowship at Moorfields Eye Hospital, all in London. He was appointed as a consultant at Bromley Hospitals NHS Trust in 2000. Professor Hammond has previously been training as programme director and regional adviser for the London Deanery/RCOphth and is the ophthalmology lead for the London (South) Comprehensive Local Research Network. Professor Hammond's research group is based in the department of twin research at Guy's and St Thomas' and identifies genetic variants associated with these eye conditions, looking at environmental and genetic factors and their interactions. |
| 12:00-1:00 | **LUNCH** |

1:00-2:00

## Early Eye Development: A complex morphogenetic process

Ales Cvekl, Ph.D.
Professor, Department of Ophthalmology & Visual Sciences
Professor, Department of Genetics
The Max Berger Chair in Ophthalmology
Vice Chair for Research Department of Ophthalmology & Visual Sciences
Albert Einstein College of Medicine

We are also studying the biology of lens fiber cell nuclei as transcriptional factories for crystallin gene synthesis. The crystallin encode highly abundant lens structural proteins that accumulate in elongating lens fiber cells and are required for lens transparency and its refraction. We are interested in nascent transcription/transcriptional bursting, mRNA splicing and transport, crystallin mRNA stability control, and their translational regulation. Multiple RNA-binding proteins were recently identified in different lens compartments.

The differentiating lens fiber cells degrade all intracellular organelles to reduce linght scattering. Or recent studies revealed that Bnip3l is required for degradation of mitochondria, endoplasmic reticulum nad Golgi apparatus. Mutations in ATP-dependent chromatin remodeling enzymes Brg1/Smarca4 and Snf2h/Smarca5 and transcription factor Gata3 in lens prevent nuclear degradation. The molecular processes that govern nuclear degradation in mature lens fibers remain poorly understood. Novel insights include use of single molecule RNA FISH and bi-directional transfer of proteins between the nucleus and cytoplasm.

Recently, we developed a new procedure to differentiate lens progenitor cells and differentiated lentoid bodies from human embryonic stem (ES) cells. This system is currently being used to study the earliest stages of human lens formation and to generate lens organoids. In addition, we are interested to develop high-throughput drug screening platforms using differentiated ES cells to manipulate gene expression in lentoid bodies and retinal pigmented epithelium to study mechnaisms in cataractogenesis and age-related macular degeneration.

Our research has implications for the identification, prevention, and treatment of inherited ocular diseases, and for a better understanding of the genetic components of age-related ocular diseases, such as cataract and age-related macular degeneration. In addition, some genes essential for eye development, such as Pax6, play important roles in the formation of other organs, including brain and pancreas. Several novel roles of PAX6 are used to explain differences between primate and rodent brains. Our studies also have impact on understanding of eye evolution and formation of new genes through gene duplication.

# 2023 BASIC SCIENCE COURSE IN OPHTHALMOLOGY

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| 2:00-3pm | **Retinal Imaging – OCT and Beyond**<br>Gadi Wollstein, MD<br>Professor, Department of Ophthalmology at NYU Grossman School of Medicine<br>Director, Research Education<br>  <br>MD from Hebrew University Hadassah Medical School<br>Fellowship, Tufts Medical Center, Boston, MA, Glaucoma<br>Fellowship, Moorfields Eye Hospital, London, UK, Glaucoma<br>Residency, Shaare Zedek Medical Center, Jerusalem, Israel, Ophthalmology<br>My research focuses on diagnosing ocular diseases, monitoring their progression and improving the understanding of the pathophysiology of ocular diseases through the use of advanced ocular imaging technologies. |
| 3:00-4:00 | **CLOSING CEREMONY** |
| 5:00 – 7pm | **MIXER – Faculty Club P&S 4th floor** |