

CURRICULUM VITAE

Joseph J. Carroll, Ph.D.
Richard O. Schultz / Ruth Works Professor of Ophthalmology
Associate Professor of Biophysics
Associate Professor of Cell Biology, Neurobiology, & Anatomy
The Medical College of Wisconsin

- (1) **HOME ADDRESS:** N8028 Preserve Park Drive
Ixonia, WI 53036-9474
(262) 443-1072

- (2) **OFFICE ADDRESS:** The Medical College of Wisconsin
Eye Institute
925 North 87th Street
Milwaukee, WI 53226
Phone: (414) 456-2052
Fax: (414) 456-6690
E-mail: jcarroll@mcw.edu

- (3) **PLACE OF BIRTH:** Milwaukee, Wisconsin

- (4) **CITIZENSHIP:** U.S.A. & Ireland

- (5) **EDUCATION:**
08/1993 – 05/1997- B.S., Human Biology, University of Wisconsin, Green Bay, WI
07/1998 – 05/2002- Ph.D., The Medical College of Wisconsin, Milwaukee, WI

- (6) **POSTGRADUATE TRAINING AND FELLOWSHIP APPOINTMENTS:**
06/2002 – 12/2002 – Postdoctoral Fellow, Cell & Developmental Biology, The Medical College of Wisconsin, Milwaukee, WI
01/2003 – 03/2006 – Postdoctoral Fellow, Center for Visual Science, University of Rochester, Rochester, NY

- (8) **FACULTY APPOINTMENTS:**
04/2006 – 07/2010 – Assistant Professor, Department of Ophthalmology, The Medical College of Wisconsin, Milwaukee, WI
04/2006 – 07/2010 – Assistant Professor, Department of Biophysics, The Medical College of Wisconsin, Milwaukee, WI
06/2008 – 07/2011 – Assistant Professor, Department of Cell Biology, Neurobiology, & Anatomy, The Medical College of Wisconsin, Milwaukee, WI

- 07/2010 – present – Associate Professor, Departments of Ophthalmology and Biophysics, The Medical College of Wisconsin, Milwaukee, WI
- 07/2011 – present – Associate Professor, Department of Cell Biology, Neurobiology, & Anatomy, The Medical College of Wisconsin, Milwaukee, WI
- 07/2011 – present – Adjunct Associate Professor, Department of Biomedical Engineering, Marquette University, Milwaukee, WI
- 10/2013 – present – Richard O. Schultz / Ruth Works Professor of Ophthalmology, The Medical College of Wisconsin, Milwaukee, WI
- 10/2013 – present – Honorary Professor of University College London, Institute of Ophthalmology, UCL, London, ENGLAND

(9) RESEARCH LEADERSHIP/ADMINISTRATIVE APPOINTMENTS:

- 01/2009 – present – Director, Core Image Analysis Module, Department of Ophthalmology, Medical College of Wisconsin, Milwaukee, WI
- 07/2009 – present – co-Director, Advanced Ocular Imaging Program, Department of Ophthalmology, Medical College of Wisconsin, Milwaukee, WI
- 01/2014 – present – Director, Core Grant for Vision Research, Department of Ophthalmology, Medical College of Wisconsin, Milwaukee, WI

(15) AWARDS AND HONORS:

- 05/2001 – Retina Research Foundation Travel Award, 2001 ARVO Annual Meeting
- 06/2001 – Course Participant & Scholarship Recipient, Structure, Function and Development of the Visual System – Cold Spring Harbor Laboratory, Cold Spring Harbor, NY
- 08/2004 – Pfizer Travel Fellowship, 2004 International Congress of Eye Research
- 10/2005 – Optical Society of America Young Investigator Award (best presentation by a student or postdoc), 2005 OSA Fall Vision Meeting, Tucson, AZ.
- 04/2006 – Wisconsin Association of Educational Opportunity Program Personnel - TRIO Achiever Award (TRIO is a US federal programs to increase access to higher education for economically disadvantaged students)
- 04/2007 – University of Wisconsin Green Bay Outstanding Recent Alumni Award
- 01/2007 – Karl Kirchgessner Foundation Vision Research Award
- 12/2007 – E. Matilda Ziegler Foundation Vision Research Award
- 01/2008 – Research to Prevent Blindness Career Development Award
- 09/2008 – Foundation Fighting Blindness Travel Award, Retinal Degeneration Meeting 2008, Emeishan, China
- 10/2010 – Outstanding Medical School Teacher, Physician Scientist Pathway, MCW Curriculum & Evaluation Committee
- 12/2011 – Outstanding Medical School Teacher, Physician Scientist Pathway and Medical Neurosciences, MCW Curriculum & Evaluation Committee
- 02/2012 – ALCON Research Institute, Young Investigator Award
- 09/2014 – Outstanding Teacher Award, MCW Graduate School of Biomedical Sciences
- 11/2014 – ARVO Fellow (Silver)
- 05/2015 – Alumnus of the Year, MCW Graduate School of Biomedical Sciences

(16) MEMBERSHIPS IN HONORARY AND PROFESSIONAL SOCIETIES:

- 10/1998 – present Association for Research in Vision and Ophthalmology (ARVO)
- 03/1999 – present Optical Society of America (OSA)
- 07/1999 – present International Colour Vision Society (ICVS)
- 06/2004 – present International Society for Eye Research (ISER)
- 06/2014 – present Associate Member, McPherson Eye Research Institute, University of Wisconsin, Madison, WI

(17) EDITORSHIPS/EDITORIAL BOARDS/JOURNAL REVIEWS:

Editorships:

- 05/2006 - 05/2007 – *Journal of the Optical Society of America A* (lead feature editor for issue on “Advances in Retinal Imaging”)

- 10/2010 – 03/2011 – *Biomedical Optics Express* (lead feature editor for issue on “Cellular Retinal Imaging”)

- 07/2011 – present – Associate Editor, *Biomedical Optics Express*

- 09/2013 – present – Editorial Board Member, *Investigative Ophthalmology & Visual Science*

- 11/2014 – present – *Visual Neuroscience* (feature editor for issue on “In Vivo Retinal Imaging”)

- 1/2015 – present – Associate Editor, *Visual Neuroscience*

Ad hoc Journal Reviewer (past 3 years):

- Biomedical Optics Express
- Current Biology
- Investigative Ophthalmology & Visual Science
- JAMA Ophthalmology
- Journal of the Optical Society of America A
- Journal of Vision
- Ophthalmology
- Optics Express
- PLoS One
- Retina
- Vision Research
- Visual Neuroscience

(19) NATIONAL ELECTED/APPOINTED LEADERSHIP AND COMMITTEE POSITIONS:

- 10/2004 – 10/2006 – Vice-chair, OSA Applications of Visual Science Technical Group
- 05/2004 – 05/2007 – Member, ARVO Advocacy Committee
- 10/2006 – 10/2008 – Chair, OSA Applications of Visual Science Technical Group
- 05/2006 – 05/2010 – Member, ARVO Members-in-Training Committee
- 05/2006 – 05/2009 – Member, ARVO Program Committee, VI Section
- 05/2009 – 05/2010 – Chair, ARVO Program Committee, VI Section
- 05/2007 – 05/2010 – Member, ARVO Commercial Relationships Committee

10/2007 Participant, ARVO Strategic Planning Retreat
 10/2007 – 12/2010 – Chair-elect, OSA Vision & Color Division
 10/2008 – 12/2014 – Member, OSA Board of Meetings
 10/2008 – 10/2010 – OSA Frontiers in Optics Subcommittee Chair, Division 7
 05/2008 – 05/2013 – ARVO Strategic Planning Working Group (MIT)
 03/2008 – 12/2014 – Member, Verriest Medal Selection Committee, ICVS
 01/2008 – 09/2008 – Session Organizer, XVIII International Congress for Eye Research
 10/2008 – present – Member, International Society of Imaging the Eye Program
 Committee
 10/2008 – present – Member, Advisory Committee for the ARVO Multidisciplinary
 Ophthalmic Imaging Group
 01/2009 – 12/2012 – Member, OSA Edgar D. Tillyer Award Committee (Chair in 2011)
 01/2009 – 05/2013 – Member, Fight for Sight Scientific Review Committee
 05/2010 – 05/2013 – Chair, ARVO Members-in-Training Committee
 12/2010 – 12/2014 – Chair, OSA Vision & Color Division
 10/2010, 02/2011 – Ad Hoc member, BMIT study section (NIH CSR)
 05/2011 – Mail reviewer, ZRG1 ETTN-E (12) B study section (NIH)
 06/2011 – 06/2012 – ARVO Annual Meeting Site Selection Working Group
 11/2011 – Mail reviewer, Collaborative Health Research Projects Selection
 Panel (Canada)
 12/2012 – Reviewer for Medical Research Council (UK)
 02/2013, 06/2013 – Ad Hoc member, ZRG1 ETTN-G (12) study section (NIH)
 11/2013 – present – Member, Dept of Veterans Affairs NURF SRG (VA)
 10/2013 – Grant Reviewer for Science Foundation Ireland
 04/2014 – Grant Reviewer for NHMRC Australia
 04/2014 – Grant Reviewer for German Science Foundation, DFG
 06/2014 – Ad Hoc member, ZDK1 GRB-9 (O3) study section (NIDDK)
 07/2014 – Ad Hoc reviewer, European Research Council

(20) RESEARCH GRANTS/AWARDS/CONTRACTS/PROJECTS:

A. Active

Peer Review

Title: **Assessing Photoreceptor Structure & Function in Normal and Diseased Retinae**

Source: National Eye Institute (NIH) (R01EY017607-07)

Role: Principal Investigator

Dates: August 1, 2013 – July 31, 2017

Title: **Core Grant for Vision Research**

Source: National Eye Institute (NIH) (P30EY001931-38)

Role: Principal Investigator and Image Analysis Module Director

Dates: April 1, 2012 – March 31, 2017

Title: **Platform Technologies for Microscopic Retinal Imaging: Development & Translation**

Source: National Eye Institute (NIH) (U01EY025477-01)

Role: Principal Investigator (MPI w/ Dr. Alf Dubra)

Dates: May 1, 2015 – April 30, 2020

Title: **Clinical and Genetic Characterization of Individuals With Achromatopsia**

PI: William Hauswirth, Ph.D.

Source: National Eye Institute (NIH) (R24EY022023)

Role: co-Investigator & MCW subcontract PI

Dates: June 30, 2013 – May 31, 2018

Title: **Retinal Versus Cortical Contributions to Vision Loss in Albinism**

Source: National Eye Institute (NIH) (R01EY024969-01)

Role: Principal Investigator (MPI w/ Dr. Ted DeYoe)

Dates: December 1, 2014 – November 30, 2018

Title: **Improving Therapeutic Strategies in Age-Related Macular Degeneration Using Adaptive Optics Retinal Imaging**

Source: The Edward N. & Della L. Thome Memorial Foundation

Role: Principal Investigator

Dates: January 31, 2015 – January 30, 2017

Title: **Research Training Program in Vision Science**

PI: Joseph C. Besharse, Ph.D.

Source: National Eye Institute (NIH) (T32EY014537)

Role: Graduate Student Mentor

Dates: September 1, 2013 – August 31, 2018

Non-Peer Review

Title: **Pediatric Imaging of Retinopathy of Prematurity**

PI: Deborah Costakos, M.S., M.D.

Source: Greater Milwaukee Foundation

Role: co-Investigator

Dates: July 1, 2013 - June 30, 2017

Title: **Adaptive Optics Imaging – Phase 2 Trial**

Source: Lowy Medical Research Institute

Role: Principal Investigator

Dates: July 1, 2014 - June 30, 2015

Title: **rAAV-CNGB33 Gene Therapy For Achromatopsia: Translational Research Studies**

Source: Applied Genetics Technology Corporation (AGTC)

Role: Principal Investigator

Dates: April 1, 2013 – December 31, 2015

Title: **Adaptive Optics Imaging – Phase 2 Trial**

Source: Lowy Medical Research Institute (LMRI)

Role: Principal Investigator

Dates: October 1, 2013 – September 30, 2016

C. Prior

Peer Review

- Title: **Organization of the Trichromatic Cone Mosaic**
Source: National Eye Institute (NIH) (F32EY014749)
Role: Principal Investigator
Dates: April 1, 2003 - March 31, 2006
- Title: **Imaging the Effects of Cone Opsin Mutations on the Integrity of the Cone Photoreceptor Mosaic**
Source: Fight for Sight
Role: Principal Investigator
Dates: June 1, 2007 - June 30, 2008
- Title: **Uncovering Mechanisms of Retinal Disease with High-Resolution Retinal Imaging**
Source: E. Matilda Ziegler Foundation for the Blind, Inc.
Role: Principal Investigator
Dates: December 31, 2007 - December 31, 2010
- Title: **Development of a Predictive Algorithm for Age-related Macular Degeneration**
PI: Murray Brilliant, Ph.D.
Source: Wisconsin Genomics Initiative
Role: Co-Principal Investigator
Dates: August 1, 2010 – June 30, 2012
- Title: **Career Development Award**
Source: Research to Prevent Blindness
Role: Principal Investigator
Dates: January 1, 2008 - January 1, 2012
- Title: **Advanced Imaging of Photoreceptor Disruption in Retinal Disease**
Source: Foundation Fighting Blindness
Role: Principal Investigator
Dates: July 1, 2011 – June 30, 2014

Non-Peer Review

- Title: **Relationship Between Cone Density and Cortical Magnification Assessed with fMRI**
Source: Rochester Center for Brain Imaging
Role: Principal Investigator
Dates: March 1, 2005 - December 31, 2005
- Title: **Visualizing the Effects of Disruptions in Cone Opsin Expression on the Topography of the Human Cone Mosaic**
Source: Karl Kirchgessner Foundation (unsolicited)
Role: Principal Investigator
Dates: January 1, 2007 - December 31, 2007

Title: **Advanced Retinal Imaging and Improving the Success of Gene Therapy**
Source: Hope for Vision
Role: Principal Investigator
Dates: January 14, 2009 - December 31, 2011

Title: **Assessing Foveal Anatomy in Albinism and Aniridia Using High Resolution Retinal Imaging**
Source: Vision for Tomorrow Foundation
Role: Principal Investigator
Dates: May 1, 2010 - July 1, 2012

(21) INVITED LECTURES/WORKSHOPS/PRESENTATIONS:

International

Carroll, J. & Williams, D.R. “Retinal imaging with adaptive optics reveals a novel disease mechanism for dichromacy,” presented at the 2004 FASEB Summer Research Conference – Retinal Neurobiology & Visual Processing, Saxtons River, VT (July, 2004).

Carroll, J., Choi, S., Gray, D., Wolfing, J., Williams, D.R. “Mechanisms of color blindness revealed with adaptive optics retinal imaging,” presented at the XVIth International Congress of Eye Research, Sydney, Australia (August, 2004).

Carroll, J. “Inferences about photoreceptor degeneration from high-resolution retinal imaging,” presented at the Department of Physics, National University of Ireland, Galway, Ireland (March, 2005).

Carroll, J. “In vivo imaging of human photoreceptor disease with adaptive optics,” presented at the 9th Annual Vision Research Conference: Neuroimaging the Retina, Fort Lauderdale, FL (May, 2005).

Carroll, J. “Organization of the human cone mosaic: Implications for red-green color vision,” presented at the 2006 ARVO Annual Meeting, Ft. Lauderdale, FL (April, 2006).

Carroll, J. “High-resolution imaging of human photoreceptor disease with adaptive-optics ophthalmoscopy,” presented at the 2006 ARVO Annual Meeting, Ft. Lauderdale, FL (April, 2006).

Carroll, J., Porter, J., Neitz, J., Williams, D. R., Neitz, M., “The effects of cone opsin gene disruption on the human photoreceptor mosaic,” presented at the Engineering the Eye Conference, National University of Ireland, Galway, Ireland (June, 2006).

Carroll, J., Roorda, A., Williams, D.R. “Applications of retinal imaging with adaptive-optics ophthalmoscopy,” presented at the XVIIth International Congress of Eye Research, Buenos Aires, Argentina (November, 2006).

Carroll, J. “High-resolution retinal imaging in inherited colour vision defects,” presented at the Summer Colour Conference, University of Melbourne, Australia (February, 2007).

Carroll, J. “High-resolution measurement of visual function using adaptive optics,” presented at the 8th International Congress of Wavefront Sensing and Optimized Refractive Corrections, Santa Fe, NM (February, 2007).

Carroll, J. “Organization of the human cone mosaic: implications for red-green colour vision,” presented at the World Congress of the International Brain Research Organization, Melbourne, Australia (July, 2007).

Carroll, J. “Disruption of the human cone mosaic caused by cone opsin mutations,” presented at The Australian National University, Canberra, Australia (July, 2007).

Carroll, J. “Assessing the healthy and diseased retina with imaging approaches,” presented at the 2008 FASEB Summer Research Conference – Retinal Neurobiology & Visual Processing, Snowmass Village, CO (July, 2008).

Carroll, J. “Clinical applications of high-resolution retinal imaging,” presented to the Applied Optics group in the Department of Physics, National University of Ireland, Galway, Ireland (July, 2009).

Carroll, J. “Resolving drusen-associated photoreceptor disruption in vivo with adaptive optics,” presented at the Macula of Paris, Paris, France (January 2010).

Carroll, J. “Imaging the human retina: Development and disruption,” presented at the 3rd Annual Kongsberg Vision Meeting, Buskerud University College, Kongsberg, Norway (October, 2010).

Carroll, J. “Imaging the human retina with adaptive optics: Assessing development and disruption,” presented at the AAAS Annual Meeting, Washington, DC (February, 2011).

Carroll, J. & Dubra, A. “Imaging the cone mosaic in retinal disease,” presented at the 2011 FASEB Summer Research Conference – Biology & Chemistry of Vision, Carefree, AZ (June, 2011).

Carroll, J. “Imaging the human retina: Development and disruption,” presented at the Department of Genetics, Institute of Ophthalmology, London, England (July, 2011).

Carroll, J. “Imaging photoreceptor disruption in the human retina,” presented at the Bosch Institute Annual Scientific Meeting, University of Sydney, Sydney, Australia (June, 2013).

Carroll, J. “Adaptive optics imaging of the human retina,” presented at the Retina 2013 Meeting, Dublin, Ireland (November, 2013).

Carroll, J. “Imaging photoreceptor structure with AOSLO: Recent advances,” presented at the 7th Annual Kongsberg Vision Meeting, Buskerud University College, Kongsberg, Norway (October, 2014).

Carroll, J. “High-resolution imaging of photoreceptor structure in retinal disease,” presented at the 3rd Biennial International Symposium on Age Related Macular Degeneration, Harvard Medical School, Boston, MA (October, 2014).

Carroll, J. “In vivo imaging of human cone photoreceptor inner segments,” presented at the IRCCS Fondazione G.B. Bietti, Rome, Italy (December, 2014).

Carroll, J. “Adaptive optics imaging in inherited retinal degenerations,” presented at the Casey Eye Institute’s 2nd Retinal Gene Therapy Conference, Denver, CO (May, 2015).

***Carroll, J.** “Adaptive optics imaging biomarkers,” to be presented at the IX International Meeting of the IRCCS Fondazione G.B. Bietti, “*New Diagnostic and Therapeutic Frontiers in Ophthalmology*,” Rome, Italy (October, 2015).

***Carroll, J.** “Adaptive optics imaging in inherited retinal degenerations,” to be presented at the 13th MVRF International Scientific Conference, Boston, MA (October, 2015).

***Carroll, J.** “Towards a normative database for the human retinal vasculature” to be presented at Third International Congress on *En Face* OCT Imaging, Rome, Italy (December, 2015).

National

Carroll, J. “High-resolution imaging of human photoreceptor disease with adaptive-optics ophthalmoscopy,” presented at the New England College of Optometry (January, 2006).

Carroll, J. “Retinal imaging with adaptive optics reveals novel disease mechanisms in color blindness,” presented at SUNY College of Optometry, New York, NY (December, 2006).

Carroll, J. “Imaging the effects of cone opsin mutations on the organization of the human cone mosaic,” presented at the Periopsia Seminar Series, University of Houston College of Optometry, Houston, TX (February, 2007).

Carroll, J. “High-resolution retinal imaging reveals unusual cone mosaics in color vision defects,” presented at the 24th Annual Houston Conference on Biomedical Engineering Research, Houston, TX (February, 2007).

Carroll, J. “Imaging the effects of cone opsin mutations on the organization of the human cone mosaic,” Invited Plenary talk – Center for Adaptive Optics Spring Retreat, University of California-Santa Cruz, Santa Cruz, CA (March, 2007).

Carroll, J. “Visualizing the effect of disruptions in the cone pigment genes on the organization of the cone mosaic,” presented at the Molecular, Cellular, and Integrated Neurosciences Seminar Series, Colorado State University, Fort Collins, CO (November, 2007).

Carroll, J. “Visualizing the effect of disruptions in the cone pigment genes on the organization of the cone mosaic,” presented at the Oxyopia Seminar Series, University of California-Berkeley, Berkeley, CA (March, 2008).

Carroll, J. “Using adaptive optics to understand cone degeneration: A progress report,” presented at the Adaptive Optics Interest Group, University of California-Berkeley, Berkeley, CA (May, 2008).

Carroll, J. “Investigating preclinical phenotypes using adaptive optics retinal imaging,” presented at the Smith-Kettlewell Eye Research Institute, San Francisco, CA (May, 2008).

Carroll, J. “Imaging the effects of cone opsin mutations on the organization of the human cone mosaic,” presented at the Third Annual Berkeley Conference on Translational Research, Berkeley, CA (June, 2009).

Carroll, J. “Visualizing the effect of disruptions in the cone pigment genes on the retinal cone mosaic,” presented at Vanderbilt University, Nashville, TN (November, 2009).

Carroll, J. “Applications of adaptive optics and OCT retinal imaging,” presented at UCSF Department of Ophthalmology Grand Rounds, San Francisco, CA (April, 2010).

Carroll, J. “SD-OCT image segmentation in retinal pathology assessed with adaptive optics,” presented at the Society for Imaging and Applied Mathematics, Imaging Science Meeting, Chicago, IL (April, 2010).

Carroll, J. “Imaging the human retina: Development and disruption,” presented at the 27th Center for Visual Science Symposium: Photons and Neurons, Rochester, NY (June, 2010).

Carroll, J. “OCT imaging of the human retina: Pearls and pitfalls,” presented at Casey Eye Institute, Portland, OR (June, 2010).

Carroll, J. “Disruptions in foveal morphology and cone topography visualized with high-resolution retinal imaging,” presented at The Ohio State University, College of Optometry, Columbus, OH (August, 2010).

Carroll, J. “Subclinical photoreceptor phenotypes assessed using high-resolution retinal imaging,” presented at Emory University, Department of Ophthalmology, Atlanta, GA (January, 2011).

Carroll, J. “Imaging the photoreceptor mosaic in normal and diseased eyes,” presented at Duke University, Fitzpatrick Institute for Photonics, Durham, NC (April, 2011).

Carroll, J. “Clinical applications of adaptive optics retinal imaging,” presented at Duke University, Department of Ophthalmology, Durham, NC (April, 2011).

Carroll, J. “Understanding the normal and diseased retina using adaptive optics imaging,” presented at the 95th Annual Meeting of the Optical Society of America, San Jose, CA (October, 2011).

Carroll, J. “Do you know where your cones are? Efforts in deriving repeatable cone density estimates from AO images,” Invited talk – Center for Adaptive Optics Fall Retreat, Lake Arrowhead, CA (November, 2011).

Carroll, J. “High-resolution imaging of the human retina: Development and disruption,” presented at University of Pennsylvania, Department of Ophthalmology, Philadelphia, PA (December, 2011).

Carroll, J. “Adaptive Optics in Ophthalmic Imaging,” presented at the 43rd Annual Education Program of the Ophthalmic Photographers Society, Chicago, IL (November, 2012).

Carroll, J. “Interpretation of adaptive optics images of the photoreceptor mosaic,” presented at International Retinal Imaging Symposium (IRIS-II), New York, NY (June, 2014).

Carroll, J. “Adaptive Optics in Ophthalmic Imaging: Photoreceptor Disruption,” presented at Indiana Optometric Association Fall Seminar, Bloomington, IN (October, 2014).

Carroll, J. “Imaging Photoreceptor Disruption in the Human Retina,” presented at Indiana University School of Optometry, Bloomington, IN (October, 2014).

Carroll, J. “Advances in adaptive optics retinal imaging,” presented at the Ross Eye Institute, SUNY Buffalo, Buffalo, NY (January, 2015).

Carroll, J. “Advances in adaptive optics retinal imaging,” presented at the Department of Ophthalmology, University of Florida, Gainesville, FL (January, 2015).

Carroll, J. “Advances in adaptive optics retinal imaging,” presented at the Joan & Gordon Bergy Lecture Series in Vision Science, University of Washington, Seattle, WA (April, 2015).

Carroll, J. “Applications of adaptive optics retinal imaging,” presented at Wilmer Eye Institute, Johns Hopkins University, Baltimore, MD (May, 2015).

Regional

Carroll, J. “Adaptive optics: How it works, retinal rod/cone imaging, & possible clinical applications,” presented at the 49th Annual Ophthalmology Conference, Rochester, NY (June, 2004).

Carroll, J. “Color coding in the human retina and implications for disease,” presented at the 49th Annual Ophthalmology Conference, Rochester, NY (June, 2004).

Carroll, J. “Electro-diagnostic testing: ERG, Multifocal ERG,” presented at the 50th Annual Ophthalmology Conference, Rochester, NY (May, 2005).

Carroll J. “Visualizing the effect of disruptions in the cone pigment genes on the organization of the cone mosaic,” presented at The Gerald A. Fishman, MD Lecture Series in Vision Science, University of Illinois at Chicago, Chicago, IL (June, 2007).

Carroll, J. “Visualizing the effect of disruptions in the cone pigment genes on the organization of the cone mosaic,” presented at the Department of Ophthalmology, Northwestern University, Chicago, IL (March, 2008).

Local

Carroll, J. “Applications of high-resolution retinal imaging with adaptive optics,” presented at the Department of Biophysics, Medical College of Wisconsin (September, 2005).

Carroll, J. “Applications of high-resolution retinal imaging with adaptive optics,” presented at The Brotz Lecture Series, Department of Biomedical Engineering, Marquette University (September, 2005).

Carroll, J. “Clinical applications of adaptive-optics ophthalmoscopy,” presented at the Wisconsin Eye MD Meeting, Waukesha, WI (June, 2006).

Carroll, J. “Imaging the effects of cone opsin mutations on the organization of the human cone mosaic,” presented at the Department of Cell Biology, Neurobiology, & Anatomy, Medical College of Wisconsin, Milwaukee, WI (January, 2008).

Carroll, J. “High-resolution imaging of the human retina: A progress report,” presented at The Brotz Lecture Series, Department of Biomedical Engineering, Marquette University (September, 2008).

Carroll, J. “Imaging retinal development in albinism,” presented at The Eye Institute Fall Symposium, Department of Ophthalmology, Medical College of Wisconsin (November, 2010).

Carroll, J. “Imaging the human retina: Development and disruption,” presented at the Neuroscience Research Center Inaugural Event, Medical College of Wisconsin (November, 2010).

Carroll, J. “High-resolution retinal imaging,” presented to the Society for Women in Engineering, Marquette University (October, 2011).

Carroll, J. & Costakos, D. “Imaging the human retina: Development and disruption,” presented at the Children’s Research Institute, Children’s Hospital of Wisconsin (December, 2011).

Carroll, J. “High resolution imaging of the living human retina,” presented at the Department of Biophysics, Medical College of Wisconsin (September, 2013).

Carroll, J. “Advances in non-invasive retinal imaging,” presented at the Integrated Neuroscience Research Center, Marquette University (March, 2015).

Carroll, J. “Clinical applications of high-resolution retinal imaging,” presented at the Joint Biomedical Engineering Seminar Series (MU, MCW, UWM), Medical College of Wisconsin (April, 2015).

(22) PEER REVIEWED WORKSHOPS/PRESENTATIONS:

International

Carroll, J., Neitz, M., Neitz, J. “Testing hypotheses about deutan color vision defects” presented at the XVth Symposium of the International Colour Vision Society, Göttingen, Germany (July, 1999).

Yamauchi, Y., Williams, D.R., Brainard, D.H., Roorda, A., **Carroll, J.**, Neitz, M., Neitz, J., Calderone, J.B., Jacobs, G.H. “What determines unique yellow, L/M cone ratio or visual experience?” presented at the 9th congress of the International Colour Association, Rochester, NY (June, 2001).

Carroll, J., Neitz, M., Neitz, J. “Variation in ERG-derived L/M cone ratio among trichromats is linked to the X-chromosome photopigment gene array” presented at the XVIth Symposium of the International Colour Vision Society, Cambridge, England (July, 2001).

Carroll, J., Hofer, H., Neitz, J., Neitz, M., Williams, D.R. “Variation in the cone mosaics of dichromats revealed with adaptive optics” presented at the XVIIth Symposium of the International Colour Vision Society, Seattle, WA (July, 2003).

Neitz, M., **Carroll, J.**, Renner, A., Knau, H., Werner, J.S., Neitz, J. “The genetic causes of red-green dichromacy” presented at the XVIIth Symposium of the International Colour Vision Society, Seattle, WA (July, 2003).

Carroll, J., Choi, S., Wolfing, J., Hofer, H., Williams, D.R. “Imaging retinal disease with adaptive optics” presented at the IInd European Optical Society Topical Meeting on Physiological Optics, Granada, Spain (September, 2004).

Carroll, J., Lin, J., Wolfing, J.I., Christie, N., Williams, D.R., Makous, W. “Retinal microscotomas revealed with adaptive-optics microflashes” presented at the XXVIIIth Symposium of the International Colour Vision Society, Lyon, France (July, 2005).

Chen, L., **Carroll, J.**, Williams, D.R. “A new method for classifying human cones *in vivo*” presented at the 5th International Workshop on Adaptive Optics, Beijing, China (September, 2005).

Baraas, R.C., **Carroll, J.**, Gunther, K.L., Wolfing, J.I., Gray, D., Dubra, A., Williams, D.R., Neitz, M., Foster, D.H. “A progressive form of tritanopia revealed with adaptive optics retinal imaging” presented at the Engineering the Eye II Conference, Galway, Ireland (June, 2006).

Carroll, J., Tait, D., Neitz, J., Neitz, M. “Normality of color vision in compound heterozygous females carrying a protan and a deutan defect” presented at the XIXth Symposium of the International Colour Vision Society, Belem, Brazil (July, 2007).

Carroll, J., Tait, D., Neitz, J., Neitz, M. “Normality of color vision in compound heterozygous females carrying a protan and a deutan defect” presented at Vision Down Under 2007, Cairns, Australia (July, 2007).

Krauskopf, J., & **Carroll, J.** “Numerical L:M cone ratio estimated by color appearance, ERG, and adaptive optics methods” presented at the 30th European Conference on Visual Perception, Arrezo, Italy (August, 2007).

Carroll, J. “Variation in temporal properties of cone degeneration imparted by various cone opsin mutations” presented at the XIIIth Symposium on Retinal Degeneration, Emeishan, China (September, 2008).

Neitz, M., **Carroll, J.**, Gunther, K.L., Neitz, J. “Evolutionary origin of high frequency deleterious mutations in the human cone opsins and their role in the most common eye disorders” presented at the XXth Symposium of the International Colour Vision Society, Braga, Portugal (July, 2009).

Carroll, J., Dubra, A., Wagner-Schuman, M., Neitz, J., McClements, M., Hunt, D.M., Mollon, J.D., Moore, A.T., Neitz, M., Michaelides, M. “Genetic mutations within the L/M array account for both cone dysfunction and the color vision phenotype in Bornholm eye disease” presented at the XIVth Symposium on Retinal Degeneration, Mont-Treblant, Canada (July, 2010).

Carroll, J., Dubis, A.M., Genead, M., Cooper, R.F., Williams, V., Sommer, P., Stepien, K.E., Connor, T., Fishman, G.A., Dubra, A., Neitz, J., Neitz, M. “A mutant opsin allele associated with cone-type specific degeneration” presented at the XXIst Symposium of the International Colour Vision Society, Kongsberg, Norway (July, 2011).

Rosen, R., Weitz, R., **Carroll, J.**, Dubra, A., Stepien, K.E., Sripsema, N., Garcia, P., Shah, N., Scoles, D., Burns, S., Landa, G. “Clinical applications of single cell retinal imaging using adaptive optics scanning laser ophthalmoscopy – an update” presented at the 35th Annual Macula Society Meeting, Jerusalem, Israel (June, 2012).

Eells, J., Gopalakrishnan, S., Schmitt, H., Maleki, S., Ranji, M., Dubis, A., **Carroll, J.** “Photobiomodulation protects retinal mitochondria and retinal function in a rodent model of retinitis pigmentosa” presented at Asia ARVO, New Delhi, India (October, 2013).

Rosen, R., Razeen, M., Gan, A., Shah, N., Pinhas, A., Cheang, E., Liu, L., Chui, T.Y., Weitz, R., **Carroll, J.**, Dubra, A. “New insights in macular microvasculature using quantitative adaptive optics scanning light ophthalmoscopy” presented at the 37th Annual Macula Society Meeting, Key Largo, FL (February, 2014).

Carroll, J., Scoles, D., Abozaid, M., Han, D.P., Cooper, R.F., Dubra, A. “Interpreting photoreceptor ellipsoid zone lesions visualized with en face SD-OCT” presented at Second International Congress on *En Face* OCT Imaging, Rome, Italy (December, 2014).

Schwartz, S., Connor, Jr., T.B., Vaziri, K., Moshfeghi, A., Moshfeghi, D., **Carroll, J.**, Brilliant, M., McKay, B. “Inverse association between L-DOPA and age-related macular degeneration” presented at the 38th Annual Macula Society Meeting, Scottsdale, AZ (January, 2015).

Rosen, R., Weitz, R., Pinhas, A., Dubow, M., Gentile, R., Gan, A., Razeen, M., Shah, N., Cheang, E., Liu, C., **Carroll, J.**, Sulai, Y., Dubra, A., Chui, T. “Dynamic histopathology studies of retinal vascular disease using adaptive optics imaging” presented at the 38th Annual Macula Society Meeting, Scottsdale, AZ (January, 2015).

Langlo, C.S., Collison, F., Summerfelt, P., White, C., Dubra, A., Hauswirth, W., Fishman, G., **Carroll, J.** “Longitudinal measurement of cone density in congenital achromatopsia” presented at the XXIIIrd Symposium of the International Colour Vision Society, Sendai, Japan (July, 2015).

Patterson, E.J., Langlo, C.S., **Carroll, J.** “The use of the Colour Assessment and Diagnosis (CAD) test in congenital achromatopsia” presented at the XXIIIrd Symposium of the International Colour Vision Society, Sendai, Japan (July, 2015).

Li, Z., **Carroll, J.** “An analytical model of the influence of cone sensitivity and numerosity on the Rayleigh match” presented at the XXIIIrd Symposium of the International Colour Vision Society, Sendai, Japan (July, 2015).

National

Carroll, J., Ver Hoeve, J. N., Murphy, C. J., Summerfelt, P. M., Neitz, J. “Cone photopigment spectral sensitivities in the horse” presented at the 30th Annual meeting of the American College of Veterinary Ophthalmologists, Chicago, IL (November, 1999).

Carroll, J., Neitz, J., Neitz, M. “Evaluation of the flicker photometric electroretinogram as a method for estimating L:M cone ratios in human eyes” presented at the 2000 OSA Annual Meeting, Providence, RI (October, 2000).

Carroll, J., Hofer, H., Neitz, M., Williams, D. R., Neitz, J. “Correlation of electroretinogram and adaptive optics derived L:M cone ratio estimates” presented at the 2002 FASEB Summer Research Conference – Retinal Neurobiology & Visual Processing, Saxtons River, VT (July, 2002).

Carroll, J., Lin, J., Wolfing, J. I., Christie, N., Williams, D. R., Makous, W. “Retinal microscotomas revealed with adaptive-optics microflashes, and a model” presented at the 2005 OSA Fall Vision Meeting, Tucson, AZ (October, 2005).

Carroll, J., Neitz, J., Neitz, M., Williams, D. R. “High-resolution imaging of the living retina in congenital cone disorders” presented at the Novel Approaches to Bio-Imaging Conference, Janelia Farm (HHMI Campus) Ashburn, VA (March, 2008).

Torti, C., Považay, B., Hofer, B., Herman, B., Kajic, V., Unterhuber, A., Fernandez, E. J., **Carroll, J.**, Ahnelt, P. K., Drexler, W. “In vivo genotype-phenotype correlation using ultra-high speed and resolution retinal OCT with pancorrection” presented at SPIE Photonics West, San Jose, CA (January, 2009).

Torti, C., Považay, B., Hofer, B., Herman, B., Kajic, V., Unterhuber, A., Fernandez, E. J., **Carroll, J.**, Ahnelt, P. K., Drexler, W. “Revealing cellular structure in the living human retina using ultra-high speed and resolution OCT with pancorrection” presented at SPIE Photonics West, San Jose, CA (January, 2009).

Wagner Schuman, M. L., Dubis, A., Rha, J., Schroeder, B., Godara, P., Stepien, K., **Carroll, J.**, Ahnelt, P. K., Drexler, W. “Photoreceptor mosaic phenotype associated with opsin-gene disruptions: A 6-year follow-up” presented at ARVO-ISIE, Fort Lauderdale, FL (May, 2009).

Godara, P., Rha, J., Schroeder, B., **Carroll, J.**, Weinberg, D. V. “Unusual adaptive optics findings in a patient with unexplained vision loss” presented at ARVO-ISIE, Fort Lauderdale, FL (May, 2009).

Han, D. P., Stepien, K. E., **Carroll, J.**, Schell, J., Godara, P., Rha, J. “Spectral-domain OCT and adaptive optics may detect Hydroxychloroquine retinal toxicity before symptomatic vision loss” presented at American Society of Retina Specialists, New York, NY (October, 2009).

Summers, C. G., Ostler, S., McAllister, J. T., Tait, D. M., Dubis, A., Rha, J., Stepien, K. E., **Carroll, J.** “Insight into the spectrum of foveal immaturity in albinism” presented at 36th Annual AAPOS Meeting, Orlando, FL (April, 2010).

Dubis, A.M., Wagner-Schuman, M.L., Weh, E., Odell, D.W., Chiao, H., Summerfelt, P., **Carroll, J.** “Variation in foveal pit morphology in Caucasians” presented at ARVO-ISIE, Fort Lauderdale, FL (May, 2010).

Kapur, R., Nordgren, R., Dubis, A., Rha, J., **Carroll, J.**, Holtebeck, A., Han, D. P., Stepien, K. E. “Imaging outer retinal structure in hydroxychloroquine patients” presented at ASRS, Vancouver, BC (August, 2010).

Eells, J.T., Gopalakrishnan, S., Schmitt, H., Dubis, A.M., **Carroll, J.** “Photobiomodulation protects against retinal degeneration in a rodent model of retinitis pigmentosa” presented at SPIE Photonics West, San Francisco, CA (February, 2013).

Chiu, S.J., Dubis, A.M., Cooper, R.F., Dubra, A., **Carroll, J.**, Izatt, J.A., Farsiu, S. “Validated automatic segmentation of photoreceptors in adaptive optics scanning ophthalmoscope images” presented at SPIE Photonics West, San Francisco, CA (February, 2013).

Rosen, R., Weitz, R., **Carroll, J.**, Dubow, M., Pinhas, A., Shah, N., Chui, T., Sulai, Y., Sripsema, N., Dubra, A. “Fluoro microangiography – First clinical studies of fluorescein angiography using adaptive optics scanning light ophthalmoscopy” presented at ARVO-ISIE, Seattle, WA (May, 2013).

Stepien, K.E., Sulai, Y., Langlo, C., Cooper, R., Flatter, J., Kay, D., Robison, S., Weinberg, D., Dubra, A., **Carroll, J.** “Alterations in cone photoreceptor reflectivity as a biomarker of photoreceptor health” presented at ARVO-ISIE, Seattle, WA (May, 2013).

Rosen, R., Pinhas, A., Razeen, M., Shah, N., Gan, A., Bavier, R., Weitz, R., **Carroll, J.**, Dubra, A., Chui, T.Y.P. “Quantitative insights into macular microvascularity using adaptive optics scanning light ophthalmoscopy fluorescein angiography” presented at ARVO-ISIE, Orlando, FL (May, 2014).

Sajdak, B., Cooper, R.F., Bazan, K., Higgins, B., Scoles, D.H., Wilk, M., Dubra, A., **Carroll, J.** “Improving the processing and analysis workflow of adaptive optics retinal imaging” presented at ARVO-ISIE, Orlando, FL (May, 2014).

Severn, P., Dubis, A.M., Cooper, R.F., **Carroll, J.**, Dubra, A., Fitzke, F., Rubin, G., Egan, C., Michaelides, M. “Clinical assessment and single cell imaging in unexplained vision loss” presented at ARVO-ISIE, Orlando, FL (May, 2014).

Eells, J.T., **Carroll, J.**, Ranji, M., Gopalakrishnan, S. “Unblinded by the light: Photobiomodulation in retinal injury and disease” presented at the American Society for Photobiology Annual Meeting, San Diego, CA (June, 2014).

Collison, F.T., Fishman, G.A., Weleber, R.G., **Carroll, J.**, Langlo, C.S., Chulay, J.D. “Prospective cohort study in achromatopsia” presented at the XVIth Symposium on Retinal Degeneration, Pacific Grove, CA (July, 2014).

Dubis, A.M., Aboshiha, J., BaAbbad, R., Pack, A., Samra, R.S., Ramsamy, G., Sulai, Y., Dubra, A., Webster, W., **Carroll, J.**, Michaelides, M. “Photoreceptor mosaic variability in *RPGR*-associated retinal dystrophy” presented at the XVIth Symposium on Retinal Degeneration, Pacific Grove, CA (July, 2014).

Stepien, K.E., Zakka, F.R., Scoles, D.H., Liu, B.S., Cooper, R.F., Langlo, C.S., Connor, T.B., Dubra, A., **Carroll, J.** “Correlation of photoreceptor structure with autofluorescence in retinal degeneration associated with *ABCA4* mutations” presented at the XVIth Symposium on Retinal Degeneration, Pacific Grove, CA (July, 2014).

Langlo, C.S., Scoles, D.H., Fishman, G.A., Gamm, D.M., Struck, M., Chiang, J., Dubra, A., **Carroll, J.** “Imaging cone inner segment structure in achromatopsia using split detector AOSLO” presented at the XVIth Symposium on Retinal Degeneration, Pacific Grove, CA (July, 2014).

Eells, J.T., Abroe, B., Schmitt, H., Summerfelt, P., Dubis, A., **Carroll, J.**, Gopalakrishnan, S. “830nm photobiomodulation is retinoprotective in a rodent model of retinitis pigmentosa” presented at the XVIth Symposium on Retinal Degeneration, Pacific Grove, CA (July, 2014).

Kim, J.E., Scoles, D.H., Blodi, B.A., Langlo, C.S., Stepien, K.E., Weinberg, D.V., **Carroll, J.**, Dubra, A., “Inner retina and vascular imaging in macular telangiectasia using adaptive optics” presented at the 47th Annual Scientific Meeting of The Retina Society, Philadelphia, PA (September, 2014).

(23) COMMITTEE SERVICE:

Medical College Committees

- 07/2000 - 06/2001 – President, Graduate Student Association, The Medical College of Wisconsin
- 07/2008 – present – Member, MCW IRB Review Committee (#2)
- 09/2008 – 07/2012 – Co-chair, Basic Science Faculty Search Committee, Department of Ophthalmology
- 10/2008 – present – Member, MSTP Admissions Committee
- 07/2008 – 07/2009 – Member, Faculty Council Curriculum & Evaluation Committee M3/M4 Subcommittee
- 01/2009 – Member, Advancing Healthier Wisconsin Grant Review Committee
- 07/2009 – 06/2012 – Member, GSC Course Evaluation Committee
- 07/2009 – 07/2012 – Member, Research Affairs Grant Review Committee
- 07/2009 – 07/2013 – Member, Physician Scientist Pathway Council
- 07/2009 – 05/2015 – Board Member, MCW/Marquette Medical Alumni Association
- 03/2010 – 06/2012 – Member, MCW Internship Program Committee
- 01/2011 – present – Member, Neuroscience Doctoral Program Admissions Committee
- 01/2015 – present – Member, Search Committee, Executive Director of Alumni Relations
- 02/2015 – Participant, Marquette University Opus College of Engineering Thought Leaders Summit

(24) MEDICAL COLLEGE TEACHING ACTIVITIES:

Medical Student Education

- 01/2000 – 05/2002 – Teaching Assistant, Integrated Medical Neuroscience Lab
- 01/2008 – present – Lecturer, Integrated Medical Neuroscience
- 01/2008 – present – Lab Staff, Integrated Medical Neuroscience
- 01/2010 – 06/2013 – Small Group Leader, Physician Scientist Pathway
- 12/2010 – Core Session Presenter, Physician Scientist Pathway

Graduate Student Education

- 01/2008 – present – Lecturer, The Biology of Vision

- 01/2008 – present – Lecturer, Integrated Graduate Neuroscience (continued as Fundamentals of Neuroscience)
- 10/2008 – Lecturer, Molecular & Cellular Neurobiology
- 01/2009 – present – Course Director, Integrated Graduate Neuroscience (continued as Fundamentals of Neuroscience)
- 03/2009 – Lecturer, Research Ethics Discussion Series
- 03/2009 – Lecturer, Mechanisms of Cellular Signaling
- 03/2013 – Lecturer, PhD program in Basic and Translational Sciences
- 07/2013 – present – Course Director, Advanced Systems Neuroscience

Resident & Fellow Education

- 02/2007 – present Basic Science Lecturer, Ophthalmology Residency Program
- 08/2008, 08/2009 OCT Workshop, Ophthalmology Residency Program
- 10/2009 – present Retina Lectures (Color Vision, Congenital Cone Disorders; Ophthalmology Residency Program)

Community/Lay Public

- 11/2006 “Retinal Imaging”; Eye Opener seminar series
- 03/2007 “Vision Research”; Oconomowoc High School
- 05/2008 “Envisioning the Future: Emerging Technologies for the Restoration and Preservation of Sight”; MCW Science Café
- 05/2009 Mentor, The Prairie School Interim Program
- 07/2010 Lecturer, MCW Apprenticeship in Medicine Program (AIM)
- 08/2011 “Advances in Retinal Imaging in Achromatopsia” – Achromatopsia Convention, The Chicago Lighthouse for People who Are Blind or Visually Impaired
- 12/2011 “Advances in high-resolution imaging of the human retina,” presented at the Milwaukee Chapter Meeting of the Foundation Fighting Blindness
- 01/2013 “Retinal Disease Research Breakthroughs: An Imaging Story,” presented at the Milwaukee Chapter Meeting of the Foundation Fighting Blindness
- 11/2013 Fighting Blindness Public Engagement Day, presented at Retina 2013, Dublin, Ireland
- 02/2014 “Adaptive Optics Imaging: From the Stars to Our Eyes,” presented at the Milwaukee Ophthalmological Society monthly meeting
- 11/2014 Fighting Blindness Public Engagement Day, presented at Retina 2014, Dublin, Ireland
- 01/2015 “Retinal Disease Research Breakthroughs,” presented at the Wisconsin Vision Seminar for the Foundation Fighting Blindness
- 04/2015 “Applications of High Resolution Retinal Imaging,” presented at the Neuroscience Research Center Advisory Board Meeting
- 06/2015 “Advances in Research and Treatment on Macular Degeneration,” presented at the Summer Meeting of the Froedtert & the Medical College of Wisconsin Presidents’ Advisory Council

(26) MCW STUDENTS, FACULTY, RESIDENTS AND CLINICAL/RESEARCH FELLOWS MENTORED:

High School Students

Natalie DeCheck	05/2009	The Prairie School Interim Program
Bradley Julga	06/2012 – 08/2012	Mentor, MCW ROADS program
Brookfield Central	10/2013 – 03/2014	SMART Team Mentor

Undergraduate Students

Allison Gegios	05/2008 – 08/2008	Mentor, MCW SPUR program
William Howenstine	05/2008 – 08/2008	Mentor, MCW SPUR program
Christina Sloan	05/2009 – 08/2009	Mentor, MCW SPUR program
Summer Thompson	05/2009 – 08/2009	Mentor, MCW SPUR program
Ben Hansen	05/2010 – 08/2010	Mentor, MCW SPUR program
Charles Fields	05/2010 – 08/2010	Mentor, MCW SPUR program
Michele Stoehr	05/2010 – 08/2010	Mentor, MCW SPUR program
Savannah Anderson	09/2010 – 05/2011	MSOE Internship student
Robert Garrioch	06/2011 – 09/2011	Mentor, MCW SPUR program
Alex Pechauer	01/2012 – 05/2012	Mentor, MCW PURE program
Brittany Bartlein	05/2012 – 08/2012	Mentor, MCW SPUR program
Aimee Beluch	11/2012 – 06/2013	Marquette Undergrad
Kathleen Bazan	05/2013 – 08/2013	Mentor, MCW SPUR program
Rebecca Mastey	05/2015 – present	Mentor, MCW SPUR program
Jonah Robinson	05/2015 – present	Mentor, MCW BUILD program
Ryan O'Toole	05/2015 – present	Marquette Undergrad

Medical Students

John McAllister*	05/2007 – 08/2007	MSSRP student mentor
	04/2009	Honors research mentor
Nazia Ayub	05/2008 – 08/2008	MSSRP student mentor
Shawn Ostler	05/2009 – 08/2009	MSSRP student mentor
Rachel Martin	05/2009 – 08/2009	MSSRP student mentor
Cory Siebe	05/2009 – 08/2009	MSSRP student mentor
Daniel Odell	05/2009 – 08/2009	MSSRP student mentor
	01/2010 – 05/2012	Physician Scientist Pathway mentor
Jackson Lever*	04/2009	Research elective mentor
Hellen Chiao	01/2010 – 05/2012	Physician Scientist Pathway mentor
Jason Croskrey*	01/2010 – 05/2012	Physician Scientist Pathway mentor
	05/2010 – 08/2010	MSSRP student mentor
Philip Sommer	01/2010 – 05/2012	Physician Scientist Pathway mentor
	05/2010 – 08/2010	MSSRP student mentor
Melissa Wagner-Schuman	07/2010 – 05/2012	Physician Scientist Pathway mentor
David Kay*	11/2010 – 05/2014	Physician Scientist Pathway mentor
	05/2011 – 08/2011	MSSRP student mentor
Megan Land*	11/2010 – 05/2014	Physician Scientist Pathway mentor
	05/2011 – 08/2011	MSSRP student mentor
	10/2013	Honors research mentor
Sean Hansen*	11/2010 – 05/2014	Physician Scientist Pathway mentor
	05/2011 – 08/2011	MSSRP student mentor
Leah Landsem	10/2011 – 05/2014	Physician Scientist Pathway mentor

	02/2013	Research elective mentor
John Flatter*	10/2011 – present	Physician Scientist Pathway mentor
	05/2012 – 08/2012	MSSRP student mentor
	10/2013	Honors research mentor
Derek Denney*	05/2012 – 08/2012	MSSRP student mentor
Ben Liu	10/2012 – present	Physician Scientist Pathway mentor
	05/2013 – 08/2013	MSSRP student mentor
Edward Randerson	05/2014 – 08/2014	MSSRP student mentor
	05/2014 – present	Physician Scientist Pathway mentor
Matthew Braza	05/2014 – 08/2014	MSSRP student mentor
	07/2014 – present	Physician Scientist Pathway mentor
Ryan Johnson	05/2014 – 08/2014	MSSRP student mentor
	05/2014 – present	Physician Scientist Pathway mentor
Timothy Carll	05/2014 – 08/2014	MSSRP student mentor
Kyle Greiber	05/2014 – 08/2014	MSSRP student mentor
Rachel Linderman	05/2015 – 08/2015	MSSRP student mentor
Madia Russilo	05/2015 – 08/2015	MSSRP student mentor
Jamil Khan	05/2015 – 08/2015	MSSRP student mentor
Alana Trotter	05/2015 – 08/2015	Research Mentor, M5 Curriculum

*=matched in Ophthalmology residency

Graduate Students

Ph.D. Students Advised (MCW)

Adam Dubis	05/2007 – 05/2012	Characterizing Foveal Morphology in the Normal and Diseased Retina
Chris Langlo (MSTP)	06/2012 – present	TBD
Melissa Wilk	06/2012 – present	Visual System Structure and Function: Consequences of Disrupted Melanin Synthesis
Alex Salmon	05/2015 – present	TBD

Ph.D. Students Advised (Marquette University Biomedical Engineering Program)

Robert Cooper	01/2010 – present	Analyzing Reflectance Changes of Rod & Cone Photoreceptors
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Masters Students Advised (Marquette University Biomedical Engineering Program)

Hitesh Tanna	02/2008 – 12/2009	Tools for Retinal Image Processing
Ashavini Pavaskar	02/2009 – 05/2011	Automated OCT Retinal Image Analysis

Ph.D. / M.S. Committees

Jim Kuchenbecker	05/2007 – 05/2008	Ph.D. (joint Marquette-MCW)
Diane Tait	07/2006 – 05/2008	Ph.D.
Matt Mauck	05/2007 – 06/2008	Ph.D.
Melissa Wagner-Schuman	07/2006 – 05/2010	Ph.D.
Dan Roberson	07/2005 – 02/2011	Ph.D.
Sandeep Gopalakrishnan	05/2010 – 07/2012	Ph.D. (UW-Milwaukee)
Andy Salzwedel	05/2010 – 05/2014	Ph.D.

Alex Puckett	10/2009 – 05/2013	Ph.D.
Danielle Reitsma	10/2011 – 08/2013	Ph.D.
Elisabeth Finstad	05/2015	MSc. (<i>Buskerud University College, Norway; external examiner</i>)

Ph.D. Rotation Students

Danielle Reitsma	Spring 2009	Neuroscience Doctoral Program
Anthony Prisco	Summer 2009	MSTP Program
Kate Engerer	Summer 2009	MSTP Program
Eric Weh	Winter 2009	IDP Program
Nathan Schuld	Spring 2010	IDP Program
Teresa Patitucci	Summer/Fall 2010	IDP Program
Melissa Diederichs	Summer/Fall 2011	Neuroscience Doctoral Program
Francie Moehring	Fall 2013	Neuroscience Doctoral Program
Ashley Echert	Fall 2013	Neuroscience Doctoral Program
Erica Woertz	Summer 2014	MSTP Program
Zachary Brandt	Fall 2014	IDP Program
Alex Salmon	Spring 2015	Neuroscience Doctoral Program

Research Fellows

Jungtae Rha, PhD	10/2006 – 10/2012	Research mentor
Diane Tait, PhD	05/2008 – 10/2009	Research mentor
Jesson Martin, PhD	02/2007 – 07/2008	Research mentor
Pooja Godara, MD	10/2008 – 12/2009	Research mentor
	07/2011 – 07/2012	Research mentor
Fouad Zakka, MD	08/2012 – 06/2014	Research mentor
Mortada Abdelaal	01/2014 – 07/2014	Research mentor (Egypt)
Emily Patterson, PhD	10/2014 – present	Research mentor
Lynn Sun, MD, PhD	04/2015 – present	Research mentor

(28) PROGRAMMATIC DEVELOPMENTS:

- 2007-present – Initiated the organization of a departmental seminar series (*Ophthalmology*); coordinated speaker invitations with fellow faculty and assisted in development of promotional materials
- 2008 – Implemented Cirrus OCT imaging capabilities for Ophthalmology clinic, provided formal training of technicians, optometrists, and provided continued technical support.
- 2009 – Established the Eye Institute *Advanced Ocular Imaging Program*
- 2008-present – Assist with the Eye Institute’s comprehensive color vision testing service
- 2010 – co-organizer, Department of Ophthalmology Annual Fall Symposium, CME approved, “*Advances in Ocular Imaging*”
- 2014 – co-organizer, Department of Ophthalmology Annual Fall Symposium, CME approved, “*The Aging Eye*”

(30) BIBLIOGRAPHY:

REFEREED JOURNAL PUBLICATIONS/ORIGINAL PAPERS

1. **Carroll, J.**, McMahon, C., Neitz, M., Neitz, J., “Flicker-photometric electroretinogram estimates of L:M cone photoreceptor ratio in men with photopigment spectra derived from genetics” *Journal of the Optical Society of America A* 17(3): 499-509 (2000). PMID: 10708031

2. **Carroll, J.**, Neitz, M., Neitz, J., “Testing hypotheses about visual pigments underlying deutan color vision” *Color Research & Application* 26(S1): 106-111 (2001).
3. **Carroll, J.**, Ver Hoeve, J.N., Neitz, M., Murphy, C.J., Neitz, J., “Photopigment basis for dichromatic color vision in the horse” *Journal of Vision* 1(2): 80-87 (2001). [PMID: 12678603](#)
4. **Carroll, J.**, Neitz, M., Neitz, J., “Estimates of L:M cone ratio from ERG flicker photometry and genetics” *Journal of Vision* 2(8): 531-542 (2002). [PMID: 12678637](#)
5. Neitz, J., **Carroll, J.**, Yamauchi, Y., Neitz, M., Williams, D.R., “Color perception is mediated by a plastic neural mechanism that remains adjustable in adults” *Neuron* 35(4): 783-792 (2002). [PMID: 12194876](#)
6. Neitz, M., **Carroll, J.**, Renner, A., Knau, H., Werner, J.S., Neitz, J., “Variety of genotypes in males diagnosed as dichromatic on a conventional clinical anomaloscope” *Visual Neuroscience* 21(3): 205-216 (2004). [PMID: 15518190](#)
7. **Carroll, J.**, Neitz, M., Hofer, H., Neitz, J., Williams, D.R., “Functional photoreceptor loss revealed with adaptive optics: An alternate cause of color blindness” *Proceedings of the National Academy of Sciences, USA* 101(22): 8461-8466 (2004). [PMCID: PMC420416](#)
8. Putnam, N., Hofer, H., Doble, N., Chen, L., **Carroll, J.**, Williams, D.R., “The locus of fixation and the foveal cone mosaic” *Journal of Vision* 5(7): 632-639 (2005). [PMID: 16231998](#)
9. Hofer, H., **Carroll, J.**, Neitz, J., Neitz, M., Williams, D.R., “Organization of the human trichromatic cone mosaic” *Journal of Neuroscience* 25(42): 9669-9679 (2005). [PMID: 16237171](#)
10. Wolfing, J. I., Chung, M., **Carroll, J.**, Roorda, A., Williams, D.R., “High-resolution retinal imaging of cone-rod dystrophy” *Ophthalmology* 113(6): 1014-1019 (2006). [PMID: 16650474](#)
11. Makous, W., **Carroll, J.**, Lin, J., Wolfing, J.I., Christie, N., Williams, D.R., “Retinal microscotomas revealed with adaptive-optics microflashes” *Investigative Ophthalmology & Visual Science* 47(9): 4160-4167 (2006). [PMID: 16936137](#)
12. Baraas, R.C., **Carroll, J.**, Gunther, K.L., Chung, M., Williams, D.R., Foster, D.H., Neitz, M., “Adaptive-optics retinal imaging reveals S-cone dystrophy in tritan color-vision deficiency” *Journal of the Optical Society of America A* 24(5): 1438-1447 (2007). [PMCID: PMC2082754](#)
13. McMahan, C., **Carroll, J.**, Awua, S., Neitz, J., Neitz, M., “The L:M cone ratio in males of African descent with normal color vision” *Journal of Vision* 8(2):5, 1-9 <http://journalofvision.org/8/2/5/>, doi:10.1167/8.2.5 (2008). [PMCID: PMC2431169](#)
14. **Carroll, J.**, Choi, S.S., Williams, D.R., “In vivo imaging of the photoreceptor mosaic of a rod monochromat” *Vision Research* 48:26, 2564-2568 (2008). [PMCID: PMC2582057](#)
15. Tait, D., **Carroll, J.**, “Normality of color vision in a compound heterozygous female carrying a protan and a deutan defect” *Clinical and Experimental Optometry* 92:4, 356-361 (2009). [PMCID: PMC3328350](#)
16. Dubis, A., McAllister, J.T., **Carroll, J.**, “Reconstructing foveal pit morphology from optical coherence tomography imaging” *British Journal of Ophthalmology* 93(9), 1223-1227 (2009). [PMCID: PMC3327485](#)
17. Torti, C., Považay, B., Hofer, B., Unterhuber, A., **Carroll, J.**, Ahnelt, P.K., Drexler, W. “Adaptive optics optical coherence tomography at 120,000 depth scans/s for non-invasive cellular phenotyping of the living human retina” *Optics Express* 17(22): 19382-19400 (2009). [PMCID: PMC3474252](#)

18. Rha, J., Schroeder, B., Godara, P., **Carroll, J.** “Variable optical activation of human cone photoreceptors visualized using short coherence light source” *Optics Letters* 34(24): 3782-3784 (2009). [PMCID: PMC3474246](#)
19. **Carroll, J.**, Baraas, R.C., Morgan, J.I.W., Neitz, J., Williams, D.R., Foster, D.H., Neitz, M. “Expression of opsin with Cys203Arg mutation results in retinal cone degeneration” *Proceedings of the National Academy of Sciences, USA* 106(49): 20948-20953 (2009). [PMCID: PMC2791574](#)
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