

**STATE BOARD OF OPTOMETRY**

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Continuing Education Course Approval Checklist

Title:

Provider Name:

☒ Completed Application

Open to all Optometrists? ☒ Yes ☐ No

Maintain Record Agreement? ☒ Yes ☐ No

☒ Correct Application Fee

☒ Detailed Course Summary

☒ Detailed Course Outline

☒ PowerPoint and/or other Presentation Materials

☐ Advertising (optional)

☒ CV for EACH Course Instructor

☒ License Verification for Each Course Instructor

Disciplinary History? ☐ Yes ☒ No

Cashiering and Board Use Only			
Receipt #	Payor ID	Beneficiary ID	Amount
1-3204	6019072	618953	50.00

BUSINESS, CONSUMER SERVICES, AND HOUSING AGENCY

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CONTINUING EDUCATION COURSE APPROVAL APPLICATION

\$50 Mandatory Fee

Pursuant to California Code of Regulations (CCR) § 1536, the Board will approve continuing education (CE) courses after receiving the applicable fee, the requested information below and it has been determined that the course meets criteria specified in CCR § 1536(g).

In addition to the information requested below, please attach a copy of the course schedule, a detailed course outline and presentation materials (e.g., PowerPoint presentation). Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title OCT in Glaucoma	Course Presentation Date 04/08/2017
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Course Provider Contact Information

Provider Name Amy Atondo (First) (Last) (Middle)	
Provider Mailing Address Street 1450 San Pablo St. City Los Angeles State CA Zip 90033	
Provider Email Address amy.atondo@med.usc.edu	
Will the proposed course be open to all California licensed optometrists?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name Grace Richter Marie (First) (Last) (Middle)	
License Number A115137	License Type MD
Phone Number (323) 442-6372	Email Address grace.richter@med.usc.edu

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

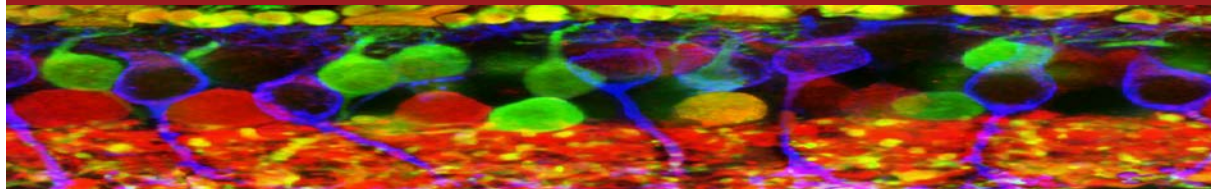
Signature of Course Provider

3/6/2017

Date

USC Roski Eye Institute

Keck Medicine of USC



Dear Colleague:

Please join us for our FREE 3 HOUR Glaucoma CE by Drs. Sahar Bedrood, MD, PhD, Alena Reznik, MD and Grace Richter, MD, MPH on April 8, 2017. We invite you to participate in this specialty 3 hour continuing education (CE) lecture. We will have a Q & A after each Lecture. Lectures include:

08:00am – 08:30am	Registration and Continental Breakfast
08:30am – 08:40am	Welcome and Introduction by Dr. Alena Reznik
08:40am – 09:40am	OCT in Glaucoma by Dr. Grace Richter
09:40am – 10:40am	Biomechanical Glaucoma Damage By Dr. Sahar Bedrood
10:40am – 10:55am	Break
10:55am – 11:55am	Suprachoroidal Space by Dr. Alena Reznik

USC Roski Eye Institute
1450 San Pablo St. 3rd Floor Conference Room
Los Angeles, CA 90033

Free registration is provided for your convenience.

RSVP acceptance or regrets to Amy Atondo at amy.atondo@med.usc.edu Should you have any questions or require additional information, please call 323-442-6372.

The Keck School of Medicine of the University of Southern California designates this lecture for a maximum of 3 CE credits. Registrar and Administrator for the Optometry Portion is California State Board of Optometry.



Grace Richter, MD, MPH



Sahar Bedrood, MD, PhD



Alena Reznik, MD

Department of Ophthalmology * USC Eye Institute
Keck School of Medicine * University of Southern California

OCTA in Glaucoma CE Info

Summary:


The purpose of this lecture is to introduce the audience to optical coherence tomography angiography and how this technology is applicable to the diagnosis and management of glaucoma. Case examples of typical glaucoma patients and the patterns of glaucomatous defects to be watching for will be discussed in detail. In addition, the current literature on OCTA in glaucoma will be reviewed. Additionally, case examples demonstrating how OCTA supplemented OCT diagnosis for glaucoma will be presented. Finally, the vascular mechanisms thought to underly glaucoma will be discussed as well as how OCTA will help us to understand those mechanisms.

Outline:

- I. What is optical coherence tomography angiography?
- II. Normal and Glaucomatous OCTA images and case examples
- III. Review of Literature on OCTA in glaucoma
- IV. How does OCTA supplement OCT in glaucoma diagnosis
- V. uveitic glaucoma case example
- VI. non-glaucomatous optic neuropathy case example
- VI. How OCTA will help us understand the vascular mechanisms underlying glaucoma


OCTA in Glaucoma

Grace Richter, MD, MPH
Assistant Professor of Ophthalmology, Glaucoma Division
February 4, 2017

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Financial disclosures


- Use OCTA research devices provided by Carl Zeiss Meditec

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Outline

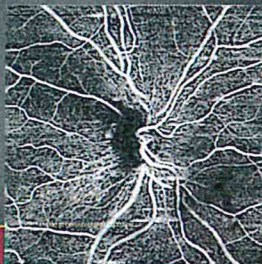
OCTA:


- Applied to routine glaucoma cases
- Applied to diagnostic dilemmas
- Future directions

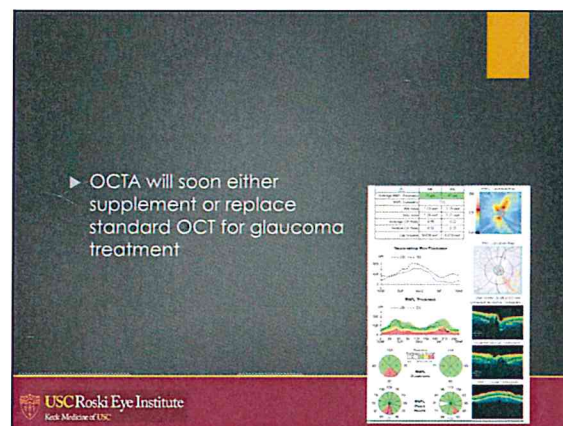
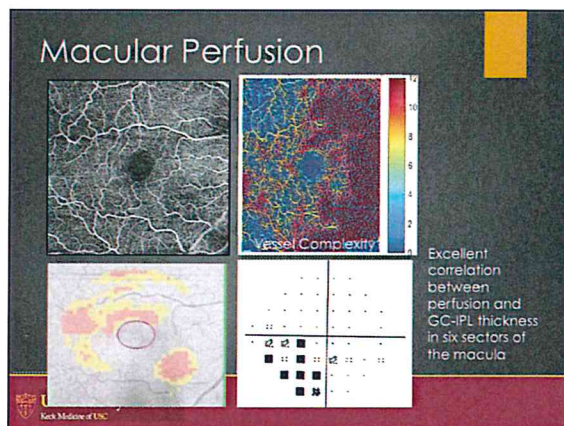
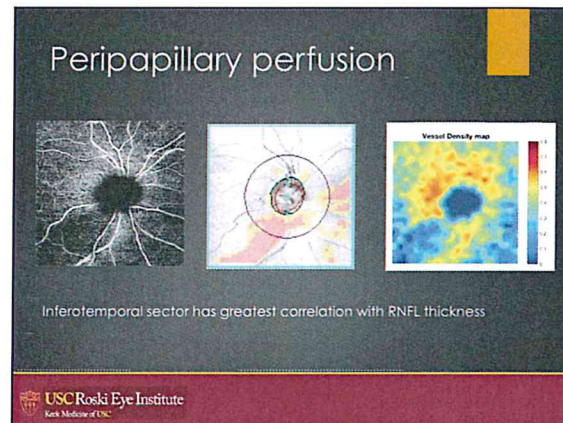
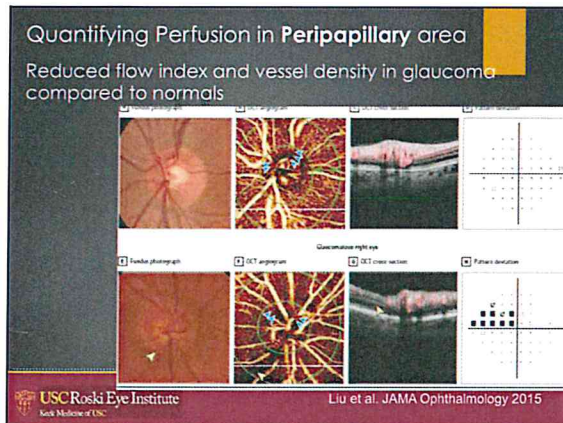
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What is OCT Angiography?

- Extraction of microvascular circulation from OCT image data by specialized processing techniques



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What does OCTA currently offer to glaucoma practice?

- Case 1: Uveitic glaucoma with gliotic "hyperemic" nerve
- Case 2: Normal tension glaucoma second opinion

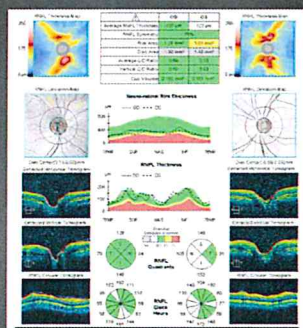
CASE 1

- 33yo Caucasian F referred by ophthalmologist for elevated IOP OS over prior 6-8 months
- Vc cc 20/20 OU (myopic)
- IOP 12 OD, **35 OS** on max tolerated gt
- Normal corneal thickness. No family history glaucoma. Normal color plates OU
- Gonioscopy: open OU with **increased pigment OS**
- Anterior segment: Normal OD; **old stellate KP and trace cell OS**



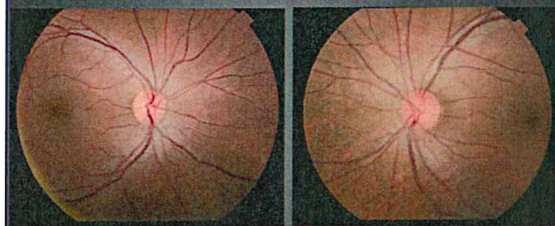
CASE 1

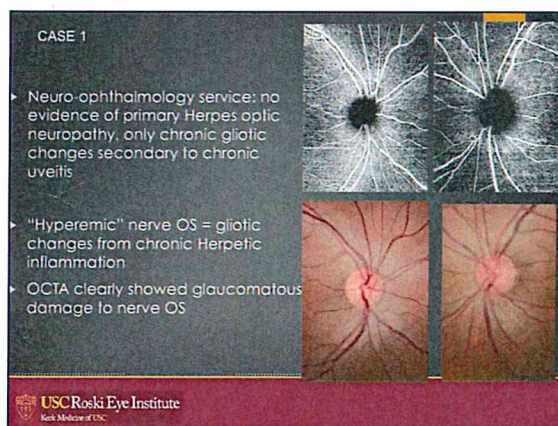
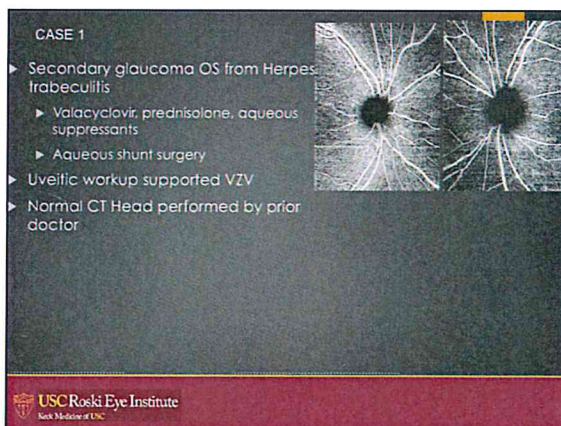
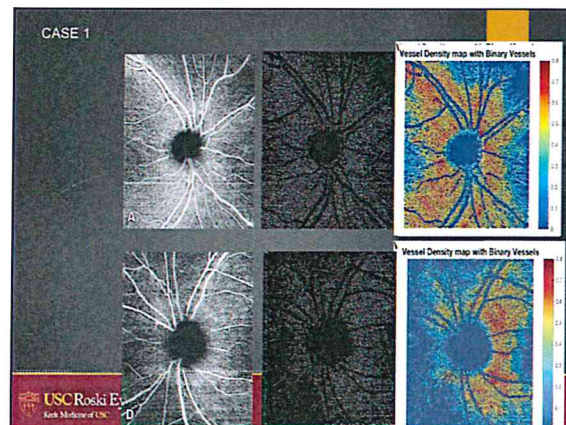
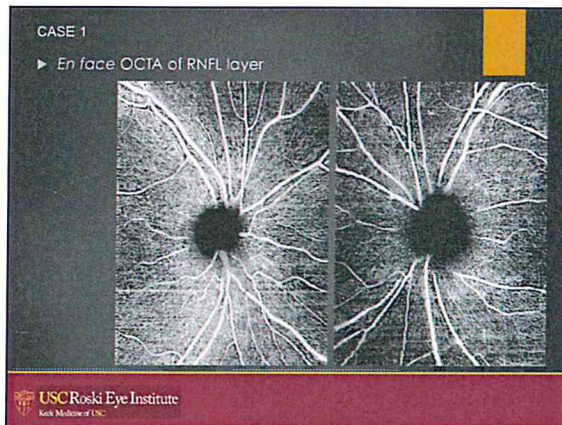
- OCT Nerve

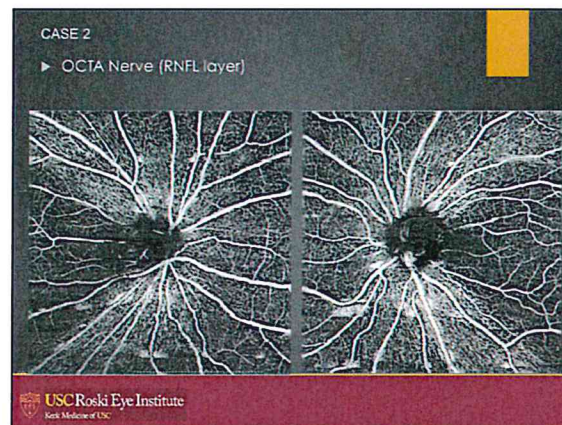
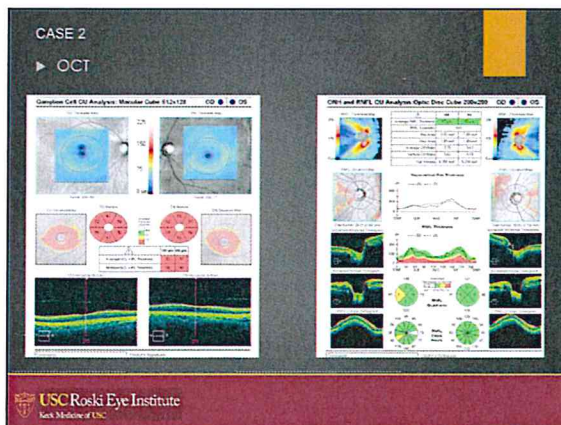
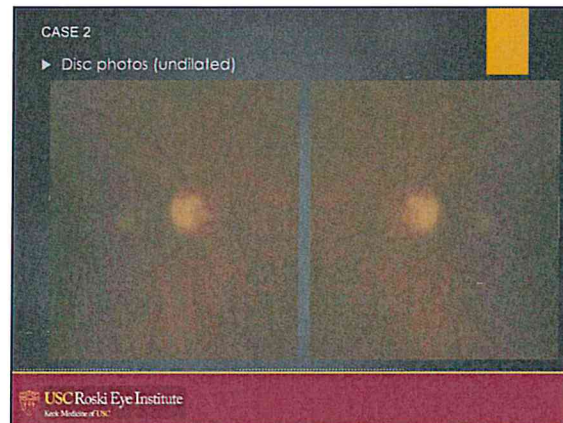
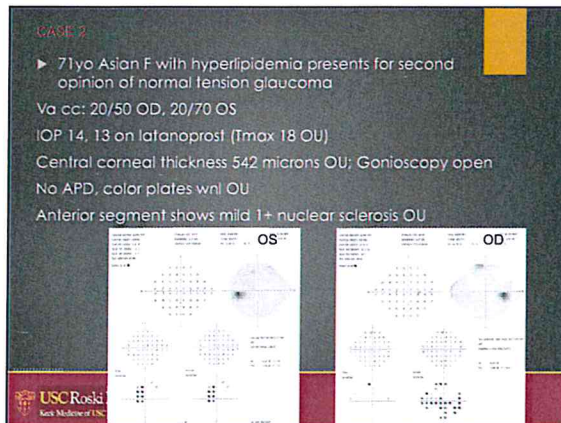


CASE 1

- Disc photos









Ocular Blood Flow and GON

- ▶ OBF is reduced in all parts of eye (iris, retina, choroid, ONH, retrobulbar vessels) in GON
- ▶ Does reduced OBF follow ganglion cell loss or does it play a causal role??
- ▶ OBF has been shown to be predictive of progression

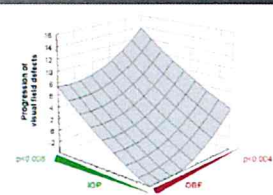
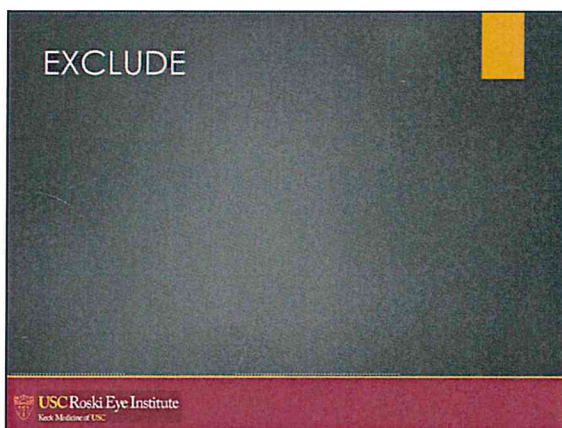


Fig. 3. The higher the intraocular pressure, the higher the chance of progression. Likewise, the lower the ocular blood flow, the higher the chance of progression. (Saitou M et al.¹⁰)

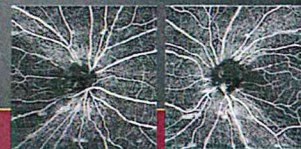
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CASE 2

Neuro-ophthalmology consultation

- ▶ NORMAL Nutritional and other work-up (vitamin B12/methylmalonic acid/homocysteine, RBC folate, Vitamin B1 whole blood, vitamin B6, Zinc level, copper level, lead level, arsenic level, cadmium level, ACE, ANA with reflex, NMO)
- ▶ No history of toxic medication use
- ▶ NORMAL Contrast-enhanced MRI brain and orbits – normal.
- ▶ Mother died when she was small child. Father had normal vision
- ▶ Unable to do genetic work-up due to insurance issues
- ▶ Presumed Hereditary Metabolic Optic Neuropathy



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Glaucoma

Naïfold Capillary Abnormalities in Primary Open-Angle Glaucoma: A Multisite Study

Louis R. Pasquale,^{1,2} Akiko Hanyuda,³ Ai Ren,¹ Michael Giovino,¹ Scott H. Greenstein,¹ Clara Cousins,¹ Thomas Patrianakos,⁴ Angelo P. Tanna,⁵ Christopher Wanderling,⁶ William Norkett,⁶ Janey L. Wiggs,¹ Kelsey Green,⁶ Jae H. Kang,² and Paul A. Knepper^{5,6}

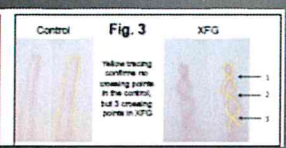


Fig. 3

Control XFG

Yellow tracing confirms no abnormality in the control, but it shows abnormalities in XFG


Figure 3. A capillary image of a normal eye (control) and a glaucoma eye (XFG). The image shows the capillary structure in a normal eye. The yellow tracing in the XFG image highlights the abnormalities in the capillary structure.

multisite study. *Invest Ophthalmol Vis Sci.* 2015;56:7021-7028.

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Summary

- ▶ OCTA of the peripapillary region is an important diagnostic tool in unique cases where OCT provides limited utility
- ▶ May replace OCT RNFL assessments as a diagnostic tool
- ▶ May someday help us to predict which patients have a vascular predisposition to glaucoma



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Thank you!!

USC Roski Eye Institute

- ▶ Beau Sylvester
- ▶ Ingy Muhl, MD
- ▶ Vivek Patel, MD
- ▶ Arman Zaman, MD
- ▶ Arjun Reddy
- ▶ Anoush Shahzadeh, MPH
- ▶ Bruce Burkemper, PhD
- ▶ Amir Kashani, MD, PhD
- ▶ Alena Reznik, MD
- ▶ Sahar Bedrood, MD, PhD
- ▶ Rohit Varma, MD, MPH
- ▶ Lermik Torossian, OD
- ▶ Veronica Iozaki, OD
- ▶ Kent Nguyen, OD

University of Washington, Seattle

- ▶ Ricky Wang, PhD
- ▶ Zhongdi Chu, MS

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CURRICULUM VITAE
GRACE MARIE RICHTER
DECEMBER 9, 2016

PERSONAL INFORMATION:

Work

USC Eye Institute
Keck Medicine of USC

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(323) 442-6421 office
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Home

1442 Virginia Ave
Glendale, CA 91202

Citizenship: USA
Email: grace.richter@med.usc.edu

EDUCATION AND PROFESSIONAL APPOINTMENTS

EDUCATION:

- | | |
|-----------|---|
| 2000-2004 | Summa Cum Laude, Bachelor of Arts, Chemistry (Biochemistry concentration) and International Studies, Washington University in St. Louis |
| 2003 | University of Ghana, Legon, Study Abroad (International Studies coursework, Public Health Internship) |
| 2007-2008 | Masters of Public Health, Columbia University Mailman School of Public Health, New York |
| 2004-2009 | Doctor of Medicine, Columbia University College of Physicians and Surgeons, New York |

POST-GRADUATE TRAINING:

- | | |
|-----------|--|
| 2009-2010 | <i>Internship, Internal Medicine</i>
St. Mary's Medical Center
Long Beach, CA |
| 2010-2013 | <i>Residency, Ophthalmology</i>
University of Southern California/LAC+USC Medical Center, Doheny Eye Institute
Los Angeles, CA |
| 2013-2014 | <i>Assistant Chief of Service ("Chief Resident")</i>
LAC+USC Medical Center
Los Angeles, CA |
| 2014-2015 | <i>Glaucoma Fellowship</i>
Jules Stein Eye Institute, University of California, Los Angeles
Fellowship Director: Joseph Caprioli, MD |
| 11/2014 | Received American Board of Ophthalmology Certification |

ACADEMIC APPOINTMENTS:

2015-Present Assistant Professor Ophthalmology, USC Eye Institute, Los Angeles, CA

HONORS, AWARDS:

2017 Top Doctors- Super Doctors

2016-2017 American Glaucoma Society Mentoring for the Advancement of Physician-Scientists Award

2015-2016 American Glaucoma Society Mentoring for the Advancement of Physician-Scientists Award

2014-2015 Heed Ophthalmic Foundation Fellowship

2012 Doheny Eye Institute Ophthalmic Knowledge Award

2012 Doheny Eye Institute ARVO Travel Grant

2011 Doheny Eye Institute Ophthalmic Knowledge Award

2011 Doheny Eye Institute ARVO Travel Grant

2009 National Eye Institute ARVO Travel Grant

2008 Baylor Pediatric AIDS Initiative Visiting Scholar Travel Grant

2007-2008 Wyman Merit Scholarship in Public Health at Columbia University

2005-2007 Louis and Rachel Rudin Scholar at Columbia University

2005 NIH Summer Research Fellowship at Columbia University

2004 Phi Beta Kappa Honor Society

2004 Sigma Xi Scientific Honorary

2000-2004 Washington University Arts and Sciences Scholar

2002 Howard Hughes Medical Institute Undergraduate Research Grant at Washington University

2001-2003 Charles E. Thoele Scholarship, St. Joseph's Medical Center, Hot Springs, Arkansas

2000-2004 Robert C. Byrd Scholar, Arkansas Department of Education

TEACHING

USC Eye Institute

2015-Present Conduct regular glaucoma lectures for fellows, residents, and medical students, as well as wetlabs for fellow and residents

LAC+USC Medical Center

2013-2014 Assistant Chief of Service ("Chief Resident")
Resident supervisor at County Hospital – Led daily morning rounds, conducted weekly Ophthalmology Fundamentals Lectures, staffed clinic and operating room daily, administrative leader for ophthalmology at LAC+USC and for residency program, performed complex anterior segment cases for LAC

Columbia University College of Physicians and Surgeons

2005-2008

Washington University in St. Louis

2003-2004 General Chemistry II Laboratory (3 units) Teaching Assistant
Conducted weekly lectures and oversaw 25-student laboratory section

SERVICE

Department of Ophthalmology, Keck School of Medicine of USC

- Organizer and Master of Ceremonies for USC Eye Institute Glaucoma Continuing Medical Education Conference, March 2016
- Moderator and Master of Ceremonies for USC Department of Ophthalmology Clinical Case Conference Day; January 2014.
- Graduate Medical Education Committee Member; USC Doheny, Department of Ophthalmology. 2011-2013

Association for Research in Vision and Ophthalmology (ARVO)

- Moderator for ARVO Poster Session: Cataract. May 7, 2012.
- Moderator for ARVO Paper Session: Cataract, Anterior Segment, and Trachoma. May 2011.
- Moderator for ARVO Poster Session: Cornea and Anterior Segment. May 2011.

Columbia University, College of Physicians and Surgeons

- Co-president, Ophthalmology Interest Group, March 2007- May 2009.
- Co-president, Columbia P&S Chapter of AMA, 2005-2006.
- Volunteer teacher, General Chemistry MCAT preparation course for disadvantaged pre-medical undergraduate students. Summer 2005.

- Teacher for *Student Success Network*, second year medical students' organization to aid first year students, 2005-2006.
- Volunteer, Columbia Student Medical Outreach (CoSMO). Student-run free health clinic, Washington Heights, NYC, 2004-2005.

PROFESSIONAL SOCIETY MEMBERSHIPS:

2008-Present	Association for Research in Vision and Ophthalmology (ARVO)
2012-Present	American Academy of Ophthalmology (AAO)
2013-Present	American Glaucoma Society (AGS)
2010-Present	Los Angeles Society of Ophthalmology (LASO)

RECENT OPHTHALMOLOGY COMMUNITY OUTREACH PROJECTS:

<i>Year-Year</i>	<i>Position</i>	<i>Organization/Institution, City,</i>	<i>Role or Activity</i>
October 2015	Surgeon	Taveuni Eye Project, Fiji	(100+ manual small incision cataract surgeries (MSICS) over 2 weeks)
March 2014	Surgeon	El Fuerte, Sinaloa, Liga International, Flying Doctors of Mercy	(4-day trip of eye screening and 20 MSICS cases)
November 2013	Surgeon	Taveuni Eye Project, Fiji	(100+ MSCIS and pterygia over 2 weeks)

RESEARCH AND SCHOLARSHIP

MANUSCRIPT REVIEW PANEL:

<i>Year-Year</i>	<i>Journal</i>
2015-Present	Ophthalmology

PUBLICATIONS:

REFEREED JOURNAL ARTICLES:

- **Richter GM**, Zhang X, Francis B, Chopra V, Greenfield D, Varma R, Schuman JS, Huang D for the Advanced Imaging Glaucoma Study Group. Regression analysis of optical coherence tomography disc variables for glaucoma diagnosis. *Journal of Glaucoma*. 2016, Feb 19.
- **Richter GM**, Coleman AL. Current status and future prospects: Minimally Invasive Glaucoma Surgery. *Clinical Ophthalmology*. 2016;10:189-206.
- **Richter GM**, Choudhury F, Torres M, Azen SP, Varma R; Los Angeles Latino Eye Study Group. Risk factors for Incident Cortical, Nuclear, Posterior Subcapsular, and Mixed Lens Opacities: The Los Angeles Latino Eye Study. *Ophthalmology*. 2012;119:2040-7.
- **Richter GM**, Torres M, Choudhury F, Azen SP, Varma R; Los Angeles Latino Eye Study Group. Risk factors for [Prevalent] Cortical, Nuclear, Posterior Subcapsular, and Mixed Lens Opacities: The Los Angeles Latino Eye Study. *Ophthalmology*. 2012;119:547-54.

- Varma R, **Richter GM**, Torres M, Foong AW, Choudhury F, Azen SP; Los Angeles Latino Eye Study Group. Four-Year Incidence and Progression of Lens Opacities: The Los Angeles Latino Eye Study. *American Journal of Ophthalmology*. 2010;149:728-34.
- **Richter GM**, Chung J, Azen SP, Varma R; Los Angeles Latino Eye Study Group. Prevalence of visually significant cataract and factors associated with unmet need for cataract surgery: Los Angeles Latino Eye Study. *Ophthalmology*. 2009;116:2327-35.
- **Richter GM**, Sun G, Lee TC, Chan RV, Flynn JT, Starren J, Chiang MF. Speed of Telemedicine Vs Ophthalmoscopy for Retinopathy of Prematurity Diagnosis. *American Journal of Ophthalmology*. 2009;148:136-42.
- **Richter GM**, Williams SL, Starren J, Flynn JT, Chiang MF. Telemedicine for Retinopathy of Prematurity Diagnosis: Evaluations and Challenges. *Survey of Ophthalmology*. 2009;54:671-85.
- Chiang MF, Wang L, Kim D, Scott K, **Richter G**, Kane S, Flynn J, Starren J. Diagnostic performance of a telemedicine system for ophthalmology: advantages in accuracy and speed compared to standard care. *AMIA Annu Symp Proc*. 2010;13:111-5.
- Gaut JP, Yeh GC, Tran HD, Byun J, Henderson J, **Richter GM**, Brennan M, Lulis A, Belaaouaj A, Hotchkiss RS, Heinecke JW. Neutrophils employ the myeloperoxidase system to generate antimicrobial brominating and chlorinating oxidants during sepsis. *Proceedings of the National Academy of Sciences*. 2001;98:11961-6.

REFEREED REVIEWS, CHAPTERS, AND EDITORIALS:

- **Richter GM**, Coleman AL. How does subconjunctival filtration affect intraocular pressure fluctuation? Sidebar submitted to book, *Minimally Invasive Glaucoma Surgery: the Science and the Practice*. Editors: *In Press*.
- Williams SL, **Richter GM**, Chiang MF. Telemedicine and Retinal Imaging for Retinopathy of Prematurity Management. In: Azad R, ed. *Retinopathy of Prematurity*.

RESEARCH ABSTRACTS AND PRESENTATIONS:

- Wong BJ, Varma R, Patel V, West D, Puliafito C, Kashani AH, **Richter GM**. Anatomic correlations between optical coherence tomography angiography microvasculature defects and ganglion cell analysis thinning in glaucomatous and non-glaucomatous optic neuropathy. Pending acceptance. To be presented at Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting; May 2016; Seattle, WA.
- **Richter GM**, Koulisis N, Reznik A, Puliafito C, Varma R, Kashani AH. Anatomic correlations between focal peripapillary perfusion defects on OCT angiography and nerve fiber layer thinning in primary open angle glaucoma. Accepted. To be presented at American Glaucoma Society Meeting; March 2016; Fort Lauderdale, FL.
- **Richter GM**, Zhang X, Francis B, Chopra V, Greenfield D, Varma R, Schuman JS, Huang D for the Advanced Imaging Glaucoma Study Group. Regression analysis of optical coherence tomography disc variables for glaucoma diagnosis [presentation]. Presented at: American

Academy of Ophthalmology Annual Meeting; 2013 November 17; New Orleans, LA. Also presented at Doheny Days Annual Conference June 2013

- .
- **Richter GM**, Patel S, Gupta M, Bach D, Fou L, Sadda S. Outcomes of Focal Laser for Diabetic Macular Edema at Los Angeles County Medical Center [presentation]. Presented at: Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting; 2013 May; Fort Lauderdale, FL. Also presented at: Doheny Days Annual Conference June 2012.
- Rodger D, **Richter GM**, Nazari H, Rao N, Perivascular fundus autofluorescence abnormalities in autoimmune retinopathy. Presented at Association for Research in Vision and Ophthalmology (ARVO), 2013 May; Fort Lauderdale, FL.
- **Richter GM**, Wu C, Torres M, Azen SP, Varma R. Four-year incidence of cataract surgery and associated risk factors in the Los Angeles Latino Eye Study [poster]. Presented at: Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting; 2012 May; Fort Lauderdale, FL. Also presented at: Doheny Days Annual Conference June 2011.
- **Richter GM**, Choudhury F, Torres M, Azen SP, Varma R. Risk factors for Incident Cortical, Nuclear, Posterior Subcapsular, and Mixed Lens Opacities: The Los Angeles Latino Eye Study [presentation]. Presented at: Association for Research in Vision and Ophthalmology Annual Meeting; 2011 May 5; Fort Lauderdale, FL.
- **Richter GM**, Chung, Azen SP, Varma R. Risk factors for Incident Cortical, Nuclear, Posterior Subcapsular, and Mixed Lens Opacities: The Los Angeles Latino Eye Study [presentation]. Presented at: Association for Research in Vision and Ophthalmology Annual Meeting; 2009 May; Fort Lauderdale, FL.
- **Richter GM**, Bateman DA, Flynn JT, Chiang MF. Accuracy of Vermont Oxford Network database for retinopathy of prematurity data [poster]. Presented at: Association for Research in Vision and Ophthalmology Annual Meeting; 2008 Apr 28; Fort Lauderdale, FL.
- Chan RVP, Yonekawa Y, Sun G, Williams SL, **Richter GM**, Chiang MF, Lee TH. Advances in the Management of Retinopathy of Prematurity [presentation]. Aspen Retinal Detachment Society Meeting; 2-6 March 2008; Aspen, Colorado.
- Cheng SS, **Richter GM**, Flood PD. The Effect of Nicotine on Chronic Pelvic Pain [abstract]. In: American Society of Anesthesiologists Annual Meeting; 13-17 Oct 2006; San Francisco, CA.
- **Richter GM**, Flood PD. Effect of Nicotine on Chronic Pelvic Pain [presentation]. At: NIH / Columbia College of Physicians and Surgeons Summer Research Fellowship Symposium; 2005 Aug; New York, NY.
- **Richter GM**; Bergt C, Heinecke JW. Potential role of matrix metalloproteinases in degrading high-density lipoprotein *in vivo* [poster]. Presented at: Howard Hughes Medical Institute / Washington University Research Symposium; 2002 Sept 21; St. Louis Missouri.
- **Richter GM**, Gaut JP, Heinecke JW. Identification of Novel Peroxidases *In Vivo*. [presentation]. Presented at: Washington University Pre-freshmen Biology Summer Scholars Symposium; 2000 Aug; St. Louis, Missouri.