

COLLEGE OF MEDICINE CURRICULUM VITAE

Randy H. Kardon, M.D., Ph.D.

University of Iowa
University of Iowa Hospitals and Clinics
Dept. of Ophthalmology and Visual Sciences - PFP
Iowa City, IA, USA

Veterans Affairs Medical Center
Iowa City, IA, USA

I. EDUCATIONAL AND PROFESSIONAL HISTORY

A. Institutions Attended, Postgraduate Medical Education, Certification and Licensure

1975-1982 University of Iowa College of Medicine B.S., M.D., Ph.D. (Pharmacology)

Post-graduate Education

6/82-6/83 Medical Internship, Gundersen Clinic & Lutheran Hospital, LaCrosse, WI
7/83-12/83 Research Fellow, Department of Ophthalmology, University of Iowa, Iowa City, IA
1/84-7/87 Ophthalmology Residency, Department of Ophthalmology, University of Iowa, Iowa City, IA
7/87-7/89 Neuro-Ophthalmology Fellow, Department of Ophthalmology, University of Iowa, Iowa City, IA (under the direction of H. Stanley Thompson, MD, and James Corbett, MD)

Certification and Licensure

1983 Iowa State License #23796
1988 Board Certification: American Board of Ophthalmology
1989 Iowa Controlled Substance #1238423
1989 Federal DEA #BK5801368

B. Academic and Professional Positions

July 1989-1994 Assistant Professor, Department of Ophthalmology, College of Medicine, University of Iowa, Iowa City, IA
July 1989-Present Staff, Ophthalmology, Surgery Division, Veterans Administration Medical Center, Iowa City, Iowa
July 1990-Dec 1999 Research Associate, Career Development Award, Veterans Administration Medical Center, Iowa City IA
July 1994-2004 Associate Professor with tenure, Department of Ophthalmology College of Medicine, University of Iowa, Iowa City, IA
May 2002-Present Director, Neuro-ophthalmology Division, Department of Ophthalmology and Visual Sciences, University of Iowa
July 2004-Present Professor with tenure, Department of Ophthalmology
October 2007 Pomerantz Family Chair in Ophthalmology

C. Honors and Awards

- 1975 Phi Beta Kappa
- 1975 B.S. Degree with Honors and High Distinction
- 1977-81 Scholarship Recipient of Insurance Medical Scientist Training Program
- 1978 First Place, 20th Annual American Medical Student Association -- Eaton Pharmaceutical Medical Art Award Contest
- 1979 Borts Award for Best Research Paper at Iowa Student Medical Research Day
- 1979 American Heart Association Award for Best Cardiovascular Paper at the National Student Research Forum
- 1979 Mead-Johnson Award for Second Best Paper Overall at the National Student Research Forum
- 1980 American Heart Association Award, Third Place, National Student Research Forum
- 1980 Mead-Johnson Award, Honorable Mention, National Student Research Forum
- 1980 Chairman, Iowa Student Medical Research Day
- 1980 President, Iowa Student Medical Research Club
- 1985 P.J. Leinfelder Award for Best Resident Research Seminar, "Simultaneous and Continuous Recording of Retinal and Choroidal Blood Flow"
- 1986 P.J. Leinfelder Award for Best Resident Research Seminar, "Fundus-Pupil Perimetry: Objective Visual Field Testing Using the Pupillary Response"
- 1987-89 Fight for Sight Research Fellowship Grant
- 1987-89 National Society to Prevent Blindness Burroughs-Wellcome Fellowship
- 1990-1999 Recipient of Career Development Award (VAMC)
- 1992 Distinguished Vision Scientist, New England Eye Center
- 1992 Recipient of the Charles D. Phelps Research Award
- 1993-Present Listed in The Best Doctors in America
- 1994 Recipient of Carver Trust Fund Research Seed Grant (\$14,000)
- 1994 Recipient of Research to Prevent Blindness James S. Adams Scholar Award (\$30,000)
- 1994 Recipient of University of Iowa College of Medicine Collegiate Teaching Award (\$3,000)
- 1995 Recipient of the American Academy of Ophthalmology Honor Award
- 1995 John E. Harris Visiting Professor University of Minnesota
- 1995 Educational Grant "A Digital Video Library of Eye Movement and Pupil Disorders" (\$5,000)
- 1997 Senior Honor Award, American Academy of Ophthalmology
- 1997 N-Title Workshop Award for Web Course Development (\$3,000)
- 1997-1998 Recipient of Research to Prevent Blindness Lew Wasserman Scholar Award (\$50,000)
- 2003 Lowenfeld Invited Lecturer, 25th Pupil Colloquium, Crete, Greece
- 2005 Visiting Professor, Swiss Ophthalmology Society
- 2006 Visiting Professor, Department of Ophthalmology, University of California, Davis
- 2006 Visiting Professor, Department of Ophthalmology, University of Utah
- 2006 Visiting Professor, Department of Neurology, University of Illinois, Peoria
- 2006 Invited Speaker and Chair of Symposium on the Pupil, International Neuro-ophthalmologic Society (INOS), Japan
- 2006 Senior Achievement Award, American Academy of Ophthalmology
- 2007 Awarded Pomerantz Family Chair in Ophthalmology

- 2007 Invited Speaker "Neuro-ophthalmology and Surgery of the Eye", Japanese Neuro-ophthalmologic Society, Hamamatsu, Japan
- 2007 Visiting Professor, Department of Ophthalmology, University of BC, Vancouver, Canada
- 2010 ARVO Fellow Award 2010

II. TEACHING

A. Teaching assignments on semester by semester basis

Supervision of undergraduate, graduate and medical students in pupil laboratory research
 Lecturer for Introduction to Clinical Medicine (Sophomore Med Students)
 Lecturer for Introduction to Ophthalmology Course (Senior Med Students)
 Lecturer for Basic & Clinical Science Course in Ophthalmology (Residents)
 Lecturer for Development, Structure & Function of Human Organ Systems Course (First Year Medical Students)

B. Students Supervised

- 1987- Residents on Neuro-ophthalmology Clinic Service
- 1987-94 Chad Denison, Undergraduate Scholars Program, 2nd Yr Med Student
- 1988-94 Chris Hauptert, Undergraduate research student, 3rd Year Medical Student (Best Clinical Paper, Medical Student Research Day, 1991)
- 1988 Steven Cramer, Undergraduate Scholars Program
- 1988 Sara Baker BS, MS candidate, Biomedical Engineering
- 1989 John Hade BS, 2nd Year Medical Student
- 1989 David Muller BS, 4th Year Medical Student
- 1989 Keith Dahlhauser BS: 4th Year Medical Student
- 1989 James Wentzien BA: 4th Year Medical Student
- 1990-99 Paula Moore, Program Specialist
- 1990-92 Adam Abramson, High School Honors Student
- 1991-92 Elizabeth Brown, 4th Year Medical Student
- 1991-94 Stacy Thompson, 1st Year Medical Student
- 1991 Roger Barth, MD, Glaucoma Fellow-Comparison Of Automated Pupil Perimetry With Visual Threshold Perimetry In Glaucomatous Field Loss
- 1991 Timothy Martin, MD, Neuro-ophthalmology Fellow-Unequal Direct and Consensual Pupillary Responses: A Mechanism Suggested by Hemiretinal Stimulation
- 1991 Barbara Evans, MD, Ophthalmology Resident-the State Of Retinal Adaptation During Relative Afferent Pupil Defect Testing
- 1991 William Haynes, MD, Ophthalmology Resident-Pupillometric An Videographic Evaluation Of Anisocoria In Patients With The Pigmentary Dispersion Syndrome
- 1992 Kevin McKinney, MD, Ophthalmology Resident-Quantitative Changes in The Operated and Fellow Eye After Optic Nerve Sheath Fenestration for Idiopathic Intracranial Hypertension
- 1992 Christina Johnson, MD, Ophthalmology Resident
- 1992-94 Jason Heth, 1st Year Medical Student (Best Clinical Paper, Medical Student
- 1992-93 Wayne Solley, 4th Year Medical Student
- 1993-94 Senior Medical Student Advisor for Manuel Mendoza, Chris Raptis, Chris Hauptert

- 1993 Aditya Mishra, MD, Neuro-ophthalmology Fellow-Pupil Flicker Following Frequency and its Relationship to Pupil Size and Light Stimulus Intensity
- 1993 Norman Zabriskie, MD, Ophthalmology Resident-The Pupillary Photostress Test
- 1993 Aki Selky Kawasaki, MD, Neuro-ophthalmology Research Fellow Research Day
- 1994 William White, MD, Neuro-ophthalmology Fellow-Exponential Time Course of Visual Function Recovery in Optic Neuritis
- 1994 Raghav Gupta, 2nd Year Medical Student, research on comparison of spatial lummation in the visual and pupillary systems
- 1994 Jeremiah Brown, MD, Ophthalmology Resident-Visual Acuity Needed for Smooth Pursuit: A Guide for Use in Patients With Suspected Functional Visual Loss
- 1995 Johane Robitaille, MD, Neuro-ophthalmology Fellow - Post-Operative Drift In Adult Strabismus Surgery
- 1995 Sean Donahue, MD, PhD, Pediatric Ophthalmology Fellow-Automated Perimetry In Amblyopia: Full Field Depression In The Involved Eye
- 1995 Sachio Kawashima, MD, Research Fellow-Visual Perception Evoked By Transcranial Magnetic Field Stimulation Of The Occiput In Normal Subjects
- 1995 William Keeling, MD, PhD, Ophthalmology Resident-High Speed Digital Fluorescein Angiographic Analysis of Retinal and Choroidal Circulation
- 1995 Brett Rhode, MD, Ophthalmology Resident-The Time Course Of Peripapillary Atrophy In AION
- 1995 Jane Mizener, MD, Ophthalmology Resident-Autoimmune Retinopathy: It's Not Always Cancer-Associated
- 1996 Brett Rhode, MD, Ophthalmology Resident-The Relationship Of Peripapillary Atrophy And AION
- 1996 Bradley J. Katz, MD, PhD, Ophthalmology Resident-Development And Testing Of A New Method Of Assessing Critical Flicker Fusion Frequency
- 1996 William Keeling, MD, PhD, Ophthalmology Resident-High Speed Digital Fluorescein Angiographic Analysis Of Retinal And Choroidal Circulation
- 1996 Richard Neahring, MD, Ophthalmology Resident-Contraction Anisocoria
- 1996 Adam Henn, 1st year Medical Student-Use Of The Photostress Test To Diagnose Retinal Dysfunction
- 1997 Darwin Wooten, MD, Ophthalmology Resident-Effect Of Visual Field Loss On The Pupillary Light Reflex
- 1997-99 Sung-Pyo Hong, MD, Visiting Scholar, Taegu, Korea, Research Fellow
- 1997 Jeffrey Jordan, MD, Ophthalmology Resident-Vascular Disorders Of The Optic Nerve Head In Patients With Obstructive Sleep Apnea
- 1997 Bradley Katz, MD, PhD, Ophthalmology Resident-The Flicker Stick: A Linear Array for Assessing Critical Flicker
- 1997 Ann Neff, MD, Ophthalmology Resident-Slowly Progressive Oculomotor Nerve Palsies In Young Adults: Imaging of Intrinsic Nerve Tumors
- 1998 Joanna Narkiewicz, MD, Research Fellow, Use of Pupil Perimetry in objective diagnosis of visual field loss
- 1999 Rutiger Schmidt, MD, Research Fellow, Determination of the mechanical constraints of pupil movement in humans
- 1999- Susan Anderson, Research Assistant
- 2000 Mary Lucy Pereira, Research Fellow, RAPD in acute elevation of IOP in glaucoma
- 2000 Oliver Bergamin, Research Fellow, dynamics of pupil light reflex in health and disease

- 2000 Leigh Bassman, Research Assistant, effect of stimulus intensity on pupil light reflex in optic neuropathies
- 2003 Michael Abramoff, MD, Postdoc Research Fellow, intrinsic optical imaging of retinal function
- 2004 Philip Spanheimer Medical Student Research Program, pattern electroretinogram and ocular coherence tomography (OCT) in compressive optic neuropathy
- 2004 Kalene Fix, undergraduate student, screening of visual loss using automated pupil light reflex testing
- 2007 Elizabeth Grace, Medical Student Honors Research Program, use of chromatic light stimuli and pupil light reflex to differentiate retinal and optic nerve disease
- 2007 Alex Versakas Undergraduate Honors Research Program, relationship of the optic nerve size and cup measured by optical coherence tomography (OCT) to retinal nerve fiber thickness in optic neuropathies
- 2009 Poonam Bansal M.D. Post-doctoral Research Fellow, evaluation of optic disc edema due to raised intracranial pressure using digital stereo photographs, optical coherence tomography (OCT) and visual fields on successive visits to evaluate change.

Neuro-ophthalmology Fellows Supervised

O = Ophthalmologist

N = Neurologist

Gerard L. Hershewe, D.O.	July 1989 - July 1990	(N)
Pinar Kirkali, M.D.	January 1990 - January 1991	(O)
Jason J. S. Barton, M.D.	July 1990 - July 1991	(N)
Timothy J. Martin, M.D.	July 1990 - July 1991	(O)
Aldo Fantin, M.D.	July 1991 - July 1992	(N)
Jonathan Calkwood	July 1992 - October 1992	(N)
Adyita Mishra, M.D.	January 1992 - July 1993	(N)
Aki Selky, M.D.	July 1993 - October 1993	(N)
Sean Donahue, M.D.	July 1993 - July 1994	(O)
William White, M.D.	July 1993 - July 1994	(O)
Richard Neahring, M.D.	July 1994 - December 1994	(N)
Johane Robitaille, M.D.	January 1995 - July 1995	(O)
Peter H. Spiegel, M.D.	July 1995 - June 1996	(O)
Anil D. Patel, M.D. FRCSC	July 1996 - June 1998	(O)
Michael L. Murphy, M.D.	July 1996 - December 1996	(O)
Syndee J. Givre, M.D., Ph.D.	July 1998 – June 2000	(O)
Aasim Kamal, M.D.	July 1999 – June 2000	(O/N)
Fiona Costello, M.D.	Sept. 2000 – June 2002	(N)
Julie Falardeau, M.D.	July 2001 – June 2002	(O)
Steven Goldin, M.D.	July 2002 – June 2003	(O)
Sonalee Kulkarni, MD	July 2003 – June 2004	(O/N)
Shannon Lynch, MD	July 2004 – June 2005	(O)
Vinay Shah M.D.	July 2005 – June 2006	(O)
Sandeep Randhawa M.D.	July 2005 – June 2006	(O)
Reid Longmuir M.D.	July 2006 – June 2007	(O)
Jacinthe Rouleau M.D.	July 2006 – June 2007	(O)
Nathan Troy Tagg M.D.	July 2007 - June 2008	(N)
Colin Scott M.D.	July 2007 - June 2008	(N)
Michael Johnson M.D.	July 2007 - June 2008	(O)
Fabiana Policeni, M.D.	July 2008 – June 2009	(O)
Mansoor Mughal, M.D.	July 2008 – June 2009	(O)
Yanjun Chen, MD, PhD	July 2009 – present	(N)
Travis Rumery, DO	July 2009 – present	(†)

† Internal medicine

III. SCHOLARSHIP

A. Publications

Peer-reviewed Papers

1. Kardon RH, Kessel RG: SEM studies on vascular casts of the rat ovary IN Scanning Electron Microscopy, Vol III, Johari O (ed), SEM Inc: 743-750, 1979

2. Kessel RG, Kardon RH: The shape, polarization, and innervation of sensory hair cells in the guinea pig crista ampullaris and macular utriculi. In Scanning Electro Microscopy, Vol III, Johari O (ed), SEM Inc: 967-974, 1979
3. Kessel RG, Kardon RH, Angyal J: The digestive system. In Carolina Tips, 43(4), Burlington NC: Carolina Biological Supply Co, 1980
4. Kardon RH, Kessel RG: Three dimensional organization of the hepatic microcirculation in the rodent as observed by scanning electron microscopy of corrosion casts. *Gastroenterol* 79: 72, 1980
5. Kardon RH, Kessel RG: The microcirculation of lymphoid tissue in three dimensions. Scanning electron microscopy of corrosion casts of the lymph node, thymus, and perirectal lymphoid tissue. *Biomed Res* 2(Suppl): 173, 1981
6. Kessel RG, Kardon RH: Scanning electron microscopy of mammalian neuroepithelium. *Biomed Res*, 2(Suppl): 482-499, 1981
7. Reynolds DG, Kardon RH: Methods of studying the splanchnic vascular architecture. In The Measurement of Splanchnic Blood Flow, Granger N, Bulkey G (eds), Baltimore: Williams & Wilkins Co, 1981
8. Kardon RH, Farley D, Heidger P, Van Orden D: Intra-arterial cushions of the rat uterine artery: A scanning electron microscopy evaluation utilizing vascular casts. *Anat Rec* 203: 19-29, 1982
9. Kardon RH, Cutkomp J, Weingeist TA: Retinal and choroidal blood flow measurement in monkeys using implantable ultrasonic Doppler flow probes. IN Proceedings of the 10th Biennial Congress of the International Society for Ophthalmic Echography, 1984
10. Kardon RH, Hauptert C, Thompson HS: Automated pupil perimetry in Noninvasive Assessment of the Visual System. Washington, DC Optical Society of America. The Society, 1990, 44-7. (Technical Digest Series 3). Available from: Optical Society of America. 1816 Jefferson Pl, NW, Washington, DC 20036
11. Kardon RH, Denison CE, Brown CK, Thompson HS: Critical evaluation of the cocaine test in the diagnosis of Horner's syndrome. *Arch Ophthalmol* 108: 384-387, March 1990
12. Cremer SA, Thompson HS, Digre KB, Kardon RH: Hydroxyamphetamine mydriasis in normal subjects. *Am J Ophthalmol* 110(1): 66-70, July 1990
13. Cremer SA, Thompson HS, Digre KB, Kardon RH: Hydroxyamphetamine mydriasis in Horner's syndrome. *Am J Ophthalmol* 110(1): 71-76, July 1990
14. Stone EM, Coppinger JM, Kardon RH, Donelson J: Mae III positively detects the mitochondrial mutation associated with Type I Leber's hereditary optic neuropathy. *Arch Ophthalmol* 108: 1417-1420, October 1990

15. Haller K, Miller-Meeks M, Kardon RH: Magnetic resonance imaging and acute traumatic INO. *Ophthalmol* 97: 1162-1165, September 1990
16. Kardon RH, Denison CE, Brown CK, Thompson HS: Reply to the cocaine test and Horner's syndrome. *Arch Ophthalmol* 8: 1667-1668, December 1990
17. Hayreh SS, Kardon RH, McAllister DL, Fleury PJ: Acepromazine effects on intraocular pressure. *Arch Ophthalmol* 109: 119-124, January 1991
18. Sobol WM, Kimura AE, Kardon RH, Thompson HS: Pupillary constriction to darkness in a patient with blue-cone monochromatism. *J Clin Neuro-Ophthalmol* 11: 53-54, January 1991
19. Kardon RH, Mirsky R: Pupillary studies of the retinal "off" response in: *Noninvasive Assessment of the Visual System, 1991 Technical Digest Series (1)*: 186-189, 1991
20. Kardon RH, Kirkali PA, Thompson HS: Automated pupil perimetry. Pupil field mapping in patients and normal subjects. *Ophthalmol* 98: 485-496, April 1991
21. Kardon RH, Traynelis VC, Billier J: Inferior division paresis of the oculomotor nerve caused by basilar artery aneurysm. *J Cerebrovasc Dis* 1: 171-176, May-June 1991
22. Munden PM, Kardon RH, Denison CE, Carter KD: Palpebral fissure responses to topical adrenergic drugs. *Am J Ophthalmol* 111: 706-710, June 1991
23. Haynes WL, Thompson HS, Kardon RH, Alward WLM: Asymmetric pigmentary dispersion syndrome mimicking Horner's syndrome. *Am J Ophthalmol* 112: 463-464, October 1991
24. Yuh WTC, Hanigan MT, Nerad JA, Enhardt JC, Carter KD, Kardon RH, Shellock FG: Extrusion of eye socket magnetic implant after MR imaging: Potential hazard to patient with eye prosthesis. *JMRI* 1 (6): 711-713, November/December 1991
25. Kardon RH: Pupil Perimetry. In *Current Opinion in Ophthalmology*. 3; 565-570, Current Science, Philadelphia, 1992
26. Kardon RH, Hauptert CL, Thompson HS: The relationship between static perimetry and the relative afferent pupillary defect. *Am J Ophthalmol* 115: 351-356, March 1993
27. Shults WT, Hamby S, Corbett JJ, Kardon R, Winterkorn JS, Odel JG: Neuro-ophthalmic complications of intracranial catheters. *Neurosurgery* 33: 135-138, July 1993
28. Wall M, Kardon RH, Moore P: Effects of stimulus size on test-retested variability. In Perimetry Update 1992/93: Proceedings of the Xth International Perimetric Society Meeting, Koyoto, Japan, Oct 20-22, 1992, edited by Richard P. Mills, New York: Kugler; 371-376, 1993
29. Zabriskie N, Kardon RH: The Pupil Photostress Test. *Ophthalmology* 101(6): 1122-1130, 1994

30. Kardon RH: Anisocoria following a scleral buckle. *Ophthalmol World News* 1(1): 10-11, January 1995
31. Wall M, Dollar JD, Sadun AA, Kardon R: Idiopathic Intracranial Hypertension. Lack of histologic evidence for cerebral edema. *Arch Neurol* 52: 141-5, February 1995
32. Barton JJ, Kardon RH, Slagel D, Thompson HS: Bilateral central ptosis in acquired immunodeficiency syndrome. [Review] [20 refs] *Canadian Journal of Neurological Sciences* 22(1): 52-5, 1995 Feb.
33. Donahue SP, Kardon RH, Thompson HS: Hour glass visual fields as a sign of bilateral lateral geniculate myelinolysis. *Am J Ophthalmol* 119(3): 378-380, March 1995
34. Kawasaki A, Moore P, Kardon RH: Variability of the relative afferent pupillary defect. *Am J Ophthalmol* 120(5): 622-633, November 1995
35. Butler Jr VP, Odel JG, Rath E, Wolin MJ, Behrenns MM, Martin TJ, Kardon RH, Gouras P: Digitalis-induced visual disturbances with therapeutic serum digitalis concentrations. *Ann Intern Med* 123(9): 676-680, November 1995
36. Kardon R: Pupillary light reflex. *Current Opinion in Ophthalmology* 6(6): 20-26, 1995
37. Kardon R: Comments on: Two Neuro-ophthalmic episodes separated in time and space; By Cullom Jr RD, Cullom ME: *Sur Ophthalmol* 40 (3): 217-224, November/December 1995
38. Thompson S, Kardon R: Migraine associated stroke. *Ophthalmol World News* 2(5): 22-23, May 1996
39. Kawasaki A, Moore P, Kardon RH: Long-term fluctuation of relative afferent pupillary defect in subjects with normal visual function. *Am J Ophthalmol* 122(6): 875-882, December 1996
40. Mizener JB, Kimura AE, Adamus G, Thirkill CE, Goeken JA, Kardon RH: Autoimmune Retinopathy in the absence of cancer. *Am J Ophthalmol* 123(5): 607-618, May 1997
41. Wilhelm H, Kardon RH: The pupillary light reflex pathway. *Neuro-ophthalmol* 17(2): 59-62, 1997
42. Donahue SP, Moore P, Kardon RH: Automated pupil perimetry in amblyopia: generalized depression in the involved eye. *Ophthalmology* 104(12): 2161-2167, December 1997
43. Leira EC, Bendixen BH, Kardon RH, Adams HP Jr: Brief transient Horner's syndrome can be the hallmark of a carotid artery dissection. *Neurology* 50(1): 289-290, January 1998

44. Kardon RK, Corbett JJ, Thompson HS: Segmental denervation and reinnervation of the iris sphincter as shown by infrared videographic transillumination. *Ophthalmol* 105(2): 313-321, February 1998
45. Ajax ET, Kardon R: Late-onset Leber's hereditary optic neuropathy. *J Neuro-Ophthalmol* 18(1): 30-31, March 1998
46. Kardon RH: Drop the Alzheimer's drop test. Editorial, *Neurology* 50: 588-591, March 1998
47. Lagreze WDA, Kardon RH: Correlation of relative afferent pupillary defect and estimated retinal ganglion cell loss. *Graefes Archive for Clinical & Experimental Ophthalmology* 236(6): 401-404, June 1998
48. Kardon R: Pupil assay and Alzheimer's disease: a critical analysis [reply]. *Neurology* 53(3): 673-674, February 1999
49. Donahue SP, Wall M, Kutzko K, Kardon RH: Automated perimetry in amblyopia: a generalized depression. *Am J Ophthalmol* 127(3): 312-321, March 1999
50. Oh KT, Alward WLM, Kardon RH: Myositis associated with a Baerveldt glaucoma implant. *Am J Ophthalmol* 128(3): 375-376, September 1999
51. Maturi RK, Folk JC, Nichols B, Oetting TT, Kardon RH: Hydroxychloroquine retinopathy. *Arch Ophthalmol* 117(9):1262-1263, September 1999
52. Yuh TC, Zhu M, Taoka T, Quets, JP, Maley JE, Muhonen MG, Schuster ME, Kardon RH: MR Imaging of Pituitary Morphology in Idiopathic Intracranial Hypertension. *J Mag Reson Imaging* 12: 808-813, 2000
53. Oh KT, Boldt HC, Maturi RK, Folk JC, Kardon RH: Evaluation of Patients with Visual Field Defects Following Macular Hole Surgery using Multifocal Electroretinography. *Retina* 20(3): 238-243, 2000
54. Givre SJ, Wall M, Kardon RH: Visual Loss and Recovery in a Patient with Friedreich Ataxia. *J Neuro-ophthalmol* 20(4): 229-233, 2000
55. Hong, S, Narkiewicz, J, Kardon RH: Comparison of Pupil Perimetry and Visual Perimetry in Normal Eyes: Decibel Sensitivity and Variability. *Invest Ophthalmol Vis Sci* 42(5): 957-965, April 2001
56. Wall M, Punke SG, Stickney TL, Brito CF, Withrow KR, Kardon RH: SITA standard in optic neuropathies and hemianopias: A comparison with full threshold testing. *Invest Ophthalmol Vis Sci* 42(2): 528-537, February 2001
57. Kawasaki A, Kardon RH: Disorders of the Pupil. *Neuro-Ophthalmol* 14(1): 149-168, March 2001

58. Kardon RH, Givre SJ, Wall M, Hood D: Comparison Of Threshold And Multifocal-VEP Perimetry In Recovered Optic Neuritis. In Perimetry Update 2000:Proceedings of the XVIIth International Perimetric Society Meeting, Sept. 6-9, 2000, edited by Wall & Mills, New York: Kugler, 19-28, 2001
59. Oh KT, Folk JC, Maturi RK, Moore P, Kardon RH: Multifocal Electroretinography in Multifocal Choroiditis and the Multiple Evanescent White Dot Syndrome. *Retina* 21(6): 581-589, 2001
60. Wszolek ZK, Kardon RH, Wolten EC, Pfeiffer RF: Frontotemporal Dementia and Parkinsonism Linked to Chromosome 17 (FTDP-17): PPND Family. A Longitudinal Videotape Demonstration. *Mov Disord*, 16(4): 756-760, November 2001
61. Kardon RK, Kwon YH, Truitt PW, Nemeth SC, Ts'o D, Soliz P: Optical imaging device of retinal function. In *Ophthalmic Technologies XII*, Fabrice Manns, Per G. Söderberg, Arthur Ho, Editors, Proceedings of SPIE (4611): 230-238, 2002.
62. Lee AG, Golnik K, Kardon R, Wall M, Eggenberger E, Yedavally S: Sleep Apnea and Intracranial Hypertension in Men. *Ophthalmol* 109 (3): 482-485, March 2002
63. Bergamin O, Kardon RH: Greater pupillary escape differentiates central from peripheral visual field loss. *Ophthalmol* 109(4): 771-780, April 2002
64. Grozdanic S, Sakaguchi DS, Kwon YH, Kardon RH, Sonea IM: Characterization of the pupil light reflex, electroretinogram and tonometric parameters in healthy rat eyes. *Current Eye Research* 25(2): 69-78, August 2002.
65. Hayreh SS, Zimmerman B, Kardon RH: Visual improvement with corticosteroid therapy in giant cell arteritis: Report of a large study and review of literature. *Acta Ophthalmol Scand* 80: 355-367, August 2002
66. Costello F, Kardon RH, Wall M, Kirby P, Ryken T, Lee AG. Papilledema as the presenting manifestation of spinal schwannoma. *J Neuro-Ophthalmol* 22(3): 199-203, 2002
67. Hunt MH, Lee AG, Kardon RK, Lesley WS, Chaloupka JC: Improvement in papilledema and visual loss after endovascular stent placement in dural sinus thrombosis. *Neuro-ophthalmol* 26(2): 85-92, 2002
68. Eggenberger E, Golnik K, Lee A, Santos R, Suntay A, Satana B, Vaphlades M, Stevens C, Kaufman D, Wall M, Kardon R: Prognosis of ischemic internuclear ophthalmoplegia. *Ophthalmol* 109(9): 1676-1678, 2002
69. Costello F, Lee AG, Afifi AK, Kelkar P, Kardon RH, White M: Childhood-onset chronic inflammatory demyelinating polyradiculoneuropathy with cranial nerve involvement. *J Child Neurol* 17(11): 819-823, November 2002.

70. Bergamin O, Zimmerman MB, Kardon RH: Pupil light reflex in normal and diseased Eyes. *Diagnosis of visual dysfunction using waveform partitioning. Ophthalmol* 110(1): 106-114, January 2003.
71. Bergamin O, Kardon RH: Latency of the pupil light reflex : Sample rate, stimulus intensity, and variation in normal subjects. *Invest Ophthalmol Vis Sci* 44(4): 1546-1554, April 2003
72. Grozdanic S, Sakaguchi DS, Kwon YH, Kardon RH and Sonea IM: Functional characterization of retina and optic nerve after acute ocular ischemia in rats. *Investigative Ophthalmology & Visual Science* 44(6): 2597-2605, 2003
73. Grozdanic S, Betts DM, Sakaguchi DS, Kwon YH, Kardon RH and Sonea IM: Temporary elevation of the intraocular pressure by cauterization of vortex and episcleral veins in rats causes functional deficits in the retina and optic nerve. *Experimental Eye Research* 77(1): 27-33, 2003
74. Grozdanic S, Betts DM, Allbaugh RA, Sakaguchi DS, Kwon YH, Kardon RH and Sonea IM: Characterization of the pupil light reflex, electroretinogram and tonometric parameters in healthy mouse eyes. *Current Eye Research* 26(6): 371-378, 2003
75. Grozdanic S, Betts DM, Sakaguchi DS, Allbaugh RA, Kwon YH, Kardon RH: Laser-induced mouse model of chronic ocular hypertension. *Investigative Ophthalmology & Visual Science*. 44(10): 4337-4346, 2003
76. Grassi MA, Lee AG, Kardon R, Nerad JA: A lot of Clot. *Surv Ophthalmol* 48(5): 555-561, 2003
77. Grozdanic SD, Kwon YH, Sakaguchi Ds, Kardon RH, Sonea IM: Functional evaluation of retina and optic nerve in the rat model of chronic ocular hypertension. *Exp Eye Res* 79(1): 75-83, 2004
78. Lee AG, Eggenberger E, Galetta S, Kerrison J, Miller NR, Kirby P, Wall M, Hitchon P, Kardon RH: Neuro-ophthalmic manifestations of hemangiopericytoma. *Seminars Ophthalmol* 19: 95-100, 2004
79. Lee AG, Anderson R, Kardon RH, Wall M: Presumed "Sulfa Allergy" in patients with intracranial Hypertension treated with acetazolamide or furosemide; cross-reactivity, myth or reality? *Am J Ophthalmol* 138(1): 114-118, July 2004
80. Lee AG, Chau FY, Golnik, KC, Brazis PW, Wall M, Kardon RH: Evaluation of Isolated Optic Atrophy: An Update and Review. *Comprehen Ophthalmol Update* 5(6): 297-304, December 2004
81. Kawasaki A, Kardon RH: Evaluation of a simple photographic technique to detect pupillary dilation lag due to Horner's syndrome. *Neuro ophthalmol* 28(5-6): 215-219, 2004

82. Kardon, R: Are we ready to replace cocaine with apraclonidine in the pharmacologic diagnosis of Horner syndrome? *J Neuro-ophthalmol* 25(2): 69-70, 2005
83. Kardon, R: Introduction to Anatomy and Neural Pathways. *Am Orthopt J* 55 (1): 2-9, 2005
84. Kawasaki A, Crippa S, Anderson S, Kardon RH: The Pupil response to large regional stimuli in patients with focal visual field loss. *Neuro-Ophthalmol* 29 (4): 143-147, 2005
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63. Kardon R, Kawasaki A: Efferent pupillographic asymmetries in patients with midbrain relative afferent pupillary defects: the tectal "relative efferent pupillary defect" (REPD). Presented at the North American Neuro-ophthalmology Society, Keystone, Colorado, February 1997.
64. Kawasaki A, Kardon R: Afferent pupillographic findings in patients with tectal midbrain relative afferent pupillary defects: similarity to optic tract lesions. Presented at the North American Neuro-ophthalmology Society, Keystone, Colorado, February, 1997.
65. Moore PA, Kardon RH: The effect of corneal and conjunctival anesthesia on blink rate. Invest Ophthalmol Vis Sci 38(4) Part 1, S390, 1997
66. Kardon R, Kawasaki A: The tectal "relative efferent pupillary defect" (REPD). Invest Ophthalmol Vis Sci 38(4) Part 1, S391, 1997
67. Kawasaki A, Kardon R: Hemifield pupil responses in patients with tectal midbrain relative afferent pupillary defects: similarity to optic tract lesions. Invest Ophthalmol Vis Sci 38(4) Part 1, S391, 1997
68. Burgett R, Kawasaki A, Kardon RH, Wilson G: Differentiation of oculosympathetic defects from physiologic anisocoria by comparison of the early and late phases of pupil dilation in response to auditory and light stimuli. Invest Ophthalmol Vis Sci 38(4) Part 1, S392, 1997.
69. Boldt HC, Maturi RK, Oh KT, Folk JC, Kardon R: Visual field defects following vitrectomy for macular hole: Assessment with multifocal electroretinography (MERG) and nerve fiber layer analysis. Presented at the Macula Society XXIst Annual Meeting, Boca Raton, Florida, February 21, 1998.
70. Kawasaki A, Kardon R: When is pupillary "dilation lag" a clinically useful sign of Horner's syndrome? Presented at the North American Neuro-ophthalmology Society Meeting, Orlando, Florida, March 1998.

71. Kardon RH, Wooten DB: Effect of visual field loss on the waveform of the pupillary light reflex. Presented at the North American Neuro-ophthalmology Society Meeting, Orlando, Florida, March 1998.
72. Oh KT, Oh DM, Kardon, RH: Effect of induced media opacity on multifocal electroretinography. *Invest Ophthalmol Vis Sci* 39, S187, 1998.
73. Wilson G, Kawasaki A, Moore P, Cornsweet T, Kardon R: Clinical application of a new non-touch eye movement and pupil movement monitor. *Invest Ophthalmol Vis Sci* 39, S767, 1998.
74. Moore P, Kardon RH: Clinical use of the multifocal electroretinogram (MERG) in neuro-ophthalmology: Distinguishing optic nerve disease from retinal dysfunction. *Invest Ophthalmol Vis Sci* 39, S972, 1998.
75. Kardon RH, Wooten DB: Effect of visual field loss on the waveform of the pupillary light reflex. *Invest Ophthalmol Vis Sci* 39, S1050, 1998.
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79. Givre SJ, Kardon R: Functional differences between the midbrain and cortical pupillary light reflex pathway: Effect of stimulus size. Presented at the North American Neuro-ophthalmology Society Meeting, Snowmass, Colorado, March 1999.
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81. Kardon RH, Hong S, Narkiewicz J, Moore PA: Comparison between visual and pupil threshold in normal subjects: Interindividual and intereye variability. *Invest Ophthalmol Vis Sci* 40, S656, 1999.
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83. Givre SJ, Hood DC, Wall M, Kardon RH: Comparison of threshold and multifocal-VEP in perimetry in recovered optic neuritis. Presented at the North American Neuro-ophthalmology Society Meeting, Mont Tremblant, Quebec Canada, March 2000.

84. Kardon RH, Kawasaki A, Hong S: The effect of pupil size on retinal illumination and the pupil light reflex: Role of ocular pigmentation. Presented at the North American Neuro-ophthalmology Society Meeting, Mont Tremblant, Quebec Canada, March 2000.
85. Kardon, RH: Aberrant regeneration of the pupil. Presented at the North American Neuro-ophthalmology Society Meeting, Mont Tremblant, Quebec Canada, March 2000.
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89. Givre SJ, Hood DC, Wall M, Kardon RH: Comparison of threshold and multifocal-VEP perimetry in recovering and recovered optic neuritis. Invest Ophthalmol Vis Sci 41, S625, 2000.
90. Kardon RH, Moore PA, Hayreh SS: The pupillary light reveals greater glaucomatous damage at brighter stimulus intensity. Invest Ophthalmol Vis Sci 41, S898, 2000.
91. Kardon RH, Anderson SC, Pereira ML: Correlation between optical coherence tomography (OCT) and automated visual field (HVF) in patients with non-glaucomatous optic neuropathy. Presented at the North American Neuro-ophthalmology Society Meeting Rancho Mirage, California, February 2001.
92. Anderson SC, Pereira MM, Kwon YH, Kardon RH: Changes in optic nerve function over time from unilateral elevations in intraocular pressure measured by the pupil light reflex: Invest Ophthalmol Vis Sci 42(4), S148, 2001.
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94. Hong S, Na S, Kardon RH, Shin JP, Kim SY: Location asymmetry analysis in automated perimetry in normal subjects. Invest Ophthalmol Vis Sci 42(4), S846, 2001
95. Kardon RH, Anderson SC, Pereria MM: Correlation between optical coherence tomography (OCT) and automated visual field (HVF) in patients with non-glaucomatous optic neuropathy. Invest Ophthalmol Vis Sci 42(4), S847, 2001
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98. Lee AG, Kardon RH, Wall M, Schlechte J: Endocrinologic abnormalities in pseudotumor cerebri in men. Presented at the North American Neuro-ophthalmology Society, Copper Mountain, CO, February 9-14, 2002.
99. Bergamin O, Anderson S, Kardon RH: Variation in substructure of the retinal nerve fiber layer (RNFL) in normal and damaged eyes revealed by Optical Coherence Tomography (OCT). The Association for Research in Vision and Ophthalmology (ARVO), Program Summary Book, 40 and on line at. www.arvo.org. 2002.
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101. S. Grozdanic, Y.H. Kwon, R.H. Kardon, D.S. Sakaguchi and I.M. Sonea. Functional recovery after acute elevation of the intraocular pressure in rats, Retinal Cell Rescue 5th Annual Vision Research Conference, May 3-4; Ft Lauderdale, FL, 2002
102. S. Grozdanic, M.I. Torres, R.H. Kardon, Y.H. Kwon, D.S. Sakaguchi and I.M. Sonea: Functional deficits induced by laser surgery in the mouse. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting-ARVO, May 5-10; Ft Lauderdale, FL, 2002
103. Y.H. Kwon, S.D. Grozdanic, D.M. Betts, D.S. Sakaguchi, R.H. Kardon, I.M. Sonea: Functional assessment of the retina and optic nerve in the rat model of chronic ocular hypertension. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting-ARVO; Ft Lauderdale, FL, 2003
104. D.S. Sakaguchi, S.D. Grozdanic, A.M. Ast, Y.H. Kwon, R.H. Kardon, D.M. Betts, I.M. Sonea: Transplantation of adult neural stem cells into healthy and acute ischemic rat eyes: A functional and morphological analysis. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting-ARVO; Ft Lauderdale, FL, 2003
105. Grozdanic ,SD, Kwon YH, Betts DM, Allbaugh RA, R.H. Kardon, D.S. Sakaguchi, I.M. Sonea: Laser-induced mouse model of chronic ocular hypertension – a new model for glaucoma studies. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting-ARVO; Ft Lauderdale, FL, 2003
106. Lee, AG, Kirby P, Kardon RH, Wall, M, Hitchon P: Shouda, Woulda, Coulda... Presented at the Frank B. Walsh Society, Orlando, FL, March 2004
107. Bergamin O, Kardon RH: The effects of afferent disease on the timing and contraction of the pupil light reflex. Presented at the North American Neuro-ophthalmology Society, Orlando, FL, March 30, 2004.

108. Kardon, RH: Use of the Multifocal ERG to differentiate arteritic from non-arteritic anterior ischemic optic neuropathy (AION). Presented at the North American Neuro-ophthalmology Society, Orlando, FL, March 30, 2004.
109. Tso Dy, Kwon Y, Kardon R, Soliz P, Li H, Abramoff M, Zarella M: Signal sources observed with intrinsic signal optical imaging of retina. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, Ft. Lauderdale, FL, 2004
110. Kardon R, Tso D, Soliz P, Barriga S, Li H, Kwon YH: Intrinsic optical imaging of the retina in awake humans. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, Ft. Lauderdale, FL, 2004
111. Bergamin O, Kardon RH: The effects of afferent disease on the timing and contraction of the pupil light reflex. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, Ft. Lauderdale, FL, 2004
112. Orasky J, Grozdanic SD, Hildreth SN, Lazic T, Lavik E, Betts DM, Kwon, YH, Kardon RH, Sakaguchi DS: Sustained delivery of neurotrophic growth factors from biodegradable microspheres after acute elevation of intraocular pressure in rats. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, Ft. Lauderdale, FL, 2004
113. Boldan MV, Kardon RH: Changes in nerve fiber layer reflectivity using Optical Coherence Tomography in the setting of optic neuropathy. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, Ft. Lauderdale, FL, 2004
114. Anderson SC, Kardon RH: Correlation of regional thickness of the retinal nerve fiber layer (RNFL) by Optical Coherence Tomography (OCT3) with visual field topography in optic neuropathies. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, Ft. Lauderdale, FL, 2004
115. Grozdanic SD, Ostojic J, Syed NA, Hargrove MS, Trent JT, Betts DM, Kuehn MH, Kwon YH, Kardon RH, Sakaguchi DS: Neuroglobin and histoglobin (cytoglobin)-New hexacoordinate globins in the human eye. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, Ft. Lauderdale, FL, 2004
116. Kwon YH, Grozdanic SD, Ast AM, Kardon RH, Betts DM, Sakaguchi DS: Functional and morphological assessment of chronic hypertensive rat eyes after neural progenitor cell transplantation. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, Ft. Lauderdale, FL, 2004
117. Kardon RH: Origin of the Relative Afferent Pupillary Defect in Optic Tract Lesions. Presented at North American Neuro-ophthalmology Society Meeting,, Copper Mountain, CO, February 2005
118. Kardon RH: Obesity Profile, Risk Factors and Quality of Life in Idiopathic Intracranial Hypertension (IIH). Presented at North American Neuro-ophthalmology Society Meeting,, Copper Mountain, CO, February 2005

119. Ostojic J, de Lathouder Y, Trent, III JT, Hargrove MS, Betts D.M, Kwon YH, Kardon RH, Kuehn M, Sakaguchi D.S., Grozdanic SD: Patterns of Expression of Neuroglobin and Cytoglobin in the Healthy and Glaucomatous Dog Retina. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, Ft. Lauderdale, FL, 2005
120. Abramoff, MD, Kwon YH, Ts'o D, Soliz P, Berriga S, Kardon R: Imaging of Retinal Function in Awake Humans: Time course of the Functional Signal in Response to Focal Visual Stimulation. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, Ft. Lauderdale, FL, 2005
121. Taravati P, Brito CF, Woodward KR, Doyle CK, Kardon RH, Wall M: The Effect of Stimulus Size on Perimetric Variability. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, Ft. Lauderdale, FL, 2005
122. Tso DY, Zarella M, Schallek J, Kwon Y, Kardon R, Abramoff M, Soliz P, Pokorny J: The Origins of Stimulus Dependent Intrinsic Optical Signals of the Retina. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, Ft. Lauderdale, FL, 2005
123. Wagner PS, Anderson SC, Kardon RH: Effect of Eye Position Change on the OCT Profile of Retinal Nerve Fiber Layer Thickness (RNFL) in Glaucoma and Normal Subjects. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, Ft. Lauderdale, FL, 2005
124. Kardon RH, Spanheimer P: Simultaneous Assessment of Pattern Evoked Potentials From Retinal Ganglion Cells and Visual Cortex (PERG and VEP) in Normal Eyes and in Compressive Optic Neuropathy. The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, Ft. Lauderdale, FL, 2005
125. Anderson SC, Wagner PS, Doyle C, Woodward K, Wall M, Kardon RH: Long-Term Variability of the Retinal Nerve Fiber Layer Thickness (RNFL) in Glaucoma Measured by Optical Coherence Tomography (OCT). The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, Ft. Lauderdale, FL, 2005

B. Areas of Research Interest and Current Projects

Areas of Research Interest

1. Relationship between structure and function of the optic nerve in optic neuropathies
2. Relationship of visual dysfunction to pupillomotor responsiveness to light
3. Diagnosis and treatment of manifestations of Traumatic Brain Injury (TBI)
4. Development of optical imaging of retinal function
5. Development of low-cost retinal imaging device and automated analysis
6. Development of Multifocal Visual Evoked Potentials (MVEP) as an objective form of visual field testing in diagnosing and following the course of optic nerve disease
7. Pharmacology of the central and peripheral pupillomotor pathways
8. Autonomic disorders of pupillary function

9. Risk factors in the pathogenesis of optic nerve diseases
10. Multifocal electroretinogram in diagnosing visual loss
11. Development of a no-touch, eye movement monitoring instrument to diagnose disorders of eye movement in clinical patients

Current Projects

1. The use of objective pupil perimetry in the assessment of visual dysfunction.
2. Computerized determination of the relative afferent pupillary defect and the factors that affect it.
3. The use of optical coherence tomography (OCT) of the retinal nerve fiber layer in the diagnosis of optic neuropathy.
4. The therapeutic use of intravitreal neurotrophic growth factors to improve visual function in retinal and optic nerve injury.
5. Diagnosis, monitoring, and treatment of visual disturbances caused by Traumatic Brain Injury (TBI).
6. Mechanisms and treatment of photophobia and migraine due to central trigeminal dysfunction.
7. Multifocal Electroretinography (MERG) as a tool to differentiate optic nerve from retinal disease.
8. Evaluation of the pupillary light reflex as a sensitive objective indicator of visual dysfunction.
9. Characterization of etiology and site of visual dysfunction by evaluation of stimulus intensity/pupil response curve functions.
10. The use of critical flicker fusion to diagnose optic neuropathy and differentiate between optical and neuronal causes of visual loss.
11. Evaluation of the pupil, eyelid, and sweating (skin conductance) in Horner's Syndrome.
12. Stress testing of optic nerve and retinal function: measurement of retinal sensitivity as a function of intraocular pressure using scleral suction in conjunction with the pupillary light reflex.
13. Development of a prototype fundus camera to perform optical imaging of retinal function.
14. Use of visual evoked potentials to obtain objective visual field testing (Multifocal VEP) in patients with optic nerve disease.
15. Development of low-cost retinal imaging device and automated analysis of retinal and optic nerve disorders.

C. Published reviews of scholarship

None

D. Grants Received

Federal

Department of Veterans Affairs Center of Excellence for The Prevention and Treatment of Visual Loss (PI and Director of Center), 2009-2014, \$5,000,000.

Department of Defense (DOD) Vision Research Program VRP09, "Objective Methods To Test Visual Dysfunction in the Presence of Cognitive Impairment" Role: PI (5%=0.6 months/year), 2010-2013, \$1,130,193

1R01EY018853-01A2 NIH (NEI) "Focal Structure-Function Relationships in Macular Layers from 3D Spectral OCT" Role: Co-PI (1.8 months/year), 2009-2012 Annual Direct Costs: \$250,000/year, total=\$750,000.

Department of Veterans Affairs Rehabilitation Division grant application, "Novel Treatment Modalities for Hemorrhage in Traumatic Blast Injury", Role: Co-PI (1.2 months/year), 2010-2014, Annual Direct Costs \$250,000/year, Total=\$1,000,000.

Veterans Administration Rehab Grant "Cholinergic Drugs For Reversal Of Visual Deficits In Glaucoma" PI (1.8 months/year), 2010-2014, Annual Direct Costs: \$250,000/year, total=\$1,000,000.

Veterans Administration Career Development Award for Mathew Harper Ph.D.; Characterization of a Novel Model of Traumatic Brain Injury, Role: Primary Mentor for Mathew Harper, 2010-2013, Annual Direct Costs: \$150,000, Total=\$750,000.

Veterans Administration Rehab Grant, "proposal #6139 titled "Rehabilitation of Glaucoma Using Computer-Analyzed Eye Images" January, 2008-2011 \$720,562

Department of Defense (DOD) Peer Reviewed Medical Research Program (PRMRP PR064674) "Treatment of Laser-Induced Retinal Injury and Visual Loss Using Sustained Release of Intra-vitreous Neurotrophic Growth Factors" (PI), 2008-2011 \$580,000

Veterans Administration Rehab Grant, "Growth Factor Treatment of Visual Loss in Compressive Optic Nerve Injury" October 2008-2011 \$727,283 for 3 years

NIH (NEI) R01EY017066-01, "Low-cost, portable, computer assisted imaging for diabetic retinopathy" (Co-investigator), 2005-2010, \$1,843,750

National Eye Institute (NEI) Subcontract R009040554 "Optical Coherence Tomography (OCT) Substudy for Idiopathic Intracranial Hypertension Treatment Trial (IIHTT), Role: Co-PI (0.7 months/year effort), 2010-2012, Annual Direct Costs: \$66,885, Total=\$169,038.

University of Iowa Carver Collaborative Pilot Grant, "Is the Neuropeptide CGRP involved in the pathogenesis of Photophobia in Traumatic Brain Injury?" Role: Co-PI (0.6 months/year). Annual Direct Costs: \$21,000/year, Total=\$42,000.

Veterans Administration Rehab Grant, "Treatment of Visual Loss in Glaucoma and Ischemia with Neurotrophic Growth Factors", July 1, 2005-2008 \$745,298

Veterans Administration Rehab Grant, "Predicting Rehabilitation of Visual Loss in Compressive Optic Neuropathy", July 1, 2004-2007 \$407,000 for three years

National Eye Institute (NEI) Cooperative agreement U10 EY 09435 through JAEB Center for Health Research for Longitudinal Optic Neuritis Study to evaluate and analyze images from optical coherence tomography of the optic nerve and retina. Role: Principle Investigator. March 2008-April 2009 (\$22,125)

National Eye Institute (NEI) Cooperative agreement U10 EY 09435 through JAEB Center for Health Research for Longitudinal Optic Neuritis Study to be reading center and evaluate and analyze images from optical coherence tomography of the optic nerve and retina. Role: Principle Investigator. May 2006-April 2007 (\$15,000)

Veterans Administration Research Enhancement Award Program (REAP) Award, "Vascular Disease in Diabetes: Metabolic Basis", William Sivitz, PI, Randy Kardon Co-investigator. January 1, 2003-December 31, 2008, (\$250,000 year/5 years)

Veterans Administration Merit Review, "Using the Pupillary Light Reflex to Measure Visual Dysfunction", 1990-1993, (\$150,000) Renewal, 1993-1998, (\$298,900/5 years) (renewal 1999-2004(\$765,000/5 years).

Small Business Innovation Research (SBIR) Phase I, National Eye Institute in conjunction with Dr. Young Kwon and Kestrel Corp.2000 (\$100,000) Optical Imaging Device of Retina Function.

Small Business Innovation Research (SBIR) Phase II, National Eye Institute in conjunction with Dr. Young Kwon and Kestrel Corp.2001-2003 (\$750,000) Optical Imaging Device of Retina Function.

National Medical Technology Testbed Grant (\$345,100) 1999-2002, Tom Cornsweet PI, R. Kardon Co-Investigator; Pupil and Eye Movement Screening Device in a Patient Population

Veterans Administration Career Development Award, 1990-1994, (\$380,000/4 years) , (Renewal) 1995-2000, (\$600,000/5 years)

Veterans Administration Research Committee, \$15,000 Equipment Award,1992

Veterans Administration Research Committee, \$18,000 Equipment Award, 1991

Veterans Administration Research Committee, \$11,000 Equipment Award, 1990

College of Medicine

College of Medicine/ISU collaborative project "Stem Cells: Regeneration of the optic nerve in glaucoma", 2000, \$30,000 Total (\$12,000 UI portion)

Carver Trust Fund: Research Grant: "Ocular Perfusion and Function of the Eye: The Effects of Raised Intraocular Pressure on the Pupillary Light Reflex", \$14,000

College of Medicine Office Educational Grant, "The Building of a Computerized Video Library of Eye Movement and Pupillary Disorders", 1995, \$5,000

Other

Donation for research of \$15,000 from John Pappajohn

AHAF (American Health Assistance Foundation National Glaucoma Research Grant, Laser-induced mouse model of chronic ocular hypertension, PI I. Sonea, Iowa State University , Co-I R. Kardon, Y. Kwon, University of Iowa, D Sakaguchi, Iowa State University. (\$35,750) April 1, 2002 to March 31, 2003.

Glaucoma Foundation Grant, Neural stem cell transplants: A novel strategy for the treatment of glaucoma, PI D Sakaguchi, Iowa State University, Co-I, R. Kardon, Y. Kwon, University of Iowa and I Sonea, Iowa State University. (\$35,000), September 1, 2001

Inter-Institutional Grant, Iowa State University & University of Iowa. Regeneration of the optic nerve with stem cells in glaucoma. D. Betts, I. Sonea, Y. Niyo PI's, R Kardon & Y. Kwon co-investigators(12,500) 2000-2001, [\$43,305].

Fight for Sight Fellowship Grant (\$14,000) for Dr. Syndee Givre; R Kardon, sponsor

Research to Prevent Blindness Lew R. Wasserman Merit Award 1997 (\$50,000)

Midwest Eye Institute (Indianapolis, IN) Research Award 1993-present (\$500,000)

N-Title Workshop Award for Web Course Development (\$3,000)

Research to Prevent Blindness James S. Adams Scholar Award 1994-95 (\$30,000)

Knights Templar Foundation Grant, "The Pupillary Light Reflex in Amblyopia" (\$20,000)

Zeis-Humphrey 1993-1995 (\$130,000) Pupil Perimetry

Humphrey-Allergan 1991-1992 (\$25,000) Pupil Perimetry

Humphrey-Allergan 1999-2000 (\$30,000) Pupil Perimetry

Fight for Sight Grant-in-Aid, 1990-1991, (\$11,000)

"Automated Pupil Perimetry in Visual Field Loss"

Fight for Sight Research Fellowship Grant, 1987-1988, (renewal 1988-1989, \$12,000/year)

National Society to Prevent Blindness Burroughs-Wellcome Fellowship Grant, 1987-1988, renewed 1988-1989, (\$24,000/year)

Scholarship, Insurance Medical Scientist Training Program, 1977-82

E. Invited Lectures:

1. "Special Problems and Different Methods for Preparation Of Tissue For SEM" and "Scanning Electron Microscopy of The Microvascular Casts"
Regional Meeting of the Electron Microscopy Society of America, Norman, OK
March 1979
2. "Application of Scanning Electron Microscopy of Corrosion Casts to Investigating the Microcirculation"
University of Southern Illinois, Carbondale, IL, May 1979
3. "New Methods of Revealing the Internal Three Dimensional Organization of Tissues and Organs"
International Symposium: SEM in Cell Biology, Kyoto, Japan, May 1980
4. "SEM of Vascular Casts: Evidence For a Microcirculation Within the Wall of Arterioles"
Central States Electron Microscopy Society
Southwest Missouri State University, Springfield, MO, October 1980
5. "What's New In Horner's Syndrome?"
North American Neuro-Ophthalmology Society, Cancun, Mexico, March 1989
6. "Aberrant Regeneration of the Third Nerve"
American Orthoptist Society, American Academy of Ophthalmology Annual Meeting, New Orleans, LA, October, 1989
7. "Automated Pupil Perimetry"
The Noninvasive Assessment of the Visual System Meeting; Incline Village, NV,
February 1990
8. "Automated Pupil Perimetry"
The Association for Research in Vision and Ophthalmology (ARVO); Sarasota, FL;
April-May, 1990
9. "Cranial Nerve Palsies Affecting Ocular Motility"
Symposium on Outpatient Neurology, The University of Iowa, Iowa City, IA,
September 1990
10. "Clinical Cases In Neuro-ophthalmology"
American Society of Ophthalmic Registered Nurses Annual Meeting, Atlanta, GA,
October 1990
11. "Ischemic Causes Of Visual Field Defects"
Stroke Conference, University of Iowa, Department of Neurology, Iowa City, IA,
October 1990
12. "Automated Pupil Perimetry",
American Academy of Ophthalmology Meeting, Atlanta, GA, November 1990

13. "Comparison of Automated Pupil Perimetry With Visual Threshold Perimetry Over The 30 Degree Field In Normal Subjects", "Early Dark Adaptation In Normal Subjects As Measured By The Pupillary Light Reflex", and "Characterization Of The Stimulus Response Curve For The Pupillary Light Reflex In Normal Subjects and In Patients With Visual Field Loss"
Pupil Colloquium, Falmouth, MA, September 1991
14. "The Pathogenesis of Visual Field Loss in Idiopathic Intracranial Hypertension"
North American Neuro-Ophthalmologic Society, San Diego, CA, February 1992
15. "Neuro-ophthalmology Teasers - Vertical Deviations"
Midwest AACO Regional Meeting, Madison, WI, June 1992
16. "Afferent Pupil", "High Pass Perimetry", "Pseudotumor Cerebri, Natural History and Medical Treatment", "Pupil Perimetry", and "Anterior Ischemic Optic Neuropathy, Natural History"
18th Annual Kevin Hill Seminar, What's Neu in Neuro-Ophthalmology, Colby College, Waterville, ME, July 1992
17. "Pupil Perimetry: Objective Analysis of the Visual Field"
Distinguished Vision Scientist Seminar Series, New England Eye Center, Boston, MA, October 1992
18. "The Pupillary Light Reflex in Postgeniculate Lesions"
North American Neuro-Ophthalmology Society, Big Sky, MT, February 1993
19. "Motility Disorders" and "The Pupil"
Canadian Ophthalmologic Society, Halifax, Nova Scotia, May 1993
20. "Special Motility Problems"
Midwest AACO Regional Meeting, University of Minnesota, Minneapolis, MN, June 1993
21. "Neuro-ophthalmic Visual Field Assessment" and "Pupil Assessment and Anomalies"
Hawkeye Optometric Institute, Five Seasons Hotel, Cedar Rapids, IA, October 1993
22. "Unusual Presentation of Oculomotor Paralysis"
Midwest AACO Regional Meeting, Anheuser-Busch Eye Institute, St. Louis University, St. Louis, MO, April 1994
23. "Objective Visual Field Testing: What can pupil perimetry tell us?"
Visiting Scholars Program, University of Alabama, Birmingham, AL, January 1995
24. "Objective Pupil Perimetry in Clinical Testing"
John E. Harris Visiting Professor, University of Minnesota, Minneapolis, MN, April 1995

25. "Pupil Workshop"
Midwest AACO Regional Meeting, Eye Surgeons Associates, PC, Rock Island, IL, June 1995
26. "The Pupillary Light Reflex as an Objective Measure of Visual Function"
Greater New York Ophthalmology Clinical Lecture Series, Manhattan Eye, Ear & Throat Hospital, New York, NY, March 1996
27. "Pupils 'R Us: The Sequel"
American Association of Certified Orthoptists, Instruction Course for 1996 National Meeting, American Academy of Ophthalmology Meeting, Chicago, IL, October 1996
28. "Pupils R Us - Case Studies"
Department of Ophthalmology, Mayo Clinic, Rochester, MN, January 1997
29. "Aberrant Reinnervation of the Oculomotor Nerve: Recognition of Lid, Pupil, and Motility Signs"
Midwest AACO Regional Meeting, Department of Ophthalmology, University of Iowa Hospitals and Clinics, Iowa City, IA, April 1997
30. "Case Studies"
Cedar Rapids / Iowa City area Optometrists, Department of Ophthalmology, University of Iowa Hospitals and Clinics, Iowa City, IA, June 1997
31. "Multifocal ERG in diagnosing visual loss"-Case Studies
Davenport Area Optometrists, Genesis Medical Center, Davenport, Iowa, October 1997
32. "Afferent pupil defect: Nuances in testing and interpretation" North American Neuro-ophthalmologic Society Symposium
American Academy of Ophthalmology, San Francisco, CA, October 1997
33. "The future of pupil perimetry"
Japanese Electrophysiologic Society, Kurashiki University, Japan, November 1997
34. "Giant Cell Arteritis"
Iowa Academy of Family Physicians, Lake Okoboji, IA, July 1998
35. "Clinical Neuro-ophthalmology"
Davenport area Optometrists, Davenport, IA, October 1998
36. "Visual Loss: Retina or Optic Nerve?"
Hawkeye Optometric Institute, Iowa City, IA, October 1999
37. "Visual Loss: Retina or Optic Nerve?"
Houston Ophthalmological Society, Houston, TX, December 1999

38. "Objective Perimetry 2000 – Pupil Perimetry, Electroretinographic Perimetry, and Visual Evoked Potential Perimetry"
Des Moines Ophthalmological Society, Des Moines, IA, February 2000
39. "Puzzling Pupil Problems"
Hawkeye Optometric Society, Cedar Rapids, IA, October 2000
40. "The Use of Pupillography in the diagnosis of Optic Nerve Disease"
Hospital Ophthalmique Jules Gonin, Lausanne, Switzerland, June 2002
41. "The Clinical Spectrum of Oculomotor Nerve Palsy"
Department of Neurology, Ottawa General Hospital, Ottawa, Ontario, Canada, August/September 2002
42. "Afferent Pupil Function in Retinal and Optic Nerve Disease"
Lowenfeld Invited Lecturer, 25th Pupil Colloquium, Crete, Greece, September 2003
43. "Differentiating Retinal from Optic Nerve Disease Using Multifocal Electroretinography"
Henry Ford Eye Department, Detroit, Michigan, September 2003
44. "Is it Retina?" and "Got Retina"
Cleveland Clinic, Cleveland Ohio, October/November 2003
45. "New Aspects of Pupil Function in Diagnosing Retinal and Optic Nerve Disease"
Chair of Symposium and Invited Speaker, International Neuro-Ophthalmology Society, Tokyo, Japan, November 2006
46. "Dangerous Causes of Unequal Pupils"
Invited Speaker for Washington National Eye Center, Washington, D.C., March 2007
47. "Clinical Implications of New Aspects of the Pupil Light Reflex Mediated by Melanopsin Retinal Ganglion Cells"
Japanese Ophthalmologic Society, Hamamatsu, Japan, September 2007
48. "A Neuro-ophthalmologist's Perspective on the Detection and Treatment of Traumatic Brain Injury"
Veterans Administration/Department of Defense Visual Consequences of Traumatic Brain Injury, San Antonio, Texas, December 2007
49. "Visual Rehabilitation for Soldiers with Post-Traumatic Brain Injury: A Neuro-ophthalmologist's Perspective"
American Academy of Ophthalmology Mid Year Forum, Washington D.C. April 2008
50. "New Clinical Implications for the Use of the Pupil Light Reflex"
Montreal EOUM Annual Clinical Ophthalmology Conference, Invited Guest Lecturer and Visiting Professor, Montreal, CA, May 2008

51. "Use of the Pupil Light Reflex to Diagnose Retinal Disease"
International Neuro-ophthalmology Society, Invited Guest Speaker, Napa, California, June 2008.
52. "Use of the Pupil Light Reflex and Understanding of Melanopsin Retinal Ganglion Cell Physiology to Diagnose Optic Nerve and Retinal Disorders"
Visiting Professor, Jules Stein Eye Institute, UCLA, February 2009
53. "The Melanopsin Retinal Ganglion Cell in Retinal and Optic Nerve Disease"
Visiting Professor, Casey Eye Institute, Portland, OR, February 2009
54. "The Pupil Light Reflex in Differentiating Photoreceptor from Optic Nerve Disease"
Visiting Professor, Case Western Reserve, Cleveland, OH, April 2009
55. "Use of the Pupil Light Reflex in Diagnosing Retinal and Optic Nerve Disorders"
Visiting Professor, Ophthalmology Dept, University of Toronto, CA, June 2009.
56. "Approach to Abnormal Pupils", "Typical and Atypical Optic Neuritis", "New Aspects Relating the Pupil Light Reflex and the Melanopsin Retinal Ganglion Cell to Clinical Practice", "The Use of OCT in Neuro-ophthalmic Conditions", "Dangerous Pupil Abnormalities", "Disorders of the Third Nerve", "Aberrant Regeneration of the Third Nerve", "Afferent Pupil Defects", "Efferent Pupil Defects", and "Clinical Application of the Physiology of the Melanopsin Retinal Ganglion Cell and Pupil Light Reflex for Diagnosing Photoreceptor Disease"
Visiting Professor, Department of Ophthalmology, Tan Tock Seng Hospital, Singapore, October 15-21, 2009.

F. Pending Decisions

None

IV. SERVICE

A. Offices held in professional organizations

Editorships

2008-Present Editorial Board, Archives of Ophthalmology
1997-Present Editorial Board, Journal of Neuro-Ophthalmology

Review Panels

2008-Present Chairman of Veterans Administration Rehabilitation Division, Merit Review Grant Review Committee
2006-Present NEI R21 grant review panel, retinal disease
2001-Present Veterans Administration Merit Review Board for Grant Review
1995-Present Grant Review Committee for Fight For Sight Scientific Awards Program
1999-Present Scientific Director, Grant in Aid Program, Fight for Sight Scientific Awards Program

Department, Collegiate, or University and National Committees

2002- Director, Neuro-ophthalmology Division, Department of Ophthalmology, UIHC
1997- Clinical Research Center Coordinating Committee
1995- Hospital Information Systems Committee member
1995- Research Program Specialist for Ophthalmology for the Department of Veterans Affairs Medical Research Service (Merit Review Board)
1995-98 Research and Development Committee Veterans Administration Med Ctr.
1994- College of Medicine Computerized Medical Record Committee
1994 Steering Committee for Noninvasive Assessment of the Visual System
1994- Committee Member, Departmental Faculty Practice Plan
1993 Image Analysis Facility Advisory Committee
1993 College of Medicine Prizes, Awards and Fellowship Committee
1992 Hospital Medical Records Committee Member
1992 Ophthalmology Resident Selection Committee
1991 Chairman of Minor Room Procedure Committee
1991 Chairman of Committee to Evaluate the Ophthalmic Exam Form
1990- Coordinator of Ophthalmology Department Resident Research
1994 Co-chairman of Session on Axonology; North American Neuro Ophthalmology Society Meeting
1994 Chairman of Image Analysis Session for Noninvasive Assessment of the Visual System
1994 Co-chairman, Session on Pupil and Accommodation,
1994 Association for Research and Vision in Ophthalmology (ARVO)
1993 Co-chairman International Pupil Colloquium