

## CURRICULUM VITAE

Updated August 7, 2018

### PART I: General Information

**Name:** Joseph Felix Rizzo, III

### Education:

1974 B.S. (Biology and Chemistry), Louisiana State University  
1978 M.D. (Medicine), Louisiana State University, New Orleans, LA

### Postdoctoral Training:

07/78-06/79 Intern in Adult Medicine, University of Southern California/Los Angeles  
County Hospital  
07/79-06/82 Resident in Neurology, Tufts/New England Medical Center  
07/82-06/85 Resident in Ophthalmology, Boston University School of Medicine  
07/85-06/86 Clinical Fellow, Neuro-Ophthalmology, Massachusetts Eye and Ear  
Infirmary/Harvard Medical School (Mentor: Simmons Lessell, M.D.)  
07/86-06/01 Laboratory of Richard Masland, Ph.D., Massachusetts General Hospital

### Licensure and Certification:

1979 Massachusetts Medical License  
1984 Board-Certified, American Board of Psychiatry and Neurology  
1987 Board-Certified, American Board of Ophthalmology

### Academic Appointments:

1986-1988 Instructor in Ophthalmology, Harvard Medical School, Boston, MA  
1986-1990 Clinical Research Affiliate, Massachusetts Institute of Technology,  
Cambridge, MA  
1989-1998 Assistant Professor of Ophthalmology, Harvard Medical School, Boston,

MA  
1990- Research Affiliate, Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge, MA  
1998-2010 Associate Professor of Ophthalmology, Harvard Medical School, Boston, MA  
2010- Professor of Ophthalmology, Harvard Medical School, Boston MA  
2011- David G. Cogan Professor of Ophthalmology in the Field of Neuro-Ophthalmology

**Hospital or Affiliated Institution Appointments:**

01/86-12/86 Assistant in Ophthalmology, Associate Staff, Massachusetts Eye and Ear Infirmary, Boston, MA  
01/87-12/97 Assistant in Ophthalmology, Active Staff, Massachusetts Eye and Ear Infirmary, Boston, MA  
01/98- Associate Surgeon, Massachusetts Eye and Ear Infirmary and the Massachusetts General Hospital, Boston, MA  
06/03- Clinical Associate: Surgery Service/Ophthalmology, Massachusetts General Hospital, Boston, MA

**Other Professional Positions and Major Visiting Appointments:**

1994-1997 Quarterly Visiting Physician, Rhode Island Hospital, Department of Ophthalmology  
2010-2015 Scientific Consultant, NASA  
2015- Medical Consultant, Magic Leap, Inc.  
2015- Data Safety Monitoring Board, Gensight, Inc, Paris/New York

**Hospital and Health Care Organization Clinical Service Responsibilities:**

1986- Staff Attending, Ophthalmology, Massachusetts Eye and Ear Infirmary

**Major Administrative Responsibilities:**

1991-2015 Director, Neuro-Ophthalmology section, Lancaster Course in Ophthalmology, Waterville, ME  
2001- 2011 Director, Center of Innovative Visual Rehabilitation, Veterans Administration Hospital, Jamaica Plain, Boston  
2006- Director, Neuro-Ophthalmology Service, Massachusetts Eye and Ear Infirmary  
2006-2018 Director, Neuro-Ophthalmology Fellowship program, Massachusetts Eye and Ear Infirmary and across the Harvard Hospitals  
2010- Director of Alumni Association, Massachusetts Eye and Ear Infirmary

**Major Committee Assignments: Affiliated Institution**

1989-2008 Fellowship Committee, Massachusetts Eye and Ear Infirmary  
1990-2012 Medical Records Committee [Chairperson], Massachusetts Eye and Ear Infirmary  
1991-2010 Patent Committee, Massachusetts Eye and Ear Infirmary

- 1992- Residency Selection Committee, Massachusetts Eye and Ear Infirmary
- 1997-2001 Joint Governing Committee, Schepens-Massachusetts Eye and Ear Infirmary Study Unit
- 2006-2010 Strategic Planning Committee, Massachusetts Eye and Ear Infirmary
- 2016-2017 Summit Committee member, to explore internal funding opportunities for the Massachusetts Eye and Ear Infirmary

**Professional Societies:**

- 1980 Massachusetts Medical Society, Member
- 1984 American Academy of Neurology, Member
- 1985- American Academy of Ophthalmology, Member
- 1987- Association for Research in Vision and Ophthalmology, Member
- 1987- North American Neuro-Ophthalmic Society, Member
  - Scientific Program Committee, 1991-1996
  - Secretary, 1992-1994
  - Chairperson, Abstracts Subcommittee, 1992-1995
  - Certification and Accreditation Committee, 1993-1999
  - Education Committee, 1993-2006
  - Research Symposium Planning Committee, 1993-1995
  - Nominations Committee, 1993-2000
  - Fellowship Committee, 2004-
  - Frank B. Walsh Committee, 2004-2009
- 1987-1995 Frank Walsh Society, Member
- 1988- American Medical Association, Member
- 1988-1995 Massachusetts Society of Eye Physicians and Surgeons, Member
- 1991-2005; New England Ophthalmological Society, Member
- 2015-
- 2018- Treasurer, New England Ophthalmological Society

**Community Service Related to Professional Work:**

- 1993-1994 Member, Medical Advisory Board Member Registry of Motor Vehicles, Commonwealth of Massachusetts
- 1994- Member, Medical Advisory Board Myasthenia Gravis Foundation, Massachusetts Chapter
- 2016 - Member, Board of Trustees, Carroll Center for the Blind, Newton, MA

**Entrepreneurship and Corporate Activities:**

- 2012 Co-Founder, Bionic Eye Technologies
- 2012 Co-Founder, Visus Technologies
- 2014- Medical Advisor, Magic Leap

**Editorial Boards:**

- 2003-2004 Ad-Hoc Editorial Board Member, Investigative Ophthalmology and Visual Science

- 2004-2010 Editorial Board Member, Investigative Ophthalmology and Visual Science
- 2010-2017 Associate Editor, Investigative Ophthalmology and Visual Science.

**Awards and Honors:**

- 1972 Phi Beta Sigma, Honor Society, Louisiana State University
- 1975 Phi Kappa Phi, Honor Society, Louisiana State University
- 1976 Ciba Award (presented to the person contributing the most to the medical school class), Louisiana State University School of Medicine
- 1978 Dean's Award for "Overall Excellence", Louisiana State University School of Medicine
- 1995 Special Award , Xth Congress European Society of Ophthalmology, Milan, Italy
- 2004 Bartemeus Award (for leadership within the field of retinal prosthetics), Detroit Institute of Ophthalmology
- 2007 Senior Achievement Award, American Academy of Ophthalmology
- 2009 ARVO Fellow Award, The Association for Research in Vision and Ophthalmology
- 2013 The Schwartz Center Compassionate Caregiver Award”, Honorable Mention
- 2013 “Top Innovator” Award, Life Sciences and Healthcare. Young Start Up Ventures, Sponsored by the New York Venture Summit,
- 2013 ARVO Gold Fellow Award, The Association for Research in Vision and Ophthalmology

**Part II: Research, Teaching, and Clinical Contributions**

**A. Narrative report of Research, Teaching, and Clinical Contributions**

I am a Neuro-Ophthalmologist and a physician scientist, and I direct a research project to develop a retinal prosthesis to restore vision to the blind. My professional time is nearly equally divided between clinical work and research, with additional time allocations for teaching (10%) and administrative responsibilities (5%). An overview of my areas of primary focus is provided below.

Research

My research is dedicated toward either studying the mechanisms of visual loss, improving our diagnostic methods for blinding diseases, or developing new treatments for blinding diseases.

Basic Science and Translational Research. I founded the Boston Retinal Implant Project (BRIP) in the late 1980s, and I have since served as co-director of the Project. The BRIP is a multi-disciplinary research initiative that is based at the Massachusetts Eye and Ear Infirmary and the Massachusetts Institute of Technology. The goal of the BRIP is to develop a retinal prosthesis to offer a new therapeutic option for patients who have acquired blindness. Our team also is exploring the use of our technology at the level of the lateral geniculate nucleus as a strategy to restore vision for a wider range of blinding conditions.

My primary roles on the Project have been to: 1) set the strategic direction of the Project; 2) perform administrative duties, including hiring and firing of research and administrative staff; 3) coordinate the biological initiatives with our team of engineers; and 4) develop in-vivo techniques related to development of a retinal prosthesis. Regarding the latter, my most recent interest is the development of a technological platform to study the neural code of vision, which I believe will help inform our approach to deliver electrical stimulation to blind patients to create visual images.

### Clinical Research

My clinical research has focused primarily on the study of optic neuritis/multiple sclerosis, ischemic optic neuropathy, pseudotumor cerebri and giant cell arteritis. I have completed three significant clinical research studies that have influenced the diagnosis and treatment of optic neuritis and ischemic optic neuropathy, which are the two most common forms of non-glaucomatous optic neuropathy in adults. Some of my significant findings include: 1) recognition that all women and most men who experience optic neuritis eventually developed multiple sclerosis; 2) the demonstration of a significant overlap in the clinical profiles of optic neuritis and ischemic optic neuropathy; and 3) the recognition that magnetic resonance imaging (MRI) provides the most objective method to distinguish between these two disorders. The improved diagnostic accuracy obtained by MRI reduces the potential that patients with ischemic optic neuropathy might be unnecessarily treated as if they had multiple sclerosis. My work also included the first observation of optic neuropathy in Familial Dysautonomia, and occult large vessel occlusive disease of the retina and choroid as a cause for persistent monocular visual loss.

### Teaching

I share responsibility for supervision and teaching of one clinical fellow and eight residents per year in the basic evaluation and management of Neuro-Ophthalmic disorders. I provide one-on-one instruction to residents, fellows and medical students on the Neuro-Ophthalmology rotation, and I deliver approximately 35 lectures per year on a wide range of clinical problems. As director of the Neuro-Ophthalmology service, I also design and provide oversight for our fellowship training program. For 25 years, I served as Director of the Neuro-Ophthalmology section of the Lancaster course in Ophthalmology, which is the oldest and largest educational course that is designed for residents-in-training.

### Clinical Care

I deliver medical care to patients only at the Massachusetts Eye and Ear Infirmary, where I practice as one of three full-time Neuro-Ophthalmologists. I evaluate roughly 40% of all patients referred to our service. My practice is primarily one of diagnostic consultation for a wide range of visual disturbances that result from damage to the eye or brain.

### Intersection Among Professional Activities

My goal in becoming a physician-scientist has been to deliver high quality care to individual patients while performing research to hopefully help a much larger number of patients than I would ever meet. My interactions with severely blind patients led me to establish my research project to develop a retinal prosthesis. The scientific knowledge that I gain from my basic/ translational research has helped to improve my ability to understand the problems that affect my patients.

## Entrepreneurship

I have founded two companies related to rehabilitation of patients with visual impairments: Bionic Eye Technologies and Visus Technology. Bionic Eye Technologies has developed a bio-electronic, implantable retinal prosthesis designed to restore vision to the blind by electrical stimulation applied to the retina. Visus Technology has developed a portable, sensory substitution device, using "apps" on a phone, to provide assistance to the visually-impaired. Technology developed by Visus has been commercialized in partnership with Verizon.

## **B. Funding Information**

- 1986-1991 Physician Scientist Award, National Eye Institute, National Institutes of Health, Title: "Identification of Sub-Populations of Human Retinal Ganglion Cells"
- 1988- Principal Investigator, Lion's Club (yearly application, with continuous funding), Title: "Development of a Silicon Retinal Implant to Restore Some Vision to Blind Patients"
- 1990-1996 Co-Principal Investigator, Seaver Foundation, Title: "Development of a Silicon Retinal Implant to Restore Some Vision to Blind Patients"
- 1991-1992 Principal Investigator, The E. Matilda Ziegler Foundation for the Blind, Inc., Title: "Development of a Silicon Retinal Implant to Restore Some Vision to Blind Patients"
- 1991-1996 Consultant, National Institute on Aging, P01-AG09976, Title: "Sleep, Aging and Circadian Rhythm Disorders"
- 1994-1996 Principal Investigator, Joseph Drown Foundation, Title: "Development of a Silicon Retinal Implant to Restore Some Vision to Blind Patients"
- 1994-1999 Collaborator, National Institutes of Health, Title: "The Role of Human Visual Cortex in Perception"
- 1996-1997 Principal Investigator, Grousbeck Foundation, Title: "Development of a Silicon Retinal Implant to Restore Some Vision to Blind Patients"
- 1997-2001 Co-Principal Investigator, Catalyst Foundation, New York, Title: "Retinal Implant Chip for the Blind"
- 1997-2001 Co-Principal Investigator, Keck Foundation, Title: "Development of a Silicon Retinal Implant to Restore Vision to the Blind"
- 2000-2001 Principal Investigator, Wynn Foundation, Title: "Retinal Electrical Stimulation of Patients with RP"
- 2000-2003 P.I., Foundation Fighting Blindness, Grant #: T-VP-1000-69, Title: "In Vitro Electrical Stimulation of Retinas"
- 2000-2005 Co-Principal Investigator, National Institute of Health, Sub-Contract with Second Sight, Title: "Development/Testing of Artificial Retinas for the Blind"
- 2001-2006 Principal Investigator, Veterans Administration, Title: "Center of Excellence Project to Support the Center for Innovative Visual Rehabilitation"
- 2002-2003 Principal Investigator, Veterans Administration, Equipment grant to support development of a retinal prosthesis
- 2002-2004 Principal Investigator, Veterans Administration, Title: "High Density Feedthroughs for Implantable Prosthesis Packages"
- 2003-2007 Supervisor/Investigator, Catalyst Foundation, Title: "Second Generation Retinal Implant for the Blind"
- 2004-2006 Principal Investigator, Veterans Administration, Title: "Development of a Biocompatible Retinal Prosthesis"

- 2005-2007 Principal Investigator, Defense Applied Research Program Agency (DARPA), NEOVISION Program, Title: "Study of the Interface between the Retina and a Custom Designed Stimulator Chip"
- 2005-2008 Principal Investigator, National Science Foundation, Title: "Development of a Technological Platform to Study the Neural Code of Vision"
- 2006-2011 Principal Investigator, Veterans Administration, Title: "Center of Excellence" grant (second cycle of funding) to support the "Center for Innovative Visual Rehabilitation"
- 2007-2008 Principal Investigator, TATRC: United States Army Medical Research and Material Command, Title: "Development of a Modular, Configurable Retinal Prosthesis"
- 2007-2008 Sub-Contractor (P.I.), National Institutes of Health (SBIR Grant), Title: "Functionalized Coatings for Enhanced Neural Interfaces"
- 2007-2009 Principal Investigator, Department of Defense, Title: "Optimization of Microelectronic Methods to Produce an Implantable Retinal Prosthesis to Treat Blindness"
- 2009-2010 Sub-Contract P.I., N.I.H., ARRA Advanced Engineering Development of a Chronic Retinal Implant
- 2010-2011 Principal Investigator, U.S. Department of Veterans Affairs, Title: "Objective Diagnosis of Mild Blast-Induced TBI".
- 2010-2013 Principal Investigator, U.S. Department of Veterans Affairs, Title: "Use of Penetrating Electrodes in the Boston Retinal Prosthesis."
- 2011-2013 Principal Investigator, Cures for Kids, Title: "Development of an Advanced "Smart Glasses" Prototype to Provide Navigation Assistance for Blind Children."
- 2014-2017 Principal Investigator, National Institutes of Health. Title: Preclinical Preparation for the Boston Retinal Implant Device. 1 U01 EB018873-01
- 2016- 2019 Principal Investigator, National Institutes of Health. Title: Preclinical Testing for the Boston Retinal Implant Prosthesis with Penetrating Electrodes. 1 R01 EB022013-01
- 2016-2018 Principle Investigator, Department of Defense Office of the Congressionally Directed Medical Research Programs. Title: "Central Visual Prosthesis with Interface at the Lateral Geniculate Nucleus". MR152018

**C. Report of Other (Non-Funded) Activities**

- P.I. Incidence of Polycystic Ovarian Syndrome and Idiopathic Intracranial Hypertension
- P.I. Screening of a Battery of Tests to Identify Better Means of Assessing Vision in Severely Blind Patients
- P.I. Observational Study of Neoplastic Infiltrative Optic Neuropathy
- P.I. fMRI Study of Visual Cortical Plasticity in Patients Who Are Blind from Retinitis Pigmentosa and Age-Related Macular Degeneration
- P.I. "Anatomical Study of the Anatomy of the Carotid Siphon Using Three-Dimensional Magnetic Resonance Angiography."
- P.I. "Study of the Use of Optical Coherence Tomography to Study the Anatomy of Edematous Optic Nerve Heads."
- Collaborator National Institutes of Health, Grant Awarded to NORDIC: Prospective Study of Idiopathic Intracranial Hypertension.
- Collaborator Pfizer Incorporated. Prospective Study of Blindness Associated with the

Use of PDE-5 Inhibitor Drugs.

## D. Report of Teaching

### 1. Local Contributions

#### a. Medical School Courses

1990-1991	<u>Course in Human Nervous System and Behavior - New Pathway Curriculum</u>			
	Tutor	10 Medical Students	<i>contact time</i> 2 hours/week for 5 week(s)	<i>prep time</i> 1 hours/week for 5 week(s)
1990-1991	<u>Neurobiology Lecture, "The Retinal Anatomical Basis of Afferent Visual Function"</u>			
	Lecturer	50 Medical Students	<i>contact time</i> 2 hours/year for 1 year(s)	<i>prep time</i> 1 hours/year for 1 year(s)
1992-2009	<u>Introduction to Neuroscience; Health Sciences and Technology</u>			
	Lecturer	40 Medical Students	<i>contact time</i> 2 hours/year for 1 year(s)	<i>prep time</i> none reported

#### b. Graduate Medical Courses

1986-	<u>Neuro-Ophthalmology Lecture Series; Massachusetts Eye and Ear Infirmary</u>			
	Lecturer	10 Residents 10 Other Students	<i>contact time</i> 5 hours/year for 28 years	<i>prep time</i> 5 hours/year for 15 28 years
1989	<u>Schepens Eye Research Institute, "Neuro-Ophthalmological Aspects of Retinal Disease"</u>			
1989-2002	<u>Neuro-Ophthalmology section Harvard-Post Graduate Review course for Ophthalmologists, Harvard Medical School</u>			
	Lecturer	75 Graduate Students	<i>contact time</i> 4 hours/year for 15 year(s)	<i>prep time</i> 6 hours/year for 15 year(s)
1991-	<u>Lancaster Course in Ophthalmology: Neuro-Ophthalmology Section. Waterville, ME</u>			
	Lecturer	40-60 Attendees	<i>contact time</i> 15 hours/year for 25years	<i>prep time</i> 10hours/year for 25 years
1992	<u>Emergency Lecture Series: "Neuro-Ophthalmic Complications of Ocular Trauma"</u>			



### **c. Local Invited Presentations**

#### Annual Invited Lecturer

1995-"Ocular Myasthenia", Myasthenia Gravis Support Group of Massachusetts  
2001-"Neuro-Ophthalmic Manifestations of Chiasmal Disease", Neuro-Endocrinology  
2008 Service, Massachusetts General Hospital

1999 Commencement Address: Resident and Fellowship Graduation Ceremony,  
Massachusetts Eye and Ear Infirmary

#### Grand Rounds

1986 "Optic Neuritis and Multiple Sclerosis", Department of Neurology, Beth Israel  
Deaconess Medical Center, Boston  
1986 "Transient Monocular Blindness", Department of Neurology, Saint Elizabeth's  
Hospital, Brighton  
1986 "Optic Neuritis and Multiple Sclerosis", Department of Ophthalmology, Boston  
University School of Medicine, Boston  
1986-Ophthalmology Grand Rounds, Department of Ophthalmology, Massachusetts  
1996 Eye and Ear Infirmary, Boston  
1987 "Optic Neuritis and Multiple Sclerosis", Department of Ophthalmology, Tufts/New  
England Medical Center, Boston  
1987 "Clinical Aspects of Afferent Pathway Disease", Department of Ophthalmology,  
Boston University School of Medicine, Boston  
1987 "Risk of Developing Multiple Sclerosis after Optic Neuritis", Department of  
Neurology, Massachusetts General Hospital, Boston  
1988 "Optic Neuritis and Multiple Sclerosis", Department of Neurology, Brigham and  
Women's/Beth Israel Hospital, Boston  
1989 "Optic Neuritis and Multiple Sclerosis", Department of Ophthalmology, Tufts/New  
England Medical Center, Boston  
1990 "Clinical Aspects of Afferent Pathway Disease", Department of Ophthalmology,  
Tufts/New England Medical Center, Boston  
1992 "Diagnosis and Management of Optic Neuritis", Department of Ophthalmology,  
Children's Hospital, Boston  
1993 "Clinical Vignettes that Reveal Aspects of Neuronal Behavior", Department of  
Neurology, Massachusetts General Hospital, Boston  
1993 "Clinical Vignettes that Reveal Aspects of Neuronal Behavior", Department of  
Ophthalmology, Lahey Clinical Medical Center, Burlington, MA  
1994 "ATP Deficiency Optic Neuropathy", Department of Ophthalmology, Tufts/New  
England Medical Center, Boston  
1996 "New Treatment and Concepts of Transient Monocular Blindness", Department of  
Neurology, Tufts/New England Medical Center, Boston  
1999 "Development of a Silicon Retinal Prosthesis", Department of Neurosurgery,  
Massachusetts General Hospital, Boston  
2000 "Development of a Silicon Retinal Prosthesis", Department of Neurology,  
Massachusetts General Hospital, Boston  
2002 "Neuro-Ophthalmic Manifestations of Myasthenia Gravis", Department of  
Neurology, Tufts/New England Medical Center, Boston  
2005 "Ophthalmic Aspects of Giant Cell Arteritis", Department of Rheumatology, Boston  
University School of Medicine, Boston  
2011 "The Boston Retinal Implant Project: Status and Competitive Landscape,"  
Massachusetts Eye and Ear Infirmary, Boston

- 2011 "The VA-Based Program on Retinal Prosthetics: Our Progress and a Status Report on this Field of Research," Department of Veterans Affairs, Veterans Hospital, Jamaica Plain
- 2014-New England College of Optometry, "Central Disorders of Ocular Motility", 3 hours
- 2015 Boston University, Clinical Neuroscience Grand Rounds, "Ocular Stroke"
- 2015 Harvard Medical School student presentations of interesting cases, Neurology service
- 2015 Rheumatology Service Grand Rounds, Massachusetts General Hospital. "Causes of Visual Loss in Giant Cell Arteritis".

#### Invited Lecturers

- 1991-"Retro-Chiasmal Syndromes", New England College of Optometry
- 1995
- 1996 "Overlapping Clinical Features of Retinal and Optic Nerve Disease" and "Retinal Basis for Visual Function", Tufts/Boston University Combined Resident Lecture Series
- 1997 "Management of Temporal Arteritis", Division of Ophthalmology, North Shore Medical Center
- 1997 Vision Rehabilitation Service, Massachusetts Eye and Ear Infirmary
- 1997 "Clinical Overview of the Ocular Motor System", Tufts/Boston University Combined Resident Lecture Series
- 2005 "The Use of Modern Technology to Restore Vision to the Blind", Boston Museum of Science
- 2006 "Development of a Retinal Prosthesis to Restore Vision to the Blind: The Changing Landscape of Military Ophthalmology", Schepens Eye Research Institute, Boston
- 2014 Presidents Lecture, Massachusetts Eye and Ear Infirmary

#### Research Presentation

- 1991 "Retinal Transplantation", Department of Anatomy and Neurobiology, Boston University Graduate Seminar series, Boston
- 1993 "Development of a Silicon Retinal Prosthesis", Massachusetts Institute of Technology Colloquium
- 2002 Center for Innovative, Minimally Invasive Technology, "Development of a Retinal Prosthesis", Massachusetts General Hospital
- 2004 "Puzzling, Retrospective Perceptual Results from Electrical Stimulation of Human Retina", Department of Anatomy and Neurobiology, Boston University School of Medicine, Boston
- 2008 "Development of a Retinal Prosthesis," Lion's Club
  
- 2009 Development of a Retinal Prosthesis, Boston University, Department of Biomedical Engineering.

#### Seminar

- 1990 "Paraneoplastic Retinopathy", Schepens Eye Research Institute
- 1991 "Optic Neuropathies Masquerading as Retinopathy", Schepens Eye Research Institute, Boston
- 1995 "Management of Temporal Arteritis", Springfield Ophthalmology Association, Springfield, MA
- 2007 1st Harvard - wide Neural Prosthesis Seminar, Harvard Medical School

- 2008 "Ischemic Optic Neuropathy", Tufts Medical School
- 2009 Myasthenia Gravis, New England Ophthalmologic Society
- 2010 Clinical, Assessment, and Intervention Updates in Neurorehabilitation, The Inn at Longwood, Boston
- 2011 Research and Clinical Advisory Panel (RCAP) for NASA's Visual Impairment/Intracranial Pressure (VIIP) Risk, Houston, TX
- 2016 Medial Laboratory, Massachusetts Institute of Technology. "Massive Data Sets"
- d. Continuing Medical Education Courses**
- 1987 New England Ophthalmological Society, "Optic Neuritis and Multiple Sclerosis"
- 1989-Neuro-Ophthalmology Fall Festival (bi-annual; 8 events in total)
- 1989 Symposium on Head Trauma, Spaulding Rehabilitation Hospital, Boston. "Neuro-Ophthalmic Manifestations of Closed Head Injury"
- 1989-Neuro-Ophthalmology Section (for Ophthalmologists); Harvard Post-Graduate
- 2002 Review Course in Ophthalmology
- 1990 New England Ophthalmological Society, "Partial Central Retinal Artery Occlusion"
- 1991 Course in Acute Neurology and Stroke Management, sponsored by St. Elizabeth's Hospital, Brighton, MA
- 1991 American Academy of Ophthalmology, "Traumatic Optic Neuropathy", Update Course
- 1992 New England Council of Optometrists, Regional meeting. "Clinical Overview of the Afferent Visual System"
- 1992 Practicing Ophthalmology for Primary Care Physicians, Massachusetts Eye and Ear Infirmary. "Migraine"
- 1993 New England Ophthalmological Society, "Visual Function in Alzheimer's Disease"
- 1996 New England Ophthalmological Society, "Diagnosis and Management of Temporal Arteritis"
- 1997 Clinical Update Course in Ophthalmology: "Results of the Optic Neuritis Treatment Trial" and "Paraneoplastic Retinopathy"
- 1997 New England Optometric Society, Annual Regional Meeting. "Clinical Aspects of Optic Nerve Disease"
- 2000 "New Treatments for Neo-Vascular Age-Related Macular Degeneration", sponsored by Harvard Medical School
- 2001 New England Council of Optometrists, Regional Meeting. "Retinal and Cortical Visual Field Defects in a Young Woman"
- 2001 New England Council of Optometrists, Regional Meeting. "Development of a Retinal Prosthesis"
- 2002 New England Ophthalmological Society. "Sneeze Induced Neuro-Ophthalmic Complications"
- 2003 New England Ophthalmological Society. "Ischemic Optic Neuropathy"
- 2004 New England Ophthalmological Society. "Traumatic Optic Neuropathy"
- 2005 Director, Kevin Hill Seminar in Ophthalmology on Neuro-Ophthalmology; 5 Lectures
- 2005 New England Ophthalmological Society's 18th Annual Meeting for Ophthalmic Medical Personnel. "Common Forms of Optic Neuropathies"
- 2005 New England Ophthalmological Society. "Pediatric Nystagmus"
- 2006 Chandler Visiting Lecture; Academic Organizer
- 2007 Alumni Meeting, Department of Ophthalmology, Massachusetts Eye and Ear Infirmary; Course Co-Director
- 2008-Illinois Eye Review (annual course): Overview of Clinical Neuro-Ophthalmology
- 2010 New England Ophthalmological Society. "Giant Cell Arteritis."
- 2011 Principles and Practice of Clinical Research, International Distance-Learning

Clinical Research Training Program. Harvard Medical School.

**e. Advisory and Supervisory Responsibilities in Clinical or Laboratory Setting**

- 1986-2011 19 Undergraduate and Graduate Students (10 Undergraduate; 9 Graduate). Responsibilities included: supervision of students either in our clinic or in my laboratory, reviewing theses, and jointly performing experiments.
- 1986- 240 Ophthalmology Residents and 36 Clinical Fellows for 250 hrs/year, Responsibilities include supervision during the 2 month rotation for residents for the year long commitment for fellows; supervise emergency room patients; and teach at the Massachusetts Eye and Ear Infirmary.

**f. Leadership Roles**

- 1989-2002 Director, Neuro-Ophthalmology section Harvard-Post Graduate Review course for Ophthalmologists, Harvard Medical School  
Responsibility: Preparation of lectures and hand-outs that summarize the fundamental clinical issues in the practice of neuro-ophthalmology for a six hour lecture session given once per year.
- 1991-1992 Member, Advanced Concepts in Visual Science Course Planning Committee, Massachusetts Eye and Ear Infirmary  
Responsibility: Identify topics and lecturers in emerging fields relevant to visual science.
- 1993 Organizer and Moderator, New England Ophthalmic Society Symposium on Clinical Neuro-Ophthalmology, New England Ophthalmic Society  
Responsibility: Selection of topics and choosing lecturers for a half-day symposium to approximately 200 ophthalmologists.
- 1995 Course Co-Director, "Biomedical Engineering Society, Annual Meeting", Boston, MA., Biomedical Engineering Society  
Responsibility: Prepare a four hour symposium and select speakers to review the topic of visual prostheses.
- 2007- Trustee, Schepens Eye Research Institute, The Schepens Eye Research Institute  
Responsibility: To provide oversight of The Institute's research activities
- 2008- Symposium Chair, Massachusetts Eye and Ear Infirmary Annual Alumni Meeting, Massachusetts Eye and Ear Infirmary  
Responsibility: Symposium Chair, 2008 Update on Ophthalmology
- 2013-2014 Participant and lecturer at the "Lasker/IRRF Initiative for Innovation in Vision Science", Woods Hole, MA and Janelia Farm Research Campus, Ashburn, VA
- 2014-2017 Co-Organizer of effort to develop international consensus for psychophysical methods to test vision in severely blind patients

**g. Advisees/Trainees**

<i>Training Duration</i>	<i>Name</i>	<i>Current Position</i>
1991-1992	Nick Volpe, M.D.	Professor of Ophthalmology, University of Pennsylvania, Philadelphia, PA
1992-1993	Len Levin, M.D., Ph.D.	Professor of Ophthalmology, University of Wisconsin, Madison, WI
1994-1995	Misha Pless, M.D.	Associate Professor of Neurology,

1996-1997	Judith Warner, M.D.	Massachusetts General Hospital, Boston, MA Associate Professor of Ophthalmology, University of Utah School of Medicine, Salt Lake City, UH
1997-1998	Howard Pomeranz, M.D., Ph.D.	Professor of Neuro-Ophthalmology, Long Island Jewish Hospital, Hyde Park, NY
1999-2000	David Newman-Toker, MD, PhD	Assistant Professor of Neurology, Johns Hopkins University School of Medicine
2000-2001	Michael Lee, M.D.	Associate Professor, Department of Ophthalmology, University of Minnesota, Minneapolis, MN
2001-2002	Nathalie Collignon, MD, PhD	Associate Professor of Ophthalmology, University Hospital, University of Liege, Belgium
2002-2003	Dean Cestari, M.D.	Assistant Professor of Ophthalmology, Massachusetts Eye and Ear Infirmary, Boston, MA
2003-2004	Jonathan Kim, M.D.	Associate Professor of Ophthalmology, Loma Linda University Medical Center, Loma Linda, CA
2004-2005	Susan Pepin, M.D.	Assistant Professor of Ophthalmology, Dartmouth Medical School, Hanover, NH
2006-2007	Marc Dinkin, M.D.	Assistant Professor of Neurology, Brigham and Women's Hospital, Boston, MA
2007-2008	Kenneth Chang, M.D., M.P.H.	Instructor in Ophthalmology, Harvard Medical School/Massachusetts Eye and Ear Infirmary
2008-2009	Ellen Brown-Mitchell, M.D.	Pediatric Ophthalmology Fellow, UPMC Eye Center
2008-2009	Adam Cohen, M.D.	Assistant Professor of Neurology and Neuro- radiology, Massachusetts General Hospital Faculty, Children's Hospital Boston, Department of Ophthalmology, Harvard Medical School
2009-2010	Gena Heidary, M.D., Ph.D.	
2009-2010	Ming He, M.D.	J.F. Kennedy Rehabilitation Center, New Jersey Faculty, Harvard Medical School/Massachusetts Eye and Ear; as of 2014, Clinical Trials specialist, Novartis
2010-2011	R. Stacy, MD, PhD	
2010-2011	Ivy Thornton, MD	Neuro-Ophthalmology, Cleveland
2011-2012	Cristiano Oliveira, MD	Neuro-Ophthalmology, Weill-Cornell Medical Center
2011-2012	Joshua Kruger, MD	Neuro-Ophthalmology, Hadassa Medical Center, Israel
2012-2013	Behzad Mansouri, MDPHD Philip Skidd, MD	<ul style="list-style-type: none"> <li>University of Winnipeg, Canada, Dept of Neurology</li> <li>Vermont Medical Center, Dept. of Ophthalmology</li> </ul>
2013-2014	Andrew Gross, MD	Neuro-Ophthalmology, Lake Norman Regional Medical Center, Mooresville, North Carolina

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|-----------|--|---|
| 2014-2015 | Kathleen Boudreault MD<br>Nailyn Rasool, MD<br>Crandall Peeler, MD | <ul style="list-style-type: none"> <li>• Columbia Medical School, Dept. of Ophthalmology</li> <li>• Columbia Medical School, Dept. of Ophthalmology</li> <li>• Boson University Medical Center, Dept. of Ophthalmology</li> </ul> |
| 2015-2016 | Ivana Vodopivec,MDPhD<br>Cinithi Pillai, MD<br>Olga Rosenvald, MD  | <ul style="list-style-type: none"> <li>• Harvard Medical School/Brigham and Womens Hospital</li> <li>• Downstate Medical Center, New York</li> <li>• Harvard Medical School, MGH</li> </ul>                                       |
| 2016-2017 | Aubrey Gilbert, MD, PhD<br>Marc Bouffard, MD<br>Bart Chwalisz, MD  | <ul style="list-style-type: none"> <li>• Kaiser Permanente</li> <li>• Harvard Medical School</li> <li>• Harvard Medical School/MGH</li> </ul>   |

## 2. Regional, national, or international contributions

### a. Invited Presentations

#### Regional

- 1987 "Optic Neuritis and Multiple Sclerosis", New England Ophthalmological Society[*Competitively Selected*]
- 1990 "Partial Central Retinal Artery Occlusion", New England Ophthalmological Society[*Competitively Selected*]
- 1991 "Traumatic Optic Neuropathy", American Academy of Ophthalmology; Regional Update Course[*Competitively Selected*]
- 1992 "Clinical Overlap of Optic Neuritis & Ischemic Optic Neuropathy", Rhode Island Society of Eye and Physicians and Surgeons, RI[*Invited Lecture*]
- 1992 Three lectures on clinical Neuro-Ophthalmological topics, Greater New York Ophthalmology Clinical Lecture Series, NY[*Invited Lecture*]
- 1992 "Occult Retinal and Choroidal Vascular Disease", Manhattan Eye, Ear and Throat Hospital, Department of Ophthalmology[*Grand Rounds*]
- 1993 "Occult Retinal & Choroidal Vascular Disease", Rhode Island Hospital, Providence, RI[*Ophthalmology Grand Rounds*]
- 1994 "Optic Neuritis Treatment Trial", Western Massachusetts Ophthalmological Society[*Invited Lecture*]
- 1994 "Variations on the Theme of Ischemic Optic Neuropathy", New York Hospital, Cornell Medical Center, New York[*D. Jackson Coleman Visiting Professorship*]
- 1995 "Steps Toward the Development of a Retinal Prosthesis", Biomedical Engineering Society, Annual Meeting, Boston, MA[*Invited Lecturer*]
- 1997 "Transient Monocular Blindness: New Concepts and Therapy", Department of Neurology, Brown University Medical Center, Providence, RI[*Neurology Grand Rounds*]
- 1999 "Italian-American Biomedical Exchange Symposium", Boston University, Boston, Massachusetts[*Guest Lecturer*]
- 2006 "The Relevance of Neuroscience for the Development of a Retinal Prosthesis to Restore Vision to the Blind", Boston Society of Neurology and Psychiatry, 2006[*Invited Lecturer*]
- 2006 "Development of a Retinal Prosthesis to Restore Vision to the Blind", Advanced Technologies in the Neurosciences, sponsored by Dartmouth Medical School and CIMIT, Hanover, NH[*Invited Lecture*]

- 2009 Higher Cortical Visual Impairment, Georgetown University [*Invited Lecture*]
- 2011 Harmes Lecturer in Ophthalmology. Dartmouth Medical School, Dartmouth-Hitchcock Medical Center.
- 2011 Guest Speaker, Boston College Colloquium Series, Departments of Biology and Physics.
- 2011 Speaker, "Development of the Boston Retinal Prosthesis", 33rd Annual International IEEE EMBS Conference August 30 - September 3, 2011, Boston Marriott Copley Place, Boston, MA
- 2012 "Neuro-Ophthalmic Potpourri: The clinical approach to afferent and efferent disease in the pediatric population". Pediatric Grand Rounds, Baystate Medical Center, Springfield MA
- 2014-New England School of Optometry. "Nystagmus and Other Disorders of Central Motility
- 2015 Organizer: Neuro-Ophthalmology symposium, New England Ophthalmological Society
- 2015 Speaker: New England Ophthalmological Society. "Giant Cell Arteritis"
- 2016 Speaker: New England Ophthalmological Society: "Distinguishing Cortical from Anterior Visual Loss"
- 2016 Guest Speaker, Annual meeting, Carroll Center for the Blind, Newton, MA. "New Opportunities for Advanced Visual Rehabilitation"
- 2017 Guest Speaker, New England Ophthalmological Society

### **National**

- 1986 "Optic Neuritis and the Risk of Developing Multiple Sclerosis", North American Neuro-Ophthalmic Society [*Competitively Selected*]
- 1986 "A Progressive Neurologic Syndrome Following Immunization", Frank Walsh Neuro-Ophthalmic Society [*Competitively Selected*]
- 1987 "Multiple Sclerosis Following Idiopathic Optic Neuritis", American Academy of Neurology [*Competitively Selected*]
- 1987 "Optic Neuritis and Multiple Sclerosis", University of Iowa, Iowa City, IA [*Ophthalmology Grand Rounds*]
- 1987 "Ophthalmoplegia with Congenital Hypotonia", Frank Walsh Neuro-Ophthalmic Society [*Competitively Selected*]
- 1988 "Clinical Aspects of Retinal Ganglion Cell Function", North American Neuro-ophthalmic Society [*Invited Lecture*]
- 1988 Neuro-Ophthalmology mini-symposium, "Clinical Applications of Optic Nerve Blood Flow Studies", Association for Research in Vision and Ophthalmology [*Invited Lecture*]
- 1988 "How Do We See? Retinal Anatomy Underlying Afferent Visual Function", Louisiana State University School of Medicine, New Orleans, LA [*Ophthalmology Grand Rounds*]
- 1989 "Measurement of Optic Nerve Blood Velocity as a Function of Age in Normal Subjects", North American Neuro-ophthalmic Society [*Competitively Selected*]
- 1990 "Lymphoma Affecting the Neuro-Ophthalmic Pathways", North American Neuro-Ophthalmology Society [*Invited Lecture*]
- 1990 "Paraneoplastic Retinopathy", Frank Walsh Society [*Competitively Selected*]
- 1990 "Optic Neuritis and Ischemic Optic Neuropathy", Neuro-Ophthalmology Conference; University Hospital, Washington, D.C. [*Invited Lecture*]
- 1991 "Acromegaly with Visual Loss", Frank Walsh Society [*Competitively Selected*]
- 1991 "Unconscious Sight Regulating Circadian Rhythms in a Blind Patient", Los Angeles Neuro-Ophthalmology Society, Los Angeles, CA [*Visiting Lecturer*]

- 1991 "Anatomical and Physiological Basis of Afferent Visual Function", North American Neuro-ophthalmology Society[*Seminar*]
- 1992 "ATP Deficiency; A genre of optic neuropathy", North American Neuro-Ophthalmology Society[*Competitively Selected*]
- 1992 "ATP Deficiency: A genre of optic neuropathy", University of Pennsylvania, Philadelphia, PA[*Neurology Grand Rounds*]
- 1992 Three clinical lectures, Pacific Medical Center, San Francisco, CA[*Ophthalmology Grand Rounds*]
- 1993 "Development of a Silicon Retinal Implant to Restore Some Vision to Blind Patients", Department of Ophthalmology, University of Chicago, Chicago, IL[*Guest Lecturer*]
- 1993 "Development of a Retinal Prosthesis", Louisiana State University Medical Center, New Orleans, LA[*Ophthalmology Grand Rounds*]
- 1993 "Development of a Retinal Prosthesis", Department of Ophthalmology, Mayo Clinic, Rochester, MN[*Visiting Professor*]
- 1993 "Varying the Intensity of Stimulus Light for Detection of Afferent Pupil Defects", North American Neuro-ophthalmology Society[*Competitively Selected*]
- 1993 "Management of Optic Neuritis", American Academy of Ophthalmology[*Competitively Selected*]
- 1993 "Overview of Afferent Visual Function", Southern College of Optometry, Memphis, TN[*Visiting Lecturer*]
- 1993 Case presentations and one clinical lecture, Oregon State Society of Ophthalmology, Portland, Oregon[*Annual Guest Lecturer*]
- 1993 "Development of a Retinal Prosthesis", FASEB Conference, Copper Mountain, CO[*Invited Lecture*]
- 1994 "Pathological Cupping of the Optic Nerve Head", Jules Stein Eye Institute[*Visiting Professor*]
- 1994 "Steps Toward the Development of a Retinal Prosthesis", Nashville Ophthalmological Society, Nashville, TN[*Guest Lecturer*]
- 1994 "Development of a Silicon Retinal Implant to Restore Some Vision to Blind Patients", Salk Institute, La Jolla, CA[*Invited Lecture*]
- 1994 "Overlapping Clinical Profiles of Retinal and Optic Nerve Disease", Departments of Ophthalmology and Neurology, Vanderbilt University[*Visiting Professor*]
- 1994 "Development of a Retinal Prosthesis", Department of Ophthalmology, Willis-Knighton Hospital, Shreveport, LA[*Visiting Professor*]
- 1994 "Subconscious Sight Regulating Circadian Rhythms in Several Blind Patients", North American Neuro-Ophthalmology Society[*Competitively Selected*]
- 1994 "Development of a Retinal Prosthesis", Defense Science Research Council, La Jolla, CA[*Invited Lecture*]
- 1994 "Implications of the Optic Neuritis Treatment Trial", Rhode Island Hospital[*Ophthalmology Grand Rounds*]
- 1994 "Application of Human Photoreceptor, Retinal Ganglion Cell and Occipital Cortical Density Data to Visual Field Analysis", North American Neuro-Ophthalmology Society, Tuscon, AZ[*Competitively Selected*]
- 1994 "Development of a Silicon Retinal Implant to Restore Some Vision to Blind Patients", California Institute of Technology, Pasedena, CA[*Invited Lecture*]
- 1994 "Development of a Retinal Prosthesis", University of Southwestern Louisiana, Lafayette, LA[*Plenary Lecturer, 37th Midwest Symposium on Circuits and Systems*]
- 1994 Five lectures on clinical Neuro-Ophthalmology, Los Angeles Ophthalmological Research Club, Los Angeles, CA[*Visiting Professor*]



- 1994 "Development of a Retinal Prosthesis", Smith-Ketterwell Institute, San Francisco, CA [*Invited Lecture*]
- 1994 One Clinical Lecture, Pittsburg Ophthalmological Society [*Visiting Lecturer*]
- 1994 "Compressive Optic Neuropathies", Department of Ophthalmology, National Naval Medical Center, Bethesda, MD [*Visiting Professor*]
- 1994 "Histopathology of an Adult Onset Optic Neuropathy", Frank Walsh Neuro-Ophthalmology Meeting, Washington, D.C. [*Competitively Selected*]
- 1995 "Vision Without Perception", American Academy of Ophthalmology, Atlanta, GA [*Seminar*]
- 1995 Four clinical lectures, Department of Ophthalmology, Cleveland Clinic [*Visiting Professor*]
- 1995 "Steps Toward the Development of a Retinal Prosthesis", Science Writers Convention, Orlando, Florida, sponsored by Research to Prevent Blindness [*Guest Lecturer*]
- 1995 One clinical and one basic science lecture, University of New Jersey Medical and Dental Health Science Center [*Visiting Professor*]
- 1995 "Disorders of Ocular Motility" (3 hours), New York City Resident Lecture Series [*Guest Lecturer*]
- 1995 "Childhood Optic Neuritis", Manhattan Eye and Ear Infirmary, Manhattan, NY [*Pediatric Ophthalmology Grand Rounds*]
- 1995 "Steps Toward the Development of a Retinal Prosthesis", NASA-Goddard Space Center, Maryland [*Invited Lecturer*]
- 1995-Two hours each of case presentations by residents and clinical lectures, 1997 Ophthalmology Department, Brown University, Providence, RI [*Quarterly Visiting Professor*]
- 1995-Five lectures per year of clinical neuro-ophthalmological topics, Stanford
- 1998 University-sponsored training course for Ophthalmology residents-in-training, Palo Alto, CA [*Invited Lecturer*]
- 1996 "Development of a Retinal Implant", 2nd Annual RESNA Engineering Research Symposium, Salt Lake City [*Invited Lecturer*]
- 1996 Clinical lecture, Department of Ophthalmology, University of Missouri, Columbia, MO [*Visiting Professor*]
- 1996 "Steps Toward Development of a Retinal Prosthesis" and 3 hours of case discussions, University of Michigan Ophthalmology Grand Rounds [*Visiting Professor*]
- 1996 Clinical Lecturer, Walter Reed Army Hospital Biennial Ophthalmology Symposium [*Visiting Professor*]
- 1996 Clinical lecture, Long Island Jewish Hospital/Northshore Hospital Long Island, NY [*Visiting Lecturer*]
- 1996 "New Concepts of Transient Monocular Blindness", Scheie Eye Institute, University of Pennsylvania [*Ophthalmology Grand Rounds*]
- 1996 Delivered both Ophthalmology and Neurology Grand Rounds, Department of Neurology, University of Mississippi, Jackson, Mississippi [*Visiting Professor*]
- 1997 Clinical Lecture, Great Lakes Symposium of VLSI circuits and design, Lafayette, Louisiana [*Invited Plenary Lecturer*]
- 1998 Presentation in Symposium of Retinal Prostheses, sponsored by "Vision Research", Fort Lauderdale, Florida [*Invited Lecture*]
- 1999 "Development of a Silicon Retinal Prosthesis", Cornell Medical Center Grand Rounds [*Visiting Professor*]
- 1999 Regional Biomedical Symposium, University of Southwestern Louisiana, Department of Engineering [*Guest Lecturer*]

- 2000 "Development of a Silicon Retinal Prosthesis", MACULA 2000/ Atlantic Coast Retinal Meeting[*Guest Lecturer*]
- 2000 Clinical Lecture, Inauguration, Mann Institute of Biomedical Engineering, University of Southern California, Los Angel[*Invited Lecturer*]
- 2000 "Development of a Retinal Prosthesis", National Medical Association, Washington, D.C.[*Invited Lecturer*]
- 2001 "Giant Cell Arteritis", American Academy of Ophthalmology, Sponsored by the North American Neuro-Ophthalmology Society, Dallas[*Competitively Selected*]
- 2002 "Retinal Prosthesis: The Boston School", Retina Mini-Symposium, American Academy of Ophthalmology meeting[*Invited Lecturer*]
- 2002 "Differential Diagnosis of Optic Neuropathy", American Academy of Ophthalmology, Sponsored by the North American Neuro-Ophthalmology Society, Fort[*Competitively Selected*]
- 2002 "Engineering and Clinical Challenges of Developing a Retinal Prosthesis", Foundation Fighting Blindness, Chicago, IL[*Invited Lecture*]
- 2003 "Retinal Prosthesis: Unexpectedly Small Percepts Evoked in Human Testing", Research Conference sponsored by the Department of Ophthalmology, Stanford University[*Invited Lecture*]
- 2003 "International Conference on Restoration of Neural Function", Veterans Administration, Asilimar, CA[*Invited Lecture*]
- 2003 "Development of a Retinal Prosthesis", John F. Kennedy Rehabilitation Hospital, New Jersey, Department of Neurology[*Invited Lecturer*]
- 2003 "Development of a Retinal Prosthesis", Case Western Reserve University[*Purnell Visiting Professor*]
- 2004 Lecture , The Institute of Ophthalmology and Visual Science, New Jersey Medical School[*Invited Lecturer*]
- 2004 "Regulatory Considerations in the Development of a Retinal Prosthesis", Federal Food and Drug Administration, Center for Drug Evaluation and Research[*Invited Speaker*]
- 2004 "Development of a Retinal Prosthesis", Long Island Jewish Hospital[*Invited Lecture*]
- 2004 Lecture, Chicago Ophthalmological Society[*Invited Lecture*]
- 2004 Lecture, Federation of American Societies for Experimental Biology, Saxtons River, Vermont[*Invited Speaker*]
- 2004 Lecture, New Jersey Institute of Technology, Newark, NJ[*Invited Lecturer*]
- 2005 "The Visual Potential of a Retinal Prosthesis", American College of Eye Surgeons, Fort Lauderdale, FL[*Invited Lecturer*]
- 2005 "Challenges in the Development of a Retinal Prosthesis", Symposium on the "Integration of New Technologies for the Care of Retinal Disease", Aspen, CO[*Invited Lecturer*]
- 2005 "Technologies Related to Development of a Retinal Prosthesis", Dual Sensory Disability Conference, sponsored by the Department of Veterans Affairs, Portland, OR[*Invited Lecturer*]
- 2005 Lecture, White House Conference on "Emerging Technologies in Support of the New Freedom Initiative", Department of Veterans Affairs[*Invited Lecturer*]
- 2005 "The Process of Discovery" Lecture Series, Cleveland Clinic - Case Western Medical School, Cleveland, OH[*Invited Lecturer*]
- 2006 "Replacement and Rescue", Symposium Meeting at the John A. Moran Eye Center, University of Utah School of Medicine[*Invited Lecturer*]
- 2006 "Development of a Retinal Prosthesis", Neuroscience Institute, Medical University of South Carolina, Charleston, SC[*Invited Professor: Neuroscience Grand*]

*Rounds]*

- 2006 Neuro-Ophthalmology, 2005-2006 Greater New York Ophthalmology Clinical Lecture Series[*Invited Lecturer*]
- 2006 "A Retinal Prosthesis as a Potential Treatment for Trauma-Induced Blindness", Dartmouth 2006 Poly-Trauma Conference, Hanover, NH[*Invited Lecture*]
- 2006 Clinical Lecture, The New York Eye and Ear Infirmary[*Invited Professor*]
- 2006 "Strategies and Solutions: the Changing Landscape of Military Ophthalmology", Schepens Eye Research Institute, Boston, MA[*Invited Lecturer*]
- 2007 "Emergency Neuro-Ophthalmology: Diagnosis and Management", American Academy of Ophthalmology Annual Meeting, New Orleans, LA[*Invited Lecturer*]
- 2008 "Use of Retinal Prosthesis to Restore Vision Following Traumatic Ocular Injury and Naturally-Occurring Retinal Diseases", Third Biennial Military Vision Research Symposium: Traumatic Eye and Brain Injury[*Invited Lecture; Moderator*]
- 2008 Product Line Review: Ocular Health "A Novel Retinal Prosthesis that is Modular and Configurable", Telemedicine and Advanced Technology Research Center[*Invited Lecture*]
- 2008 "The Bionic Eye: Posterior Segment - New Therapies", Monroe J. Hirsch Memorial Research, American Academy of Optometry[*Invited Lecture*]
- 2008 Bio-X Symposium: "What Level of Vision Might a Retinal Prosthesis Provide to Blind Patients?", Stanford University[*Invited Lecture*]
- 2009 The Development of Visual Prostheses and other Assistive Devices., NANOS[*Invited Lecture*]
- 2009-Illinois Eye Review: Neuro-Ophthalmology Overview, University of Illinois[*Invited Lecture*], Annual
- 2009 **Charles Dwight Townes Memorial Lecture** 2009, University of Louisville , University of Louisville[*Invited Lecture*]
- 2010 "The Status of the Field of Visual Prosthetics with Specific Attention to the Boston Retinal Implant Project," Extraordinary Ophthalmology Lecture Series, Annual Meeting, Department of Ophthalmology, University of Wisconsin, Madison
- 2011 "Updates on Ischemic Optic Neuropathy, Updates on Pseudotumor Cerebri, Interesting Adult Neuro-Ophthalmic Cases," SUNY Downstate Department of Ophthalmology's Current Concepts in Ophthalmology 2011, Caesar's Atlantic City, New Jersey.
- 2011 "The Boston Retinal Implant Project, "NEI/FDA Endpoints Symposium: Use of Functional Vision Endpoints in Visual Prostheses Product Development. National Eye Institute, Bethesda, Maryland.
- 2011 Moderator, "Overview of Progress on the Boston Retinal Prosthesis." ARVO 2011 Visionary Genomics. Fort Lauderdale, Florida.
- 2011 "Giant Cell Arteritis" and "Idiopathic Intracranial Hypertension". Vanderbilt University, "Comprehensive Ophthalmology Pearls XV"
- 2013 Guest Lecturer: Neuro-Ophthalmology Symposium, sponsored by the Sarasota Retina Institute, Sarasota, Fla. : "Retinal Disease Related to Neuro-Ophthalmology"; "The Field of Retinal Prosthetics: Hope vs Reality"; Retinal Vascular Disease with Neuro-Ophthalmic Implications"
- 2013 **Carol F. Zimmerman Lectureship in Neuro-Ophthalmology**, The University of Texas, Southwestern Medical Center. "The Boston Retinal Implant Project: Hope Vs Reality"; "Giant Cell Arteritis"
- 2013 Invited Speaker: 3<sup>rd</sup> Euretina Winter Meeting, Rome, Italy. Innovation in Management of Retinal Disease. "Attaining Higher Resolution Visual Prosthetics: A Review"

- 2013 Invited Lecture: American Academy of Ophthalmology. Session entitled: "Extreme Vision: Science Fiction or Truth". My topic: "Science Fiction Meets Real Science: Prosthetics"
- 2013 **Roger Johnson Resident and Alumni Day Commencement Speaker**, Department of Ophthalmology, University of Washington: "Giant Cell Arteritis: New Concepts and Management"
- 2013 **Jay and Rebekah Enoch Lecture**: "The Field of Visual Prosthetics", Washington University, St. Louis, MO
- 2013 Invited Speaker: 62<sup>nd</sup> Annual Symposium of the New Orleans Academy of Ophthalmology. "Sundry Optic Neuropathies"; "Transient Monocular Blindness"; "The Field of Visual Prosthetics"
- 2015 Invited Lecturer, Wills Eye Hospital. "Idiopathic Intracranial Hypertension: Results of the Recently completed multi-center study"; "Giant Cell Arteritis: New concepts on pathogenesis, diagnosis and treatment"; Brief survey of nystagmus"
- 2015 **Wally Prechter Endowed Lectureship**, Kresge Eye Institute, Detroit, MI. "
- 2015 **The James E. McDonald Lecture**, 26<sup>th</sup> Annual Loyola Ophthalmology Resident-Alumni Day, Loyola Stritch School of Medicine. "The Boston Retinal Implant Project"
- 2015 University of Minnesota, Annual Conference and (separately) Retina conference: "Retinal Prosthetics: Hype vs. Hope"; "Retinal Prosthetics: What is Required for Higher Quality Vision"
- 2016 Eunice Kennedy Shriver National Institutes of Child Health and Human Development: Rehabilitation Research at NIH: Moving the Field Forward.
- 2016 DARPA conference, San Jose, CA. "The State of the Art of Visual Prosthetic Devices"
- 2016 **Pappas Endowed Lecture**. Department of Ophthalmology, Northwestern School of Medicine.
- 2016 Military Health Research Symposium, Kissimee, FL; "Visual Prosthesis with Interface at the Lateral Geniculate Nucleus"
- 2016 Rehabilitation Research at NIH: Moving the Field Forward, sponsored by the NIH, Bethesda, MD. "Visual Prosthetics to Restore Vision to the Blind"
- 2017 Vanderbilt University and Nashville Ophthalmological Society. "Current Status of Visual Prosthetic Devices"
- 2017 Department of Ophthalmology, Louisiana State University, Shreveport, LA. Graduation Ceremony. "What Can Be Expected from Visual Prosthetic Devices", and "Visual Hallucinations"
- 2017 **James Corbett Lecture**. University of Mississippi Medical Center, Jackson, MS. "Giant Cell Arteritis".
- 2017 **Loris and David Rich Lecture Series in Visual Science**. University of Alabama Medical Center, Birmingham, AL. "The Status of Visual Prosthetics"
- 2017 University of Texas Medical Branch, Galveston, Tx. "Idiopathic Intracranial Hypertension"
- 2018 University of Texas, Houston, Grand Rounds. "Visual Hallucinations"
- 2018 **Everett L. Goar Memorial Lecture**, Houston Ophthalmological Society. "Update on Giant Cell Arteritis"
- 2018 Baylor University Medical School, Department of Ophthalmology. "Idiopathic Intracranial Hypertension"
- 2018 Invited lecturer at the Sarasota Retina Institute. "The Status of Visual Prosthetic Devices"; "Visual Hallucinations"; Idiopathic Intracranial Hypertension"

## **International**

- 1992 Case presentations and 2 clinical lectures, Université Laval, Department of Ophthalmology, Quebec, Canada [*Visiting Professor*]
- 1994 Three lectures on clinical neuro-ophthalmology, Fondation Ophtalmologique A. De Rothschild, Paris [*Invited Lecturer*]
- 1994 "Development of a Retinal Prosthesis", Istituto Scientifico, Ospedale S. Raffaele, University of Milan [*Invited Lecture*]
- 1994 "Development of a Silicon Retinal Implant", European Congress of Ophthalmology, Milan, Italy [*Plenary Lecturer*]
- 1994 Two day long course in fundamentals of Neuro-Ophthalmology, Universidad de Valladolid, Spain [*Visiting Professor*]
- 1996 Clinical Lecture, Scandinavian University Research Seminar, given by Merck, Sharpe, and Dohme, Co., Denmark [*Guest Lecturer*]
- 1996 Clinical lectures, Department of Ophthalmology, Sick Children's Hospital, Toronto, Canada [*Visiting Professor*]
- 1997 Two lectures and discussion of case presentations, Department of Ophthalmology, McGill University, Montreal, Canada [*Grand Rounds*]
- 1997 Clinical Lectures, University of Vienna, Department of Ophthalmology [*Visiting Professor and Grand Rounds Lecturer*]
- 1997 Development of a Silicon Retinal Implant, European Congress of Ophthalmology, Budapest, Hungary [*Invited Lecture*]
- 1997 "Neuro-Ophthalmological Disease with Glaucomatous Features", Charles University, Prague, Czech Republic [*Guest Lecturer, Glaucoma Conference*]
- 1998 "Development of a Silicon Retinal Prosthesis", Eighth International Symposium on Retinal Degeneration, Schluchsee, Germany [*Invited Lecturer*]
- 2000 "Perceptual Results from Electrical Stimulation of Human Retina", Hospital for Sick Children, Toronto, Canada [*Invited Lectureship: "Lloyd Morgan" Lecture*]
- 2000 "Development of a Silicon Retinal Implant", Parma from the Heart Medical Symposium on Blindness, Parma, Italy [*Keynote Lecturer*]
- 2000 Lecture, 11th World Congress of Retina International, Toronto, Canada [*Invited Lecturer*]
- 2000 The Eye and the Chip: World Congress on Artificial Vision, 2000, The Detroit Institute of Ophthalmology, Detroit, MI [*Lecturer*]
- 2001 "Development of a Retinal Prosthesis", International Neuro-Ophthalmology meeting, Sardinia, Italy [*Special Lecturer*]
- 2001 "Development of a Silicon Retinal Implant", International Ophthalmology Symposium, 50th Anniversary, Menicon Co, Nagoya, Japan [*Plenary Lecture*]
- 2002 Clinical Lecture, University of Liege, Belgium [*Visiting Professor*]
- 2002 Lecture, International Society of Eye Research, Geneva, Switzerland [*Invited Lecture*]
- 2002 The Eye and the Chip: World Congress on Artificial Vision, 2002, The Detroit Institute of Ophthalmology, Detroit Michigan [*Lecturer*]
- 2004 The Eye and the Chip: World Congress on Artificial Vision, 2004, The Detroit Institute of Ophthalmology, Detroit, Michigan [*Lecturer*]
- 2004 "Development of a Retinal Prosthesis" and clinical case presentations, Swiss Ophthalmology Society [*Invited Lecturer*]
- 2006 Lecture, German Ophthalmological Society, Berlin, Germany [*Invited Lecturer*]
- 2006 "Surgery for Sub- and Epiretinal Implants", Artificial Vision 2006: The Bonn Dialogue, Bonn, Germany [*Invited Lecture*]
- 2006 Lecture, Shanghai International Biophysical Research Conference, Shanghai, China [*Executive Committee/Invited Lecturer*]

- 2006 Lecture, Brain Machine Interface Symposium, Kyoto, Japan [*Invited Lecturer*]
- 2006 "The Visual Potential of a Retinal Prosthesis", The University of Regensburg, Regensburg, Germany [*Invited Lecture*]
- 2006 The Eye and the Chip: World Congress on Artificial Vision, 2006, The Detroit Institute of Ophthalmology, Detroit, Michigan [*Lecturer*]
- 2009 14th Congress of Chinese Ophthalmological Society, Chinese Ophthalmological Society [*Invited Lecture*]
- 2010 "The Conundrum of the Field of Retinal Prosthetics," Plenary Lecture, Engineering and Physical Sciences in Medicine & The Australian Biomedical Engineering Conference, Melbourne, Australia
- 2010 "The Ocular Implant: It Does Have a Future," Fourth Amsterdam Retina Debate, Academic Medical Center, Amsterdam, The Netherlands.
- 2011 "Boston Retinal Implant: Status and Competitive Landscape," and "Management of Pseudotumor Cerebri," McGill Ophthalmology Research Day 2011; McGill Day Lecture and invited lecture. McGill University, Montreal, Canada.
- 2013 Invited Lecturer: Asia-Pacific Ophthalmology meeting, Xiamen, China
- 2013 "Neuro-Ophthalmologie", Annual Conference of the Université de Montréal. Four lectures: "Nystagmus"; "Neuro-Ophthalmic Manifestations of Thyroid Eye Disease"; "Abnormal Saccades"; "Transient Monocular Blindness"
- 2014 Guest lecturer: Vision 2014 Conference, Melbourne. "The Field of Visual Prosthetics"
- 2014 Guest Lecturer: Bionic Vision Australia, Melbourne. "Restoring Vision to the Blind with a Visual Prosthesis: Challenges, Hopes, and Hype".
- 2014 Guest Lecturer: Neuro-Ophthalmology Society of Australia Annual Meeting, Canberra, Australia. 4 lectures: "The Boston Retinal Implant Project"; "Nystagmus"; "Visual Hallucinations"; Less Common Optic Neuropathies"
- 2014 Guest Lecturer: North of England Ophthalmological Society. "The Boston Retinal Implant Project"
- 2014 The Eye and the Chip International Meeting on Visual Prosthetics, Detroit, MI. "The Status of the Boston Retinal Implant Project"; "Update on the Status of the International Consortium for Psychophysical Testing in the Field of Visual Prosthetics"
- 2015 Invited lecturer: Seoul National University, Dept. of Biomedical Engineering. "Overview of the Field of Visual Prosthetics"
- 2015 Invited lecturer: Korean Ophthalmological Society meeting, Seoul. "Clinical Outcomes in the Field of Retinal Prosthetics"
- 2016 Invited lecturer: Singapore National Eye Center. "The History of the Boston Retinal Implant Project"
- 2016 Invited lecturer: Precongress of the 38<sup>th</sup> Royal College of Ophthalmologists of Thailand, Bangkok. "Neurological Manifestations of Neuro-Ophthalmic Disease"
- 2016 Invited lecturer: Annual conference of the Thailand Neuro-Ophthalmology Society. Bangkok, Thailand. Siriraj Hospital, Bangkok, Thailand. "Vascular Disease of the Eye".
- 2017 Invited lecturer: International Meeting of the Chinese Ophthalmological Association. "Non-arteritic anterior ischemic optic neuropathy"
- 2017 Invited lecturer: Tongren Ophthalmology Hospital, Beijing. "The Intricate Connections Between the Eye and the Brain"; "Visual Prosthetics: What Are Reasonable Expectations?"; "Non-Arteritic Anterior Ischemic Optic Neuropathy"
- 2018 Invited lecturer. King Salman Disability Research Center, Riyadh, Saudi Arabia. "The Opportunity for a Visual Prosthesis To Restore Vision to Patients with Retinitis Pigmentosa".

- 2018 Grand Rounds: King Khaled Eye Specialist Hospital, Riyadh, Saudi Arabia. "What Is The Potential for a Visual Prosthesis to Restore Vision to Patients with Retinitis Pigmentosa?"
- 2018 Grand Rounds. King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia. "The Potential Therapeutic Value of Visual Prosthetics – What Do I Tell My Patients?"

#### **b. Professional Leadership Roles related to Teaching**

- 1977-1978 National. Louisiana State University School of Medicine, New Orleans, LA. President, Student Body
- 1991 National. North American Neuro-Ophthalmic Society Course. Co-Director of "Neuro-anatomical basis of afferent visual function": Selection of topics and speakers for seminars at our annual meeting.
- 1991-1999 National. North American Neuro-Ophthalmic Society Member, Scientific Program Committee: Choice of topics and lecturers for mini-symposia given at the yearly educational meeting.
- 1992 Regional. Lancaster Review Course for Ophthalmologists, Colby College, Waterville, ME. Director, Neuro-Ophthalmology Section: Selection of faculty, organization of subject matter of roughly 30 lectures given over four days, preparation of detailed hand-outs and quality control of presentations.
- 1992-1995 National. North American Neuro-Ophthalmic Society Chairman, Abstracts Subcommittee: Help choose the best abstracts submitted for presentation at our yearly meeting.
- 1993- National. North American Neuro-Ophthalmic Society Member, Certification and Accreditation Committee: Defining the base of knowledge and associated technical skills necessary to practice Neuro-Ophthalmology as part of an effort to determine if our sub-specialty should attempt to employ a certification standard for its practitioners.
- 1993 National. American Academy of Ophthalmology Course Director and Moderator, "Practical Discussions in Neuro-Ophthalmology" for approximately 1,000 attendees: Selection of six speakers for a four hour symposium.
- 1993 National. Association for Research in Vision and Ophthalmology Moderator, Neuro-Ophthalmic Symposium
- 1993-1995 National. North American Neuro-Ophthalmic Society Member, Research Symposium Planning Committee: Identify topics for mini-symposia for meetings of neuro-ophthalmologists held each year in conjunction with the Association for Research in Vision and Ophthalmology.
- 1994 International. European Congress of Ophthalmology Meeting, Milan, Italy. Course Director, "Practical Neuro-Ophthalmic Discussions": Selection of topics of discussion and lecturers for a two hour long seminar given to 30 attendees.
- 1995 National. North American Neuro-Ophthalmic Society. Course Co-Director, "Visual Rehabilitation": Select topics of presentation and lecturers for a symposium at the annual meeting.
- 1999-2006 National. American Academy of Ophthalmology Member, Faculty Committee, For the preparation of the Neuro-Ophthalmology Text and the Basic Clinical Science Course

- 2000- International Biannual "Eye and the Chip", International Meeting on Visual Prosthetics, sponsored by the Detroit Institute of Ophthalmology, Detroit, IL. Member, Scientific Planning Committee, and Meeting Organizer.
- 2001 National. Association of Research in Vision and Ophthalmology, Ft. Lauderdale, FL. Moderator, Visual Prosthetic Symposium
- 2004 National. Association of Research in Vision and Ophthalmology, Ft. Lauderdale, FL. Moderator, Visual Prosthetic Symposium
- 2005 National. American Academy of Ophthalmology, Chicago, IL Moderator, Neuro-Ophthalmology Sub-Specialty Day
- 2006- Regional. Massachusetts Eye and Ear Infirmary, Boston. Course Director, Neuro-Ophthalmology Fall Festival (Bi-Annual)
- 2006 Regional. Massachusetts Eye and Ear Infirmary, Boston. Academic Organizer, Chandler Visiting Lecture
- 2006 International. Shanghai International Biophysical Research Conference, Shanghai, China. Executive Planning Committee Member/Scientific Organizer of Conference
- 2007 Regional (annual meeting). Department of Ophthalmology, Massachusetts Eye and Ear Infirmary, Boston. Course Co-Director, Alumni Meeting
- 2008 National. NANOS. Organizer, NanoTechnology for Neuro-Ophthalmology
- 2009 National. NANOS. Moderator, Nanotechnology & Evolving Strategies for Vision Restoration, NANOS
- 2014 Regional. Organizer and Moderator for Neuro-Ophthalmology Symposium, sponsored by the New England Ophthalmology Society
- 2016 Regional. Organizer and Moderator, New England Ophthalmology Society symposium: "Neuro-Ophthalmology Urgencies and Emergencies), June 3, 2016.
- 2018 National. Organizer/moderator, symposium on unexplained visual loss, North American Neuro-Ophthalmology Society meeting, Hawaii.

### **Description of Teaching Award(s) Received**

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| 1986 | "Fellow of the Year"<br>Massachusetts Eye and Ear Infirmary                      |
| 2000 | "Teacher of the Year Award"<br>Lancaster Course in Ophthalmology, Waterville, ME |

### **Part III: Bibliography**

#### **Original Articles**

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### **Reviews/Chapters/Short Reports/Editorials**

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