

**KAUSTABH GHOSH, Ph.D.**

Department of Ophthalmology  
 University of California, Los Angeles  
 Doheny Eye Institute  
 150 N. Orange Grove Blvd, Rm 330, Pasadena, CA 91103  
 Tel# 323-342-7164; Email: ghoshk@ucla.edu

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**EDUCATION AND TRAINING**

2001 B.Tech, Chemical Engineering, National Institute of Technology, Warangal, India  
 2002 M.S., Biomedical Engineering, Stony Brook University (SUNY)  
 2006 Ph.D., Biomedical Engineering, Stony Brook University (SUNY)  
 2011 Postdoctoral Fellowship, Vascular Biology Program, Boston Children's Hospital and Harvard Medical School

**PROFESSIONAL EXPERIENCE**

2002 Visiting Scholar, Department of Medicinal Chemistry, University of Utah  
 2011-2018 Assistant Professor, Department of Bioengineering, University of California, Riverside (UCR)  
 2011-2019 Participating Faculty, Stem Cell Center, UCR  
 2012-2019 Participating Faculty, Program in Cell, Molecular and Development Biology, UCR  
 2016-2019 Participating Faculty, Division of Biomedical Sciences, UCR  
 2017-2019 Faculty, Center for Molecular and Translational Medicine, UCR  
 2018-2019 Associate Professor, Department of Bioengineering, UCR  
 2019- Associate Professor, Department of Ophthalmology, University of California, Los Angeles (UCLA)  
 2019- Faculty, Graduate Program in Biosciences, MCIP Home Area, UCLA  
 2019- Principal Investigator, Doheny Eye Institute

**HONORS AND AWARDS**

1999-2001 Undergraduate Merit Scholarship, National Institute of Technology, Warangal, INDIA  
 2004 Outstanding Mentor Award, Siemens Foundation  
 2004 Graduate Student Scholarship, New Jersey Center for Biomaterials  
 2006 President's Award to Distinguished Doctoral Students, Stony Brook University (SUNY)  
 2008 NIH/NIBIB T32 Postdoctoral Training Grant  
 2011 Lindbergh Lecturer, University of Wisconsin-Madison  
 2013 Regents Faculty Fellowship, University of California  
 2014 Hellman Fellowship  
 2016 Outstanding Educator Award, Orange County Engineering Council, CA  
 2017 Regents Faculty Development Award, University of California  
 2017 Featured Scientist, BrightFocus Foundation  
 2022 Catalyst Award for Innovative Research Approaches for Age-related Macular Degeneration, Research to Prevent Blindness/International Retinal Research Foundation

**PROFESSIONAL MEMBERSHIP AND SERVICE****Membership**

2003-2008 Biomedical Engineering Society (BMES)  
 2012-2017 Member, American Heart Association (AHA)  
 2013- Member, North American Vascular Biology Organization (NAVBO)  
 2014- Member, Association for Research in Vision and Ophthalmology (ARVO)

**Grant Reviewing**

2014-2015 Collaborative Seed Grant Program, Research and Economic Development, UCR  
 2015-2017 Ad hoc Reviewer, DoD Peer Reviewed Medical Research Program, Diabetes Section  
 2018-2020 Ad hoc Reviewer, NIH DPVS Study Section  
 2019-2022 Ad hoc Reviewer, NIH Special Emphasis Panel, ZRG1 BDCN  
 2021-2022 Ad hoc Reviewer, NIH Pathophysiology of Eye Diseases (PED)-2 Study Section  
 2022- Standing Member, NIH Pathophysiology of Eye Diseases (PED)-2 Study Section

**Editorial Activities**

- 2011- Editorial Board Member, Journal of Regenerative Medicine and Tissue Engineering
- 2017- Editorial Board Member, Scientific Reports
- 2022- Guest Editor, *Ophthalmology* Special Issue, Journal of Visualized Experiments (JoVE)
- 2022- Guest Editor, *Vascular Aging* Special Issue, Scientific Reports
- 2023- Review Editor, Cell Physiology Section, Frontiers in Physiology
- 2023- Associate Editor, Retina Section, Frontiers in Ophthalmology

**Manuscript Reviewing**

Diabetes; Diabetologia; Cell Reports Medicine; Investigative Ophthalmology and Visual Sciences (IOVS); Experimental Eye Research; Scientific Reports; American Journal of Pathology; Microvascular Research; Frontiers in Cell and Developmental Biology; Frontiers in Bioengineering and Biotechnology; Redox Biology; Life Sciences, Cellular and Molecular Life Sciences; Acta Biomaterialia; Journal of Investigative Dermatology; BMC Biotechnology; Annals of Biomedical Engineering; IEEE Transactions on NanoBioscience; Journal of Biomedical Materials Research A; Polymer; Photochemistry and Photobiology; Journal of Biomedical Optics

**Conference Organization**

- 2013 Session Chair, NSF International Workshop on Stem Cell Differentiation: Influence of Biomaterials and Biomechanics, Shanghai, China
- 2015 Co-chair, Awards Committee, Annual Symposium of Inland Empire Stem Cell Consortium, CA
- 2016 Co-Chair, Paper Session on Angiogenesis and ROP, ARVO Annual Meeting, Seattle, WA
- 2017 Moderator, Poster Session on AMD- Novel Therapies, ARVO Annual Meeting, Baltimore, MD
- 2018 Co-Chair, Biomaterials & Drug Delivery Track, UC Systemwide Bioengineering Symposium, Riverside, CA
- 2020 Session Chair, International Conference on Emerging Areas in Biosciences and Biomedical Technologies-2, IIT Indore, India
- 2024 Co-Organizer and Moderator, Doheny ARVO Breakfast Symposium on "Fresh Perspectives on Retinopathy", Seattle, WA

**Institutional and Departmental Committees**

- 2011 College Faculty Representative for Graduate Student Recruitment, UC Riverside (UCR)
- 2012-2013 Member, Stem Cell Core Academic Coordinator Search Committee, UCR
- 2013- Member, Bourns College Committee on Mammalian Cell Culture Facility, UCR
- 2013-2015 Member, Bioengineering Grant Proposal Review Committee, UCR
- 2014-2017 Faculty Advisor, Bioengineering Website Management, UCR
- 2014 Faculty Advisor, Dean's Orientation for Transfer Students, UCR
- 2014-2017 Member, Campus Senate Committee on Research, UCR
- 2015 Member, Bioengineering Lecturer Search Committee, UCR
- 2016-2018 Chair, Bioengineering Lecturer Search Committee, UCR
- 2016-2017 Member, Campus Hire Search Committee for *Food, Bugs, Gut, Brain & Behavior* Cluster, UCR
- 2018-2019 Member, IACUC Committee for Animal Research, UCR
- 2020- Chair, Organizing Committee, Distinguished Lecture Series, Doheny Eye Institute
- 2024- Member, Faculty Search Committee, UCLA and Doheny Eye Institute

**Outreach Activities**

- 2012 Invited Seminar, *Designing a career in Bioengineering*, Science Fair Expo, Riverside County Office of Education, Riverside, CA
- 2012-2013 Science Judge, Science Fair Expo, Riverside County Office of Education
- 2012-2013 Member, Riverside District Science Leadership Network (DSLNL)
- 2013 Invited Seminar, *An Integrated, Multidisciplinary Approach to Tissue Development and Engineering*, 2013 California Science Education Conference, California Science Teachers Association (CSTA), Palm Springs, CA

## RESEARCH EXPERIENCE

### Advisors

- 2001-2006 *Prof. Richard A.F. Clark*, PhD Major Advisor, Professor of Biomedical Engineering, Dermatology and Medicine, Stony Brook University (SUNY)  
*Prof. Miriam Rafailovich*, PhD Co-Advisor, Professor of Materials Science and Chemical Engineering, Stony Brook University (SUNY)  
*Prof. Glenn D. Prestwich*, PhD Co-Advisor, Professor of Medicinal Chemistry, Univ. of Utah
- 2006-2011 *Prof. Donald E. Ingber*, Postdoctoral Advisor, Professor of Vascular Biology Program, Boston Children's Hospital, and Director of the Wyss Institute for Biologically Inspired Engineering, Harvard University

### Research Areas

Mechanobiology, Cell-Matrix Interactions, Vascular Inflammation and Degeneration, Diabetic Retinopathy, Age-related Macular Degeneration

### Research Collaborators

Timothy Kern (*UC Irvine*) - Diabetic Retinopathy  
 Martha Neuringer and Trevor McGill (*Oregon Health Sci. Univ.*) – Age-related Macular Degeneration  
 Rama Natarajan (*City of Hope*) – Vascular Inflammation

### Funding

#### - ACTIVE

- Research to Prevent Blindness/IRRF Catalyst Award for Innovative Research Approaches for AMD  
 Mechanobiology of choroidal vascular loss in early AMD 01/01/23 – 12/31/25 \$300,000  
 Role: PI
  - Jules Stein Eye Institute and Research to Prevent Blindness Innovation Award  
 Mechanical regulation of bone marrow neutrophils: Implications for diabetic retinopathy  
 Role: PI 05/01/24 – 10/31/24 \$25,000  
 Co-Investigator: Deming Sun (UCLA and Doheny Eye Institute)
- #### - COMPLETED
- NIH/NEI 1R01 EY028242-01 09/01/17 – 06/30/23 \$1,905,374  
 Role of retinal capillary stiffness in diabetic retinopathy  
 Role: PI  
 Co-Investigator: Timothy Kern (UC Irvine)
  - W.M. Keck Foundation - The Stephen Ryan Initiative for Macular Research (RIMR) Special Grant  
 Vascular Degeneration Basic Research 01/01/21 – 06/30/23 \$250,000  
 Role: PI
  - UCLA Clinical and Translational Science Institute T1/T2 Accelerator Program Core Voucher Award  
 Transcriptomic and proteomic analysis of choroidal vascular cells to identify a novel link between mechanobiology and inflammation in age-related macular degeneration  
 Role: PI 07/12/22 – 03/31/23 \$10,000
  - NIH/NEI 1R01EY027440-01A1 09/30/17 – 08/31/21 \$1,513,494  
 Discovery of biomarkers for age-related macular degeneration  
 Role: Co-Investigator  
 PI: Valentine Vullev (UC Riverside)
  - BrightFocus Foundation M2016161– Macular Degeneration Grant 07/01/16 – 06/30/19 \$160,000  
 Micromechanical determinants of choriocapillaris dysfunction in AMD pathogenesis

Role: PI

Co-Investigators: Martha Neuringer and Trevor McGill (Oregon Health and Science Univ.)

8. UC Riverside – Collaborative Seed Grant 07/01/17 – 06/30/18 \$10,000  
Investigating the role of retinal capillary stiffness in diabetic retinopathy  
Role: Co-PI  
Co-PI: Umar Mohideen (UCR)
9. UC Riverside – Technology Commercialization Grant 02/01/16 – 06/30/17 \$35,000  
Site-targeted nanoliposomal nitroglycerin therapeutics  
Role: PI
10. City of Hope-UC Riverside Biomedical Research Initiative (CUBRI) 04/01/15 – 12/31/16 \$100,000  
Identification and role of matrix stiffness-responsive micrnas in diabetic vascular inflammation  
Role: Co-PI  
Co-PI: Rama Natarajan (City of Hope)
11. Hellman Foundation 07/01/14 – 09/30/15 \$29,800  
Lung-targeting nitroglycerin nanotherapeutic for improved treatment of pulmonary arterial hypertension  
Role: PI
12. University of California, Riverside – Collaborative Seed Grant 07/01/14 – 09/30/15 \$10,000  
Mechanochemical characterization of vascular endothelial cells and subendothelial matrix during atherosclerosis progression  
Role: Co-PI  
Co-PI: Umar Mohideen (UCR)
13. University of California, Riverside - Proof-of-Concept Funds 09/05/13 – 06/30/14 \$20,000  
Site-targeting nitroglycerin nanotherapeutic for local microvascular normalization  
Role: PI
14. University of California, Riverside - Seed Funds 07/16/13 – 09/30/14 \$25,000  
An integrated technological platform for guidance and real-time tracking of pluripotent stem cell differentiation into vascular endothelial cells  
Role: Co-PI  
Co-PIs: Jiayu Liao (UCR); Prue Talbot (UCR)
15. NIH/NIBIB T32 EB008539-01 06/30/08 – 06/29/10 \$86,656  
Engineered Microenvironments for *In Situ* Pancreatic Islet Regeneration  
Role: PI

### Journal Articles

Google Scholar Profile: <https://scholar.google.com/citations?user=YOSaS-QAAAAJ&hl=en&oi=ao>

1. Shu XZ, **Ghosh K**, Liu Y, Palumbo FS, Clark RA, Prestwich GD. Attachment and spreading of fibroblasts on an RGD peptide–modified injectable hyaluronan hydrogel. Journal of Biomedical Materials Research. 2004; 68A: 365-375; PMID: 14704979
2. **Ghosh K**, Shu XZ, Mou R, Lombardi J, Prestwich GD, Rafailovich MH, Clark RAF. Rheological characterization of *in situ* crosslinkable hyaluronan hydrogels. Biomacromolecules. 2005; 6: 2857-2865; PMID: 16153128
3. **Ghosh K**, Ren X-D, Shu XZ, Prestwich GD, Clark RAF. Fibronectin functional domains coupled to hyaluronan stimulate adult human dermal fibroblast responses critical for wound healing. Tissue Engineering. 2006; 12(3): 601-613; PMID: 16579693

4. Ji Y, **Ghosh K**, Shu XZ, Li B, Sokolov JC, Prestwich GD, Clark RAF, Rafailovich MH. Electrospun three-dimensional hyaluronic acid nanofibrous scaffolds. Biomaterials. 2006; 27: 3782-3792; PMID: 16556462
5. Mehra T\*, **Ghosh K\***, Shu XZ, Prestwich GD, Clark RAF. Molecular stenting with a crosslinked hyaluronan derivative inhibits collagen gel contraction. Journal of Investigative Dermatology. 2006; 126(10): 2202-2209; PMID: 16741511 \*Equal contribution
6. Ji Y, **Ghosh K**, Li B, Sokolov JC, Clark RAF, Rafailovich M. Dual-syringe reactive electrospinning of crosslinked hyaluronic acid hydrogel nanofibers for tissue engineering applications. Macromolecular Bioscience. 2006; 6(10): 811-817; PMID: 17022092
7. **Ghosh K**, Pan Z, Guan E, Ge S, Liu Y, Nakamura T, Ren X-D, Rafailovich M, Clark RAF. Cell adaptation to a physiologically relevant ECM mimic with different viscoelastic properties. Biomaterials. 2007; 28(4): 671-679; PMID: 17049594; PMID: 17049594
8. Clark RAF, **Ghosh K**, Tonnesen MG. Tissue engineering for cutaneous wounds. Journal of Investigative Dermatology. 2007; 127(5): 1018-29; PMID: 17435787
9. **Ghosh K** and Ingber DE. Micromechanical control of cell and tissue development. Implications For tissue engineering. Advanced Drug Delivery Reviews; 2007; 59(13): 1306-1318; PMID: 17920155
10. Pernodet N, Jurukovski V, Fields J, Fields A, Ramek A, Tmironav T, **Ghosh K**, Bernheim T, Hall K, Ge S, Slutsky L, Dorst K, Simon M, Rafailovich M. Detecting cancer cells in normal tissue by scanning force modulation microscopy. Microscopy and Analysis. 2008; 22(2): 5-8
11. **Ghosh K**, Thodeti CK, Dudley AC, Mammoto A, Klagsbrun M, Ingber DE. Tumor-derived endothelial cells exhibit aberrant Rho-mediated mechanosensing and abnormal angiogenesis in vitro. Proceedings of the National Academy of Sciences USA. 2008; 105(32): 11305-11310; PMID: 18685096  
*\*Featured in EurekAlert/AAAS News, ScienceDaily, Genetic Engineering and Biotechnology News, Children's Hospital Boston News, among others*
12. Liu Y, Ji Y, **Ghosh K**, Clark RAF, Sokolov JC, Rafailovich MH. Effects of fiber orientation and diameter on the behavior of human dermal fibroblasts on electrospun PMMA scaffolds. Journal of Biomedical Materials Research: Part A. 2009; 90A(4): 1092-1106; PMID: 18671267
13. Thodeti CK, Matthews B, Ravi A, Mammoto A, **Ghosh K**, Bracha AL, Ingber DE. TRPV4 channels mediate cyclic strain-induced endothelial cell reorientation through integrin to integrin signaling. Circulation Research. 2009; 104(9): 1123-1130; PMID: 19359599
14. Pan Z, **Ghosh K**, Liu Y, Nakamura T, Clark RAF, Rafailovich MH. Traction stresses and translational distortion of the nucleus during fibroblast migration on a physiologically relevant ECM mimic. Biophysical Journal; 2009; 96(10): 4286-4298; PMID: 19450499
15. **Ghosh K**, Kanapathipillai M, Korin N, McCarthy J, Ingber DE. Polymeric nanomaterials for islet targeting and immunotherapeutic delivery. Nano Letters. 2012; 12(1):203-208; PMID: 22196766  
*\*Featured in EurekAlert/AAAS News, ScienceDaily, Harvard Gazette, Children's Hospital Boston News, among others*
16. Kanapathipillai M, Mammoto A, Mammoto T, Kang JH, Jiang E, **Ghosh K**, Korin N, Gibbs A, Mannix R, Ingber D. Inhibition of mammary tumor growth using lysyl oxidase-targeting nanoparticles to modify extracellular matrix. Nano Letters. 2012; 12(6): 3213-3217; PMID: 22554317
17. Korin N, Kanapathipillai M, Matthews BD, Crescente M, Brill A, Mammoto T, **Ghosh K**, Jurek S, Bencherif SA, Bhatta D, Coskun AU, Feldman CL, Wagner DD, Ingber DE. Shear-activated

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nanotherapeutics for drug targeting to obstructed blood vessels. Science. 2012; 337(6095):738-742; PMID: 22767894

18. Adini A, Adini I, **Ghosh K**, Benny O, Pravda E, Hu R, Luyindula D, D'Amato RJ. The stem cell marker Prominin-1/CD133 interacts with vascular endothelial growth factor and potentiates its action. Angiogenesis; 2013; 16(2):405-416; PMID: 23150059
19. Pan Z, **Ghosh K**, Hung V, Macri L, Einhorn J, Bhatnagar D, Simon M, Clark RAF, Rafailovich MH. Deformation gradients imprint the direction and speed of *en masse* fibroblast migration for fast healing. Journal of Investigative Dermatology. 2013; 133(10):2471-2479; PMID: 23594599
20. Adini I, **Ghosh K**, Adini A, Chi Z-L, Yoshimura T, Benny O, Connor KM, Rogers MS, Bazinet L, Birsner AE, Bielenberg D, D'Amato RJ. Melanocyte-secreted fibromodulin promotes an angiogenic microenvironment. Journal of Clinical Investigation. 2014; 124(1):425-436; PMID: 24355922  
\*With accompanying Editorial: J Clin Invest. 2014; 124(1):76-79; PMID: 24355914
21. Yang X, Scott HA, Ardekani S, Williams M, Talbot P, **Ghosh K**. Aberrant cell and basement membrane architecture contribute to sidestream smoke-induced choroidal endothelial dysfunction. Investigative Ophthalmology and Visual Science. 2014; 55:3140-3147; PMID: 24713480
22. Ardekani S, Scott HA, Gupta S, Eum S, Yang X, Brunelle AR, Wilson SM, Mohindeen U, **Ghosh K**. Nanoliposomal nitroglycerin exerts potent anti-inflammatory effects. Scientific Reports. 2015; 5: 16258-16270; PMID: 26584637
23. Adini I and **Ghosh K**. Mouse retinal whole mounts and quantification of vasculature protocol. Bio-Protocol. 2015; Aug 5: 5(15):e1546; PMID: 29552585
24. Scott HA, Quach, B, Yang X, Ardekani S, Cabrera AP, Wilson R, Messaoudi-Powers I, **Ghosh K**. Matrix stiffness exerts biphasic control over monocyte-endothelial adhesion via rho mediated ICAM-1 clustering. Integrative Biology. 2016; 8:869-878; PMID: 27444067
25. Adapala RK, Thoppil RJ, **Ghosh K**, Cappelli HC, Dudley AC, Paruchuri S, Keshamouni V, Klagsbrun M, Meszaros JG, Chilian WM, Ingber DE, Thodeti CK. Activation of mechanosensitive ion channel TRPV4 normalizes tumor vasculature and improves cancer therapy. Oncogene. 2016; 35:314-322; PMID: 25867067
26. Monickaraj F, McGuire PG, Nitta CF, **Ghosh K**, Das A. Cathepsin D: a macrophage-derived factor mediating increased endothelial cell permeability with implications for alteration of the blood-retinal barrier in diabetic retinopathy. The FASEB Journal. 2016; 30:1670-1682; PMID: 26718887
27. Yang X, Scott HA, Monickaraj F, Xu J, Ardekani S, Nitta CF, Cabrera AP, McGuire PG, Mohindeen U, Das A, **Ghosh K**. Basement membrane stiffening promotes retinal endothelial activation associated with diabetes. The FASEB Journal. 2016; 30:601-611; PMID: 26443820
28. Mohan RR, Cabrera AP, Harrison RE, Gorham RD Jr, Johnson LV, **Ghosh K**,\* Morikis D. Peptide redesign for inhibition of the complement system: Targeting age-related macular degeneration. Molecular Vision. 2016; 22:1280-1290; PMID: 27829783  
\*Co-Corresponding Author
29. Cabrera AP, Bhaskaran A, Xu J, Yang X, Scott HA, Mohideen U, **Ghosh K**. Senescence increases choroidal endothelial stiffness and susceptibility to complement injury: implications for choriocapillaris loss in AMD. Investigative Ophthalmology and Visual Science. 2016; 57: 5910-5918; PMID: 27802521  
\*Featured on Journal Cover
30. Cabrera AP, Stoddard J, Santiago Tierno I, Matisioudis N, Agarwal M, Renner L, Palegar N,

Neuringer M, McGill T, **Ghosh K**. Increased cell stiffness contributes to complement-mediated injury of choroidal endothelial cells in a monkey model of early age-related macular degeneration. Journal of Pathology. 2022; 257(3); 314-326; PMID: 35239183

31. Chandrakumar S, Santiago Tierno I, Agarwal M, Matisioudis N, Kern TS, **Ghosh K**. Subendothelial matrix stiffening by lysyl oxidase enhances RAGE-mediated retinal endothelial activation in diabetes. Diabetes. 2023; 72(7); 973-985; PMID: 37058096
32. Chandrakumar S, Santiago Tierno I, Agarwal M, Lessieur EM, Du Y, Tang J, Kiser J, Yang X, Rodriguez A, Kern TS, **Ghosh K**. Mechanical regulation of retinal vascular inflammation and degeneration in diabetes. Diabetes. 2024; 73(2):280-291; PMID: 37986627  
*\*Highlighted by NEI/NIH, Yahoo, AP News, among others*
33. Santiago Tierno I, Agarwal M, Matisioudis N, Chandrakumar S, **Ghosh K**. Isolation of mouse retinal capillaries and subendothelial matrix for stiffness measurement using atomic force microscopy. Journal of Visualized Experiments 2024; Jul 12; (209); PMID: 39072627
34. **Ghosh K**. Aging vasculature in the choroid and retina. Reference Collection in Neuroscience and Biobehavioral Psychology. 2024; <https://doi.org/10.1016/B978-0-443-13820-1.00155-9>

### Undergraduate Research Publications

35. Eum S, Ardekani S, **Ghosh K**. Nanoliposomal nitroglycerin exhibits potent anti-inflammatory effects and ameliorates adverse effects associated with high-dose nitroglycerin. UCR Undergraduate Research Journal. 2015; IX:85-90

### Book Chapters

1. **Ghosh K** and Clark RAF. Wound Repair. In: Lanza, R., Langer, R. & Vacanti, J., eds. Principles of Tissue Engineering - 3<sup>rd</sup> edition. 2007; San Diego, CA: Elsevier Academic Press.
2. **Ghosh K**. Biocompatibility of hyaluronic acid: from cell recognition to therapeutic applications. In: Reis, R., ed. Natural-based Polymers for Biomedical Applications 2008; Cambridge, UK: Woodhead Publishing Ltd.
3. Thodeti CK and **Ghosh K**. Mechanisms of tumor cell migration and invasion in lung cancer metastasis. In: Keshamouni, V., Arenberg, D. & Kalemkarian, G., eds. Lung Cancer Metastasis: Basic Science and Clinical Practice. 2009; New York, NY: Springer.
4. **Ghosh K**, Thodeti CK and Ingber DE. Micromechanical Design Criteria for Tissue Engineering Biomaterials. In: Ratner, B., Hoffman, A., Schoen, F. & Lemons, J., eds. Biomaterials Science: An Introduction to Materials in Medicine – 3<sup>rd</sup> edition, 2012; Elsevier Academic Press.
5. **Ghosh K**, Khajavi M, Adini A. Quantitative study of *in vivo* angiogenesis and vasculogenesis using Matrigel-based assays. In: Cuttitta, F. & Zudaire, E. eds. The Textbook of Angiogenesis and Lymphangiogenesis: Methods and Applications, 2012; Springer Press
6. **Ghosh K**. Aging vasculature in the choroid and retina. In: D'Amore, P., ed. Encyclopedia of the eye - second edition, 2024; Elsevier

### Patents

1. Morikis D, Mohan RR, Harrison RES, Gorham RD Jr, Cabrera AP, **Ghosh K**. Potent and highly soluble PEGylated compstatin peptides. 2016; US Provisional Patent Application 62/379,907

### Conference Talks, Seminars, and Lectures

1. Robust en masse migration of human fibroblasts on functional fibronectin domains coupled to crosslinked hyaluronan. 2004 BMES Annual Fall Meeting. Philadelphia, PA, USA 10/2004

2. Functional tissue engineering of Smart™ Matrix for chronic wound healing. Second Annual BME Research Symposium, Stony Brook, NY, USA 01/2005
3. Tissue engineering for wound repair. Importance of biological and mechanical signaling. Harvard-MIT Biomedical Engineering Center, Cambridge, MA, USA 04/2006
4. Biophysical regulation of tooth development. Systems-Based Consortium for Organ Design and Engineering, Brigham & Women's Hospital and Harvard Medical School, Boston, MA, USA 02/2008
5. Endothelial progenitor cells for pancreatic islet regeneration. Systems-Based Consortium for Organ Design and Engineering, Brigham & Women's Hospital and Harvard Medical School, Boston, MA, USA 03/2009
6. Physical Determinants of Cell and Tissue Development and Engineering. Mechanical Engineering Seminar, The Johns Hopkins University, Baltimore, MD, USA 02/2011 **Invited**
7. Micromechanical Determinants and Biomaterial Design for *in situ* Tissue Development and Engineering. The Lindbergh Lectures, University of Wisconsin-Madison, WI, USA 04/2011 **Invited**
8. Leveraging Bone Marrow-derived Vasculogenic Cells for *in Situ* Tissue Vascularization and Regeneration. Stem Cell Seminar, University of California-Riverside, CA, USA 05/2012 **Invited**
9. Site-targeted Nanotherapeutic Approach to Enhance Nitric Oxide-mediated Vascular Regeneration. NSF International Workshop on Stem Cell Differentiation: Influence of Biomaterials and Biomechanics, Shanghai, CHINA 06/2013 **Invited**
10. Uncovering and Leveraging the Superior Regenerative Potential of Circulating Endothelial Progenitor Cells. NYSTEM Workshop: At the Crossroad of Stem Cell Research and Engineering, Stony Brook University, NY, USA 09/2013 **Invited**
11. Site-Targeting Nanotherapeutics for Microvascular Normalization. 2<sup>nd</sup> International Conference and Exhibition on Materials Science & Engineering, OMICS, Las Vegas, USA 10/2013 **Invited**
12. Micromechanical Control of Vascular Function. 11<sup>th</sup> Annual Award Symposium, UCR Center for Plant Cell Biology, Riverside, USA 12/2013 **Invited**
13. Physical Determinants of Endothelial Inflammation. 95<sup>th</sup> Annual Meeting, AAAS Pacific Division, Riverside, USA 06/2014 **Invited**
14. Role of Matrix Stiffness and Mechanotransduction in Vascular Inflammation: From Mechanistic Understanding to Nanotherapeutic Strategies, UCR Biomedical Sciences Seminar, Riverside, USA 01/2015 **Invited**
15. Mechanical Control of Retinal Endothelial Activation Associated with Diabetic Retinopathy. NIH Conference- "Diabetic Retinopathy: A Global Epidemic". NIH/Association of Research in Vision and Ophthalmology (ARVO), Bethesda, MD, USA 08/2015
16. Senescence-associated Cell Stiffening Increases Choroidal EC Sensitivity to Complement Injury. 8<sup>th</sup> Annual Conference, Beckman Institute of Macular Research (BIMR), Irvine, CA, USA 01/2016 **Invited**
17. Integrating the Principles of Mechanobiology and Nanotechnology to Tackle Chronic Vascular Inflammation. School of Medicine Seminar Series, Loma Linda Medical Center, Loma Linda, CA, USA 02/2016 **Invited**



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18. An Integrated Bioengineering Approach to Combat Chronic Vascular Inflammation. Biological Sciences Seminar, Western University of Health Sciences. Pomona, CA, USA 10/2016 **Invited**
19. Uncovering the Role of Vascular Stiffness in Chronic Vascular Inflammation. Biomedical Sciences Seminar, UC Riverside, CA, USA 10/2016 **Invited**
20. Role of Vascular Stiffness in Retinal Endothelial Activation Associated with Diabetic Retinopathy. International Vascular Biology Meeting, North American Vascular Biology Organization (NAVBO), Boston, MA, USA 11/2016
21. Vascular Stiffening and EC Dysfunction in Diabetic Retinopathy and AMD. Minisymposium: An eye on the eye microvasculature, 2017 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), Baltimore, MD, USA 05/2017 **Invited**
22. Understanding Precisely How Aging Increases the Risk of Macular Degeneration. An Evening of BrightFocus, BrightFocus Foundation, Washington DC, USA 06/2017 **Invited**
23. Leveraging the Principles of Mechanobiology and Nanotechnology to Combat Chronic Vascular Inflammation. 2017 BMES Annual Fall Meeting. Phoenix, AZ, USA 10/2017 **Invited**
24. Learning the Hard Way: Role of Vascular Stiffness in Inflammatory Eye Diseases. Department of Biomedical Engineering. Stony Brook University, NY, USA 06/2018
25. Vascular Stiffening as a New Paradigm of Inflammatory Retinal Diseases. Pharmacology Seminar. Case Western Reserve University, OH, USA 09/2018
26. CUBRI Funding: Supporting Bold Scientific Ideas to Advance Biomedical Research and Careers. City of Hope UCR Biomedical Research Initiative (CUBRI) Workshop. UC Riverside, CA, USA 10/2018 **Invited**
27. Vascular Stiffening as a New Determinant of Inflammatory Retinal Diseases. Stein Eye Institute Seminar. UCLA, CA, USA 10/2019 **Invited**
28. A New Perspective of Vision-threatening Retinal Diseases at the Intersection of Biology and Physics. International Conference on Emerging Areas in Biosciences and Biomedical Technologies-2, IIT Indore, India 02/2020 **Invited**
29. Mechanobiology of Vascular Degeneration in Inflammatory Retinal Diseases. Wilmer Science Seminar Series. Johns Hopkins University, MD, USA 02/2021 **Invited**
30. Potential Mechanisms and Implications of Choroidal Vascular Degeneration in AMD. Ryan Initiative for Macular Research (RIMR) Annual Meeting. Irvine, CA, USA 04/2021 **Invited**
31. How Might the Choriocapillaris Degenerate in Early AMD? Ryan Initiative for Macular Research (RIMR) Annual Meeting. Irvine, CA, USA 03/2022 **Invited**
32. Mechanical Regulation of Retinal Vascular Loss in Diabetic Retinopathy. Department of Ophthalmology – Bruins Vision Project. UCLA, CA, USA 02/2023 **Invited**
33. Learning the Hard Way: Uncovering the Role of Vascular Stiffness in Diabetic Retinopathy. Vision Research Seminar Program. University of Illinois at Chicago, IL, USA 04/2023 **Invited**
34. Mechanical Regulation of Retinal Vascular Inflammation and Degeneration in Diabetes. Center for Biotechnology and Genomic Medicine Seminar Series. Medical College of Georgia, Augusta University, GA, USA 09/2023 **Invited**

35. Leadership Through Difficult Times – Navigating Challenges in Research and Leadership: *Pivoting when study results are not as expected*. ARVO Advance e-Conference. 01/2024 **Invited**

36. Stiffening of Retinal Vessels Threatens Vision in Diabetes. 10<sup>th</sup> Annual Bench-to-Bedside Symposium, Gavin Herbert Eye Institute, UC Irvine, CA, USA 06/2024 **Invited**

37. Mechanobiology of Retinal Vascular Inflammation and Degeneration in Diabetes. Distinguished Speaker Series, Department of Ophthalmology, Visual and Anatomical Sciences, Wayne State University, MI, USA 10/2024 **Invited**

38. Stiffening of Retinal Vessels Threatens Vision in Diabetes. Vascular Biology 2024 – Annual Meeting of the North American Vascular Biology Organization, Monterey, CA, USA 10/2024

39. Role of Mechanobiology in Early Diabetic Retinopathy. Doheny Oculomics Symposium, Doheny Eye Institute, Pasadena, CA 11/2024 **Invited**

### Conference Abstracts

1. **Ghosh K**, Ren XD, Shu XZ, Prestwich GD, Clark RAF. Cellular response to functional fibronectin domains coupled to cross-linked hyaluronic acid backbone. BMES Annual Fall Meeting, Nashville, TN, USA 10/2003

2. **Ghosh K**, Shu XZ, Muralidhar S, Ge S, Fang X, Rafailovich M, Prestwich GD, Clark RAF. Mechanochemical transduction in cells seeded on fibronectin (FN)-conjugated hyaluronan matrix corresponds to FN functional domains and crosslinking density. Hyaluronan 2003, Cleveland, OH, USA 12/2003

3. **Ghosh K**, Shu XZ, Ge S, Fang X, Rafailovich M, Prestwich GD, Clark RAF. Effect of three distinct recombinant cell-binding domains of FN (rCDFN) and substrate crosslinking density on the morphology and dynamics of Human Dermal Fibroblast cells. American Physical Society March Meeting, Montreal, Canada 03/2004

4. Ge S, Sokolov JC, Rafailovich MH, **Ghosh K**, Clark RA. Local mechanical property and adhesion force mapping of living fibroblast cells using an atomic force microscope. American Physical Society March Meeting, Montreal, Canada 03/2004

5. Guan E, Muralidhar S, **Ghosh K**, Clark RA, Rafailovich M, Sokolov J. A novel approach to measure the forces exerted by cells on elastic substrates. American Physical Society March Meeting, Montreal, Canada 03/2004

6. **Ghosh K**, Ren X-D, Shu XZ, Prestwich GD, Clark RAF. Engineered extracellular matrix (engECM), composed of hyaluronan (HA) and recombinant fibronectin functional domains (rFNfd), promotes robust en masse migration of adult human dermal fibroblasts (AHDF) and *in vivo* wound repair. Tissue Engineering Society International (TESI) Fall Meeting, Lausanne, Switzerland 10/2004

7. **Ghosh K**, Guan E, Pan Z, Ren X-D, Liu Y, Ge S, Shu XZ, Nakamura T, Prestwich GD, Rafailovich M, Clark RAF: Cell adaptation to ECM: integrated response to viscoelastic properties and ligand arrays. Tissue Engineering Society International (TESI) Fall Meeting, Shanghai, China 10/2005

8. Pernodet N, Fields J, Slutsky L, **Ghosh K**, Bernheim T, Ge S, Rafailovich M. Single cancer cell detection. Materials Research Society (MRS) Fall Meeting, Boston, MA, USA 11/2005

9. **Ghosh K**, Mehra T, Shu XZ, Prestwich GD, Clark RAF. Crosslinked HA with PEG nanostents inhibits collagen gel contraction: a potential preventative towards burn contracture. Annual Meeting of the American Society for Cell Biology (ASCB), San Francisco, CA, USA 12/2005

10. **Ghosh K**, Guan E, Ren X-D, Ge S, Liu Y, Nakamura T, Rafailovich M, Clark RAF. Cell adaptation to substrate mechanics: implications in tissue repair. Gordon Research Conference on Signal Transduction by Engineered ECM, New London, CT, USA 07/2006
11. **Ghosh K**, Thodeti CK, Dudley AC, Mammoto A, Klagsbrun M, Ingber DE. Aberrant Rho-mediated mechanochemical control of tumor angiogenesis. Gordon Research Conference on Signal Transduction by Engineered ECM, Lewiston, ME, USA 07/2008
12. Yang X, Adini I, Ardekani S, Scott HA, **Ghosh K**. Differential MMP expression contributes to superior vasculogenic potential of endothelial progenitor cells. Gordon Research Conference on Signal Transduction by Engineered ECM, Biddeford, ME, USA 07/2012
13. Ardekani S, Scott H, Bradley J, Yang X, **Ghosh K**. In Situ microvascular normalization using site-targeting nanotherapeutics. Gordon Research Conference on Vascular Cell Biology, Ventura, CA, USA 01/2013
14. Scott H, Yang X, Tehseldar S, Ardekani S, Bradley J, **Ghosh K**. ECM-dependent micromechanical control of NO-mediated Inflammation. Gordon Research Conference on Vascular Cell Biology, Ventura, CA, USA 01/2013
15. **Ghosh K**, Scott H, Yang X, Ardekani S. Role of ECM stiffness in microvascular inflammation. Basic Cardiovascular Sciences Conference, American Heart Association, Las Vegas, USA 07/2013
16. Ardekani S, Scott H, Yang X, **Ghosh K**. Microvascular normalization properties of nitroglycerin nanotherapeutic: new use for an old drug. Vascular Biology 2013, North American Vascular Biology Organization (NAVBO), Hyannis, MA, USA 10/2013
17. Yang X, Scott H, Ardekani S, **Ghosh K**. Aberrant cell and basement membrane architecture contribute to sidestream smoke-induced choroidal endothelial dysfunction. 2014 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), Orlando, FL, USA 05/2014
18. Scott H, Yang X, Ardekani S, **Ghosh K**. Extracellular matrix stiffness exerts biphasic mechanochemical control of endothelial inflammation. North American Vascular Biology Organization (NAVBO) Conference on Cardiovascular Inflammation and Remodeling, New Haven, CT, USA 05/2014
19. Ardekani S, Gupta S, Eum S, Scott H, Yang X, Mohindeen U, **Ghosh K**. Novel nitroglycerin nanotherapeutic exhibits potent anti-inflammatory properties: implications for therapy without tolerance. North American Vascular Biology Organization (NAVBO) Conference on Cardiovascular Inflammation and Remodeling, New Haven, CT, USA 05/2014
20. Yang X, Scott H, Ardekani S, **Ghosh K**. Role of LOX-dependent matrix stiffening in diabetic retinal endothelial inflammation. AAAS 95th Annual Meeting Pacific Division, Riverside, CA, USA 06/2014
21. Scott H, Yang X, Ardekani S, **Ghosh K**. Role of matrix stiffness in the mechanochemical regulation of endothelial inflammation. AAAS 95th Annual Meeting Pacific Division, Riverside, CA, USA 06/2014
22. Ardekani S, Scott H, Gupta S, Eum S, Yang X, Mohindeen U, **Ghosh K**. Synthesis and characterization of novel nitroglycerin nanoformulation for superior anti-inflammatory therapy. AAAS 95th Annual Meeting Pacific Division, Riverside, CA, USA 06/2014
23. Yang X, Scott H, Xu J, Ardekani S, Cabrera A, Mohideen U, **Ghosh K**. Role of Matrix Stiffening in Retinal Endothelial Inflammation Associated with Diabetic Retinopathy. 2014 BMES Annual Fall Meeting, San Antonio, TX, USA 10/2014

24. Yang X, Scott H, Xu J, Ardekani S, Cabrera A, Mohideen U, **Ghosh K**. Lysyl Oxidase (LOX)-dependent matrix stiffening contributes to diabetic retinal endothelial inflammation. 2015 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), Denver, CO, USA 05/2015
25. Cabrera A, Bhaskaran A, Xu J, Yang X, Scott HA, Mohideen U, **Ghosh K**. Senescence-associated choroidal endothelial cell stiffening contributes to choriocapillaris dysfunction seen in AMD. 2015 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), Denver, CO, USA 05/2015
26. Yang X, Scott HA, Xu J, Ardekani S, Cabrera A, Mohideen U, **Ghosh K**. Loss of mechanosensitive TRPV4 in retinal endothelial cells contributes to inflammation in early diabetic retinopathy. NIH Conference- "Diabetic Retinopathy: A Global Epidemic". NIH/Association of Research in Vision and Ophthalmology (ARVO), Bethesda, MD, USA 08/2015
27. Scott HA, Yang X, Ardekani S, Quach B, Cabrera A, **Ghosh K**. Subendothelial matrix stiffening promotes chronic vascular inflammation via the Rho/TRPV4 axis. Vascular Biology 2015, North American Vascular Biology Organization (NAVBO), Hyannis, MA, USA 10/2015
28. Ardekani S, Eum S, Scott HA, Gupta S, Yang X, Brunelle AR, Wilson SM, Mohindeen U, **Ghosh K**. Site-targeting nitroglycerin nanotherapeutic for local immunosuppression without induction of tolerance. Scientific Sessions, American Heart Association (AHA), Orlando, FL, USA 11/2015
29. Yang X, Bhaskaran A, Scott HA, Ardekani S, Xu J, Mohideen U, Kern T, **Ghosh K**. Rho/ROCK-mediated retinal endothelial stiffening impairs TRPV4 signaling and promotes diabetic retinal inflammation. 2016 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), Seattle, WA, USA, 05/2016
30. **Ghosh K**, Yang X, Bhaskaran A, Das A, Kern T. Molecular mechanisms underlying the mechanical control of retinal endothelial activation associated with diabetes. 2016 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), Seattle, WA, USA 05/2016
31. Scott HA, Reddy MA, Natarajan R, **Ghosh K**. miR-203a promotes vascular inflammation via inhibition of mechanosensitive TRPV4. International Vascular Biology Meeting, North American Vascular Biology Organization (NAVBO), Boston, MA, USA 11/2016
32. Cabrera A, Yang X, Bhaskaran A, **Ghosh K**. Role of activated monocytes in lysyl oxidase-mediated retinal vascular stiffening and inflammation associated with diabetes. 2017 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), Baltimore, MD, USA 05/2017
33. Cabrera A, Stoddard J, Neuringer M, McGill T, **Ghosh K**. Role of endothelial cell stiffening in choriocapillaris atrophy associated with dry AMD. 2018 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), Honolulu, HI, USA 05/2018
34. Santiago Tierno I, Chandrakumar S, Liu H, Lessieur EM, Du Y, Kern TS, **Ghosh K**. Lysyl oxidase inhibition prevents inflammation-dependent retinal vascular atrophy in early diabetic retinopathy. 2020 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), Baltimore, MD, USA 05/2020
35. Chandrakumar S, Santiago Tierno I, **Ghosh K**. Lysyl oxidase-mediated subendothelial matrix stiffening contributes to advanced glycation end products-dependent retinal endothelial activation associated with diabetic retinopathy. 2020 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), Baltimore, MD, USA 05/2020
36. **Ghosh K**, Santiago Tierno I, Tavva V, Palegar N. ICAM-1-targeting red blood cell-derived nanoparticles for local suppression of retinal vascular inflammation in diabetes. 2020 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), Baltimore, MD, USA 05/2020

37. Santiago Tierno I, Chandrakumar S, Liu H, Lessieur EM, Du Y, Kern TS, **Ghosh K**. Retinal vascular stiffness as a key mediator of retinal vascular pathology associated with diabetes. 21<sup>st</sup> International Vascular Biology Meeting (IVBM) 2020, South Korea, 09/2020
38. Chandrakumar S, Santiago Tierno I, Matisioudis N, Agarwal M, **Ghosh K**. Mechanical control of AGE/RAGE signaling in retinal vascular inflammation. 2021 Association for Research in Vision and Ophthalmology (ARVO) Virtual Meeting, 05/2021
39. Chandrakumar S, Santiago Tierno I, Agarwal M, Lessieur E, Liu H, Kern TS, **Ghosh K**. Retinal vascular stiffening contributes to leukocyte-mediated endothelial apoptosis in diabetes. 2022 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), Denver, CO, USA 04/2022
40. Santiago Tierno I, Chandrakumar S, Agarwal M, **Ghosh K**. Impaired neovascularization by choroidal endothelial cells from a monkey model of early age-related macular degeneration. 2022 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), Denver, CO, USA 04/2022
41. Agarwal M, Chandrakumar S, Santiago Tierno I, **Ghosh K**. Role of cytoskeletal dynamics in neutrophil activation and cytotoxicity toward retinal endothelial cells in early diabetic retinopathy. 2022 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), Denver, CO, USA 04/2022
42. Santiago Tierno I, Agarwal M, Chandrakumar S, Chanda A, **Ghosh K**. Choroidal endothelial cells in age-related macular degeneration exhibit impaired neovascularization and altered mechanotransduction. 2022 Gordon Research Conference (GRC) on Endothelial Cell Phenotypes in Health and Disease, Barcelona, Spain 07/2022
43. Chandrakumar S, Agarwal M, Santiago Tierno I, **Ghosh K**. Lysyl oxidase mediates VEGF- and TNF- $\alpha$ -induced retinal endothelial activation. 2023 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), New Orleans, LA, USA 04/2023
44. Agarwal M, Chandrakumar S, Santiago Tierno I, Chanda A, Lessieur E, Kern TS, **Ghosh K**. Lysyl oxidase promotes neutrophil cytotoxicity towards retinal endothelial cells in diabetes. 2023 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), New Orleans, LA, USA 04/2023
45. Santiago Tierno I, Chandrakumar S, Agarwal M, **Ghosh K**. Mechanobiology of vascular dysfunction in early age-related macular degeneration. Vascular Biology 2023, Newport, RI, USA 10/2023
46. Chandrakumar S, Santiago Tierno I, Agarwal M, **Ghosh K**. Mechanical regulation of retinal vascular inflammation and degeneration in diabetes. Vascular Biology 2023, Newport, RI, USA 10/2023
47. Agarwal M, Chandrakumar S, Santiago Tierno I, Lessieur E, Kern TS, **Ghosh K**. Actin remodeling governs neutrophil activation: Implications for retinal capillary degeneration in diabetic retinopathy. 2024 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), Seattle, WA, USA 05/2024
48. Chandrakumar S, Yang X, Agarwal M, Santiago Tierno I, Kern TS, **Ghosh K**. Activation of mechanosensitive TRPV4 channel inhibits retinal vascular inflammation in diabetes. 2024 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), Seattle, WA, USA 05/2024
49. Santiago Tierno I, Agarwal M, Chandrakumar S, **Ghosh K**. Abnormal subendothelial matrix exacerbates choroidal endothelial cell death in early age-related macular degeneration. 2024 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), Seattle, WA, USA 05/2024
50. Santiago Tierno I, Chandrakumar S, Agarwal M, **Ghosh K**. Subendothelial matrix stiffening: A novel regulator of choroidal endothelial cell death in early age-related macular degeneration. Vascular Biology

**RESEARCH MENTORSHIP**• **UCLA/Doheny Eye Institute****Junior Faculty**

1. Sadhan Das, Ph.D. 07/2020 -  
 Govt. of India DBT/Wellcome Trust India Alliance Intermediate Fellow  
 Assistant Professor of Biological Sciences  
 Indian Institute of Science Education and Research (IISER), Mohali, India  
*Research Project:* Mechanistic insights into epigenetic layers involved in impaired wound healing and cardiovascular diseases in diabetes

**Postdoctoral Fellows**

2. Mahesh Agarwal, Ph.D. 01/2021 –  
*Research Project:* Role of leukocyte mechanics in diabetic retinopathy  
*Honors:* 2024 Doheny ARVO Poster Presentation Award

3. Sathishkumar Chandrakumar, Ph.D. 11/2019 –  
*Research Project:* Role and regulation of lysyl oxidase (LOX) in the mechanical control of diabetic retinopathy  
*Honors:* Travel award at the 2021 Association for Research in Vision and Ophthalmology (ARVO) Annual Virtual Meeting, 2023 Doheny ARVO Poster Presentation Award

**Doctoral Students: Dissertation Supervision**

4. Irene Santiago, M.S. - MCIP Interdepartmental PhD Program 01/2020 –  
*PhD Thesis Title:* Mechanical regulation of choroidal endothelial cell dysfunction in early AMD  
*Honors:* 2020, 2021 Ursula Mandel Fellowship, 2020-21 Graduate Council Diversity Fellowship, E-poster award at the 2020 International Vascular Biology Meeting (South Korea), 2024 Doheny ARVO Oral Presentation Award

**Undergraduate Student**

5. Annie Hu, California Institute of Technology, Pasadena 02/2024 – 08/2024  
*Research Project:* Mechanobiology of choroidal endothelial death and repair response in early AMD

**Research Fellow**

6. Nikolaos Matisioudis, M.S. 07/2020 – 07/2021  
*Research Project:* Measuring cell and matrix mechanostuctural properties using atomic force microscope

**Research Intern**

7. Zehra Rizvi, M.D. Candidate, California University of Science and Medicine 10/2024 –  
*Research Project:* Mechanical regulation of retinal EC-Muller cell crosstalk in early diabetic retinopathy

8. Adrita Chanda, Undergraduate Student, Vellore Institute of Technology, India 03/2022 – 07/2022  
*Research Project:* Role of neutrophils in lysyl oxidase-mediated retinal vascular stiffening in diabetes

• **UC Riverside****Postdoctoral Fellows**

1. Sathishkumar Chandrakumar, Ph.D. 11/2018 – 10/2019  
*Research Project:* Role and regulation of lysyl oxidase (LOX) in diabetic retinopathy

2. Raja Veerapandian, Ph.D. 11/2017 – 05/2018  
*Research Project:* Role of capillary stiffening in diabetic retinopathy

**Doctoral Students: Dissertation Supervision**

3. Andrea Cabrera, Ph.D. Student in Bioengineering 09/2015 – 07/2018

Kaustabh Ghosh, Ph.D.

*PhD Thesis Title:* Role of endothelial cell stiffening in choriocapillaris atrophy associated with dry AMD

*Honors:* 2017 UCR GRMP Fellowship, National Academies Ford Foundation Fellowship Honorable Mention

*Current Position:* Research Scientist, Johnson & Johnson

4. Xiao Yang, Ph.D. Student in Bioengineering 09/2011-03/2016

*PhD Thesis Title:* Mechanical control of retinal vascular inflammation in diabetes

*Honors:* ARVO Travel Scholarship, 1<sup>st</sup> Place Award in Oral Presentation, 2014 Annual Meeting of AAAS Pacific Division

*Current Position:* Scientist, AdvanBio

5. Harry A. Scott, Ph.D. Student in Bioengineering 09/2011-09/2016

*PhD Thesis Title:* Role of subendothelial matrix stiffness and mechanotransduction in chronic vascular inflammation

*Honors:* 2014 UCR GRMP Fellowship, 3<sup>rd</sup> Place Award in Oral Presentation, 2014 Annual Meeting of AAAS Pacific Division

*Current Position:* Senior Scientist, Kestrel Biosciences

6. Soroush Ardekani, Ph.D. Student in Bioengineering 09/2011-03/2016

*PhD Thesis Title:* Site-targeting nanotherapeutic for suppression of vascular inflammation

*Honors:* 2015 UCR GRMP Fellowship, 2<sup>nd</sup> Place Award in Oral Presentation, 2014 Annual Meeting of AAAS Pacific Division

*Current Position:* Formulation Scientist and Manager, Pacira Biosciences

### **Masters Students: Thesis Supervision**

7. Neha Palegar, MS Student in Bioengineering 04/2017 – 06/2018

*MS Thesis Title:* Design optimization and characterization of ICAM-1-targeting nanotherapeutics

*Current Position:* Senior QA Scientist, Schrodinger

### **Masters Students: Non-Thesis Supervision**

8. Irene Santiago, M.S. Student in Bioengineering 07/2018 – 10/2019

*Current Position:* PhD Student, MCIP Interdepartmental PhD Program, UCLA

9. Aakash Saha, MS Student in Bioengineering 09/2018-11/2019

*Current Position:* PhD Student, UC Riverside

10. Arun Bhaskaran, MS Student in Bioengineering 09/2014-03/2016

*Current Position:* Senior Engineer-Consultant, Edwards Lifesciences

11. Shane Eum, MS Student in Bioengineering 09/2015-06/2016

*Honors:* 2014 HSI Undergraduate Research Fellowship, 2015 UCR Undergraduate Research Journal

*Current Position:* Systems Engineer-Operations, BrightInsigh

### **International Undergraduate Exchange Students**

1. Manuel Charro, Universidad Europea – Madrid, Spain 04/2015-06/2015

2. Irene Santiago Tierno, Universidad Europea – Madrid, Spain 03/2017-06/2018

### **Undergraduate Students**

1. Shane Eum, B.S. Student in Bioengineering 12/2011-06/2015

2. Stephanie Tehseldar, B.S. Student in Bioengineering 09/2011-06/2013

3. Jonathan Bradley, Undergraduate CIRM Research Intern, CSU-SB 04/2012-09/2013

4. Miguel Quispe, B.S. Student in Biomedical Sciences 01/2013-07/2013

5. Faiz Mirza, B.S. Student in Bioengineering 05/2013-10/2013

6. Arun Bhaskaran, B.S. Student in Bioengineering 10/2013-07/2014

7. Boi Quach, B.S. Student in Bioengineering 01/2014-06/2016

8. Bilal Abu-Seraj, B.S. Student in Chemical Engineering 04/2016-06/2017

9. Timothy Yadegar, B.S. Student in Bioengineering 07/2015-08/2017

10. Venkatesh Tavva, B.S. Student in Bioengineering 07/2017-10/2019

11. Justin Yan, B.S. Student in Biology 01/2018-10/2019

12. Victoria Guardado, B.S. Student in Bioengineering 07/2018-10/2019

13. Sedra Tibi, B.S. Student in Biology 07/2018-10/2019

Kaustabh Ghosh, Ph.D.

### **Undergraduate Senior Design Group Supervision**

1. BIEN175-Brianna Magallanes, Dipti Patel, Frances Laceste, Nilam Patel, Ana Gall  
11/2018-06/2019
2. BIEN175-Ulises Perez, Vivian Luong, Kusal Chokshi, Sharon Gupta  
11/2017-06/2018
3. BIEN175-Mohammad Ibrahim, Ramsey Batarsey, Michael Khalil, Damian Fonseca Suchilt  
01/2018-06/2018
4. BIEN175-Cassandra Turgman, Alan Wong, Christopher Vargas, Lorene Chan  
12/2012-06/2013
5. BIEN175-Trevor Christiansen, Anh Vu, Kymbhat Aizharkyn, Stephen Nguyen, Kelly Ustariz  
10/2014-06/2015

### **Visiting Researcher/Scholar Advising**

1. Ashwin Gopalan, M.D., Resident Intern in Internal Medicine, Loma Linda Medical Center  
03/2014-07/2015
2. Irit Adini, Ph.D., Instructor, Boston Children's Hospital and Harvard Medical School  
11/2014-03/2017

### **TEACHING EXPERIENCE**

- [UCLA](#)

#### **Instructor**

- MCIP 262 – Molecular Mechanisms of Human Diseases; Block II topic on “Vascular Mechanobiology in Health and Disease”, *Winter 2021, 2022, 2023, 2024*
- MCIP 290B – Graduate Tutorial in Biophysics, *Fall 2020*
- MCIP 296 – Graduate Seminar, *Fall 2020-2023, Winter & Spring 2021-2024*
- MCIP 599 – Research Dissertation, *Fall 2022, 2023, Winter & Spring 2023, 2024*

#### **Discussion Leader**

- MIMG C234 – Ethics and Accountability in Biomedical Research, *Spring 2020, 2021, 2022, 2023, 2024*

#### **Lecturer**

- Stein Eye Institute Distinguished Lecture Series, Vision Science Training Grant, *Fall 2019*

- [UC Riverside](#)

#### **Instructor**

##### Undergraduate Courses

- BIEN 138 – Fundamental Principles of Wound Repair; *Winter 2013-14, Fall 2014-18, Spring 2019*
- BIEN 120 – Biosystems and Signal Analysis; *Spring 2012-17*

##### Graduate Courses

- BIEN 235 – Vascular Biomechanics and Engineering; *Fall 2013, Winter 2015-19*

#### **Co-Instructor**

##### Graduate Courses

- CMDB 207 – Stem Cell Biology and Disease; *Spring Quarter 2013-19*

#### **Courses Developed**

- BIEN 138 – Fundamental Principles of Wound Repair; Undergraduate technical elective
- BIEN 235 - Vascular Biomechanics and Engineering; Graduate technical elective
- BIEN 274 – Special Topics in Endothelial Biomedicine; Graduate seminar/discussion

- [Stony Brook University](#)

#### **Undergraduate Teaching Assistant**, SUNY at Stony Brook

- BIO 325 – Animal Development; *Fall Semester 2001*
- BIO 203 – Biology laboratory for Cellular and Organ Physiology; *Spring Semester 2002*
- BME 404 – Laboratory Course on Tissue Engineering; *Spring Semester 2004-06*



**DISSERTATION OR QUALIFYING EXAM COMMITTEE MEMBERSHIP**• **UCLA****Dissertation Committee**

- |                                                                               |          |
|-------------------------------------------------------------------------------|----------|
| 1. Irene Santiago Tierno, Ph.D. Student in MCIP Interdepartmental PhD Program | 01/2020- |
|-------------------------------------------------------------------------------|----------|

**Written Qualifying Exam Committee**

- |                                                                       |                 |
|-----------------------------------------------------------------------|-----------------|
| 1. Noelle Morrow, Ph.D. Student in MCIP Interdepartmental PhD Program | 12/2023-05/2024 |
|-----------------------------------------------------------------------|-----------------|

• **UC Riverside****Dissertation Committee***DOCTORAL*

- |                                                              |                 |
|--------------------------------------------------------------|-----------------|
| 1. Soroush Ardekani, Ph.D. Student in Bioengineering         | 09/2011-03/2016 |
| 2. Xiao Yang, Ph.D. Student in Bioengineering                | 09/2011-03/2016 |
| 3. Harry Scott, Ph.D. Student in Bioengineering              | 09/2011-09/2016 |
| 4. Andrea Cabrera, Ph.D. Student in Bioengineering           | 09/2015-09/2018 |
| 5. Maricela Maldonado, Ph.D. Student in Bioengineering       | 04/2015-08/2016 |
| 6. Dianira Erudaitius, Ph.D. Student in Bioengineering       | 07/2015-08/2017 |
| 7. Jacob Vasquez, Ph.D. Student in Bioengineering            | 12/2016-12/2016 |
| 8. Arjang Salehi, Ph.D. Student in Cell, Mol and Dev Biology | 09/2015-05/2019 |
| 9. Nehemiah Zewde, Ph.D. Student in Bioengineering           | 05/2016-07/2019 |

*MASTERS*

- |                                                       |                 |
|-------------------------------------------------------|-----------------|
| 10. He Qu, M.S. Student in Bioengineering             | 06/2013-12/2013 |
| 11. Ryan Peck, M.S. Student in Mechanical Engineering | 09/2014-05/2015 |
| 12. Neha Palegar, M.S. Student in Bioengineering      | 04/2017-06/2018 |

**Oral Qualifying Exam Committee**

- |                                                                                 |         |
|---------------------------------------------------------------------------------|---------|
| 1. Hilda Wiryawan, Ph.D. Student in Biomedical Sciences                         | 06/2012 |
| 2. Vasundhra Bahl, Ph.D. Student in Environmental Toxicology Grad Program       | 06/2012 |
| 3. Melissa Eberle, Ph.D. Student in Bioengineering                              | 09/2012 |
| 4. Noriko Ozaki, Ph.D. Student in Bioengineering                                | 06/2013 |
| 5. Zied Gaib, Ph.D. Student in Bioengineering                                   | 06/2013 |
| 6. Michael Yee, Ph.D. Student in Biomedical Sciences                            | 05/2014 |
| 7. Soroush Ardekani, Ph.D. Student in Bioengineering                            | 07/2014 |
| 8. Harry Scott, Ph.D. Student in Bioengineering                                 | 08/2014 |
| 9. Xiao Yang, Ph.D. Student in Bioengineering                                   | 08/2014 |
| 10. Jillian Larsen, Ph.D. Student in Bioengineering                             | 12/2014 |
| 11. Luis Jimenez, Ph.D. Student in Biomedical Sciences                          | 04/2015 |
| 12. Maricela Maldonado, Ph.D. Student in Bioengineering                         | 04/2015 |
| 13. Reed Harrison, Ph.D. Student in Bioengineering                              | 05/2015 |
| 14. Rohith Mohan, Ph.D. Student in Bioengineering                               | 06/2015 |
| 15. Dianira Erudaitius, Ph.D. Student in Bioengineering                         | 07/2015 |
| 16. Anica Soyac, Ph.D. Student in Biomedical Sciences                           | 04/2016 |
| 17. Ryan Peck, Ph.D. Student in Mechanical Engineering                          | 04/2016 |
| 18. Samantha Corber, Ph.D. Student in Mechanical Engineering                    | 04/2016 |
| 19. Nehemiah Zewde, Ph.D. Student in Bioengineering                             | 05/2016 |
| 20. Stephanie King, Ph.D. Student in Biomedical Sciences                        | 09/2016 |
| 21. Patrick Shelar, Ph.D. Student in Cell, Molecular, and Developmental Biology | 03/2017 |
| 22. Arjang Salehi, Ph.D. Student in Cell, Molecular, and Developmental Biology  | 04/2017 |
| 23. Joseph Cheeney, Ph.D. Student in Materials Science and Engineering          | 01/2018 |
| 24. Brent Adkins, Ph.D. Student in Chemistry                                    | 06/2018 |