

Chirag M. Shah M.D., M.P.H.

EDUCATION AND TRAINING

ILLINOIS RETINA ASSOCIATES / RUSH UNIVERSITY MEDICAL CENTER

PGY-5 - PGY-6 Vitreoretinal Surgery 2020 - 2022

UNIVERSITY OF CALIFORNIA, IRVINE

PGY-2 - PGY-4 Ophthalmology 2017 - 2020

PGY-1 Internal Medicine 2016 - 2017

STONY BROOK UNIVERSITY, SCHOOL OF MEDICINE

M.D. 2016

UNIVERSITY OF CALIFORNIA, DAVIS

M.P.H. Biostatistics 2010

B.Sc. with Honors Neurobiology, Physiology, & Behavior 2008

HONORS, AWARDS, AND ACHIEVEMENTS

American Board of Ophthalmology Board-Certified 2022
Heed Ophthalmic Foundation Resident Award 2019
Ophthalmology Times Research Scholar Honoree 2019
98th percentile on OKAP 2019
ARVO Invited Moderator for Scientific Session 2019
99th percentile on OKAP 2018
UCI Resident Research Excellence Award 2018 and 2019
ARVO Foundation Travel Grant 2018
\$50,000 Research Grant from Carl Zeiss Meditec 2017
ARVO Research Communicator Award 2015 and 2018
Barry Collier International Scholarship for Research 2013
1st place poster award at Bay Area International Health Conference 2009
Phi Sigma Honor Society Member 2007 - present
Golden Key International Honor Society Member 2005 - present
Dean's Honors List (various academic terms) 2004 - 2008
Human Corps Community Service Award 2006 and 2007
Undergraduate Research Scholar 2006 and 2007
University of California President's Undergraduate Fellowship 2006 - 2007

WORK AND RESEARCH EXPERIENCE

RETINA RESULTS

Retinal Ophthalmologist & Surgeon July 2022 – Present

VISUS THERAPEUTICS

Physician Scientist January 2022 – Present

ILLINOIS RETINA ASSOCIATES

Vitreoretinal Surgery Fellow

July 2020 – June 2022

CATARACT LENS AND REFRACTIVE OCT STUDY GROUP

July 2017 – Present

Study Lead

- Developed international collaborations and professional relationships with private ophthalmic companies
Optical Express and Carl Zeiss Meditec
- Attained \$50,000 research grant to research links between retinal anatomy and cataract surgery
- Analyzing database of 11,000 patients and writing multiple manuscripts for publication and presentation
- Leading the machine learning segment of the study to develop a new lens equation based upon OCT
- Gave podium presentations at ARVO 2018, 2019; ASCRS 2019
- Served as moderator for biometry session at ARVO 2019

INSTITUTO DE MICROCIRUGIA OCULAR LASER

December 2018

Visiting Scholar (Monterrey, Mexico)

- Presented lectures on OCTA and Posterior Uveitis to local physicians and researchers
- Performed charity surgeries (pars plana vitrectomies, limbal stem cell transplants, cataract extractions)

NEW YORK EYE AND EAR INFIRMIRY

September 2013 – June 2016

Medical Student Researcher for Dr. Ronald Gentile and Dr. Richard Rosen

- Collected data, ran statistical analysis, and prepared manuscripts on the following:
 - o *Retrospective Review of Endophthalmitis Cases Presenting to the NYEE Urgent Care*
 - o *Characterizing a Novel COL2A1 Mutation Phenotype in a Dominican Family*
 - o *Quantitative Retinal Vascular Perfusion Density Mapping of Diabetic and Normal Subjects Utilizing Optical Coherence Tomography Angiography*
 - o *Improvement in Microperimetry in Patients Receiving Copaxone for Dry ARMD*

GAVIN HERBERT EYE INSTITUTE

August 2014 – October 2014

Visiting Junior Specialist with Dr. Mitul Mehta

- o *Protecting the Macula and Optic Nerve from Metallic IOFBs Using Fluid Interfaces*
 - Developed bench experiment and created silicone model eye to study trajectory of intraocular foreign bodies (IOFBs) in various contexts.
 - Presented work at international meetings resulting in first author manuscript in *Retina*.

AFRICAN INSTITUTE FOR DEVELOPMENT POLICY

Founding Researcher (Nairobi, Kenya)

October 2010 – August 2012

- Secured \$500,000 of funding from Western partners and established international non-profit think tank.
- Recruited staff and developed organizational infrastructure in foreign countries.
- Established operations and led build-out of offices abroad.
- Coordinated analysis of African Maternal, Sexual, and Reproductive Health outcomes and financing.
- Quantitatively modeled the impacts of population growth upon health and development.

BIDADA SARVODAYA TRUST AND HOSPITAL

December 2008 – June 2010

Epidemiologic Research Lead (Kutch, Gujarat, India, and Buena Park, CA, USA)

- Recruited and lead a multidisciplinary team of health practitioners in a study on parasite infections.
- Developed vision program to provide vision care to underprivileged school children.
- Developed public-private partnerships with the Ministry of Health.
- Developed the school-based health education and outreach programs of the hospital.
- Raised funding and in-kind contributions to support research programs.

UC DAVIS CENTER FOR NEUROSCIENCE

September 2006 – September 2007

President's Undergraduate Fellow with Dr. Barbara Chapman and Dr. Andrew Huberman

- Prepared and analyzed histologic sections of retinal ganglion cell axons to the thalamus.
- Created 3D model of ferret lateral geniculate nuclei in normal and monocular deprivation ferrets.
- Assisted in electrophysiology experiments recording mammalian cortical response to visual stimuli.
- Dissected and created projections of ferret retinae for analysis of spontaneous action potentials.

CLINICAL TRIALS

ADVERUM (sub-investigator)

A Multi-Center, Randomized, Double-masked, Active Controlled Study of ADVM-022 (AAV.7m8-aflibercept) in Neovascular (Wet) Age-related Macular Degeneration (nAMD).

ADVISE (sub-investigator)

Adalimumab vs. conventional Immunosuppression for Uveitis Trial. Treatment of non-infectious, intermediate, posterior, panuveitis. Adalimumab OR conventional immunosuppressive therapy.

APELLIS – DERBY (sub-investigator)

A phase 3, multicenter, randomized, double-masked, sham-controlled study to compare the efficacy and safety of intravitreal APL-2 therapy with sham injections in patients with geographic atrophy (GA) secondary to age-related macular degeneration (AMD).

APELLIS EXTENSION – GALE (sub-investigator)

A Phase 3, Open-Label, Multicenter, Extension Study To Evaluate The Long-Term Safety And Efficacy Of Pegcetacoplan In Subjects With Geographic Atrophy Secondary To Age-Related Macular Degeneration: APL2-GA-305.

DOVETAIL (sub-investigator)

A Multi-Center, Non-Randomized, Open-Label, Multiple Ascending Dose Study to Investigate the Safety, Tolerability, Pharmacokinetics and Pharmacodynamics of RO7200220 in Monotherapy and in Combination with Ranibizumab following Intravitreal Administration in Patients with Uveitic Macular Edema.

DRCR PROTOCOL AF (sub-investigator)

A Randomized Clinical Trial Evaluating Fenofibrate for Prevention of Diabetic Retinopathy Worsening.

DRCR PROTOCOL AJ (sub-investigator)

Vitreous Proteomics in Eyes with a Macular Hole

EXPLORE (sub-investigator)

A Phase II, outcomes assessor-masked, multicenter, randomized study to evaluate the safety and efficacy of two doses of GT005 administered as a single subretinal injection in subjects with geographic atrophy secondary to age-related macular degeneration.

EYEVENSYS (sub-investigator)

A 48 Week Phase II, Multicenter, Randomized, Open-Label, Study to Evaluate the Efficacy and Safety of Two (2) EYS606 Treatment Regimens in Subjects with Active CNIU.

GEMINI-001 (sub-investigator)

A Genetic Screening Study to Evaluate Long-term Clinical Outcomes in Subjects with Non-Central Geographic Atrophy (GA) Who Are Carriers of High-Risk Genetic Complement Variants Associated with Dry Age-related Macular Degeneration(AMD).

GEMINI-002 (sub-investigator)

Prospective Registry and Natural History Studies to Evaluate Clinical characteristics and Disease Progression in Participants with Non-Central geographic Atrophy (GA) Who Are Carriers of High-Risk Genetic Variants of Complement Factor H (CFH).

KODIAK (sub-investigator)

A Prospective, Randomized, Double-masked, Active Comparator-controlled, Multi-center, Two-arm, Phase 3 Study to Evaluate the Efficacy and Safety of Intravitreal KSI-301 Compared with Intravitreal Aflibercept in Participants with Visual Impairment.

LUMINA (sub-investigator)

A Phase III, Multicenter, Sham-Controlled, Randomized, Double-Masked Study Assessing the Efficacy and Safety of Intravitreal Injections of 440 µg DE-109 for the Treatment of Active, Non-Infectious Uveitis of the Posterior Segment of the Eye.

MERIT (sub-investigator)

Macular Edema Ranibizumab v. Intravitreal Anti-inflammatory Therapy Trial (MERIT).

NEW DAY (sub-investigator)

A Randomized, Masked, Controlled Study of Intravitreal ILUVIEN Implant as Baseline Therapy in Patients with Early Diabetic Macular Edema (DME)

OCUPHIRE – ZETA (sub-investigator)

Randomized, Placebo-Controlled, Double-Masked Study of the Safety and Efficacy of Orally Administered APX3330 in Subjects with Non-Proliferative Diabetic Retinopathy and Mild Proliferative Diabetic Retinopathy

TELESCOPE (sub-investigator)

A Study to Genetically Define Subjects with Geographic Atrophy Secondary to Age-Related Macular Degeneration.

ZEDS (sub-investigator)

Zoster Eye Disease Study (ZEDS). A multi-center, randomized, double-masked, placebo-controlled clinical trial of suppressive valacyclovir for one year in immunocompetent study participants with an episode of dendriform epithelial keratitis, stromal keratitis, endothelial keratitis, and/or iritis due to Herpes Zoster Ophthalmicus (HZO) in the year prior to enrollment.

PROFESSIONAL & SCIENTIFIC ORGANIZATION MEMBERSHIPS

American Society of Retina Specialists	2020 - Present
Association for Research in Vision and Ophthalmology	2015 - Present
American Society of Cataract and Refractive Surgery / Young Eye Surgeons	2018 - Present
American Academy of Ophthalmology	2016 – Present

TEACHING EXPERIENCE

OphthoQuestions Board Review Retina Section Editor	2019 - Present
Graduate Teaching Assistant (Physiology, Biochemistry, and Humanism)	2013 - 2015
Princeton Review MCAT Physics and Chemistry Instructor	2008 - 2010
Undergraduate Teaching Assistant (Evolution, Biology)	2005 – 2006

FOREIGN LANGUAGES

Spanish (conversational); Hindi (conversational); Gujarati (fluent); Vietnamese (medical)

PUBLICATIONS

1. **Shah C**, Gabriel R, Kedhar S, Kuppermann B, Mehta M. Subclinical foveal vasculopathy in patients with Systemic Lupus Erythematosus using Optical Coherence Tomography Angiography. *Journal of VitreoRetinal Diseases*. Published online first July 2019.
2. **Shah C**, Gentile R, Mehta M. Perfluorocarbon liquids’ ability to protect the macula from intraocular dropping of metallic foreign bodies: a model eye study. *Retina*, 2016 Jul; 36(7):1285-91.
3. **Shah C**, Griffith A, Ciera J, Zulu E, Palermo T. Equity and achievement in access to contraceptives in East Africa between 2000 and 2010. *International Journal of Gynecology & Obstetrics*, 2015 Dec; 133 (1): 53-8.

4. Gentile R, Lo J, **Shah C**. Medscape Ophthalmology. December 2015. A 50-Year-Old patient's left eye gradually changes color - Traumatic IOFB. https://www.medscape.com/viewarticle/856333_3
5. Agemy S, Scripsema N, **Shah C**, Chui T, Garcia P, Lee J, Zhou Q, Ko T, Rosen R. Quantitative retinal vascular perfusion density mapping of diabetic and normal subjects utilizing optical coherence tomography angiography. Retina, 2015 Nov; 35(11):2353-63.
6. Gentile R, **Shah C**. Medscape Ophthalmology. September 2015. A baseball takes a bad hop and a LASIK Is undone - Macular Hole. https://www.medscape.com/viewarticle/850625_2
7. Gentile R, **Shah C**. Medscape Ophthalmology. May 2015. Bungee Cord Trauma to the Eye - Retinal Dialysis. <https://www.medscape.com/viewarticle/844391>
8. Brown A, **Shah C**, Liu J, Pham J, Zhang J, Jadus M. Ginger's (Zingiber officinale Roscoe) inhibition of rat colonic adenocarcinoma cells proliferation and angiogenesis in vitro. Phytotherapy Research, 2008 Dec; 23(5): 640-645.
9. Acknowledgement: Huberman AD, Speer CM, Chapman B. Spontaneous retinal activity mediates development of ocular dominance columns and binocular receptive fields in v1. Neuron, 2006 Oct; 52:247–254.
10. Jeffes E, Zhang JG, Hoa N, Petkar A, Delgado C, Chong S, Obenaus A, Sanchez R, Khalaghizadeh S, Khomenko T, Knight BA, Alipanah R, Nguyen T, **Shah C**, Vohra S, Zhuang J, Liu J, Wepsic HT, Jadus M. Antiangiogenic drugs synergize with a membrane Macrophage Colony-Stimulating Factor-based tumor vaccine to therapeutically treat rats with an established malignant intracranial glioma. The Journal of Immunology, 2005 Mar 1;174(5):2533-43.

BOOK CHAPTER

Shah C, Kong C, Tao J, Grob S. Lacrimal trauma: principles of repair and management. In C.N. Burkat (Ed). Compendium of Oculofacial, Orbital, and Lacrimal Surgery. Springer Publishing. (Accepted 2018).

PODIUM PRESENTATIONS

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|---|--------------------------|-------------|
| ASRS Annual Meeting | San Antonio, TX | 2021 |
| Chirag Shah ; Terrence Murphy; Mathew MacCumber; Kirk Packo; John Pollack; Vivek Chaturvedi; et. al.
Large Operative Case Series of Degenerative Lamellar Macular Holes | | |
| ASCRS Annual Meeting | San Diego, CA | 2019 |
| Chirag Shah ; Darren Knight; Sumit Garg; James Tucker; Matthew Wade; Steven Schallhorn; Stephen Hannan; Mitul Mehta. | | |
| 1. Ocular Coherence Tomography and Forecast Error in Intraocular Lens Power Calculations. | | |
| 2. Ocular Biometry and Retinal Morphology of a Large Population of Refractive Lens Exchange Patients.
(presented by Dr. Wade as first author) | | |
| 3. Preoperative Central Macular Thickness vs Postoperative Visual Acuity and Satisfaction in a Large Population of Refractive Lens Exchange Patients. (Presented by Dr. Garg as first author) | | |
| ARVO Annual Meeting | Vancouver, BC | 2019 |
| Chirag Shah ; Darren Knight; Sumit Garg; Matthew Wade; Steven Schallhorn; Stephen Hannan; Mitul Mehta.
Improved Intraocular Lens Power Prediction using Ocular Coherence Tomography and Machine Learning. | | |
| IMOL Uveitis and Rheumatology Symposium | Monterrey, Mexico | 2018 |
| Chirag Shah | | |
| 1. Novel Uses of Optical Coherence Tomography Angiography in Systemic Lupus Erythematosus | | |
| 2. A Comprehensive Review of Uveitis for Rheumatologists | | |

ARVO Annual Meeting **Oahu, HI** **2018**
Chirag Shah; Darren Knight; Sumit Garg; James Tucker; Matthew Wade; Steven Schallhorn; Stephen Hannan; Mitul Mehta. Ultrastructural Changes in OCT and Refractive Differences after Refractive Lens Exchange Surgery.

Woodrow Wilson Center Southern Voices Workshop **Dakar, Senegal** **2011**
Chirag Shah; Violet Murunga MPH. Population Dynamics and their Impacts on Economic Development.

Kenya National Leaders' Population Conference **Nairobi, Kenya** **2010**
Chirag Shah; Eliya Zulu. Unmet Need in Maternal Health and Impact on Fertility Rates.

POSTER PRESENTATIONS

ARVO Annual Meeting **Vancouver, BC** **2019**
Tanya Huynh; **Chirag Shah**; Rami Gabriel; Baruch D. Kuppermann; Sanjay Kedhar; Andrew Browne; Mitul C. Mehta. Retinal Perfusion Deficits in Systemic Lupus Erythematosus Quantified by Ocular Coherence Tomography Angiography.

Rami Gabriel, **Chirag Shah**, Jaime Toledo-Corral, Mitul Mehta. Quantitative Optical Coherence Tomography Angiography of Dry vs Wet AMD and the Effects of Prolonged Anti-VEGF Therapy.

AAO Annual Meeting **Chicago, IL** **2018**
Chirag M. Shah; Darren Knight; James Tucker; Steve Schallhorn; Sumit Garg; Stephen Hannan; Matt Wade; Mitul C. Mehta. Ultrastructural Changes in OCT and Refractive Differences after Refractive Lens Exchange Surgery.

ARVO Annual Meeting **Seattle, WA** **2016**
Chirag M. Shah; Paulina Haas; Avnish Deobhakta; Alan Dayan; Juan Battle; Sebastian Guzman; Jeannette Dominguez MD; Juan Ubiera MD; Maria Salazar MD; Ronald C. Gentile MD. Autosomal Dominant Vitreoretinopathy of the Dajabòn: Report of a Novel COL2A1 c.3925G>A Mutation.

ARVO Annual Meeting **Denver, CO** **2015**
Chirag Shah, Ronald Gentile, Mitul Mehta. Perfluorocarbon-Balanced Salt Solution Interface Deflects IOFBs.

ASRS Annual Meeting **Vienna, Austria** **2015**
Chirag Shah, Ronald Gentile, Mitul Mehta. Minimizing Macular Damage from Metallic IOFBs with Perfluorocarbon-Balanced Salt Solution Interface.

New England Science Symposium **Cambridge, MA** **2015**
Chirag Shah, Ronald Gentile, Mitul Mehta. Making Ophthalmic Surgery Safer and More Effective Using Fluid Interfaces.

ADDITIONAL PRESENTATION CREDITS

James Tucker; Hannah Muniz Castro; **Chirag Shah**; Darren Knight; Sumit Garg; Marjan Farid; Mitul C Mehta; Matthew Wade. *Association for Research in Vision and Ophthalmology (2018)*. Lens meridian position as a predictor of effective lens position.

Matthew Wade; Darren Knight; **Chirag Shah**; Broderic Cormier; James Tucker; Stephen Hannan; Steve Schallhorn; Mitul C. Mehta. A Large Retrospective Study of Premium Lens Implantation Patterns in Refractive Lens Exchange Patients. *Association for Research in Vision and Ophthalmology (2018)*.

Richard Rosen, Steve Agemy, Patricia Garcia, Toco Chui, **Chirag Shah**. *ARVO Imaging in the Eye Conference (2015)*. Quantitative Retinal Vascular Perfusion Density Mapping of Diabetic and Normal Subjects Utilizing Optical Coherence Tomography Angiography.

Danielle Strauss, **Chirag Shah**, Ronald Gentile, Joseph Benevento, *NYEE Research Day (2015)*. 4-Year Endophthalmitis Case Review.

Jessica Lee, **Chirag Shah**, Steven Agemy, Dean Elliott, John Loewenstein, Demetrios Vavvas, Ronald Gentile, Mass Eye and Ear Vitrectomy Course Study Group *Association for Research in Vision and Ophthalmology (2015)* Qualities of the Ideal Vitreoretinal Fellow and Attending: Perspectives of the Attendings and Fellows.

Jessica Lee, **Chirag Shah**, Steven Agemy, Dean Elliott, John Loewenstein, Demetrios Vavvas, Ronald Gentile, Mass Eye and Ear Vitrectomy Course Study Group *New York Eye and Ear Infirmary Research Day (2015)*. Qualities of the Ideal Vitreoretinal Fellow and Attending: Perspectives of the Attendings and Fellows.

Jessica Lee, **Chirag Shah**, Steven Agemy, Dean Elliott, John Loewenstein, Demetrios Vavvas, Ronald Gentile, Mass Eye and Ear Vitrectomy Course Study Group *American Society for Retina Specialists (2015)* Qualities of the Ideal Vitreoretinal Fellow and Attending: Perspectives of Attendings and Fellows.

Steve Agemy, **Chirag Shah**, Jessica Lee, Patricia Garcia, Toco Choi, Ronald Gentile, Richard Rosen. Quantitative Retinal Vascular Perfusion Density Mapping of Diabetic and Normal Subjects Utilizing Optical Coherence Tomography Angiography. *NYEE Research Day (2015)*.

Danielle Strauss, Gennady Landa, Patricia Garcia, **Chirag Shah**, Katy Tai, Melissa Rivas, Richard B. Rosen. *New York Eye and Ear Infirmary Research Day (2014)*. Improvement in microperimetry in patients receiving Copaxone for dry age-related macular degeneration.

Danielle Strauss, Gennady Landa, Patricia Garcia, **Chirag Shah**, Katy Tai, Melissa Rivas, Richard B. Rosen *Association for Research in Vision and Ophthalmology (2014)*. Improvement in microperimetry in patients receiving Copaxone for dry age-related macular degeneration.

Danielle Strauss, Gennady Landa, Patricia Garcia, **Chirag Shah**, Katy Tai, Melissa Rivas, Richard B. Rosen. *American Society for Retina Specialists (2014)*. Copaxone trials in dry age-related macular degeneration